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Control of Emissions From Nonroad Spark-Ignition Engines and Equipment; Final Rule

ENVIRONMENTAL PROTECTION AGENCY

40 CFR Parts 9, 60, 80, 85, 86, 89, 90, 91, 92, 94, 1027, 1033, 1039, 1042, 1045, 1048, 1051, 1054, 1060, 1065, 1068, and 1074

[EPA–HQ–OAR–2004–0008; FRL–8712–8]

RIN 2060–AM34

Control of Emissions From Nonroad Spark-Ignition Engines and Equipment

AGENCY: Environmental Protection Agency (EPA).

ACTION: Final rule.

SUMMARY: We are setting emission standards for new nonroad spark-ignition engines that will substantially reduce emissions from these engines. The exhaust emission standards apply starting in 2010 for new marine spark-ignition engines, including first-time EPA standards for sterndrive and inboard engines. The exhaust emission standards apply starting in 2011 and 2012 for different sizes of new land-based, spark-ignition engines at or below 19 kilowatts (kW). These small engines are used primarily in lawn and garden applications. We are also adopting evaporative emission standards for vessels and equipment using any of these engines. In addition, we are making other minor amendments to our regulations.

We estimate that by 2030, this rule will result in significantly reduced pollutant emissions from regulated engine and equipment sources, including estimated annual nationwide reductions of 604,000 tons of volatile organic hydrocarbon emissions, 132,200 tons of NO_X emissions, and 5,500 tons of directly-emitted particulate matter ($PM_{2.5}$) emissions. These reductions correspond to significant reductions in the formation of ground-level ozone. We also expect to see annual reductions of 1,461,000 tons of carbon monoxide emissions, with the greatest reductions in areas where there have been problems with individual exposures. The requirements in this rule will substantially benefit public health and welfare and the environment. We estimate that by 2030, on an annual basis, these emission reductions will prevent 230 PM-related premature deaths, between 77 and 350 ozone-related premature deaths, approximately 1,700 hospitalizations and emergency room visits, 23,000 work days lost, 180,000 lost school days, 590,000 acute respiratory symptoms, and other quantifiable benefits every year. The total annual benefits of this rule in 2030 are estimated to be between \$1.8 billion and \$4.4 billion, assuming a 3% discount rate. The total annual benefits of this rule in 2030 are estimated to be between \$1.6 billion and \$4.3 billion, assuming a 7% discount rate. Estimated costs in 2030 are many times less at approximately \$190 million.

DATES: This rule is effective on December 8, 2008. The incorporation by reference of certain publications listed in this regulation is approved by the Director of the Federal Register as of December 8, 2008.

ADDRESSES:

Docket: All documents in the docket are listed in the *www.regulations.gov* index. Although listed in the index, some information is not publicly available, such as CBI or other information whose disclosure is restricted by statute. Certain other material, such as copyrighted material, will be publicly available only in hard copy. Publicly available docket materials are available either electronically in *www.regulations.gov* or in hard copy at the ''Control of Emissions from Nonroad Spark-Ignition Engines, Vessels and Equipment'' Docket. The docket is located in the EPA Headquarters Library, Room Number 3334 in the EPA West Building, located at 1301 Constitution Ave., NW., Washington, DC. The EPA/DC Public Reading Room hours of operation will be 8:30 a.m. to 4:30 p.m. Eastern Standard Time (EST), Monday through Friday, excluding holidays. The telephone number for the Public Reading Room is (202) 566–1744 and the telephone number for the Docket is (202) 566–1742.

FOR FURTHER INFORMATION CONTACT:
Carol Connell, Environmental Protection Agency, Office of Transportation and Air Quality, Assessment and Standards Division, 2000 Traverwood Drive, Ann Arbor, Michigan 48105; telephone number: 734–214–4349; fax number: 734–214–4050; e-mail address: *connell.carol@epa.gov*.

SUPPLEMENTARY INFORMATION:

Does This Action Apply to Me?

This action will affect you if you produce or import new spark-ignition engines intended for use in marine vessels or in new vessels using such engines. This action will also affect you if you produce or import new spark-ignition engines below 19 kilowatts used in nonroad equipment, including agricultural and construction equipment, or produce or import such nonroad vehicles.

The following table gives some examples of entities that may have to follow the regulations; however, since these are only examples, you should carefully examine the regulations. Note that we are adopting minor changes in the regulations that apply to a wide range of products that may not be reflected in the following table (see Section VIII). If you have questions, call the person listed in the **FOR FURTHER INFORMATION CONTACT** section above:

Category	NAICS codes [a]	SIC codes [b]	Examples of potentially regulated entities
Industry	333618	3519	Manufacturers of new engines.
Industry	333111	3523	Manufacturers of farm machinery and equipment.
Industry	333112	3524	Manufacturers of lawn and garden tractors (home).
Industry	336612	3731 3732	Manufacturers of marine vessels.
Industry	811112 811198	7533 7549	Commercial importers of vehicles and vehicle components.

[a] North American Industry Classification System (NAICS).
[b] Standard Industrial Classification (SIC) system code.

Table of Contents

I. Introduction

A. Overview

This rule will reduce the mobile-source contribution to air pollution in the United States. In particular, we are adopting standards that will require manufacturers to substantially reduce emissions from marine spark-ignition engines and from nonroad spark-ignition engines below 19 kW that are generally used in lawn and garden applications.[1] We refer to these as Marine SI engines and Small SI engines, respectively. The new emission standards are a continuation of the process of establishing standards for nonroad engines and vehicles as required by Clean Air Act section 213. All the nonroad engines subject to this rule are already regulated under existing emission standards, except sterndrive and inboard marine engines, which are subject to EPA emission standards for the first time.

Nationwide, emissions from Marine SI engines and Small SI engines contribute significantly to mobile source air pollution. By 2030 without this final rule these engines would account for about 33 percent (1,287,000 tons) of mobile source volatile organic hydrocarbon compounds (VOC) emissions, 31 percent (15,605,000 tons) of mobile source carbon monoxide (CO) emissions, 6 percent (311,300 tons) of mobile source oxides of nitrogen (NO_X) emissions, and 12 percent (44,000 tons) of mobile source particulate matter ($PM_{2.5}$) emissions. The new standards will reduce exposure to these emissions and help avoid a range of adverse health effects associated with ambient ozone, CO, and PM levels. In addition, the new standards will help reduce acute exposure to CO, air toxics, and PM for persons who operate or who work with or are otherwise active in close proximity to these engines. They will also help address environmental problems associated with Marine SI engines and Small SI engines, such as injury to vegetation and ecosystems and visibility impairment. These effects are described in more detail later in this document.

B. Why Is EPA Taking This Action?

Clean Air Act section 213(a)(1) directs us to study emissions from nonroad engines and vehicles to determine, among other things, whether these emissions ''cause, or significantly contribute to, air pollution which may reasonably be anticipated to endanger public health or welfare.'' Section 213(a)(2) further requires us to determine whether emissions of CO, VOC, and NO_X from all nonroad engines significantly contribute to ozone or CO concentrations in more than one nonattainment area. If we determine that emissions from all nonroad engines do contribute significantly to these nonattainment areas, section 213(a)(3) then requires us to establish emission standards for classes or categories of new nonroad engines and vehicles that cause or contribute to such pollution. We may also set emission standards under section 213(a)(4) regulating any other emissions from nonroad engines that we find contribute significantly to air pollution which may reasonably be anticipated to endanger public health or welfare.

Specific statutory direction to set standards for nonroad spark-ignition engines comes from section 428(b) of the 2004 Consolidated Appropriations Act, which requires EPA to adopt regulations under the Clean Air Act ''that shall contain standards to reduce emissions from new nonroad spark-ignition engines smaller than 50 horsepower.''[2] As highlighted above and more fully described in Section II, these engines emit pollutants that contribute to ground-level ozone and ambient CO levels. Human exposure to ozone and CO can cause serious respiratory and cardiovascular problems. Additionally, these emissions contribute to other serious environmental degradation. This rule implements Congress' mandate by adopting new requirements for particular nonroad engines and equipment that are regulated as part of

[1] Otto-cycle engines (referred to here as spark-ignition or SI engines) typically operate on gasoline, liquefied petroleum gas, or natural gas. Diesel-cycle engines, referred to simply as ''diesel engines'' in this document, may also be referred to as compression-ignition or CI engines. These engines typically operate on diesel fuel, but other fuels may also be used.

[2] Public Law 108–199, Div G, Title IV, § 428(b), 118 Stat. 418 (January 23, 2004).

EPA's overall nonroad emission control program.

We are adopting this rule under the procedural authority of section 307(d) of the Clean Air Act.

C. What Regulations Currently Apply to Nonroad Engines or Vehicles?

EPA has been setting emission standards for nonroad engines and/or vehicles since Congress amended the Clean Air Act in 1990 and included section 213. These amendments have led to a series of rulemakings to reduce the air pollution from this widely varying set of products. In these rulemakings, we divided the broad group of nonroad engines and vehicles into several different categories for setting application-specific requirements. Each category involves many unique characteristics related to the participating manufacturers, technology, operating characteristics, sales volumes, and market dynamics. Requirements for each category therefore take on many unique features regarding the stringency of standards, the underlying expectations regarding emission control technologies, the nature and extent of testing, and the myriad details that comprise the implementation of a compliance program.

At the same time, the requirements and other regulatory provisions for each engine category share many characteristics. Each rulemaking under section 213 sets technology-based standards consistent with the Clean Air Act and requires annual certification based on measured emission levels from test engines or vehicles. As a result, the broader context of EPA's nonroad emission control programs demonstrates both strong similarities between this rulemaking and the requirements adopted for other types of engines or vehicles and distinct differences as we take into account the unique nature of these engines and the companies that produce them.

We completed the *Nonroad Engine and Vehicle Emission Study* to satisfy Clean Air Act section 213(a)(1) in November 1991.[3] On June 17, 1994, we made an affirmative determination under section 213(a)(2) that nonroad emissions are significant contributors to ozone or CO in more than one nonattainment area (56 FR 31306). Since then we have undertaken several rulemakings to set emission standards for the various categories of nonroad engines. Table I–1 highlights the different engine or vehicle categories we have established and the corresponding cites for emission standards and other regulatory requirements. Table I–2 summarizes the series of EPA rulemakings that have set new or revised emission standards for any of these nonroad engines or vehicles. These actions are described in the following sections, with additional discussion to explain why we are not adopting more stringent standards for certain types of nonroad spark-ignition engines below 50 horsepower.

TABLE I–1: NONROAD ENGINE CATEGORIES FOR EPA EMISSION STANDARDS

Engine categories	CFR Cite for regulations establishing emission standards	Cross reference to table I–2
1. Locomotives engines	40 CFR Part 92 and 1033	d, l.
2. Marine diesel engines	40 CFR Part 94 and 1042	g, i, j, l.
3. Other nonroad diesel engines	40 CFR Parts 89 and 1039	a, e, k.
4. Marine SI engines [a]	40 CFR Part 91	c.
5. Recreational vehicles	40 CFR Part 1051	i.
6. Small SI engines [b]	40 CFR Part 90	b, f, h.
7. Large SI engines [b]	40 CFR Part 1048	i.

[a] The term "Marine SI," used throughout this document, refers to all spark-ignition engines used to propel marine vessels. This includes outboard engines, personal watercraft engines, and sterndrive/inboard engines. See Section III for additional information.

[b] The terms "Small SI" and "Large SI" are used throughout this document. All nonroad spark-ignition engines not covered by our programs for Marine SI engines or recreational vehicles are either Small SI engines or Large SI engines. Small SI engines include those engines with maximum power at or below 19 kW, and Large SI engines include engines with maximum power above 19 kW.

TABLE I–2: EPA'S RULEMAKINGS FOR NONROAD ENGINES

Nonroad engines (categories and sub-categories)	Final rulemaking	Date
a. Land-based diesel engines ≥ 37 kW—Tier 1	56 FR 31306	June 17, 1994.
b. Small SI engines—Phase 1	60 FR 34581	July 3, 1995.
c. Marine SI engines—outboard and personal watercraft	61 FR 52088	October 4, 1996.
d. Locomotives	63 FR 18978	April 16, 1998.
e. Land-based diesel engines—Tier 1 and Tier 2 for engines < 37 kW—Tier 2 and Tier 3 for engines ≥ 37 kW.	63 FR 56968	October 23, 1998.
f. Small SI engines (Nonhandheld)—Phase 2	64 FR 15208	March 30, 1999.
g. Commercial marine diesel < 30 liters per cylinder	64 FR 73300	December 29, 1999.
h. Small SI engines (Handheld)—Phase 2	65 FR 24268	April 25, 2000.
i. Recreational vehicles, Industrial spark-ignition engines > 19 kW, and Recreational marine diesel.	67 FR 68242	November 8, 2002.
j. Marine diesel engines ≥ 2.5 liters/cylinder	68 FR 9746	February 28, 2003.
k. Land-based diesel engines—Tier 4	69 FR 38958	June 29, 2004.
l. Locomotives and commercial marine diesel < 30 liters per cylinder	73 FR 37096	June 30, 2008.

[3] This study is available on EPA's Web site at *http://www.epa.gov/otaq/equip-ld*.

Small SI Engines

We have previously adopted emission standards for nonroad spark-ignition engines at or below 19 kW in two phases. The first phase of these standards introduced certification and an initial level of emission standards for both handheld and nonhandheld engines. On March 30, 1999 we adopted a second phase of standards for nonhandheld engines, including both Class I and Class II engines (64 FR 15208).[4] The Phase 2 regulations included a phase-in period that has recently been completed. These standards involved emission reductions based on improving engine calibrations to reduce exhaust emissions and added a requirement that emission standards must be met over the engines' entire useful life as defined in the regulations. We believe catalyst technology has now developed to the point that it can be applied to all nonhandheld Small SI engines to reduce exhaust emissions. Various emission control technologies are similarly available to address the different types of fuel evaporative emissions we have identified.

For handheld engines, we adopted Phase 2 exhaust emission standards in April 25, 2000 (65 FR 24268). These standards were based on the application of catalyst technology, with the expectation that manufacturers would have to make considerable investments to modify their engine designs and production processes. A technology review we completed in 2003 indicated that manufacturers were making progress toward compliance, but that additional implementation flexibility was needed if manufacturers were to fully comply with the regulations by 2010. This finding and a change in the rule were published in the **Federal Register** on January 12, 2004 (69 FR 1824). At this point, we have no information to suggest that manufacturers can uniformly apply new technology or make design improvements to reduce exhaust emissions below the Phase 2 levels. We therefore believe the Phase 2 standards continue to represent the greatest degree of emission reduction achievable for these engines.[5] However, we believe it is appropriate to apply evaporative emission standards to handheld engines similar to the standards we are adopting for the nonhandheld engines. Manufacturers can control evaporative emissions from handheld engines in a way that has little or no impact on exhaust emissions.

Marine SI Engines

On October 4, 1996 we adopted emission standards for spark-ignition outboard and personal watercraft engines that have recently been fully phased in (61 FR 52088). We decided not to finalize emission standards for sterndrive or inboard marine engines at that time. Uncontrolled emission levels from sterndrive and inboard marine engines were already significantly lower than the outboard and personal watercraft engines. We did, however, leave open the possibility of revisiting the need for emission standards for sterndrive and inboard engines in the future. See Section III for further discussion of the scope and background of past and current rulemakings for these engines.

We believe existing technology can be applied to all Marine SI engines to reduce emissions of harmful pollutants, including both exhaust and evaporative emissions. Manufacturers of outboard and personal watercraft engines can continue the trend of producing four-stroke engines and advanced-technology two-stroke engines to further reduce emissions. For sterndrive/inboard engines, manufacturers can add technologies, such as fuel injection and aftertreatment, that can safely and substantially improve the engines' emission control capabilities.

Large SI Engines

We adopted emission standards for Large SI engines on November 8, 2002 (67 FR 68242). This includes Tier 1 standards for 2004 through 2006 model years and Tier 2 standards starting with 2007 model year engines. Manufacturers are today facing a considerable challenge to comply with the Tier 2 standards, which are already substantially more stringent than any of the standards for the other engine categories subject to this final rule. The Tier 2 standards also include evaporative emission standards, new transient test procedures, additional exhaust emission standards to address off-cycle emissions, and diagnostic requirements. Stringent standards for this category of engines, and in particular engines between 25 and 50 horsepower (19 to 37 kW), have been completed in the recent past, and are currently being implemented. We do not have information at this time on possible advances in technology beyond Tier 2. We therefore believe the evidence provided in the recently promulgated rulemaking continues to represent the best available information regarding the appropriate level of standards for these engines under section 213 at this time. The California Air Resources Board has adopted an additional level of emission control for Large SI engines starting with the 2010 model year. However, as described in Section I.D.1, their new standards do not increase overall stringency beyond that reflected in the federal standards. As a result, we believe it is inappropriate to adopt more stringent emission standards for these engines in this rulemaking.

Note that the Large SI standards apply to nonroad spark-ignition engines above 19 kW. However, we adopted a special provision for engine families where production engines have total displacement at or below 1000 cc and maximum power at or below 30 kW, allowing these engine families to instead certify to the applicable standards for Small SI engines. This rule preserves this approach.

Recreational Vehicles

We adopted exhaust and evaporative emission standards for recreational vehicles in our November 8, 2002 final rule (67 FR 68242). These standards apply to all-terrain vehicles, off-highway motorcycles, and snowmobiles.[6] These exhaust emission standards were fully phased in starting with the 2007 model year. The evaporative emission standards apply starting with the 2008 model year.

Recreational vehicles will soon be subject to permeation requirements that are very similar to the requirements included in this rulemaking. We have also learned more about controlling running losses and diffusion emissions that may eventually lead us to propose comparable standards for recreational vehicles. Considering these new requirements for recreational vehicles in a later rulemaking would give us additional time to collect information to better understand the feasibility, costs, and benefits of applying these requirements to recreational vehicles.

The following sections describe the state of technology and regulatory requirements for the different types of recreational vehicles.

[4] Handheld engines generally include those engines for which the operator holds or supports the equipment during operation; nonhandheld engines are Small SI engines that are not handheld engines (see § 1054.801). Class I refers to nonhandheld engines with displacement below 225 cc; Class II refers to larger nonhandheld engines.

[5] Note that we refer to the handheld exhaust emission standards in 40 CFR part 1054 as Phase 3 standards. This is intended to maintain consistent terminology with the comparable standards in California rather than indicating an increase in stringency.

[6] Note that we treat certain high-speed off-road utility vehicles as all-terrain vehicles (see 40 CFR part 1051).

All-Terrain Vehicles

EPA's initial round of exhaust emission standards was fully implemented starting with the 2007 model year. The regulations for all-terrain vehicles (ATV) specify testing based on a chassis-based transient procedure. However, we permit manufacturers on an interim basis to optionally use a steady-state engine-based procedure. We recently completed a change in the regulations to extend this allowance from 2009 through 2014, after which manufacturers must certify all their ATVs based on the chassis-based transient test procedure that applies for off-highway motorcycles (72 FR 20730, April 26, 2007). This change does not represent an increase in stringency, but manufacturers will be taking time to make the transition to the different test procedure. We expect that there will be a good potential to apply further emission controls on these engines. However, we do not have information at this time on possible advances in technology beyond what is required for the current standards.

Off-Highway Motorcycles

For off-highway motorcycles, manufacturers are in many cases making a substantial transition to move away from two-stroke engines in favor of four-stroke engines. This transition is now underway. While it may eventually be appropriate to apply aftertreatment or other additional emission control technologies to off-highway motorcycles, we need more time for this transition to be completed and to assess the success of aftertreatment technologies such as catalysts on similar applications such as highway motorcycles. As EPA and manufacturers learn more in implementing emission standards, we expect to be able to better judge the potential for broadly applying new technology to achieve further emission reductions from off-highway motorcycles.

Snowmobiles

In our November 8, 2002 final rule we set three phases of exhaust emission standards for snowmobiles (67 FR 68242). Environmental and industry groups challenged the third phase of these standards. The court decision upheld much of EPA's reasoning for the standards, but vacated the NO_X standard and remanded the CO and HC standards to clarify the analysis and evidence upon which the standards are based. See *Bluewater Network, et al.* v. *EPA, 370 F 3d 1* (D.C. Cir. 2004). A large majority of snowmobile engines are rated above 50 hp and there is still a fundamental need for time to pass to allow us to assess the success of four-stroke engine technology in the marketplace.[7] This is an important aspect of the assessment we need to conduct with regard to the Phase 3 emission standards. We believe it is best to address this in a separate rulemaking and we have initiated that effort to evaluate the appropriate long-term emission standards for snowmobiles.

Nonroad Diesel Engines

The 2004 Consolidated Appropriations Act providing the specific statutory direction for this rulemaking focuses on nonroad spark-ignition engines. Nonroad diesel engines are therefore not included within the scope of that Congressional mandate. However, we have gone through several rulemakings to set standards for these engines under the broader authority of Clean Air Act section 213. In particular, we have divided nonroad diesel engines into three groups for setting emission standards. We adopted a series of standards for locomotives on April 16, 1998, including requirements to certify engines to emission standards when they are rebuilt (63 FR 18978). We also adopted emission standards for marine diesel engines over several different rulemakings, as described in Table I–2. These included separate actions for engines below 37 kW, engines installed in oceangoing vessels, engines installed in commercial vessels involved in inland and coastal waterways, and engines installed in recreational vessels. We recently adopted a new round of more stringent emission standards for both locomotives and marine diesel engines that will require widespread use of aftertreatment technology (73 FR 37096, June 30, 2008).

Finally, all other nonroad diesel engines are grouped together for EPA's emission standards. We have adopted multiple tiers of increasingly stringent standards in three separate rulemakings, as described in Table I–2. We most recently adopted Tier 4 standards based on the use of ultra low-sulfur diesel fuel and the application of exhaust aftertreatment technology (69 FR 38958, June 29, 2004).

D. Putting This Rule into Perspective

Most manufacturers that will be subject to this rulemaking are also affected by regulatory developments in California and in other countries. Each of these is described in more detail below.

State Initiatives

Clean Air Act section 209 prohibits California and other states from setting emission standards for new motor vehicles and new motor vehicle engines, but authorizes EPA to waive this prohibition for California, in which case other states may adopt California's standards. Similar preemption and waiver provisions apply for emission standards for nonroad engines and vehicles, whether new or in-use. However for new locomotives, new engines used in locomotives, and new engines used in farm or construction equipment with maximum power below 130 kW, California and other states are preempted and there is no provision for a waiver of preemption. In addition, in section 428 of the 2004 Consolidated Appropriations Act, Congress further precluded other states from adopting new California standards for nonroad spark-ignition engines below 50 horsepower. In addition, the amendment required that we specifically address the safety implications of any California standards for these engines before approving a waiver of federal preemption. We are codifying these preemption changes in this rule.

The California Air Resources Board (California ARB) has adopted requirements for five groups of nonroad engines: (1) Diesel- and Otto-cycle small off-road engines rated under 19 kW; (2) spark-ignition engines used for marine propulsion; (3) land-based nonroad recreational engines, including those used in all-terrain vehicles, off-highway motorcycles, go-carts, and other similar vehicles; (4) new nonroad spark-ignition engines rated over 19 kW not used in recreational applications; and (5) new land-based nonroad diesel engines rated over 130 kW. They have also approved a voluntary registration and control program for existing portable equipment.

In the 1990s California ARB adopted Tier 1 and Tier 2 standards for Small SI engines consistent with the federal requirements. In 2003, they moved beyond the federal program by adopting exhaust $HC+NO_X$ emission standards of 10 g/kW-hr for Class I engines starting in the 2007 model year and 8 g/kW-hr for Class II engines starting in the 2008 model year. In the same rule they adopted evaporative emission standards for nonhandheld equipment, requiring control of fuel tank permeation, fuel line permeation, diurnal emissions, and running losses.

[7] Only about 3 percent of snowmobiles are rated below 50 horsepower.

California ARB has adopted two tiers of exhaust emission standards for outboard and personal watercraft engines beyond EPA's original standards. The most recent standards, which apply starting in 2008, require $HC+NO_X$ emission levels as low as 16 g/kW-hr. For sterndrive and inboard engines, California ARB has adopted a 5 g/kW-hr $HC+NO_X$ emission standard for 2008 and later model year engines, with testing underway to confirm the feasibility of standards. California ARB's marine programs include no standards for exhaust CO emissions or evaporative emissions.

The California ARB emission standards for recreational vehicles have a different form than the comparable EPA standards but are roughly equivalent in stringency. The California standards include no standards for controlling evaporative emissions. Another important difference between the two programs is California ARB's reliance on a provision allowing noncompliant vehicles to be used in certain areas that are less environmentally sensitive as long as they have a specified red sticker for identifying their lack of emission controls to prevent them from operating in other areas.

California ARB in 1998 adopted requirements that apply to new nonroad engines rated over 25 hp produced for California, with standards phasing in from 2001 through 2004. Texas has adopted these initial California ARB emission standards statewide starting in 2004. More recently, California ARB adopted exhaust emission standards and new evaporative emission standards for these engines, consistent with EPA's 2007 model year standards. Their new requirements also included an additional level of emission control for Large SI engines starting with the 2010 model year. However, their 2010 standards do not increase overall stringency beyond that reflected in the federal standards. Rather, they aim to achieve reductions in $HC+NO_X$ emissions by removing the flexibility incorporated into the federal standards allowing manufacturers to have higher $HC+NO_X$ emissions by certifying to a more stringent CO standard.

Actions in Other Countries

While the new emission standards will apply only to engines sold in the United States, we are aware that manufacturers in many cases are selling the same products into other countries. To the extent that we have the same emission standards as other countries, manufacturers can contribute to reducing air emissions without being burdened by the costs associated with meeting differing or inconsistent regulatory requirements. The following discussion describes our understanding of the status of emission standards in countries outside the United States.

Regulations for spark ignition engines in handheld and nonhandheld equipment are included in the ''Directive 97/68/EC of the European Parliament and of the Council of 16 December 1997 on the approximation of the laws of the Member States relating to measures against the emission of gaseous and particulate pollutants from internal combustion engines to be installed in non-road mobile machinery (OJ L 59, 27.2.1998, p. 1)'', as amended by ''Directive 2002/88/EC of the European Parliament and of the Council of 9 December 2002.'' The Stage I emission standards are to be met by all handheld and nonhandheld engines by 24 months after entry into force of the Directive (as noted in a December 9, 2002 amendment to Directive 97/68/EC). The Stage I emission standards are similar to the U.S. EPA's Phase 1 emission standards for handheld and nonhandheld engines. The Stage II emission standards are implemented over time for the various handheld and nonhandheld engine classes from 2005 to 2009 with handheld engines at or above 50 cc on August 1, 2008. The Stage II emission standards are similar to EPA's Phase 2 emission standards for handheld and nonhandheld engines. Six months after these dates Member States must require that engines placed on the market meet the requirements of the Directive, whether or not they are already installed in machinery.

The European Commission has adopted emission standards for recreational marine engines, including both diesel and gasoline engines. These requirements apply to all new engines sold in member countries and began in 2006 for four-stroke engines and in 2007 for two-stroke engines. Table I–3 presents the European standards for diesel and gasoline recreational marine engines. The numerical emission standards for NO_X are based on the applicable standard from MARPOL Annex VI for marine diesel engines (See Table I–3). The European standards are roughly equivalent to the nonroad diesel Tier 1 emission standards for HC and CO. Emission measurements under the European standards rely on the ISO D2 duty cycle for constant-speed engines and the ISO E5 duty cycle for other engines.

TABLE I–3: EUROPEAN EMISSION STANDARDS FOR RECREATIONAL MARINE ENGINES (g/kW-hr)

Engine type	HC	NO_X	CO	PM
Two-Stroke Spark-Ignition	$30 + 100/P^{0.75}$	10.0	150 + 600/P	—
Four-Stroke Spark-Ignition	$6 + 50/P^{0.75}$	15.0	150 + 600/P	—
Compression-Ignition	$1.5 + 2/P^{0.5}$	9.8	5.0	1.0

Note: P = rated power in kilowatts (kW).

E. What Requirements Are We Adopting?

EPA's emission control provisions require engine, vessel and equipment manufacturers to design and produce their products to meet the emission standards we adopt. To ensure that engines and fuel systems meet the expected level of emission control, we also require compliance with a variety of additional requirements, such as certification, labeling engines, and meeting warranty requirements. The following sections provide a brief summary of the new requirements in this rulemaking. See the later sections for a full discussion of the rule.

Marine SI Engines and Vessels

We are adopting a more stringent level of emission standards for outboard and personal watercraft engines starting with the 2010 model year. The $HC+NO_X$ emission standards are the same as those adopted by California ARB for 2008 and later model year engines. The CO emission standard is 300 g/kW-hr for engines with maximum engine power above 40 kW; the standard increases as a function of maximum engine power for smaller engines. We expect manufacturers to meet these standards with improved fueling systems and other in-cylinder controls. We are not pursuing catalyst-based emission standards for outboard and personal watercraft engines. As discussed below, the application of catalyst-based standards to the marine environment creates special technology challenges that must be addressed. Unlike the sterndrive/inboard engines discussed in the next paragraph, outboard and personal watercraft engines are not built from automotive engine blocks and it is not straightforward to apply the fundamental engine modifications, fuel system upgrades, and other engine control modifications needed to get acceptable catalyst performance. This rule is an appropriate next step in the evolution of technology-based standards for outboard and personal watercraft engines as they are likely to lead to the elimination of carbureted two-stroke engines in favor of four-stroke engines or direct-injection two-stroke engines and to encourage the fuel system upgrades and related engine modifications needed to achieve the required reductions and to potentially set the stage for more stringent controls in the future.

We are adopting new exhaust emission standards for sterndrive and inboard marine engines. The standards are 5.0 g/kW-hr for $HC+NO_X$ and 75.0 g/kW-hr for CO starting with the 2010 model year. We expect manufacturers to meet these standards with three-way catalysts and closed-loop fuel injection. To ensure proper functioning of these emission control systems in use, we will require engines to have a diagnostic system for detecting a failure in the emission control system. For sterndrive and inboard marine engines above 373 kW with high-performance characteristics (generally referred to as ''SD/I high-performance engines''), we are adopting less stringent emission standards that reflect their limited ability to control emissions with catalysts. The $HC+NO_X$ standard is 16 g/kW-hr in for engines at or below 485 kW and 22 g/kW-hr for bigger engines. The CO standard for all SD/I high-performance engines is 350 g/kW-hr. Manufacturers of these engines must meet emission standards without generating or using emission credits. We also include a variety of other special provisions for these engines to reflect unique operating characteristics.

The emission standards described above relate to engine operation over a prescribed duty cycle for testing in the laboratory. We are also adopting not-to-exceed (NTE) standards that establish emission limits when engines operate under normal speed-load combinations that are not included in the duty cycles for the other engine standards (the NTE standards do not apply to SD/I high-performance engines).

We are adopting new standards to control evaporative emissions for all Marine SI vessels. The new standards include requirements to control fuel tank permeation, fuel line permeation, and diurnal emissions, including provisions to ensure that refueling emissions do not increase.

We are including these new regulations for Marine SI engines in 40 CFR part 1045 rather than in the current regulations in 40 CFR part 91. This new part allows us to improve the clarity of regulatory requirements and update our regulatory compliance program to be consistent with the provisions we have recently adopted for other nonroad programs. We are also making a variety of changes to 40 CFR part 91 to make minor adjustments to the current regulations and to prepare for the transition to 40 CFR part 1045.

Small SI Engines and Equipment

We are adopting $HC+NO_X$ exhaust emission standards of 10.0 g/kW-hr for Class I engines starting in the 2012 model year and 8.0 g/kW-hr for Class II engines starting in the 2011 model year. For both classes of nonhandheld engines, we are maintaining the existing CO standard of 610 g/kW-hr. We expect manufacturers to meet these standards by improving engine combustion and adding catalysts. These standards are consistent with the requirements recently adopted by California ARB.

For spark-ignition engines used in marine generators, we are adopting a more stringent Phase 3 CO emission standard of 5.0 g/kW-hr. This applies equally to all sizes of engines subject to the Small SI standards.

We are adopting new evaporative emission standards for both handheld and nonhandheld engines. The new standards include requirements to control permeation from fuel tanks and fuel lines. For nonhandheld engines we will also require control of running loss emissions.

We are drafting the new regulations for Small SI engines from 40 CFR part 90 rather than changing the current regulations in 40 CFR part 90. This new part will allow us to improve the clarity of regulatory requirements and update our regulatory compliance program to be consistent with the provisions we have recently adopted for other nonroad programs.

F. How Is This Document Organized?

Many readers may be interested only in certain aspects of the rule since it covers a broad range of engines and equipment that vary in design and use. We have therefore attempted to organize this information in a way that allows each reader to focus on the material of particular interest. The Air Quality discussion in Section II, however, is general in nature and applies to all the categories subject to the rule.

The next several sections describe the provisions that apply for Small SI engines and equipment and Marine SI engines and vessels. Sections III through V describe the new requirements related to exhaust emission standards for each of the affected engine categories, including standards, effective dates, testing information, and other specific requirements. Section VI details the new requirements related to evaporative emissions for all categories. Section VII discusses how we took energy, noise, and safety factors into consideration for the new standards.

Section VIII describes a variety of provisions that affect other categories of engines besides those that are the primary subject of this rule. This includes the following changes:

- We are reorganizing the regulatory language related to preemption of state standards and to clarify certain provisions.
- We are incorporating new provisions related to certification fees for newly regulated products covered by this rule. This involves some restructuring of the regulatory language. We are also adopting various technical amendments, such as identifying an additional payment method, that apply broadly to our certification programs.
- We are modifying 40 CFR part 1068 to clarify when engines are subject to standards. This includes several new provisions to address special cases for partially complete engines.
- We are also modifying part 1068 to clarify how the provisions apply with respect to evaporative emission standards and we are adopting various technical amendments. These changes apply to all types of nonroad engines that are subject to the provisions of part 1068.
- We are adopting several technical amendments for other categories of nonroad engines and vehicles, largely to maintain consistency across programs for different categories of engines and vehicles.
- We are amending provisions related to delegated assembly. The new approach is to adopt a universal set of requirements in § 1068.261 that applies uniformly to heavy-duty highway engines and nonroad engines.
- We are clarifying that the new exhaust and evaporative emission standards for Small SI engines also apply to the comparable stationary engines.

Section IX summarizes the projected impacts and benefits of this rule. Finally, Sections X and XI summarize the primary public comments received and describe how we satisfy our various administrative requirements.

G. Judicial Review

Under section 307(b)(1) of the Clean Air Act (CAA), judicial review of these final rules is available only by filing a petition for review in the U.S. Court of Appeals for the District of Columbia Circuit by December 8, 2008. Under section 307(b)(2) of the CAA, the requirements established by these final rules may not be challenged separately in any civil or criminal proceedings brought by EPA to enforce these requirements.

Section 307(d)(7)(B) of the CAA further provides that ''[o]nly an objection to a rule or procedure which was raised with reasonable specificity during the period for public comment (including any public hearing) may be raised during judicial review.'' This section also provides a mechanism for us to convene a proceeding for reconsideration, ''[i]f the person raising an objection can demonstrate to the EPA that it was impracticable to raise such objection within [the period for public comment] or if the grounds for such objection arose after the period for public comment (but within the time specified for judicial review) and if such objection is of central relevance to the outcome of the rule.'' Any person seeking to make such a demonstration to us should submit a Petition for Reconsideration to the Office of the Administrator, U.S. EPA, Room 3000, Ariel Rios Building, 1200 Pennsylvania Ave., NW., Washington, DC 20460, with a copy to both the person(s) listed in the preceding **FOR FURTHER INFORMATION CONTACT** section and the Associate General Counsel for the Air and Radiation Law Office, Office of General Counsel (Mail Code 2344A), U.S. EPA, 1200 Pennsylvania Ave., NW., Washington, DC 20460.

II. Public Health and Welfare Effects

The engines and fuel systems subject to this rule generate emissions of hydrocarbons (HC), nitrogen oxides (NO_X), particulate matter (PM) and carbon monoxide (CO) that contribute to nonattainment of the National Ambient Air Quality Standards (NAAQS) for ozone, PM and CO. These engines and fuel systems also emit hazardous air pollutants (air toxics) that are associated with a host of adverse health effects. Emissions from these engines and fuel systems also contribute to visibility impairment and other welfare and environmental effects.

This section summarizes the general health and welfare effects of these emissions. Interested readers are encouraged to refer to the Final RIA for more in-depth discussions.

A. Public Health Impacts

Ozone

The Small SI engine and Marine SI engine standards finalized in this action will result in reductions of volatile organic compounds (VOC), of which HC are a subset, and NO_X emissions. VOC and NO_X contribute to the formation of ground-level ozone pollution or smog. People in many areas across the U.S. continue to be exposed to unhealthy levels of ambient ozone.

Background

Ground-level ozone pollution is typically formed by the reaction of VOC and NO_X in the lower atmosphere in the presence of heat and sunlight. These pollutants, often referred to as ozone precursors, are emitted by many types of pollution sources, such as highway and nonroad motor vehicles and engines, power plants, chemical plants, refineries, makers of consumer and commercial products, industrial facilities, and smaller area sources.

The science of ozone formation, transport, and accumulation is complex.[8] Ground-level ozone is produced and destroyed in a cyclical set of chemical reactions, many of which are sensitive to temperature and sunlight. When ambient temperatures and sunlight levels remain high for several days and the air is relatively stagnant, ozone and its precursors can build up and result in more ozone than typically occurs on a single high-temperature day. Ozone can be transported hundreds of miles downwind of precursor emissions, resulting in elevated ozone levels even in areas with low local VOC or NO_X emissions.

EPA has recently amended the ozone NAAQS (73 FR 16436, March 27, 2008). The final ozone NAAQS rule addresses revisions to the primary and secondary NAAQS for ozone to provide increased protection of public health and welfare, respectively. With regard to the primary standard for ozone, EPA has revised the level of the 8-hour standard to 0.075 parts per million (ppm), expressed to three decimal places. With regard to the secondary standard for ozone, EPA has revised the current 8-hour standard by making it identical to the revised primary standard.

Health Effects of Ozone

The health and welfare effects of ozone are well documented and are assessed in EPA's 2006 ozone Air Quality Criteria Document (ozone AQCD) and EPA Staff Paper.[9, 10] Ozone can irritate the respiratory system, causing coughing, throat irritation, and/or uncomfortable sensation in the chest. Ozone can reduce lung function and make it more difficult to breathe deeply; breathing may also become more rapid and shallow than normal, thereby limiting a person's activity. Ozone can also aggravate asthma, leading to more asthma attacks that require medical attention and/or the use of additional medication. In addition, there is suggestive evidence of a contribution of ozone to cardiovascular-related morbidity and highly suggestive evidence that short-term ozone exposure directly or indirectly contributes to non-accidental and cardiopulmonary-related mortality, but additional research is needed to clarify the underlying mechanisms causing these effects. In a recent report on the estimation of ozone-related premature mortality published by the National Research Council (NRC), a panel of experts and reviewers concluded that short-term exposure to ambient ozone is likely to contribute to premature deaths and that ozone-related mortality should be included in estimates of the health benefits of reducing ozone exposure.[11] Animal toxicological evidence indicates that with repeated exposure, ozone can inflame and damage the lining of the lungs, which may lead to permanent changes in lung tissue and irreversible reductions in lung function. People who are more susceptible to effects

[8] U.S. EPA Air Quality Criteria for Ozone and Related Photochemical Oxidants (Final). U.S. Environmental Protection Agency, Washington, D.C., EPA 600/R–05/004aF-cF, 2006. This document is available in Docket EPA-HQ-OAR–2003–0190. This document may be accessed electronically at: *http://www.epa.gov/ttn/naaqs/standards/ozone/s_o3_cr_cd.html*.

[9] U.S. EPA Air Quality Criteria for Ozone and Related Photochemical Oxidants (Final). U.S. Environmental Protection Agency, Washington, DC., EPA 600/R–05/004aF–cF, 2006. This document is available in Docket EPA–HQ–OAR–2003–0190. This document may be accessed electronically at: *http://www.epa.gov/ttn/naaqs/standards/ozone/s_o3_cr_cd.html*.

[10] U.S. EPA (2007) Review of the National Ambient Air Quality Standards for Ozone, Policy Assessment of Scientific and Technical Information. OAQPS Staff Paper.EPA–452/R–07–003. This document is available in Docket EPA–HQ–OAR–2003–0190. This document is available electronically at: *http:www.epa.gov/ttn/naaqs/standards/ozone/s_o3_cr_sp.html*.

[11] National Research Council (NRC), 2008. Estimating Mortality Risk Reduction and Economic Benefits from Controlling Ozone Air Pollution. The National Academies Press: Washington, DC.

associated with exposure to ozone can include children, the elderly, and individuals with respiratory disease such as asthma. Those with greater exposures to ozone, for instance due to time spent outdoors (e.g., children and outdoor workers), are also of particular concern.

The recent ozone AQCD also examined relevant new scientific information that has emerged in the past decade, including the impact of ozone exposure on such health effects as changes in lung structure and biochemistry, inflammation of the lungs, exacerbation and causation of asthma, respiratory illness-related school absence, hospital admissions and premature mortality. Animal toxicological studies have suggested potential interactions between ozone and PM with increased responses observed to mixtures of the two pollutants compared to either ozone or PM alone. The respiratory morbidity observed in animal studies along with the evidence from epidemiologic studies supports a causal relationship between acute ambient ozone exposures and increased respiratory-related emergency room visits and hospitalizations in the warm season. In addition, there is suggestive evidence of a contribution of ozone to cardiovascular-related morbidity and non-accidental and cardiopulmonary mortality.

Plant and Ecosystem Effects of Ozone

Elevated ozone levels contribute to environmental effects, with impacts to plants and ecosystems being of most concern. Ozone can produce both acute and chronic injury in sensitive species depending on the concentration level and the duration of the exposure. Ozone effects also tend to accumulate over the growing season of the plant, so that even low concentrations experienced for a longer duration have the potential to create chronic stress on vegetation. Ozone damage to plants includes visible injury to leaves and a reduction in food production through impaired photosynthesis, both of which can lead to reduced crop yields, forestry production, and use of sensitive ornamentals in landscaping. In addition, the reduced food production in plants and subsequent reduced root growth and storage below ground, can result in other, more subtle plant and ecosystems impacts. These include increased susceptibility of plants to insect attack, disease, harsh weather, interspecies competition and overall decreased plant vigor. The adverse effects of ozone on forest and other natural vegetation can potentially lead to species shifts and loss from the affected ecosystems, resulting in a loss or reduction in associated ecosystem goods and services. Lastly, visible ozone injury to leaves can result in a loss of aesthetic value in areas of special scenic significance like national parks and wilderness areas. The final 2006 Criteria Document presents more detailed information on ozone effects on vegetation and ecosystems.

Current and Projected Ozone Levels

Ozone concentrations exceeding the level of the 1997 8-hour ozone NAAQS occur over wide geographic areas, including most of the nation's major population centers.[12] As of March 12, 2008, there were approximately 140 million people living in 72 areas (which include all or part of 337 counties) designated as not in attainment with the 1997 8-hour ozone NAAQS.[13] These numbers do not include the people living in areas where there is a future risk of failing to maintain or attain the 8-hour ozone NAAQS. The 1997 ozone NAAQS was recently revised and the 2008 ozone NAAQS was final on March 12, 2008. Table II–1 presents the number of counties in areas currently designated as nonattainment for the 1997 ozone NAAQS as well as the number of additional counties that have design values greater than the 2008 ozone NAAQS.

TABLE II–1—COUNTIES WITH DESIGN VALUES GREATER THAN THE 2008 OZONE NAAQS BASED ON 2004–2006 AIR QUALITY DATA

	Number of Counties	Population [a]
1997 Ozone Standard: Counties within the 72 areas currently designated as nonattainment	337	139,633,458
2008 Ozone Standard: Additional counties that would not meet the 2008 NAAQS [b]	74	15,984,135
Total	411	155,617,593

Notes:
[a] Population numbers are from 2000 census data.
[b] Attainment designations for 2008 ozone NAAQS have not yet been made. Nonattainment for the 2008 Ozone NAAQS will be based on three years of air quality data from later years. Also, the county numbers in the table include only the counties with monitors violating the 2008 Ozone NAAQS. The numbers in this table may be an underestimate of the number of counties and populations that will eventually be included in areas with multiple counties designated nonattainment.

States with 8-hour ozone nonattainment areas are required to take action to bring those areas into compliance in the future. Based on the final rule designating and classifying 8-hour ozone nonattainment areas (69 FR 23951, April 30, 2004), most 8-hour ozone nonattainment areas will be required to attain the 1997 ozone NAAQS in the 2007 to 2013 time frame and then maintain the NAAQS thereafter.[14] Many of these nonattainment areas will need to adopt additional emission reduction programs and the VOC and NO_X reductions from this final action are particularly important for these states. The attainment dates associated with the potential new 2008 ozone nonattainment areas are likely to be in the 2013 to 2021 timeframe, depending on the severity of the problem.

EPA has already adopted many emission control programs that are expected to reduce ambient ozone levels. Some of these control programs are described in Section I.C.1. As a result of existing programs, the number of areas that fail to meet the ozone NAAQS in the future is expected to decrease. Based on the air quality modeling performed for this rule, which does not include any additional local controls, we estimate eight counties (where 22 million people are projected to live) will exceed the 1997 8-hour

[12] A listing of the 8-hour ozone nonattainment areas is included in the RIA for this rule.

[13] Population numbers are from 2000 census data.

[14] The Los Angeles South Coast Air Basin 8-hour ozone nonattainment area will have to attain before June 15, 2021.

ozone NAAQS in 2020.[15] An additional 37 counties (where 27 million people are projected to live) are expected to be within 10 percent of violating the 1997 8-hour ozone NAAQS in 2020.

Results from the air quality modeling conducted for this final rule indicate that the Small SI and Marine SI engine emission reductions in 2020 and 2030 will improve both the average and population-weighted average ozone concentrations for the U.S. In addition, the air quality modeling shows that on average this final rule will help bring counties closer to ozone attainment as well as assist counties whose ozone concentrations are within ten percent below the standard. For example, on a population-weighted basis, the average modeled future-year 8-hour ozone design values will decrease by 0.57 ppb in 2020 and 0.76 ppb in 2030.[16] The air quality modeling methodology and the projected reductions are discussed in more detail in Chapter 2 of the RIA.

Particulate Matter

The Small SI engine and Marine SI engine standards detailed in this action will result in reductions in emissions of VOCs and NO_X which contribute to the formation of secondary $PM_{2.5}$. In addition, the standards finalized today will reduce primary (directly emitted) $PM_{2.5}$ emissions.

Background

PM represents a broad class of chemically and physically diverse substances. It can be principally characterized as discrete particles that exist in the condensed (liquid or solid) phase spanning several orders of magnitude in size. PM is further described by breaking it down into size fractions. PM_{10} refers to particles generally less than or equal to 10 micrometers (m) in aerodynamic diameter. $PM_{2.5}$ refers to fine particles, generally less than or equal to 2.5 in aerodynamic diameter. Inhalable (or ''thoracic'') coarse particles refer to those particles generally greater than 2.5 µm but less than or equal to 10 µm in aerodynamic diameter. Ultrafine PM refers to particles less than 100 nanometers (0.1 µm) in aerodynamic diameter. Larger particles tend to be removed by the respiratory clearance mechanisms (*e.g.* coughing), whereas smaller particles are deposited deeper in the lungs.

Fine particles are produced primarily by combustion processes and by transformations of gaseous emissions (e.g., SO_X, NO_X and VOC) in the atmosphere. The chemical and physical properties of $PM_{2.5}$ may vary greatly with time, region, meteorology, and source category. Thus, $PM_{2.5}$ may include a complex mixture of different pollutants including sulfates, nitrates, organic compounds, elemental carbon and metal compounds. These particles can remain in the atmosphere for days to weeks and travel hundreds to thousands of kilometers.

The primary $PM_{2.5}$ NAAQS includes a short-term (24-hour) and a long-term (annual) standard. The 1997 $PM_{2.5}$ NAAQS established by EPA set the 24-hour standard at a level of 65µg/m³ based on the 98th percentile concentration averaged over three years. The annual standard specifies an expected annual arithmetic mean not to exceed 15µg/m³ averaged over three years.

In 2006, EPA amended the NAAQS for $PM_{2.5}$ (71 FR 61144, October 17, 2006). The final rule addressed revisions to the primary and secondary NAAQS for PM to provide increased protection of public health and welfare, respectively. The level of the 24-hour $PM_{2.5}$ NAAQS was revised from 65µg/m³ to 35 µg/m³ and the level of the annual $PM_{2.5}$ NAAQS was retained at 15µg/m³. With regard to the secondary standards for $PM_{2.5}$, EPA has revised these standards to be identical in all respects to the revised primary standards.

Health Effects of $PM_{2.5}$

Scientific studies show ambient PM is associated with a series of adverse health effects. These health effects are discussed in detail in the 2004 EPA Particulate Matter Air Quality Criteria Document (PM AQCD), and the 2005 PM Staff Paper.[17] [18] Further discussion of health effects associated with PM can also be found in the RIA for this rule.

Health effects associated with short-term exposures (hours to days) to ambient PM include premature mortality, increased hospital admissions, heart and lung diseases, increased cough, adverse lower-respiratory symptoms, decrements in lung function and changes in heart rate rhythm and other cardiac effects. Studies examining populations exposed to different levels of air pollution over a number of years, including the Harvard Six Cities Study and the American Cancer Society Study, show associations between long-term exposure to ambient $PM_{2.5}$ and both total and cardiovascular and respiratory mortality.[19] In addition, a reanalysis of the American Cancer Society Study shows an association between fine particle and sulfate concentrations and lung cancer mortality.[20]

Recently, several studies have highlighted the adverse effects of PM specifically from mobile sources.[21] [22] Studies have also focused on health effects due to PM exposures on or near roadways.[23] Although these studies include all air pollution sources, including both spark-ignition (gasoline) and diesel powered vehicles, they indicate that exposure to PM emissions near roadways, thus dominated by mobile sources, are associated with health effects. The controls finalized in this action may help to reduce exposures, and specifically exposures near the source, to mobile source related $PM_{2.5}$.

Visibility

Visibility can be defined as the degree to which the atmosphere is transparent to visible light. Airborne particles degrade visibility by scattering and absorbing light. Visibility is important because it has direct significance to people's enjoyment of daily activities in all parts of the country. Individuals value good visibility for the well-being it provides them directly, where they live and work and in places where they enjoy recreational opportunities.

[15] We expect many of the 8-hour ozone nonattainment areas to adopt additional emission reduction programs but we are unable to quantify or rely upon future reductions from additional state and local programs that have not yet been adopted.

[16] Ozone design values are reported in parts per million (ppm) as specified in 40 CFR Part 50. Due to the scale of the design value changes in this action, results have been presented in parts per billion (ppb) format.

[17] U.S. EPA (2004) Air Quality Criteria for Particulate Matter (Oct 2004), Volume I Document No. EPA600/P–99/002aF and Volume II Document No. EPA600/P–99/002bF. This document is available in Docket EPA–HQ–OAR–2003–0190.

[18] U.S. EPA (2005) Review of the National Ambient Air Quality Standard for Particulate Matter: Policy Assessment of Scientific and Technical Information, OAQPS Staff Paper. EPA–452/R–05–005. This document is available in Docket EPA–HQ–OAR–2003–0190.

[19] Dockery, DW; Pope, CA III: Xu, X; *et al.* 1993. An association between air pollution and mortality in six U.S. cities. N Engl J Med 329:1753–1759.

[20] Pope, C. A., III; Burnett, R. T.; Thun, M. J.; Calle, E. E.; Krewski, D.; Ito, K.; Thurston, G. D. (2002) Lung cancer, cardiopulmonary mortality, and long-term exposure to fine particulate air pollution. J. Am. Med. Assoc. 287:1132–1141.

[21] Laden, F.; Neas, L.M.; Dockery, D.W.; Schwartz, J. (2000) Association of Fine Particulate Matter from Different Sources with Daily Mortality in Six U.S. Cities. *Environmental Health Perspectives* 108: 941–947.

[22] Janssen, N.A.H.; Schwartz, J.; Zanobetti, A.; Suh, H.H. (2002) Air Conditioning and Source-Specific Particles as Modifiers of the Effect of PM_{10} on Hospital Admissions for Heart and Lung Disease. *Environmental Health Perspectives* 110: 43–49.

[23] Riediker, M.; Cascio, W.E.; Griggs, T.R..; Herbst, M.C.; Bromberg, P.A.; Neas, L.; Williams, R.W.; Devlin, R.B. (2003) Particulate Matter Exposures in Cars is Associated with Cardiovascular Effects in Healthy Young Men. *Am. J. Respir. Crit. Care Med.* 169: 934–940.

Visibility is also highly valued in significant natural areas such as national parks and wilderness areas and special emphasis is given to protecting visibility in these areas. For more information on visibility, see the final 2004 PM AQCD as well as the 2005 PM Staff Paper.[24] [25]

EPA is pursuing a two-part strategy to address visibility. First, to address the welfare effects of PM on visibility, EPA has set secondary $PM_{2.5}$ standards which act in conjunction with the establishment of a regional haze program. In setting this secondary standard, EPA has concluded that $PM_{2.5}$ causes adverse effects on visibility in various locations, depending on PM concentrations and factors such as chemical composition and average relative humidity. Second, section 169 of the Clean Air Act provides additional authority to address existing visibility impairment and prevent future visibility impairment in the 156 national parks, forests and wilderness areas categorized as mandatory class I federal areas (62 FR 38680–81, July 18, 1997).[26] In July 1999, the regional haze rule (64 FR 35714) was put in place to protect the visibility in mandatory class I federal areas. Visibility can be said to be impaired in both $PM_{2.5}$ nonattainment areas and mandatory class I federal areas.

Current Visibility Impairment

As of March 12, 2008, over 88 million people live in nonattainment areas for the 1997 $PM_{2.5}$ NAAQS.[27] These populations, as well as large numbers of individuals who travel to these areas, are likely to experience visibility impairment. In addition, while visibility trends have improved in mandatory class I federal areas the most recent data show that these areas continue to suffer from visibility impairment.[28] In summary, visibility impairment is experienced throughout the U.S., in multi-state regions, urban areas, and remote mandatory class I federal areas.[29] [30]

Future Visibility Impairment

Air quality modeling conducted for this final rule was used to project visibility conditions in 133 mandatory class I federal areas across the U.S. in 2020 and 2030. The results indicate that improvements in visibility will occur in the future, although all areas will continue to have annual average deciview levels above background in 2020 and 2030. Chapter 2 of the RIA contains more detail on the visibility portion of the air quality modeling.

Atmospheric Deposition

Wet and dry deposition of ambient particulate matter delivers a complex mixture of metals (e.g., mercury, zinc, lead, nickel, aluminum, cadmium), organic compounds (e.g., POM, dioxins, furans) and inorganic compounds (e.g., nitrate, sulfate) to terrestrial and aquatic ecosystems. The chemical form of the compounds deposited is impacted by a variety of factors including ambient conditions (e.g., temperature, humidity, oxidant levels) and the sources of the material. Chemical and physical transformations of the particulate compounds occur in the atmosphere as well as the media onto which they deposit. These transformations in turn influence the fate, bioavailability and potential toxicity of these compounds. Atmospheric deposition has been identified as a key component of the environmental and human health hazard posed by several pollutants including mercury, dioxin and PCBs.[31]

Adverse impacts on water quality can occur when atmospheric contaminants deposit to the water surface or when material deposited on the land enters a water body through runoff. Potential impacts of atmospheric deposition to water bodies include those related to both nutrient and toxic inputs. Adverse effects to human health and welfare can occur from the addition of excess particulate nitrate nutrient enrichment, which contributes to toxic algae blooms and zones of depleted oxygen, which can lead to fish kills, frequently in coastal waters. Particles contaminated with heavy metals or other toxins may lead to the ingestion of contaminated fish, ingestion of contaminated water, damage to the marine ecology, and limited recreational uses. Several studies have been conducted in U.S. coastal waters and in the Great Lakes Region in which the role of ambient PM deposition and runoff is investigated.[32] [33] [34] [35] [36]

Adverse impacts on soil chemistry and plant life have been observed for areas heavily impacted by atmospheric deposition of nutrients, metals and acid species, resulting in species shifts, loss of biodiversity, forest decline and damage to forest productivity. Potential impacts also include adverse effects to human health through ingestion of contaminated vegetation or livestock (as in the case for dioxin deposition), reduction in crop yield, and limited use of land due to contamination.

Materials Damage and Soiling

The deposition of airborne particles can reduce the aesthetic appeal of buildings and culturally important articles through soiling, and can contribute directly (or in conjunction with other pollutants) to structural damage by means of corrosion or erosion.[37] Particles affect materials principally by promoting and accelerating the corrosion of metals, by degrading paints, and by deteriorating building materials such as concrete and limestone. Particles contribute to these effects because of their electrolytic, hygroscopic, and acidic properties, and their ability to adsorb corrosive gases (principally sulfur dioxide). The rate of metal corrosion depends on a number of factors, including the deposition rate and nature of the pollutant; the influence of the metal protective

[24] U.S. EPA (2004) Air Quality Criteria for Particulate Matter (Oct 2004), Volume I Document No. EPA600/P–99/002aF and Volume II Document No. EPA600/P–99/002bF. This document is available in Docket EPA–HQ–OAR–2003–0190.

[25] U.S. EPA (2005) Review of the National Ambient Air Quality Standard for Particulate Matter: Policy Assessment of Scientific and Technical Information, OAQPS Staff Paper. EPA–452/R–05–005. This document is available in Docket EPA–HQ–OAR–2003–0190.

[26] These areas are defined in section 162 of the Act as those national parks exceeding 6,000 acres, wilderness areas and memorial parks exceeding 5,000 acres, and all international parks which were in existence on August 7, 1977.

[27] Population numbers are from 2000 census data.

[28] U.S. EPA (2002) Latest Findings on National Air Quality—2002 Status and Trends. EPA 454/K–03–001.

[29] U.S. EPA, Air Quality Designations and Classifications for the Fine Particles ($PM_{2.5}$) National Ambient Air Quality Standards, December 17, 2004. (70 FR 943, Jan 5. 2005) This document is also available on the web at: *http://www.epa.gov/pmdesignations/*

[30] U.S. EPA. Regional Haze Regulations, July 1, 1999. (64 FR 35714, July 1, 1999).

[31] U.S. EPA (2000) Deposition of Air Pollutants to the Great Waters: Third Report to Congress. Office of Air Quality Planning and Standards. EPA–453/R–00–0005. This document is available in Docket EPA–HQ–OAR–2003–0190.

[32] U.S. EPA (2004) National Coastal Condition Report II. Office of Research and Development/Office of Water. EPA–620/R–03/002. This document is available in Docket EPA–HQ–OAR–2003–0190.

[33] Gao, Y., E.D. Nelson, M.P. Field, *et al.* 2002. Characterization of atmospheric trace elements on $PM_{2.5}$ particulate matter over the New York-New Jersey harbor estuary. *Atmos. Environ.* 36: 1077–1086.

[34] Kim, G., N. Hussain, J.R. Scudlark, and T.M. Church. 2000. Factors influencing the atmospheric depositional fluxes of stable Pb, 210Pb, and 7Be into Chesapeake Bay. *J. Atmos. Chem.* 36: 65–79.

[35] Lu, R., R.P. Turco, K. Stolzenbach, *et al.* 2003. Dry deposition of airborne trace metals on the Los Angeles Basin and adjacent coastal waters. *J. Geophys. Res.* 108(D2, 4074): AAC 11–1 to 11–24.

[36] Marvin, C.H., M.N. Charlton, E.J. Reiner, *et al.* 2002. Surficial sediment contamination in Lakes Erie and Ontario: A comparative analysis. *J. Great Lakes Res.* 28(3): 437–450.

[37] U.S EPA (2005) Review of the National Ambient Air Quality Standards for Particulate Matter: Policy Assessment of Scientific and Technical Information, OAQPS Staff Paper. This document is available in Docket EPA–HQ–OAR–2003–0190.

corrosion film; the amount of moisture present; variability in the electrochemical reactions; the presence and concentration of other surface electrolytes; and the orientation of the metal surface.

Current and Projected $PM_{2.5}$ Levels

$PM_{2.5}$ concentrations exceeding the level of the $PM_{2.5}$ NAAQS occur in many parts of the country.[38] In 2005 EPA designated 39 nonattainment areas for the 1997 $PM_{2.5}$ NAAQS (70 FR 943, January 5, 2005). These areas are comprised of 208 full or partial counties with a total population exceeding 88 million. The 1997 $PM_{2.5}$ NAAQS was revised and the 2006 $PM_{2.5}$ NAAQS became effective on December 18, 2006. Table II–2 presents the number of counties in areas currently designated as nonattainment for the 1997 $PM_{2.5}$ NAAQS as well as the number of additional counties that have design values greater than the 2006 $PM_{2.5}$ NAAQS.

TABLE II–2—COUNTIES WITH DESIGN VALUES GREATER THAN THE 2006 $PM_{2.5}$ NAAQS BASED ON 2003–2005 AIR QUALITY DATA

Nonattainment areas/other violating counties	Number of counties	Population [a]
1997 $PM_{2.5}$ Standards: Counties within the 39 areas currently designated as nonattainment	208	88,394,000
2006 $PM_{2.5}$ Standards: Additional counties that would not meet the 2006 NAAQS [b]	49	18,198,676
Total	257	106,595,676

Notes:
[a] Population numbers are from 2000 census data.
[b] Attainment designations for 2006 $PM_{2.5}$ NAAQS have not yet been made. Nonattainment for the 2006 $PM_{2.5}$ NAAQS will be based on 3 years of air quality data from later years. Also, the county numbers in the table includes only the counties with monitors violating the 2006 $PM_{2.5}$ NAAQS. The numbers in this table may be an underestimate of the number of counties and populations that will eventually be included in areas with multiple counties designated nonattainment.

Areas designated as not attaining the 1997 $PM_{2.5}$ NAAQS will need to attain the 1997 standards in the 2010 to 2015 time frame, and then maintain them thereafter. The attainment dates associated with the potential new 2006 $PM_{2.5}$ nonattainment areas are likely to be in the 2014 to 2019 timeframe. The emission standards finalized in this action become effective as early as 2009 making the inventory reductions from this rulemaking useful to states in attaining or maintaining the $PM_{2.5}$ NAAQS.

EPA has already adopted many emission control programs that are expected to reduce ambient $PM_{2.5}$ levels and which will assist in reducing the number of areas that fail to achieve the $PM_{2.5}$ NAAQS. Even so, our air quality modeling for this final rule projects that in 2020, with all current controls but excluding the reductions achieved through this rule, up to 11 counties with a population of over 24 million may not attain the current annual $PM_{2.5}$ standard of 15 $\mu g/m^3$. These numbers do not account for additional areas that have air quality measurements within 10 percent of the annual $PM_{2.5}$ standard. These areas, although not violating the standards, will also benefit from the additional reductions from this rule ensuring long term maintenance of the $PM_{2.5}$ NAAQS.

Air quality modeling performed for this final rule shows the emissions reductions will improve both the average and population-weighted average $PM_{2.5}$ concentrations for the U.S. On a population-weighted basis, the average modeled future-year annual $PM_{2.5}$ design value (DV) for all counties is expected to decrease by 0.02 $\mu g/m^3$ in 2020 and 2030. There are areas with larger decreases in their future-year annual $PM_{2.5}$ DV, for instance the Chicago region will experience a 0.08 μ g/m^3 reduction by 2030. The air quality modeling methodology and the projected reductions are discussed in more detail in Chapter 2 of the RIA.

B. Air Toxics

Small SI and Marine SI emissions also contribute to ambient levels of air toxics known or suspected as human or animal carcinogens, or that have noncancer health effects. These air toxics include benzene, 1, 3-butadiene, formaldehyde, acetaldehyde, acrolein, polycyclic organic matter (POM), and naphthalene. All of these compounds, except acetaldehyde, were identified as national or regional cancer risk or noncancer hazard drivers in the 1999 National-Scale Air Toxics Assessment (NATA) and have significant inventory contributions from mobile sources. That is, for a significant portion of the population, these compounds pose a significant portion of the total cancer and noncancer risk from breathing outdoor air toxics. In addition, human exposure to toxics from spark-ignition engines also occurs as a result of operating these engines and from intrusion of emissions in residential garages into attached indoor spaces.[39 40] The emission reductions from Small SI and Marine SI engines that are finalized in this rulemaking will help reduce exposure to these harmful substances.

Benzene: The EPA's IRIS database lists benzene as a known human carcinogen (causing leukemia) by all routes of exposure, and concludes that exposure is associated with additional health effects, including genetic changes in both humans and animals and increased proliferation of bone marrow cells in mice.[41 42 43] EPA states in its IRIS database that data indicate a causal relationship between benzene exposure and acute lymphocytic leukemia and suggest a relationship between benzene exposure and chronic non-lymphocytic

[38] A listing of the $PM_{2.5}$ nonattainment areas is included in the RIA for this rule.

[39] Baldauf, R.; Fortune, C.; Weinstein, J.; Wheeler, M.; Blanchard, B. (2006) Air contaminant exposures during the operation of lawn and garden equipment. J Expos Sci Environ Epidmeiol 16: 362–370.

[40] Isbell, M.; Ricker, J.; Gordian, M.E.; Duff, L.K. (1999) Use of biomarkers in an indoor air study: lack of correlation between aromatic VOCs with respective urinary biomarkers. Sci Total Environ 241: 151–159.

[41] U.S. EPA. 2000. Integrated Risk Information System File for Benzene. This material is available electronically at *http://www.epa.gov/iris/subst/0276.htm*.

[42] International Agency for Research on Cancer (IARC). 1982. Monographs on the evaluation of carcinogenic risk of chemicals to humans, Volume 29, Some industrial chemicals and dyestuffs, World Health Organization, Lyon, France, p. 345–389.

[43] Irons, R.D.; Stillman, W.S.; Colagiovanni, D.B.; Henry, V.A. 1992. Synergistic action of the benzene metabolite hydroquinone on myelopoietic stimulating activity of granulocyte/macrophage colony-stimulating factor in vitro, Proc. Natl. Acad. Sci. 89:3691–3695.

leukemia and chronic lymphocytic leukemia. The International Agency for Research on Carcinogens (IARC) has determined that benzene is a human carcinogen and the U.S. Department of Health and Human Services (DHHS) has characterized benzene as a known human carcinogen.[44 45]

A number of adverse noncancer health effects including blood disorders, such as preleukemia and aplastic anemia, have also been associated with long-term exposure to benzene.[46 47] The most sensitive noncancer effect observed in humans, based on current data, is the depression of the absolute lymphocyte count in blood.[48 49] In addition, recent work, including studies sponsored by the Health Effects Institute (HEI), provides evidence that biochemical responses are occurring at lower levels of benzene exposure than previously known.[50 51 52 53] EPA's IRIS program has not yet evaluated these new data.

1,3-Butadiene: EPA has characterized 1,3-butadiene as carcinogenic to humans by inhalation.[54 55] The IARC has determined that 1,3-butadiene is a human carcinogen and the U.S. DHHS has characterized 1,3-butadiene as a known human carcinogen.[56 57] There are numerous studies consistently demonstrating that 1,3-butadiene is metabolized into genotoxic metabolites by experimental animals and humans. The specific mechanisms of 1,3-butadiene-induced carcinogenesis are unknown; however, the scientific evidence strongly suggests that the carcinogenic effects are mediated by genotoxic metabolites. Animal data suggest that females may be more sensitive than males for cancer effects associated with 1,3-butadiene exposure; there are insufficient data in humans from which to draw conclusions about sensitive subpopulations. 1,3-butadiene also causes a variety of reproductive and developmental effects in mice; no human data on these effects are available. The most sensitive effect was ovarian atrophy observed in a lifetime bioassay of female mice.[58]

Formaldehyde: Since 1987, EPA has classified formaldehyde as a probable human carcinogen based on evidence in humans and in rats, mice, hamsters, and monkeys.[59] EPA is currently reviewing recently published epidemiological data. For instance, research conducted by the National Cancer Institute (NCI) found an increased risk of nasopharyngeal cancer and lymphohematopoietic malignancies such as leukemia among workers exposed to formaldehyde.[60 61] NCI is currently performing an update of these studies. A recent National Institute of Occupational Safety and Health (NIOSH) study of garment workers also found increased risk of death due to leukemia among workers exposed to formaldehyde.[62] Extended follow-up of a cohort of British chemical workers did not find evidence of an increase in nasopharyngeal or lymphohematopoietic cancers, but a continuing statistically significant excess in lung cancers was reported.[63] Recently, the IARC re-classified formaldehyde as a human carcinogen (Group 1).[64]

Formaldehyde exposure also causes a range of noncancer health effects, including irritation of the eyes (burning and watering of the eyes), nose and throat. Effects from repeated exposure in humans include respiratory tract irritation, chronic bronchitis and nasal epithelial lesions such as metaplasia and loss of cilia. Animal studies suggest that formaldehyde may also cause airway inflammation—including eosinophil infiltration into the airways. There are several studies that suggest that formaldehyde may increase the risk of asthma—particularly in the young.[65 66]

Acetaldehyde: Acetaldehyde is classified in EPA's IRIS database as a probable human carcinogen, based on nasal tumors in rats, and is considered toxic by the inhalation, oral, and intravenous routes.[67] Acetaldehyde is

44 International Agency for Research on Cancer (IARC). 1987. Monographs on the evaluation of carcinogenic risk of chemicals to humans, Volume 29, Supplement 7, Some industrial chemicals and dyestuffs, World Health Organization, Lyon, France.

45 U.S. Department of Health and Human Services National Toxicology Program 11th Report on Carcinogens available at: *http://ntp.niehs.nih.gov/go/16183*.

46 Aksoy, M. (1989). Hematotoxicity and carcinogenicity of benzene. Environ. Health Perspect. 82: 193–197.

47 Goldstein, B.D. (1988). Benzene toxicity. Occupational medicine. State of the Art Reviews. 3: 541–554.

48 Rothman, N., G.L. Li, M. Dosemeci, W.E. Bechtold, G.E. Marti, Y.Z. Wang, M. Linet, L.Q. Xi, W. Lu, M.T. Smith, N. Titenko-Holland, L.P. Zhang, W. Blot, S.N. Yin, and R.B. Hayes (1996) Hematotoxicity among Chinese workers heavily exposed to benzene. Am. J. Ind. Med. 29: 236–246.

49 U.S. EPA (2002) Toxicological Review of Benzene (Noncancer Effects). Environmental Protection Agency, Integrated Risk Information System (IRIS), Research and Development, National Center for Environmental Assessment, Washington DC. This material is available electronically at *http://www.epa.gov/iris/subst/0276.htm*.

50 Qu, O.; Shore, R.; Li, G.; Jin, X.; Chen, C.L.; Cohen, B.; Melikian, A.; Eastmond, D.; Rappaport, S.; Li, H.; Rupa, D.; Suramaya, R.; Songnian, W.; Huifant, Y.; Meng, M.; Winnik, M.; Kwok, E.; Li, Y.; Mu, R.; Xu, B.; Zhang, X.; Li, K. (2003) HEI Report 115, Validation & Evaluation of Biomarkers in Workers Exposed to Benzene in China.

51 Qu, Q., R. Shore, G. Li, X. Jin, L.C. Chen, B. Cohen, *et al.* (2002) Hematological changes among Chinese workers with a broad range of benzene exposures. Am. J. Industr. Med. 42: 275–285.

52 Lan, Qing, Zhang, L., Li, G., Vermeulen, R., *et al.* (2004) Hematotoxically in Workers Exposed to Low Levels of Benzene. Science 306: 1774–1776.

53 Turtletaub, K.W. and Mani, C. (2003) Benzene metabolism in rodents at doses relevant to human exposure from Urban Air. Research Reports Health Effect Inst. Report No.113.

54 U.S. EPA (2002) Health Assessment of 1,3-Butadiene. Office of Research and Development, National Center for Environmental Assessment, Washington Office, Washington, DC. Report No. EPA600–P–98–001F. This document is available electronically at *http://www.epa.gov/iris/supdocs/buta-sup.pdf*.

55 U.S. EPA (2002) Full IRIS Summary for 1,3-butadiene (CASRN 106–99–0). Environmental Protection Agency, Integrated Risk Information System (IRIS), Research and Development, National Center for Environmental Assessment, Washington, DC *http://www.epa.gov/iris/subst/0139.htm*.

56 International Agency for Research on Cancer (IARC) (1999) Monographs on the evaluation of carcinogenic risk of chemicals to humans, Volume 71, Re-evaluation of some organic chemicals, hydrazine and hydrogen peroxide and Volume 97 (in preparation), World Health Organization, Lyon, France.

57 U.S. Department of Health and Human Services (2005) National Toxicology Program 11th Report on Carcinogens available at: *ntp.niehs.nih.gov/index.cfm?objectid=32BA9724-F1F6-975E-7FCE50709CB4C932*.

58 Bevan, C.; Stadler, J.C.; Elliot, G.S.; *et al.* (1996) Subchronic toxicity of 4-vinylcyclohexene in rats and mice by inhalation. Fundam. Appl. Toxicol. 32:1–10.

59 U.S. EPA (1987) Assessment of Health Risks to Garment Workers and Certain Home Residents from Exposure to Formaldehyde, Office of Pesticides and Toxic Substances, April 1987.

60 Hauptmann, M.; Lubin, J. H.; Stewart, P. A.; Hayes, R. B.; Blair, A. 2003. Mortality from lymphohematopoetic malignancies among workers in formaldehyde industries. Journal of the National Cancer Institute 95: 1615–1623.

61 Hauptmann, M.; Lubin, J. H.; Stewart, P. A.; Hayes, R. B.; Blair, A. 2004. Mortality from solid cancers among workers in formaldehyde industries. American Journal of Epidemiology 159: 1117–1130.

62 Pinkerton, L. E. 2004. Mortality among a cohort of garment workers exposed to formaldehyde: an update. Occup. Environ. Med. 61: 193–200.

63 Coggon, D, EC Harris, J Poole, KT Palmer. 2003. Extended follow-up of a cohort of British chemical workers exposed to formaldehyde. J National Cancer Inst. 95:1608–1615.

64 International Agency for Research on Cancer (IARC). 2006. Formaldehyde, 2-Butoxyethanol and 1-tert-Butoxypropan-2-ol. Volume 88. (in preparation), World Health Organization, Lyon, France.

65 Agency for Toxic Substances and Disease Registry (ATSDR). 1999. Toxicological profile for Formaldehyde. Atlanta, GA: U.S. Department of Health and Human Services, Public Health Service. *http://www.atsdr.cdc.gov/toxprofiles/tp111.html*

66 WHO (2002) Concise International Chemical Assessment Document 40: Formaldehyde. Published under the joint sponsorship of the United Nations Environment Programme, the International Labour Organization, and the World Health Organization, and produced within the framework of the Inter-Organization Programme for the Sound Management of Chemicals. Geneva.

67 U.S. EPA. 191. Integrated Risk Information System File of Acetaldehyde. Research and Development, National Center for Environmental Assessment, Washington, DC. This material is available electronically at *http://www.epa.gov/iris/subst/0290.htm*.

reasonably anticipated to be a human carcinogen by the U.S. DHHS in the 11th Report on Carcinogens and is classified as possibly carcinogenic to humans (Group 2B) by the IARC.[68 69] EPA is currently conducting a reassessment of cancer risk from inhalation exposure to acetaldehyde.

The primary noncancer effects of exposure to acetaldehyde vapors include irritation of the eyes, skin, and respiratory tract.[70] In short-term (4 week) rat studies, degeneration of olfactory epithelium was observed at various concentration levels of acetaldehyde exposure.[71 72] Data from these studies were used by EPA to develop an inhalation reference concentration. Some asthmatics have been shown to be a sensitive subpopulation to decrements in functional expiratory volume (FEV1 test) and bronchoconstriction upon acetaldehyde inhalation.[73] The agency is currently conducting a reassessment of the health hazards from inhalation exposure to acetaldehyde.

Acrolein: EPA determined in 2003 that the human carcinogenic potential of acrolein could not be determined because the available data were inadequate. No information was available on the carcinogenic effects of acrolein in humans and the animal data provided inadequate evidence of carcinogenicity.[74] The IARC determined in 1995 that acrolein was not classifiable as to its carcinogenicity in humans.[75]

Acrolein is extremely acrid and irritating to humans when inhaled, with acute exposure resulting in upper respiratory tract irritation, mucus hypersecretion and congestion. Levels considerably lower than 1 ppm (2.3 mg/m^3) elicit subjective complaints of eye and nasal irritation and a decrease in the respiratory rate.[76 77] Lesions to the lungs and upper respiratory tract of rats, rabbits, and hamsters have been observed after subchronic exposure to acrolein. Based on animal data, individuals with compromised respiratory function (e.g., emphysema, asthma) are expected to be at increased risk of developing adverse responses to strong respiratory irritants such as acrolein. This was demonstrated in mice with allergic airway-disease by comparison to non-diseased mice in a study of the acute respiratory irritant effects of acrolein.[78]

EPA is currently in the process of conducting an assessment of acute exposure effects for acrolein. The intense irritancy of this carbonyl has been demonstrated during controlled tests in human subjects, who suffer intolerable eye and nasal mucosal sensory reactions within minutes of exposure.[79]

Polycyclic Organic Matter (POM): POM is generally defined as a large class of organic compounds which have multiple benzene rings and a boiling point greater than 100 degrees Celsius. Many of the compounds included in the class of compounds known as POM are classified by EPA as probable human carcinogens based on animal data. One of these compounds, naphthalene, is discussed separately below. Polycyclic aromatic hydrocarbons (PAHs) are a subset of POM that contain only hydrogen and carbon atoms. A number of PAHs are known or suspected carcinogens. Recent studies have found that maternal exposures to PAHs (a subclass of POM) in a population of pregnant women were associated with several adverse birth outcomes, including low birth weight and reduced length at birth, as well as impaired cognitive development at age three.[80 81] EPA has not yet evaluated these recent studies.

Naphthalene: Naphthalene is found in small quantities in gasoline and diesel fuels. Naphthalene emissions have been measured in larger quantities in both gasoline and diesel exhaust compared with evaporative emissions from mobile sources, indicating it is primarily a product of combustion. EPA recently released an external review draft of a reassessment of the inhalation carcinogenicity of naphthalene based on a number of recent animal carcinogenicity studies.[82] The draft reassessment recently completed external peer review.[83] Based on external peer review comments received to date, additional analyses are being undertaken. This external review draft does not represent official agency opinion and was released solely for the purposes of external peer review and public comment. Once EPA evaluates public and peer reviewer comments, the document will be revised. The National Toxicology Program listed naphthalene as ''reasonably anticipated to be a human carcinogen'' in 2004 on the basis of bioassays reporting clear evidence of carcinogenicity in rats and some evidence of carcinogenicity in mice.[84] California EPA has released a new risk assessment for naphthalene, and the IARC has reevaluated naphthalene and re-classified it as Group 2B: possibly carcinogenic to humans.[85] Naphthalene

[68] U.S. Department of Health and Human Services National Toxicology Program 11th Report on Carcinogens available at: *ntp.niehs.nih.gov/index.cfm?objectid=32BA9724-F1F6-975E-7FCE50709CB4C932.*

[69] International Agency for Research on Cancer (IARC). 1999. Re-evaluation of some organic chemicals, hydrazine, and hydrogen peroxide. IARC Monographs on the Evaluation of Carcinogenic Risk of Chemical to Humans, Vol 71. Lyon, France.

[70] U.S. EPA. 1991. Integrated Risk Information System File of Acetaldehyde. This material is available electronically at *http://www.epa.gov/iris/subst/0290.htm.*

[71] Appleman, L. M., R. A. Woutersen, V. J. Feron, R. N. Hooftman, and W. R. F. Notten. 1986. Effects of the variable versus fixed exposure levels on the toxicity of acetaldehyde in rats. *J. Appl. Toxicol.* 6: 331–336.

[72] Appleman, L.M., R.A. Woutersen, and V.J. Feron. 1982. Inhalation toxicity of acetaldehyde in rats. I. Acute and subacute studies. *Toxicology.* 23: 293–297.

[73] Myou, S.; Fujimura, M.; Nishi K.; Ohka, T.; and Matsuda, T. 1993. Aerosolized acetaldehyde induces histamine-mediated bronchoconstriction in asthmatics. *Am. Rev. Respir.Dis.*148(4 Pt 1): 940–3.

[74] U.S. EPA. 2003. Integrated Risk Information System File of Acrolein. Research and Development, National Center for Environmental Assessment, Washington, DC. This material is available at *http://www.epa.gov/iris/subst/0364.htm.*

[75] International Agency for Research on Cancer (IARC). 1995. Monographs on the evaluation of carcinogenic risk of chemicals to humans, Volume 63, Dry cleaning, some chlorinated solvents and other industrial chemicals, World Health Organization, Lyon, France.

[76] Weber-Tschopp, A; Fischer, T; Gierer, R; et al. (1977) Experimentelle reizwirkungen von Acrolein auf den Menschen. Int Arch Occup Environ Hlth 40(2):117–130. In German.

[77] Sim, VM; Pattle, RE. (1957) Effect of possible smog irritants on human subjects. J Am Med Assoc 165(15):1908–1913.

[78] Morris JB, Symanowicz PT, Olsen JE, et al. 2003. Immediate sensory nerve-mediated respiratory responses to irritants in healthy and allergic airway-diseased mice. J Appl Physiol 94(4):1563–1571.

[79] Sim VM, Pattle RE. Effect of possible smog irritants on human subjects JAMA165: 1980–2010, 1957.

[80] Perera, F.P.; Rauh, V.; Tsai, W–Y.; et al. (2002) Effect of transplacental exposure to environmental pollutants on birth outcomes in a multiethnic population. *Environ Health Perspect.* 111: 201–205.

[81] Perera, F.P.; Rauh, V.; Whyatt, R.M.; Tsai, W.Y.; Tang, D.; Diaz, D.; Hoepner, L.; Barr, D.; Tu, Y.H.; Camann, D.; Kinney, P. (2006) Effect of prenatal exposure to airborne polycyclic aromatic hydrocarbons on neurodevelopment in the first 3 years of life among inner-city children. *Environ Health Perspect* 114: 1287–1292.

[82] U.S. EPA (2004) Toxicological Review of Naphthalene (Reassessment of the Inhalation Cancer Risk), Environmental Protection Agency, Integrated Risk Information System, Research and Development, National Center for Environmental Assessment, Washington, DC. This material is available electronically at *http://www.epa.gov/iris/subst/0436.htm.*

[83] Oak Ridge Institute for Science and Education (2004) External Peer Review for the IRIS Reassessment of the Inhalation Carcinogenicity of Naphthalene. August 2004. *http://cfpub.epa.gov/ncea/cfm/recordisplay.cfm?deid=84403.*

[84] National Toxicology Program (NTP). (2004). 11th Report on Carcinogens. Public Health Service, U.S. Department of Health and Human Services, Research Triangle Park, NC. Available from: *http://ntp-server.niehs.nih.gov.*

[85] International Agency for Research on Cancer (IARC) (2002) Monographs on the Evaluation of the Carcinogenic Risk of Chemicals for Humans. Vol. 82. Lyon, France.

also causes a number of chronic non-cancer effects in animals, including abnormal cell changes and growth in respiratory and nasal tissues.[86]

The standards finalized in this action will reduce air toxics emitted from these engines, vessels and equipment. These emissions reductions will help to mitigate some of the adverse health effects associated with their operation.

C. Carbon Monoxide

CO is a colorless, odorless gas produced through the incomplete combustion of carbon-based fuels. The current primary NAAQS for CO are 35 ppm for the 1-hour average and nine ppm for the 8-hour average. These values are not to be exceeded more than once per year.

We previously found that emissions from nonroad engines contribute significantly to CO concentrations in more than one nonattainment area (59 FR 31306, June 17, 1994). We have also previously found that emissions from Small SI engines contribute to CO concentrations in more than one nonattainment area. We are adopting a finding, based on the information in this section and in Chapters 2 and 3 of the Final RIA, that emissions from Marine SI engines and vessels likewise contribute to CO concentrations in more than one CO nonattainment area.

Carbon monoxide enters the bloodstream through the lungs, forming carboxyhemoglobin and reducing the delivery of oxygen to the body's organs and tissues. The health threat from CO is most serious for those who suffer from cardiovascular disease, particularly those with angina or peripheral vascular disease. Healthy individuals also are affected, but only at higher CO levels. Exposure to elevated CO levels is associated with impairment of visual perception, work capacity, manual dexterity, learning ability and performance of complex tasks. Carbon monoxide also contributes to ozone nonattainment since carbon monoxide reacts photochemically in the atmosphere to form ozone.[87] Additional information on CO related health effects can be found in the Carbon Monoxide Air Quality Criteria Document (CO AQCD).[88]

In addition to health effects from chronic exposure to ambient CO levels, acute exposures to higher levels are also a problem, see the Final RIA for additional information. In recent years a substantial number of CO poisonings and deaths have occurred on and around recreational boats across the nation.[89] The actual number of deaths attributable to CO poisoning while boating is difficult to estimate because CO-related deaths in the water may be labeled as drowning. An interagency team consisting of the National Park Service, the U.S. Department of the Interior, and the National Institute for Occupational Safety and Health maintains a record of published CO-related fatal and nonfatal poisonings.[90] Between 1984 and 2004, 113 CO-related deaths and 458 non-fatal CO poisonings have been identified based on hospital records, press accounts and other information. Deaths have been attributed to exhaust from both onboard generators and propulsion engines. Houseboats, cabin cruisers, and ski boats are the most common types of boats associated with CO poisoning cases. These incidents have prompted other federal agencies, including the United States Coast Guard and National Park Service, to issue advisory statements and other interventions to boaters to avoid excessive CO exposure.[91]

As of March 12, 2008, there were approximately 850,000 people living in 4 areas (which include 5 counties) designated as nonattainment for CO.[92] The CO nonattainment areas are presented in the Final RIA.

EPA's NONROAD model indicates that Marine SI emissions are present in each of the CO nonattainment areas and thus contribute to CO concentrations in those nonattainment areas. The CO contribution from Marine SI engines in classified CO nonattainment areas is presented in Table II–3.

TABLE II–3—CO EMISSIONS FROM MARINE SI ENGINES AND VESSELS IN CLASSIFIED CO NONATTAINMENT AREAS [a]

Area	County	Category	CO (short tons in 2005)
Las Vegas, NV	Clark	Marine SI	3,016
Reno, NV	Washoe	Marine SI	3,494
El Paso, TX	El Paso	Marine SI	37

Source: U.S. EPA, NONROAD 2005 model.
[a] This table does not include Salem, OR which is an unclassified CO nonattainment area.

Based on the national inventory numbers in Chapter 3 of the Final RIA and the local inventory numbers described in this section, we find that emissions of CO from Marine SI engines and vessels contribute to CO concentrations in more than one CO nonattainment area.

III. Sterndrive and Inboard Marine Engines

A. Overview

This section applies to sterndrive and inboard marine (SD/I) engines. Sterndrive and inboard engines are spark-ignition engines typically derived from automotive engine blocks for which a manufacturer will take steps to "marinize" the engine for use in marine applications. This marinization process includes choosing and optimizing the fuel management system, configuring a marine cooling system, adding intake and exhaust manifolds, and adding accessory drives and units. These engines typically have water-jacketed

[86] U.S. EPA (1998) Toxicological Review of Naphthalene, Environmental Protection Agency, Integrated Risk Information System, Research and Development, National Center for Environmental Assessment, Washington, DC. This material is available electronically at *http://www.epa.gov/iris/subst/0436.htm*.

[87] U.S. EPA (2000). Air Quality Criteria for Carbon Monoxide, EPA/600/P–99/001F. This document is available in Docket EPA–HQ–OAR–2004–0008.

[88] U.S. EPA (2000). Air Quality Criteria for Carbon Monoxide, EPA/600/P–99/001F. This document is available in Docket EPA–HQ–OAR–2004–0008.

[89] Mott, J.S.; Wolfe, M.I.; Alverson, C.J.; Macdonald, S.C.; Bailey, C.R.; Ball, L.B.; Moorman, J.E.; Somers, J.H.; Mannino, D.M.; Redd, S.C. (2002) National Vehicle Emissions Policies and Practices and Declining US Carbon Monoxide-Related Mortality. *JAMA* 288:988–995.

[90] National Park Service; Department of the Interior; National Institute for Occupational Safety and Health. (2004) Boat-related carbon monoxide poisonings. This document is available electronically at *http://safetynet.smis.doi.gov/thelistbystate10–19–04.pdf* and in docket EPA–HQ–OAR–2004–0008.

[91] U.S Department of the Interior. (2004) Carbon monoxide dangers from generators and propulsion engines. On-board boats—compilation of materials. This document is available online at *http://safetynet.smis.doi.gov/COhouseboats.htm* and in docket EPA–HQ–OAR–2004–0008.

[92] Population numbers are from 2000 census data.

exhaust systems to keep surface temperatures low. Ambient surface water (seawater or freshwater) is generally added to the exhaust gases before the mixture is expelled under water.

As described in Section I, the initial rulemaking to set standards for Marine SI engines did not include final emission standards for SD/I engines. In that rulemaking, we finalized the finding under Clean Air Act section 213(a)(3) that all Marine SI engines cause or contribute to ozone concentrations in two or more ozone nonattainment areas in the United States. However, because uncontrolled SD/I engines appeared to be a low-emission alternative to outboard and personal watercraft engines in the marketplace, even after the emission standards for these engines were fully phased in, we decided to set emission standards only for outboard and personal watercraft engines. At that time, outboard and personal watercraft engines were almost all two-stroke engines with much higher emission rates compared to the SD/I engines, which were all four-stroke engines. We pointed out in that initial rulemaking that we wanted to avoid imposing costs on SD/I engines that could cause a market shift to increased use of the higher-emitting outboard engines, which will undermine the broader goal of achieving the greatest degree of emission control from the full set of Marine SI engines.

We believe this is an appropriate time to set standards for SD/I engines, for several reasons. First, the available technology for SD/I engines has developed significantly, so we are now able to anticipate substantial emission reductions. With the simultaneous developments in technology for outboard and personal watercraft engines, we can set standards that achieve substantial emission reductions from all Marine SI engines. Second, now that California has adopted standards for SD/I engines, the cost impact of setting new standards for manufacturers serving the California market is generally limited to the hardware costs of adding emission control technology; these manufacturers will be undergoing a complete redesign effort for these engines to meet the California standards. Third, while an emission control program for SD/I engines will increase the price of these engines, we no longer think this will result in a market shift to higher-emitting outboard engines. The economic impact analysis performed for this final rule, summarized in Section XII, suggests that the prices will increase less than 1 percent and sales will be impacted by less than 2 percent. It is also possible that SD/I engine manufacturers may promote higher fuel efficiency and other performance advantages of compliant engines which would allow them to promote these engines as having a greater value and justifying these small expected price increases. As a result, we believe we can achieve the maximum emission reductions from Marine SI engines by setting standards for SD/I engines based on the use of catalyst technology at the same time that we adopt more stringent standards for outboard and personal watercraft engines.

As described in Section II, we are adopting the finding under Clean Air Act section 213(a)(3) that Marine SI engines cause or contribute to CO concentrations in two or more nonattainment areas of the United States. We believe the new CO standards will also reduce the exposure of individual boaters and bystanders to potentially dangerous CO levels.

We believe catalyst technology is available for achieving the new standards. Catalysts have been used for decades in automotive applications to reduce emissions, and catalyst manufacturers have continued to develop and improve this technology. Design issues for using catalysts in marine applications are primarily centered on packaging catalysts in the water-jacketed, wet exhaust systems seen on most SD/I engines. Section III.G discusses recent development work that has shown success in packaging catalysts in SD/I applications. In addition, there are ongoing efforts in evaluating catalyst technology in SD/I engines being sponsored by the marine industry, U.S. Coast Guard, and California ARB.

We are adopting the regulatory requirements for marine spark-ignition engines in 40 CFR part 1045. These requirements are similar to the regulations that have been in place for outboard and personal watercraft engines for several years, but include updated certification procedures, as described in Section IV.A. Engines and vessels subject to part 1045 are also subject to the general compliance provisions in 40 CFR part 1068. These include prohibited acts and penalties, exemptions and importation provisions, selective enforcement audits, defect reporting and recall, and hearing procedures. See Section VIII of the preamble to the proposed rule for further discussion of these general compliance provisions.

B. Engines Covered by This Rule

(1) Definition of Sterndrive and Inboard Engines

For the purpose of this regulation, SD/I engines encompass all spark-ignition marine propulsion engines that are not outboard or personal watercraft engines. A discussion of the revised definitions for outboard and personal watercraft engines is in Section IV.B. We consider all the following to be SD/I engines: inboard, sterndrive (also known as inboard/outboard), airboat engines, and jet boat engines.

The definitions for sterndrive and inboard engines at 40 CFR part 91 are presented below:

- Sterndrive engine means a four stroke Marine SI engine that is designed such that the drive unit is external to the hull of the marine vessel, while the engine is internal to the hull of the marine vessel.
- Inboard engine means a four stroke Marine SI engine that is designed such that the propeller shaft penetrates the hull of the marine vessel while the engine and the remainder of the drive unit is internal to the hull of the marine vessel.

We are amending the above definitions for determining which exhaust emission standards apply to spark-ignition marine engines in 2010. The new definition establishes a single term to include sterndrive and inboard engines together as a single engine category. The new definition for sterndrive/inboard also is drafted to include all engines not otherwise classified as outboard or personal watercraft engines.

The new definition has several noteworthy impacts. First, it removes a requirement that only four-stroke engines can qualify as sterndrive/inboard engines. We believe limiting the definition to include only four-stroke engines is unnecessarily restrictive and could create an incentive to use two-stroke (or rotary) engines to avoid catalyst-based standards. Second, it removes limitations caused by reference to propellers. The definition should not refer specifically to propellers, because there are other propulsion drives on marine vessels, such as jet drives, that could be used with SD/I engines. Third, as explained in the section on the OB/PWC definitions, the new definitions treat engines installed in open-bay vessels (*e.g.* jet boats) and in vessels over 4 meters long as SD/I engines. Finally, the definition in part 91 does not clearly specify how to treat specialty vessels such as airboats or hovercraft that use engines similar to those in conventional SD/I applications. The definition of personal watercraft grants EPA the discretion to classify engines as SD/I engines if the engine is comparable in technology and emissions to an inboard or sterndrive engine. EPA has used this discretion to classify airboats as SD/I engines. See 40 CFR 91.3 for the existing definitions of the marine engine classes. We continue to believe these engines share fundamental characteristics with traditional SD/I engines and should therefore be treated the same way. However, we believe the definitions should address these applications expressly to make clear which standards apply. We are adopting the following definition:

• *Sterndrive/inboard engine* means a spark-ignition engine that is used to propel a vessel, but is not an outboard engine or a personal watercraft engine. A sterndrive/inboard engine may be either a conventional sterndrive/inboard engine or a high-performance engine. Engines on propeller-driven vessels, jet boats, air boats, and hovercraft are all sterndrive/inboard engines.

SD/I high-performance engines are generally characterized by high-speed operation, supercharged air intake, customized parts, very high power densities, and a short time until rebuild (50 to 200 hours). Based on current SD/I product offerings, we are defining a high-performance engine as an SD/I engine with maximum power above 373 kW (500 hp) that has design features to enhance power output such that the expected operating time until rebuild is substantially shorter than 480 hours.

(2) Exclusions and Exemptions

We are extending our basic nonroad exemptions to the SD/I engines and vessels covered by this rule. These include the testing exemption, the manufacturer-owned exemption, the display exemption, and the national-security exemption. If the conditions for an exemption are met, then the engine is not subject to the exhaust emission standards.

In the rulemaking for recreational vehicles, we chose not to apply standards to hobby products by exempting all reduced-scale models of vehicles that are not capable of transporting a person (67 FR 68242, November 8, 2002). We are extending that same provision to SD/I marine engines (see § 1045.5).

The Clean Air Act provides for different treatment of engines used solely for competition. Rather than relying on engine design features that serve as inherent indicators of dedicated competitive use, as specified in the current regulations, we have taken the approach in more recent programs of more carefully differentiating competition and noncompetition models in ways that reflect the nature of the particular products. In the case of Marine SI engines, we do not believe there are engine design features that allow us to differentiate between engines that are used in high-performance recreational applications and those that are used solely for competition. Starting January 1, 2009, Marine SI engines meeting all the following criteria will therefore be considered to be used solely for competition:

• The engine (or a vessel in which the engine is installed) may not be displayed for sale in any public dealership or otherwise offered for sale to the general public.

• Sale of the vessel in which the engine is installed must be limited to professional racers or other qualified racers.

• The engine must have performance characteristics that are substantially superior to noncompetitive models (*e.g.* higher power-to-weight ratio).

• The engines must be intended for use only in racing events sanctioned (with applicable permits) by the Coast Guard or other public organization, with operation limited to racing events, speed record attempts, and official time trials.

We are also including a provision allowing us to approve an exemption for cases in which an engine manufacturer can provide clear and convincing evidence that an engine will be used solely for competition even though not all the above criteria apply for a given situation. This may occur, for example, if a racing association specifies a particular engine model in their competition rules, where that engine has design features that prevent it from being certified or from being used for purposes other than competition.

Engine manufacturers will make their request for each new model year. We will deny a request for future production if there are indications that some engines covered by previous requests are not being used solely for competition. Competition engines are generally produced and sold in very small quantities, so manufacturers should be able to identify which engines qualify for this exemption. We are applying the same criteria to outboard and personal watercraft engines and vessels. See § 1045.620.

We are adopting a new exemption to address individuals who manufacture recreational marine vessels for personal use (see § 1045.630). Under this exemption, someone may install a used engine in a new vessel where that engine is exempt from standards, subject to certain limitations. For example, an individual may produce one such vessel over a five-year period, the vessel may not be used for commercial purposes, and any exempt engines may not be sold for at least five years. The vessel must generally be built from unassembled components, rather than simply completing assembly of a vessel that is otherwise similar to one that will be certified to meet emission standards. This exemption does not apply for freshly manufactured engines. This exemption addresses the concern that hobbyists who make their own vessels could otherwise be a manufacturer subject to the full set of emission standards by introducing these vessels into commerce. We expect this exemption to involve a very small number of vessels. We revised the provisions of the personal-use exemption since the proposal to allow people to build a vessel with an exempted engine once every five years instead of ten years. We believe this is more reflective of a hobbyists interest in building a boat and using it before moving on to the next building project.

C. Exhaust Emission Standards

We are adopting technology-based exhaust emission standards for new SD/I engines. These standards are similar to the exhaust emission standards that California ARB recently adopted (see Section I). This section describes the provisions related to controlling exhaust emissions from SD/I engines. See Section VI for a description of the new requirements related to evaporative emissions.

(1) Standards and Dates

We are adopting exhaust emission standards of 5.0 g/kW-hr $HC+NO_X$ and 75 g/kW-hr CO for SD/I engines, starting with the 2010 model year (see § 1045.105). On average, this represents about a 70 percent reduction in $HC+NO_X$ and a 50 percent reduction in CO from baseline engine configurations. Due to the challenges of controlling CO emissions at high load, the expected reduction in CO emissions from low-to mid-power operation is expected to be more than 80 percent. We are providing additional lead time for small businesses as discussed in Section III.F.2. The new standards are based on the same duty cycle that currently is in place for outboard and personal watercraft engines, as described in Section III.D. Section III.G discusses the technological feasibility of these standards in more detail.

The new standards are largely based on the use of small catalytic converters that can be packaged in the water-cooled exhaust systems typical for these applications. California ARB also adopted an $HC+NO_X$ standard of 5 g/kW-hr, starting with 2008 model year engines, but they did not adopt a standard for CO emissions. We believe the type of catalyst used to achieve the $HC+NO_X$ standard will also be effective in reducing CO emissions enough to meet the new standard with the proper calibrations, so no additional hardware will be needed to control CO emissions.

Manufacturers have expressed concern that the implementation dates may be difficult to meet, for certain engines, due to anticipated changes in engine block designs produced by General Motors. As described in the Final RIA and in the docket, the vast majority of SD/I engines are based on automotive engine blocks sold by General Motors.[93] There are five basic engine blocks used, and recently GM announced that it plans to discontinue production of the 4.3L and 8.1L engine blocks. GM anticipates that it will offer a 4.1L engine block and a 6.0L supercharged engine block to the marine industry as replacements. Full-run production of these new blocks is anticipated around the time that manufacturers will be making the transition to meeting new EPA emission standards. SD/I engine manufacturers have expressed concern that they will not be able to begin the engineering processes related to marinizing these engines, including the development of catalyst-equipped exhaust manifolds, until they see the first prototypes of the two replacement engine models. In addition, they are concerned that they do not have enough remaining years of sales of the 4.3L and 8.1L engines to justify the cost of developing catalyst-equipped exhaust manifolds for these engines and amortizing the costs of the required tooling while also developing the two new engine models.

These are unique circumstances because the SD/I engine manufacturers' plans and products depend on the manufacture of the base engine by a company not directly involved in marine engine manufacturing. The SD/I sales represent only a small fraction of GM's total engine sales and thus did not weigh heavily in their decision to replace the existing engine blocks with two comparable versions during the timeframe when the SD/I manufacturers are facing new emission standards. SD/I manufacturers have stated that alternative engine blocks that meet their needs are not available in the interim, and that it will be cost-prohibitive for them to produce their own engine blocks.

EPA's SD/I standards start to take effect with the 2010 model year, two years after the same standards apply in California. We believe a requirement to extend the California standards nationwide after a two-year delay allows manufacturers adequate time to incorporate catalysts across their product lines as they are doing in California. Once the technology is developed for use in California, it will be available for use nationwide soon thereafter. In fact, one company currently certified to the California standards is already offering catalyst-equipped SD/I engines nationwide. To address the challenge related to the transition away from the current 4.3 and 8.1 liter GM engines, we are including in the final rule a direct approval for a hardship exemption allowing manufacturers to produce these engines for one additional year without certifying them (see § 1045.145). Starting in the 2011 model year, we would expect manufacturers to have worked things out such that they could certify their full product lineup to the applicable standards.

Engines used on jet boats may have been classified under the original definitions as personal watercraft engines. As described in Section IV, engines used in jet boats or personal watercraft-like vessels that are four meters or longer will be classified as SD/I engines under the new definitions. Such engines subject to part 91 today will therefore need to continue meeting EPA emission standards as personal watercraft engines through the 2009 model year under part 91, after which they will need to meet the new SD/I standards under part 1045. This is another situation where the transition period discussed above may be helpful. In contrast, as discussed above, air boats have been classified as SD/I engines under EPA's discretionary authority and are not required to comply with part 91, but must meet the new emission standards for SD/I engines under part 1045.

As described above, engines used solely for competition are not subject to emission standards, but many SD/I high-performance engines are sold for recreational use. SD/I high-performance engines have very high power outputs, large exhaust gas flow rates, and relatively high concentrations of hydrocarbons and carbon monoxide in the exhaust gases. As described in the Final Regulatory Impact Analysis, applying catalyst technology to these engines is not practical. California ARB initially adopted the same $HC+NO_X$ standards that apply for other SD/I engines with the expectation that manufacturers would simply rely on emission credits from other SD/I engines. We believe a credit-based solution is not viable for small business manufacturers that do not have other products with which to exchange emission credits and California ARB has modified their rule to also address this concern.

We are adopting standards for SD/I high-performance engines based on the level of control that can be expected from recalibration with electronically controlled fuel injection. These standards are phased in over a two-year transition period. In the 2010 model year, the $HC+NO_X$ emission standards are 20.0 g/kW-hr for engines at or below 485 kW and 25.0 g/kW-hr for bigger engines. In 2011 and later model years, the $HC+NO_X$ emission standards drop to 16.0 g/kW-hr for engines at or below 485 kW and 22.0 g/kW-hr for bigger engines. The CO standard is 350 g/kW-hr for all SD/I high-performance engines. We believe this is achievable with more careful control of fueling rates, especially under idle conditions. Control of air-fuel ratios should result in improved emission control even after multiple rebuilds. Note that small-volume manufacturers may delay complying with the high-performance standards until 2013. In that year, the standard will be the same as the 2011 standards for larger manufacturers.

We are adopting a variety of provisions to simplify the requirements for exhaust emission certification and compliance for SD/I high-performance engines, as described in Section IV.F. We have also chosen not to apply the Not-to-Exceed emission standards to these engines because we have very limited information on their detailed emission characteristics and we are concerned about extent of testing that would be required by the large number of affected engine manufacturers that are small businesses.

We are also aware that there are some very small sterndrive or inboard engines. In particular, sailboats may have small propulsion engines for backup power. These engines will fall under the new definition of sterndrive/inboard engines, even though they are much smaller and may experience very different in-use operation. These engines generally have more in common with marine auxiliary engines or lawn and garden engines that are subject to land-based standards. We are therefore allowing manufacturers to use engines that have been certified to current land-

[93] "GM Product Changes Affecting SD/I Engine Marinizers," memo from Mike Samulski, EPA, to Docket EPA–HQ–OAR–2004–0008–0528.

based emission standards for sterndrive and inboard installation, much like we are adopting for outboard and personal watercraft engines (see § 1045.610).

The emission standards apply at the range of atmospheric pressures represented by the test conditions specified in part 1065. This includes operation at elevated altitudes. Since we expect most or all SD/I engines to have three-way catalysts with closed-loop fuel control, these engines should be able to include the ability to automatically compensate for varying altitude. Manufacturers may choose to use an altitude kit for demonstrating compliance with emission standards at high altitudes as described for OB/PWC engines in Section IV.C.1. Manufacturers using altitude kits would need to take a variety of steps to describe their approach and ensure that such altitude kits are in fact being used with in-use engines operating at high altitudes, as described in Section IV.E.8.

(2) Not-to-Exceed Standards

We are adopting emission standards that apply over an NTE zone. The NTE standards are in the form of a multiplier times the duty-cycle standard for $HC+NO_X$ and for CO (see § 1045.105. Section III.D.2 gives an overview of the NTE standards and compliance provisions and describes the NTE test procedures.

Manufacturers commented that certification to the NTE standards requires additional testing for engine models that are already certified to the new emission standards for California. In addition, they expressed concern that they may need to recalibrate existing engine models to meet the NTE standards. Manufacturers commented that this would not be possible by the date of the duty cycle standard. For engines already certified in California, manufacturers carry over preexisting certification test data from year to year. Manufacturers commented that additional time would be necessary to retest, and potentially recalibrate, these engines for certification to the NTE standards. To address these issues regarding lead time needed to retest these engines, we are not applying the NTE standards for 2010–2012 model year engines that are certified using preexisting data (i.e., carryover engine families). For new engine models, manufacturers indicated that they will be able to perform the NTE testing and duty-cycle testing as part of their efforts to certify to the new standards. Therefore the primary implementation date of 2010 applies to these engines. Beginning in the 2013 model year, all conventional SD/I engines must be certified to meet the NTE standards.

This NTE approach complements the weighted modal emission tests included in this rule. These steady-state duty cycles and standards are intended to establish average emission levels over several discrete modes of engine operation. Because it is an average, manufacturers design their engines with emission levels at individual points varying as needed to maintain maximum engine performance and still meet the engine standard. The NTE limit will be an additional requirement. It is intended to ensure that emission controls function with relative consistency across the full range of expected operating conditions.

(3) Emission Credit Programs

(a) Averaging, Banking, and Trading

We are adopting provisions for averaging, banking, and trading of emission credits for conventional SD/I engines to meet the new $HC+NO_X$ and CO standards (see § 1045.105 and part 1045, subpart H). See Section VII.C.5 of the preamble to the proposed rule for a description of general provisions related to averaging, banking, and trading programs. A description of the ABT provisions for the new SD/I standards is provided in this section.

EPA proposed that manufacturers would not be able to earn credits for one pollutant while using credits to comply with the emissions standard for another pollutant. The proposed restriction was modeled on similar requirements in other ABT programs where there was concern that a manufacturer could use technologies to reduce one pollutant while increasing another pollutant. Manufacturers are expected to comply with the new SD/I standards by using a combination of improved engine designs and catalysts. This should result in reductions in both $HC+NO_X$ emissions and CO emissions compared to current designs. While the technology is expected to reduce both $HC+NO_X$ emissions and CO emissions, there could be situations where the engines are capable of meeting one of the emission standards but not the other. EPA does not want to preclude such engines from being able to certify using the provisions of the ABT program and is therefore dropping the proposed restriction from the final rule.

Credit generation and use is calculated based on the FEL of the engine family and the standard. We are adopting FEL caps to prevent the sale of very high-emitting engines. The $HC+NO_X$ FEL cap for conventional SD/I engines is 16 g/kW-hr while the CO FEL cap is 150 g/kW-hr and applies starting in 2010, except as noted below. These FEL caps represent the average baseline emission levels of SD/I engines, based on data described in the Final RIA. However, through the 2013 model year we are separately allowing small-volume engine manufacturers to certify their four-stroke conventional SD/I engines without testing by assuming an $HC+NO_X$ FEL of 22.0 g/kW-hr and a CO FEL of 150 g/kW-hr. Manufacturers using this provision would not be subject to the FEL cap for those engine families.

We are specifying that SD/I engines are in a separate averaging set from OB/PWC engines, with a limited exception for certain jet boat engines as described below. This means that credits earned by SD/I engines may be used only to offset higher emissions from other SD/I engines. Likewise, credits earned by OB/PWC engines may be used only to offset higher emissions from other OB/PWC engines (except where we allow those credits to be used for certain jet boat engines).

Emission credits earned for SD/I engines will have an indefinite credit life with no discounting. We consider these emission credits to be part of the overall program for complying with the new standards. Given that we may consider further reductions beyond these standards in the future, we believe it will be important to assess the ABT credit situation that exists at the time any further standards are considered. Emission credit balances will be part of the analysis for determining the appropriate level and timing of new standards, consistent with the statutory requirement to establish standards that represent the greatest degree of emission reduction achievable, considering cost, safety, lead time, and other factors. If we were to allow the use of credits generated under the standards adopted in this rule to meet more stringent standards adopted in a future rulemaking, we may need to adopt emission standards at more stringent levels or with an earlier start date than we would absent the continued use of existing emission credits, depending on the level of emission credit banks. Alternatively, we may adopt future standards without allowing the use of existing emission credits.

Finally, manufacturers may include as part of their federal credit calculation the sales of engines in California as long as they don't separately account for those emission credits under the California regulations. We originally proposed to exclude engines sold in California that are subject to the California ABR standards. However, we consider California's current $HC+NO_X$ standards to be equivalent to those we are adopting in this rulemaking, so we would expect a widespread practice of producing and marketing 50-state products. Therefore, as long as a manufacturer is not generating credits under California's regulations for SD/I engines, we would allow manufacturers to count those engines when calculating credits under EPA's program. This is consistent with how EPA allows credits to be calculated in other nonroad sectors, such as recreational vehicles.

(b) Early-Credit Approaches

We are adopting an early-credit program in which a manufacturer could earn emission credits before 2010 with early introduction of emission controls designed to meet the new standards (see § 1045.145). For engines produced by small-volume SD/I manufacturers that are eligible for the one-year delay described in Section III.F.2, early credits could be earned before 2011. As proposed, use of these early credits would be limited to the first three years that the new standards apply. While we believe adequate lead time is provided to meet the new standards, we recognize that flexibility in timing could help some manufacturers—particularly small manufacturers—to meet the new standards. Other manufacturers that are able to comply early on certain models will be better able to transition their full product line to the new standards by spreading out the transition over two years or more. Under this approach, we anticipate that manufacturers will generate credits through the use of catalysts.

Manufacturers will generate these early credits based on the difference between the measured emission level of the clean engines and an assigned baseline level (16 g/kW-hr $HC+NO_X$ and 150 g/kW-hr CO). These assigned baseline levels are based on data presented in Chapter 4 of the Final RIA representing the average level observed for uncontrolled engines. We also provide bonus credits for any small-volume SD/I engine manufacturer that certifies early to the new standards to provide a further incentive for introducing catalysts in SD/I engines. The bonus credits will take the form of a multiplier times the earned credits. The multipliers are 1.25 for being one year early, 1.5 for being two years early, and 2.0 for being three years early. For example, a small-volume manufacturer certifying an engine to 5.0 g/kW-hr $HC+NO_X$ in 2009 (two years early) will get a bonus multiplier of 1.5. Early $HC+NO_X$ credits will therefore be calculated using the following equation: credits [grams] = (16–5) mu Power [kW] × Useful Life [hours] × Load Factor × 1.5. The specified load factor is 0.207, which is currently used in the OB/PWC calculations.

To earn these early credits, the engine must meet both the new $HC+NO_X$ standard and the new CO standard. These early credits will be treated the same as emission credits generated after the emission standards start to apply. This approach provides an incentive for manufacturers to pull ahead significantly cleaner technologies. We believe such an incentive will lead to early introduction of catalysts on SD/I engines and help promote earlier market acceptance of this technology. We believe this early credit program will allow manufactures to comply with the new standards in an earlier time frame because it allows them to spread out their development resources over multiple years. To ensure that manufacturers do not generate credits for meeting standards that already apply, no EPA credits will be generated for engines that are produced for sale in California.

(c) Jet Boats

Sterndrive and inboard vessels are typically propelled by traditional SD/I engines based on automotive engine blocks. As explained in Section IV, we are changing the definition of personal watercraft to ensure that engines used on jet boats will no longer be classified as personal watercraft engines but instead as SD/I engines because jet boats are more like SD/I vessels. However, manufacturers in many cases make these jet boats by installing an engine also used in outboard or personal watercraft applications (less than 4 meters in length) and coupling the engine to a jet drive for propelling the jet boat. Thus, manufacturers of outboard or personal watercraft engines may also manufacture the same or a similar engine for use on what we consider to be a jet boat.

Engines used in jet boats will be subject to SD/I emission standards. However, we are providing some flexibility in meeting the new emission standards for jet boat engines because they are currently designed to use engines derived from OB/PWC applications and because of their relatively low sales volumes. We will allow manufacturers to use emission credits generated from OB/PWC engines to demonstrate that their jet boat engines meet the new $HC+NO_X$ and CO standards for SD/I engines if the same or similar engine is certified as an outboard or personal watercraft engine, and if the majority of units sold in the United States from those related engine families are sold for use as outboard or personal watercraft engines (see § 1045.660 and § 1045.701). Manufacturers will need to group SD/I engines used for jet boats in a separate engine family from the outboard or personal watercraft engines to ensure proper labeling and calculation of emission credits, but manufacturers could rely on emission data from the same prototype engine for certifying both engine families.

Finally, manufacturers of jet boat engines subject to SD/I standards and using credits from outboard or personal watercraft engines must certify these jet boat engines to an FEL that meets or exceeds the newly adopted standards for outboard and personal watercraft engines. This limits the degree to which manufacturers may take advantage of emission credits to produce engines that are emitting at higher levels than competitive engines.

(d) SD/I High-Performance Engines

For the reasons described in Section III.C.1, the standards being adopted for SD/I high-performance engines are less stringent than originally proposed. As a result, we are not including the SD/I high-performance engines in the ABT program. Manufacturers are required to meet the emission standards for SD/I high-performance engines without using emission credits.

(4) Crankcase Emissions

Due to blowby of combustion gases and the reciprocating action of the piston, exhaust emissions can accumulate in the crankcase. Uncontrolled engine designs route these vapors directly to the atmosphere. Closed crankcases have become standard technology for automotive engines and for outboard and personal watercraft engines. Manufacturers generally do this by routing crankcase vapors through a valve into the engine's air intake system. We are requiring manufacturers to prevent crankcase emissions from SD/I marine engines (see § 1045.115). Because automotive engine blocks are already tooled for closed crankcases, the cost of adding a valve for positive crankcase ventilation is small for SD/I engines. Even with non-automotive blocks, the tooling changes necessary for closing the crankcase are straightforward.

(5) Durability Provisions

We rely on pre-production certification, and other programs, to ensure that engines control emissions throughout their intended lifetime of operation. Section VII of the preamble to the proposed rule describes how we require manufacturers to incorporate laboratory aging in the certification process, how we limit the extent of maintenance that manufacturers may specify to keep engines operating as designed, and other general provisions related to certification. The following sections describe additional provisions that are specific to SD/I engines.

(a) Useful Life

We are specifying a useful life period of ten years or 480 hours of engine operation, whichever comes first (see § 1045.105). Manufacturers are responsible for meeting emission standards during this useful life period. This is consistent with the requirements adopted by California ARB. We are further requiring that the 480-hour useful life period is a baseline value, which may be extended if data show that the average service life for engines in the family is longer. For example, we may require that the manufacturer certify the engine over a longer useful life period that more accurately represents the engines' expected operating life if we find that in-use engines are typically operating substantially more than 480 hours. This approach is similar to what we adopted for recreational vehicles.

For SD/I high-performance engines, we are specifying a useful life of 150 hours or 3 years for engines at or below 485 kW and a useful life of 50 hours or 1 year for engines above 485 kW. Due to the high power and high speed of these engines, mechanical parts are often expected to wear out quickly. For instance, one manufacturer indicated that some engines above 485 kW have scheduled head rebuilds between 50 and 75 hours of operation. These useful life values are consistent with the California ARB regulations for SD/I high-performance engines.

Some SD/I engines below 373 kW may be designed for high power output even though they do not reach the power threshold to qualify as SD/I high-performance engines. Because they do not qualify for the shorter useful life that applies to SD/I high-performance engines, they will be subject to the default value of 480 hours for other SD/I engines. However, to address the limited operating life for engines that are designed for especially high power output, we are allowing manufacturers to request a shorter useful life for such an engine family based on information showing that engines in the family rarely operate beyond the requested shorter period. For example, if engines designed for extremely high-performance are typically rebuilt after 250 hours of operation, this will form the basis for establishing a shorter useful life period for those engines. See § 1045.105 for additional detail in establishing a shorter useful life.

Jet boat engines that are certified in conjunction with outboard or personal watercraft engine families are subject to the shorter useful life period that applies for outboard or personal watercraft engines. This is necessary to prevent a situation where the original certification data is insufficient for certifying the jet boat engines without some further testing or analysis to show that the engines meet emission standards over a longer period.

(b) Warranty Periods

We are requiring that manufacturers provide an emission-related warranty during the first three years or 480 hours of engine operation, whichever comes first (see § 1045.120). This warranty period applies equally to emission-related electronic components on SD/I high-performance engines. However, we are allowing shorter warranty periods (in hours) for emission-related mechanical components on SD/I high-performance engines because these parts are expected to wear out more rapidly than comparable parts on traditional SD/I engines. Specifically, we are specifying a warranty period for emission-related mechanical components of 3 years or 150 hours for high-performance engines between 373 and 485 kW, and 1 year or 50 hours for high-performance engines above 485 kW. These warranty periods are the same as those adopted by the California ARB.

If the manufacturer offers a longer warranty for the engine or any of its components at no additional charge, we require that the emission-related warranty for the respective engine or component must be extended by the same amount. The emission-related warranty includes components related to controlling exhaust, evaporative, and crankcase emissions from the engine. These warranty requirements are consistent with provisions that apply in most other programs for nonroad engines.

(6) Engine Diagnostics

We are requiring that manufacturers design their catalyst-equipped SD/I engines to diagnose malfunctioning emission control systems starting with the introduction of the final standards (see § 1045.110). As discussed in the Final RIA, three-way catalyst systems with closed-loop fueling control work well only when the air-fuel ratios are controlled to stay within a narrow range around stoichiometry. Worn or broken components or drifting calibrations over time can prevent an engine from operating within the specified range. This increases emissions and can lead to significantly increased fuel consumption and engine wear. The operator may or may not notice the change in the way the engine operates. We are not requiring similar diagnostic controls for OB/PWC engines because the anticipated emission control technologies for these other applications are generally less susceptible to drift and gradual deterioration. We have adopted similar diagnostic requirements for Large SI engines operating in forklifts and other industrial equipment that also use three-way catalysts to meet emission standards.

This diagnostic requirement focuses solely on maintaining stoichiometric control of air-fuel ratios. This kind of design detects problems such as broken oxygen sensors, leaking exhaust pipes (upstream of sensors and catalysts), fuel deposits, and other things that require maintenance to keep the engine at the proper air-fuel ratio.

Diagnostic monitoring provides a mechanism to help keep engines tuned to operate properly, with benefits for both controlling emissions and maintaining optimal performance. There are currently no inspection and maintenance programs for marine engines, so the most important variable in making the emission control and diagnostic systems effective is getting operators to repair the engine when the diagnostic light comes on. This calls for a relatively simple design to avoid signaling false failures as much as possible. The diagnostic requirements in this final rule, therefore, focus on detecting inappropriate air-fuel ratios, which is the most likely failure mode for three-way catalyst systems. The malfunction indicator must go on when an engine runs for a full minute under closed-loop operation without reaching a stoichiometric air-fuel ratio.

California ARB has adopted diagnostic requirements for SD/I engines that involve a more extensive system for monitoring catalyst performance and other parameters. We will accept a California-approved system as meeting EPA requirements. The final regulations direct manufacturers to follow standard practices defined in documents adopted recently by the Society of Automotive Engineers in SAE J1939–5. See § 1045.110 for detailed information.

D. Test Procedures for Certification

(1) General Provisions

The marine engine test procedures are generally the same for both SD/I and OB/PWC engines. This involves laboratory measurement of emissions while the engine operates over the ISO E4 duty cycle. This is a five-mode steady-state duty cycle including an idle mode and four modes lying on a propeller curve with an exponent of 2.5, as shown in Appendix II to part 1045. The International Organization for Standardization (ISO) intended for this cycle to be used for recreational spark-ignition marine engines installed in vessels up to 24 m in length. Because most or all vessels over 24 m have diesel engines, we believe the E4 duty cycle is most appropriate for SD/I engines covered by this rule. There may be some spark-ignition engines installed in vessels somewhat longer than 24 m, but we believe the E4 duty cycle is no less appropriate in these cases. See Section IV.D for a discussion of adjustments to the test procedures related to the migration to 40 CFR part 1065, testing with a ramped-modal cycle, determining maximum test speed for denormalizing the duty cycle, and testing at high altitude.

The E4 duty cycle includes a weighting of 40 percent for idle. For SD/I high-performance engines, commenters suggested that these engines typically have substantial auxiliary loads and parasitic losses even when the vessel does not need propulsion power. While the specified duty cycle for SD/I high-performance engines is identical to that for other Marine SI engines, we would expect manufacturers to use the provisions of § 1065.510(b)(3) to target a reference torque of 15 percent instead of zero at idle.

(2) Not-to-Exceed Test Procedures and Standards

We are adopting not-to-exceed (NTE) requirements similar to those established for marine diesel engines. Engines will be required to meet the NTE standards during normal in-use operation.

(a) Concept

Our goal is to achieve control of emissions over a wide range of ambient conditions and over the broad range of in-use speed and load combinations that can occur on a marine engine. This will ensure real-world emission control, rather than just controlling emissions under certain laboratory conditions. This allows us to evaluate an engine's compliance during in-use testing without removing the engine from the vessel because the NTE requirements establish an objective standard and an easily implemented test procedure. Our traditional approach has been to set a numerical standard on a specified test procedure and rely on the additional prohibition of defeat devices to ensure in-use control over a broad range of operation not included in the test procedure. We are establishing the same prohibition on defeat devices for OB/PWC and SD/I engines (see § 1045.115).

No single test procedure or test cycle can cover all real-world applications, operations, or conditions. Yet to ensure that emission standards are providing the intended benefits in use, we must have a reasonable expectation that emissions under real-world conditions reflect those measured on the test procedure. The defeat device prohibition is designed to ensure that emission controls are employed during real-world operation, not just under laboratory testing conditions. However, the defeat device prohibition is not a quantified standard and does not have an associated test procedure, so it does not have the clear objectivity and ready enforceability of a numerical standard and test procedure. We believe using the traditional approach, i.e., using only a standardized laboratory test procedure and test cycle, makes it difficult to ensure that engines will operate with the same level of emission control in use as in the laboratory.

Because the duty cycle we have adopted uses only five modes on an average propeller curve to characterize marine engine operation, we are concerned that an engine designed to that duty cycle will not necessarily perform the same way over the range of speed and load combinations seen on a boat. This duty cycle is based on an average propeller curve, but a marine propulsion engine may never be fitted with an "average propeller." For instance, an engine installed in a specific boat with a particular propeller may operate differently based on the design of the boat and how heavily the boat is loaded, among other factors.

To ensure that engines control emissions over a wide range of speed and load combinations normally seen on boats, we are including a zone under the engine's power curve where the engine may not exceed a specified emission limit (see § 1045.105 and § 1045.515). This limit will apply to all regulated pollutants during steady-state operation. In addition, we are requiring that a wide range of real ambient conditions be included in testing with this NTE zone. The NTE zone, limit, and ambient conditions are described below.

We believe there are significant advantages to establishing NTE standards. The final NTE test procedure is flexible, so it can represent the majority of in-use engine operation and ambient conditions. The NTE approach thus takes all the benefits of a numerical standard and test procedure and expands it to cover a broad range of conditions. Also, laboratory testing makes it harder to perform in-use testing because either the engines will have to be removed from the vessel or care will have to be taken to achieve laboratory-type conditions on the vessel. With the NTE approach, in-use testing and compliance become much easier since emissions may be sampled during normal boating. By establishing an objective measurement, this approach makes enforcement of defeat device provisions easier and provides more certainty to the industry.

Even with the NTE requirements, we believe it is still appropriate to retain standards based on the steady-state duty cycle. This is the standard that we expect the certified marine engines to meet on average in use. The NTE testing is focused more on maximum emissions for segments of operation and, in most cases, will not require additional technology beyond what is used to meet the final standards. In some cases, the calibration of the engine may need to be adjusted. We believe that basing the emission standards on a distinct cycle and using the NTE zone to ensure in-use control creates a comprehensive program.

We believe the technology used to meet the standards over the five-mode duty cycle, when properly calibrated, will meet the caps that apply across the NTE zone. We therefore do not expect the final NTE standards to cause manufacturers to need additional hardware. We believe the NTE standard will not result in a large amount of additional testing, because these engines should be designed to perform as well in use as they do over the five-mode test. However, our cost analysis in the Final RIA accounts for some additional testing, especially in the early years, to provide manufacturers with assurance that their engines will meet the NTE requirements.

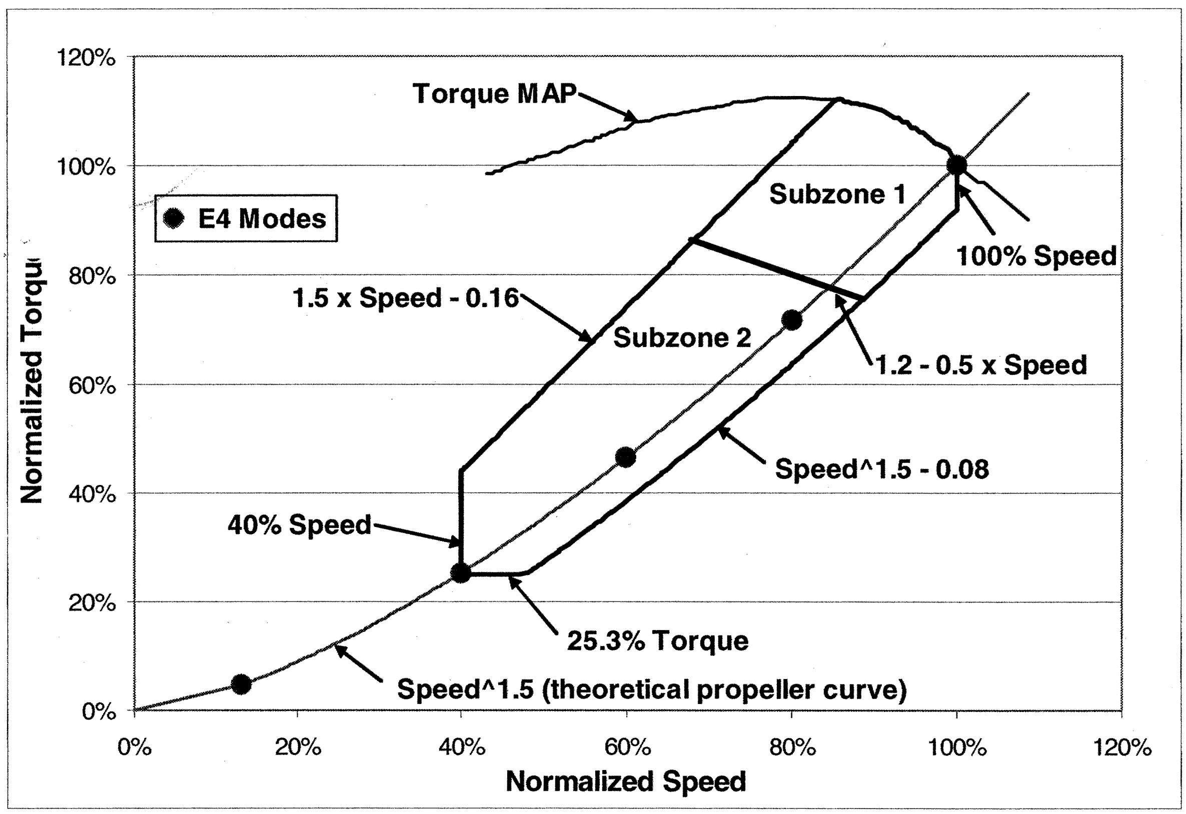
(b) Shape of NTE Zone

We developed the NTE zone based on the range of conditions that these engines typically see in use. Manufacturers collected data on several engines installed on vessels and operated under light and heavy load. Chapter 4 of the Final RIA presents this data and describes the development of the boundaries and conditions associated with the NTE zone. Although significant in-use engine operation occurs at low speeds, we are excluding operation below 40 percent of maximum test speed because brake-specific emissions increase dramatically as power approaches zero. An NTE limit for low-speed or low-power operation will be very hard for manufacturers and EPA to implement in a meaningful way.

We anticipate that most, if not all SD/I engines subject to the NTE standards will use three-way catalytic controls to meet the exhaust emission standards. For that reason, this discussion focuses on the NTE zone and subzones for catalyst-equipped engines. Catalysts are most effective when the fuel-air ratio in the exhaust is near stoichiometry, and engine manufacturers use closed-loop electronic control to monitor and maintain the proper fuel-air ratio in the exhaust for optimum catalyst efficiency. However, at high power, engine manufacturers must increase the fueling rate to reduce the exhaust temperatures. Otherwise, if the exhaust temperature becomes too high, exhaust valves and catalysts may be damaged. During rich, open-loop operation at high power, the catalyst is oxygen-limited and less effective at oxidizing HC and CO. To address the issue of open-loop catalyst efficiency, we created a high power subzone for catalyst-equipped engines. The shape of this subzone is based on data presented in the RIA on engine protection strategies.

Figure III–1 illustrates the final NTE zone for engines equipped with catalysts. Section IV.D.5 discusses the NTE test procedures and limits for non-catalyzed engines. The NTE zones and standards apply depending on whether the engine has a catalyst or not, so outboard or personal watercraft engines may be subject to the NTE approach described in this section and sterndrive/inboard engines may be subject to the NTE provisions described in Section IV.D.5. However, we expect these situations to be rather uncommon.

Figure III-1: NTE Zone and Subzones for Catalyst-Equipped Engines



The final regulations allow manufacturers to request approval for adjustments to the size and shape of the NTE zone for certain engines if they can show that the engine will not normally operate outside the revised NTE zone in use (see § 1045.515). We do not want manufacturers to go to extra lengths to design and test their engines to control emissions for operation that will not occur in use. However, manufacturers will still be responsible for all operation of an engine on a vessel that will reasonably be expected to be seen in use, and they will be responsible for ensuring that their specified operation is indicative of real-world operation. EPA testing may include any normal operation observed on in-use vessels, consistent with the applicable regulatory provisions. In addition, if a manufacturer designs an engine for operation at speeds and loads outside of the NTE zone, the manufacturer is required to notify us so the NTE zone used to comply with the applicable standards can be modified appropriately to include this operation for that engine family.

(c) NTE Emission Limits

We are establishing NTE limits for the individual subzones shown in Figure III–1 above based on data collected from several SD/I engines equipped with catalysts. These data and our analysis are presented in Chapter 4 of the Final RIA. See Section IV.D.5 for a discussion of NTE limits for engines not equipped with catalysts.

For catalyst-equipped engines, the largest contribution of emissions over the 5-mode duty cycle comes from open-loop operation at Mode 1. In addition, the idle point (Mode 5) is weighted 40 percent in the 5-mode duty cycle, but not included in the NTE zone. For this reason, brake-specific emissions throughout most of the NTE zone are less than the weighted average from the steady-state testing. For most of the NTE zone, we are therefore establishing a limit equal to the duty-cycle standard (i.e., NTE multiplier = 1.0). This means that these engines may not have steady-state emissions at any point inside the NTE zone, except in the subzone around full-load operation, that exceed the $HC+NO_X$ or CO emission standards.

Emission data on catalyst-equipped engines also show higher emissions near full-power operation. As discussed above, this is due to the need for richer fuel-air ratios under high-power operation to protect the engines from overheating. Under rich conditions, a three-way catalyst does not effectively oxidize CO emissions. Therefore, we are not setting an NTE limit in Subzone 1 for CO. Some $HC+NO_X$ control is expected in Subzone 1 because a three-way catalyst will efficiently reduce NO_X emissions under rich conditions. Similar to CO, HC emissions are not effectively oxidized in a catalyst during rich operation. We are therefore establishing a higher NTE limit of 1.5 for $HC+NO_X$ in Subzone 1. This limit is based on emission control performance during open-loop operation.

(d) Excluded Operation

As with marine diesel engines, only steady-state operation is included for NTE testing (see § 1045.515). Steady-state operation will generally mean setting the throttle (or speed control) in a fixed position. We believe most operation with Marine SI engines involves nominally steady-state operator demand. It is true that boats often experience rapid accelerations, such as with water skiing. However, boats are typically designed for planing operation at relatively high speeds. This limits the degree to which we would expect engines to experience frequent accelerations during extended operation. Also, because most of the transient events involve acceleration from idle to reach a planing condition, most transient engine operation is outside the NTE zone and will therefore not be covered by NTE testing anyway. Moreover, we believe OB/PWC and SD/I engines designed to comply with steady-state NTE requirements will be using technologies that also work effectively under the changing speed and load conditions that may occur. If we find there is substantial transient operation within the NTE zone that causes significantly increased emissions from installed engines, we will revisit this provision in the future.

We are aware that engines may not be able to meet emission standards under all conditions, such as times when emission control must be compromised for startability or safety. As with outboard and personal watercraft engines, NTE testing excludes engine starting and warm-up. We are allowing manufacturers to design their engines to utilize engine protection strategies that will not be covered by defeat device provisions or NTE standards. This is analogous to the tampering exemptions incorporated into 40 CFR 1068.101(b)(1) to address emergencies. We believe it is appropriate to allow manufacturers to design their engines with ''limp-home'' capabilities to prevent a scenario where an engine fails to function, leaving an operator on the water without any means of propulsion.

(e) Ambient Conditions

Variations in ambient conditions can affect emissions. Such conditions include air temperature, water temperature, barometric pressure, and humidity. We are applying the comparable ranges for these variables as for marine diesel engines (see § 1045.515). Within the specified ranges, there is no provision to correct emission levels to standard conditions. Outside of the specified ranges, emissions may be corrected back to the nearest end of the range using good engineering practice. The specified ranges are 13 to 35 °C (55 to 95 °F) for ambient air temperature, 5 to 27 °C (41 to 80 °F) for ambient water temperature, and 94.0 to 103.325 kPa for atmospheric pressure. NTE testing may take place at any humidity level, but manufacturers may correct for humidity effects as described in § 1065.670.

(f) Measurement Methods

While it may be easier to test outboard engines in the laboratory, there is a strong advantage to using portable measurement equipment to test SD/I engines and personal watercraft without removing the engine from the vessel. Field testing will also provide a much better means of measuring emissions to establish compliance with the NTE standards, because it is intended to ensure control of emissions during normal in-use operation that may not occur during laboratory testing over the specified duty cycle. We are adopting field-testing provisions for all SD/I engines. These field-testing procedures are described further in Section IV.E.2.

A parameter to consider is the minimum sampling time for field testing. A longer period allows for greater accuracy, due mainly to the smoothing effect of measuring over several transient events. On the other hand, an overly long sampling period can mask areas of engine operation with poor emission control characteristics. To balance these concerns, we are applying a minimum sampling period of 30 seconds. This is consistent with the requirement for marine diesel engines. Spark-ignition engines generally don't have turbochargers and they control emissions largely by maintaining air-fuel ratio. Spark-ignition engines are therefore much less prone to consistent emission spikes from off-cycle or unusual engine operation. We believe the minimum 30 second sampling time will ensure sufficient measurement accuracy and will allow for meaningful measurements.

We do not specify a maximum sampling time. We expect manufacturers testing in-use engines to select an approximate sampling time before measuring emissions. However, for any sampling period, each 30-second period of operation would be subject to the NTE standards. For example, manufacturers may measure emissions for ten minutes. The engine's emissions over the ten-minute period would need to meet the applicable NTE standards, but each 30-second period of operation during the ten-minute period should also be evaluated to determine that the engine complies.

(g) Certification

We are requiring that manufacturers state in their application for certification that their engines will comply with the NTE standards under any nominally steady-state combination of speeds and loads within the new NTE zone (see § 1045.205). The manufacturer must also provide a detailed description of all testing, engineering analysis, and other information that forms the basis for the statement. This statement will be based on testing and, if applicable, other research that supports such a statement, consistent with good engineering judgment. We will review the basis for this statement during the certification process. For marine diesel engines, we have provided guidance that manufacturers may demonstrate compliance with NTE standards by testing their engines at a number of standard points throughout the NTE zone. In addition, manufacturers must test at a few random points chosen by EPA prior to the testing.

E. Additional Certification and Compliance Provisions

(1) Production-Line Testing

There are several factors that have led us to conclude that we should not finalize production-line testing requirements for SD/I engines in this rulemaking. First, California ARB has not yet adopted production-line testing requirements for these engines. Second, the companies producing these engines are predominantly small businesses. Third, the relatively short useful life and small sales volumes limit the overall emissions effect from these engines. Fourth, we are aware that marine engines may need additional setup time for testing to simulate the marine configuration. We do not consider any of these issues to be fundamental, but we believe it is best to defer further consideration of a requirement for production-line testing until a later rulemaking. This would allow us to better understand the degree of compliance with emission standards, the effectiveness of diagnostic controls, and California ARB's interest in requiring production-line testing. However, we may require the manufacturer to conduct a reasonable degree of testing under Clean Air Act section 208 if we have reason to believe that an engine family does not conform to the regulations. This testing may take the form of a Selective Enforcement Audit.

(2) In-Use Testing

Manufacturers of OB/PWC engines have been required to test in-use engines to show that they continue to meet emission standards. We contemplated a similar requirement for SD/I engines, but have decided not to adopt a requirement for a manufacturer-run in-use testing program at this time. Manufacturers have pointed out that it would be very difficult to identify a commercial fleet of boats that could be set up to operate for hundreds of hours because it is very uncommon for commercial operators to have significant numbers of SD/I vessels. Where there are commercial fleets of vessels that may be conducive to accelerated in-use service accumulation, these vessels generally use outboard engines. Manufacturers could instead hire drivers to operate the boats, but this may be cost-prohibitive. There is also a question about access to the engines for testing. If engines need to be removed from vessels for testing in the laboratory for some reason, it is unlikely that owners will cooperate.

While we are not establishing a program to require manufacturers to routinely test in-use engines, the Clean Air Act allows us to perform our own testing at any time with in-use engines to evaluate whether they continue to meet emission standards throughout the useful life. This may involve either laboratory testing or in-field testing with portable measurement equipment. For laboratory tests, we could evaluate compliance with either the duty-cycle standards or the not-to-exceed standards. For testing with engines that remain installed on marine vessels, we will evaluate compliance with the not-to-exceed standards. In addition, as described above for production-line testing, we may require manufacturers to perform a reasonable degree of testing. This may include testing in-use engines.

(3) Certification Fees

Under our current certification program, manufacturers pay a fee to cover the costs for various certification and other compliance activities associated with implementing the emission standards. As explained below, we are assessing EPA's compliance costs associated with SD/I engines based on EPA's existing fees regulation. Section VI describes a new fees category we are adopting, based on the cost study methodology used in establishing EPA's original fees regulation, for costs related to the final evaporative emission standards for both vessels and equipment that are subject to this final rule.

EPA established a fee structure by grouping together various manufacturers and industries into fee categories, with an explanation that separation of industries into groups was appropriate to tailor the applicable fee to the level of effort expected for EPA to oversee the range of certification and compliance responsibilities (69 FR 26222, May 11, 2004). As part of this process, EPA conducted a cost analysis to determine the various compliance activities associated with each fee category and EPA's associated annual cost burden. Once the total EPA costs were determined for each fee category, the total number of certificates involved within a fee category was added together and divided into the total costs to determine the appropriate assessment for each anticipated certificate.[94] One of the fee categories created was for ''Other Engines and Vehicles,'' which includes marine engines (both compression-ignition and spark-ignition), nonroad spark-ignition engines (above and below 19 kW), locomotive engines, recreational vehicles, heavy-duty evaporative systems, and heavy-duty engines certified only for sale in California. These engine and vehicle types were grouped together because EPA planned a more basic certification review than, for example, for light-duty motor vehicles.

EPA determined in the final fees rulemaking that it was premature to assess fees for SD/I engines since they were not yet subject to emission standards. The fee calculation nevertheless includes a projection that there will eventually be 25 certificates of conformity annually for SD/I engines. We are now formally including SD/I engines in the ''Other Engines and Vehicles'' category such that the baseline fee is $839 for each certificate of conformity. Note that we will continue to update assessed fees each year, so the actual fee in 2010 and later model years will depend on these annual calculations (see § 1027.105).

(4) Special Provisions Related to Partially Complete Engines

It is common practice for one company to produce engine blocks that a second company modifies for use as a marine engine. Since our regulations prohibit the sale of uncertified engines, we are establishing provisions to clarify the status of these engines and defining a path by which these engines can be handled without violating the regulations. See Section VIII.C.1 for more information.

(5) Use of Engines Already Certified to Other Programs

In some cases, manufacturers may want to use engines already certified under our other programs. Engines certified to the emission standards for highway applications in part 86 or Large SI applications in part 1048 are meeting more stringent standards. We are therefore allowing the pre-existing certification to be valid for engines used in marine applications, on the condition that the engine is not changed from its certified configuration in any way (see § 1045.605). Manufacturers will need to demonstrate that fewer than five percent of the total sales of the engine model are for marine applications. There are also a few minor notification and labeling requirements to allow for EPA oversight of this provision. We are adopting similar provisions for engines below 19 kW that are certified to Small SI standards as described in Section III.C.1.

[94] See Cost Analysis Document at p. 21 associated with the proposed fees rule (*http://www.epa.gov/otaq/fees.htm*).

(6) Import-specific Information at Certification

We are requiring additional information to improve our ability to oversee compliance related to imported engines (see § 1045.205). In the application for certification, we require the following additional information: (1) The port or ports at which the manufacturer has imported engines over the previous 12 months, (2) the names and addresses of the agents the manufacturer has authorized to import the engines, and (3) the location of the test facilities in the United States where the manufacturer will test the engines if we select them for testing under a selective enforcement audit. See Section 1.3 of the Summary and Analysis of Comments for further discussion related to naming test facilities in the United States.

(7) Alternate Fuels

See Section IV.E.7 for a discussion of requirements that apply to spark-ignition SD/I engines that operate on fuels other than gasoline.

F. Small-Business Provisions

(1) Small Business Advocacy Review Panel

On June 7, 1999, we convened a Small Business Advocacy Review Panel under section 609(b) of the Regulatory Flexibility Act as amended by the Small Business Regulatory Enforcement Fairness Act of 1996 (RFA). The purpose of the Panel was to collect the advice and recommendations of representatives of small entities that could be affected by the proposal and to report on those comments and the Panel's findings and recommendations as to issues related to the key elements of the Initial Regulatory Flexibility Analysis under section 603 of the Regulatory Flexibility Act. We re-convened the Panel on August 17, 2006 to update our review for the proposal. The Panel reports have been placed in the rulemaking record for this final rule. Section 609(b) of the Regulatory Flexibility Act directs the review Panel to report on the comments of small entity representatives and make findings as to issues related to certain elements of an initial regulatory flexibility analysis (IRFA) under RFA section 603. Those elements of an IRFA are:

- A description of, and where feasible, an estimate of the number of small entities to which the rule will apply;
- A description of projected reporting, recordkeeping, and other compliance requirements of the rule, including an estimate of the classes of small entities that will be subject to the requirements and the type of professional skills necessary for preparation of the report or record;
- An identification, to the extent practicable, of all relevant Federal rules that may duplicate, overlap, or conflict with the rule; and
- A description of any significant alternative to the rule that accomplishes the stated objectives of applicable statutes and that minimizes any significant economic impact of the rule on small entities.

In addition to the EPA's Small Business Advocacy Chairperson, the Panel consisted of the Director of the Assessment and Standards Division of the Office of Transportation and Air Quality, the Administrator of the Office of Information and Regulatory Affairs within the Office of Management and Budget, and the Chief Counsel for Advocacy of the Small Business Administration.

EPA used the size standards provided by the Small Business Administration (SBA) at 13 CFR part 121 to identify small entities for the purposes of its regulatory flexibility analysis. Companies that manufacture internal-combustion engines and that employ fewer than 1000 employees are considered small businesses for the purpose of the RFA analysis for this rule. Equipment manufacturers, boat builders, and fuel system component manufacturers that employ fewer than 500 people are considered small businesses for the purpose of the RFA analysis for this rule. Based on this information, we asked 25 companies that met the SBA small business thresholds to serve as small entity representatives for the duration of the Panel process. Of these 25 companies, 13 were involved in the marine industry. These companies represented a cross-section of SD/I engine manufacturers, boat builders, and fuel system component manufacturers.

With input from small entity representatives, the Panel reports provide findings and recommendations on how to reduce potential burden on small businesses that may occur as a result of the proposed rule. The Panel reports are included in the rulemaking record for this action. In light of the Panel report, and where appropriate, we proposed a number of provisions for small business SD/I engine manufacturers. With this final rule we are adopting many of the flexibility options proposed with some changes due to the different standards we are adopting for SD/I high-performance engines. In addition, we are making a change to the criteria for determining which companies are eligible for the flexibility options. The following section describes the flexibility options being adopted as part of this final rule and the criteria for determining which manufacturers are eligible.

(2) Final Burden Reduction Approaches for Small-Volume SD/I Engine Manufacturers

We are establishing several options for small-volume SD/I engine manufacturers. For purposes of determining which engine manufacturers are eligible for the small business provisions described below for SD/I engine manufacturers, we are adopting a 250 employee limit. EPA believes this limit will cover all the existing small business SD/I engine manufacturers (as defined by SBA), but places a reasonable limit on how large a company could grow before they are no longer eligible for EPA's flexibilities for small volume engine manufacturers.

(a) Additional Lead Time

As recommended in the SBAR Panel report and as proposed, EPA is establishing an implementation date of 2011 for conventional SD/I engines produced by small volume engine manufacturers. In addition, EPA is establishing an implementation date of 2013 for SD/I high-performance engines produced by small volume engine manufacturers (see § 1045.145).

(b) Exhaust Emission ABT

In the proposal, EPA cited concerns raised by small businesses that ABT could give a competitive advantage to large businesses and requested comment on the desirability of credit trading between high-performance and conventional SD/I marine engines. As described earlier in Section III.C.1, EPA is adopting different standards for SD/I high-performance engines than originally proposed. While we are adopting an averaging, banking, and trading (ABT) credit program for conventional SD/I marine engines (see part 1045, subpart H), SD/I high-performance engines are required to meet the new standards without an ABT program.

(c) Early Credit Generation for ABT

As recommended in the SBAR Panel report and as proposed, we are adopting an early banking program in which small volume engine manufacturers can earn bonus credits for certifying earlier than required (see § 1045.145). This program, combined with the additional lead time for small businesses, will give small-volume SD/I engine manufacturers ample opportunity to bank emission credits prior to the implementation date of the standards and will provide greater incentive for more small business engine manufacturers to introduce advanced technology earlier across the nation than will otherwise occur. The ABT program applies only to conventional SD/I engines so the early credit provisions will not apply to SD/I high-performance engines.

(d) Assigned Emission Rates for SD/I High-Performance Engines

In the proposal, EPA noted that engine manufacturers using emission credits to comply with the standard will still need to test engines to calculate how many emission credits are needed. To minimize this testing burden, we proposed to allow manufacturers to use assigned baseline emission rates for certification based on previously generated emission data. As discussed above, we are adopting less stringent standards for SD/I high-performance engines that do not allow for the use of the ABT program for demonstrating compliance with the standards. We are not adopting baseline $HC+NO_X$ and CO emission rates for SD/I high-performance engines since the proposed levels were higher than the standards being adopted and therefore are of no use without an ABT program.

(e) Alternative Standards for SD/I High-Performance Engines

In the proposal, EPA cited concerns raised by small businesses that catalysts had not been demonstrated on high-performance engines and that they may not be practicable for this application and therefore requested comment on the need for and level of alternative standards for SD/I high-performance engines. As described in Section III.C.1, we are adopting a less stringent set of exhaust emission standards for SD/I high-performance engines than originally proposed.

In addition, as described in Section III.C.2, we are not adopting NTE standards for SD/I high-performance engines (See § 1045.105). This is consistent with the SBAR Panel recommendation that NTE standards not apply to SD/I high-performance engines.

(f) Broad Engine Families for SD/I High-Performance Engines

In the proposal, EPA noted that the testing burden could be reduced by using broader definitions of engine families. As proposed, we are adopting provisions to allow small businesses to group all their SD/I high-performance engines into a single engine family for certification (see § 1045.230). A manufacturer will need to perform emission tests only on the engine in that family that is most likely to exceed an emission standard.

(g) Simplified Test Procedures for SD/I High-Performance Engines

Existing testing requirements include detailed specifications for the calibration and maintenance of testing equipment and tolerances for performing the actual tests. For laboratory equipment and testing, these specifications and tolerances are intended to achieve the most repeatable results feasible given testing hardware capabilities. For SD/I high-performance engines, EPA is adopting a provision that allows for different equipment than is specified for the laboratory and with less restrictive specifications and tolerances more typical of in-use testing (see § 1045.501(h)). These less restrictive specifications will facilitate less expensive testing for businesses, with little or no negative effect on the environment. The relaxation on these specifications is especially helpful for testing high-performance engines due to their high exhaust flow rates, temperatures, and emission concentrations. This provision is available to all SD/I high-performance engine manufacturers, regardless of business size.

(h) Reduced Testing Requirements for SD/I Engines

We are adopting provisions to allow small-volume engine manufacturers to use an assigned deterioration factor to demonstrate compliance with the standards for certification rather than doing service accumulation and additional testing to measure deteriorated emission levels at the end of the regulatory useful life (see § 1045.240). EPA is not specifying actual levels for the assigned deterioration factors in this final rule. EPA intends to analyze available emission deterioration information to determine appropriate deterioration factors for SD/I engines. The data will likely include durability information from engines certified to California ARB's standards and may also include engines certified early to EPA's standards. Prior to the implementation date for the SD/I standards, EPA will provide guidance to engine manufacturers specifying the levels of the assigned deterioration factors for small-volume engine manufacturers.

We proposed to exempt small-volume manufacturers of SD/I engines from the production-line testing requirements. However, we are dropping the production-line testing requirements for all SD/I engine manufacturers. Therefore, no production-line testing will be required of any SD/I engine manufacturer, whether large or small (see § 1045.301).

(i) Hardship Provisions

We are adopting two types of hardship provisions for SD/I engine manufacturers, consistent with the Panel recommendations. EPA used the SBA size standards for purposes of defining ''small businesses'' for its regulatory flexibility analysis. The eligibility criteria for the hardship provisions described below reflect EPA's consideration of the Panel's recommendations and a reasonable application of existing hardship provisions. As has been our experience with similar provisions already adopted, we anticipate that hardship mechanisms will be used sparingly. First, under the unusual circumstances hardship provision, any manufacturer subject to the new standards may apply for hardship relief if circumstances outside their control cause the failure to comply and if failure to sell the subject engines or equipment or fuel system component would have a major impact on the company's solvency (see § 1068.245). An example of an unusual circumstance outside a manufacturer's control may be an ''Act of God,'' a fire at the manufacturing plant, or the unforeseen shutdown of a supplier with no alternative available. The terms and time frame of the relief will depend on the specific circumstances of the company and the situation involved. As part of its application for hardship, a company will be required to provide a compliance plan detailing when and how it will achieve compliance with the standards. This hardship provision will be available to all manufacturers of engines, equipment, boats, and fuel system components subject to the new standards, regardless of business size.

Second, an economic hardship provision allows small businesses subject to the new standards to petition EPA for limited additional lead time to comply with the standards (see § 1068.250). A small business must make the case that it has taken all possible business, technical, and economic steps to comply, but the burden of compliance costs would jeopardize the company's solvency. Hardship relief could include requirements for interim emission reductions and/or the purchase and use of emission credits. The length of the hardship relief decided during review of the hardship application will be up to one year, with the potential to extend the relief as needed. We anticipate that one to two years will normally be sufficient. As part of its application for hardship, a company will be required to provide a compliance plan detailing when and how it will achieve compliance with the standards. This hardship provision will be available only to qualifying small businesses.

Because boat builders in many cases will depend on engine manufacturers to supply certified engines in time to produce complying boats, we are also providing a hardship provision for all boat builders, regardless of size, that will allow the builder to request more time if they are unable to obtain a certified engine and they are not at fault and will face serious economic hardship without an extension (see § 1068.255).

G. Technological Feasibility

(1) Level of Standards

Over the past few years, developmental programs have demonstrated the capabilities of achieving significant reductions in exhaust emissions from SD/I engines. California ARB has acted on this information to set an $HC+NO_X$ emission standard of 5 g/kW-hr for SD/I engines, starting in 2008. At this time, three engine manufacturers have certified SD/I engines to these standards. Chapter 4 of the Final RIA presents data from these engines as well as detailed data on several developmental SD/I engines with catalysts packaged within water-cooled exhaust manifolds. Four of these developmental engines were operated with catalysts in vessels for 480 hours. The remaining developmental engines were tested with catalysts that had been subjected to a rapid-aging cycle in the laboratory. Data from these catalyst-equipped engines support the level of the standards.

SD/I high-performance engines have very high power outputs, large exhaust gas flow rates, and relatively high concentrations of hydrocarbons and carbon monoxide in the exhaust gases. As a result, we believe it is not practical to apply catalyst technology to these engines. We are therefore adopting standards for SD/I high-performance engines based on the level of control that can be expected from recalibration with electronically controlled fuel injection.

(2) Implementation Dates

We anticipate that manufacturers will use the same catalyst designs to meet the final standards that they will use to meet the California ARB standards for SD/I engines in 2008. We believe a requirement to extend the California standards nationwide after a two-year delay allows manufacturers adequate time to incorporate catalysts across their product lines. Once the technology is developed for use in California, it will be available for use nationwide. In fact, several engine models currently certified to the California standards are already available with catalysts nationwide. As discussed above, we are accommodating the transition to new base engines by agreeing to one year of hardship relief for companies that would otherwise need to design and certify an engine for that one year before it becomes obsolete.

(3) Technological Approaches

Engine manufacturers can adapt readily available technologies to control emissions from SD/I engines. Electronically controlled fuel injection gives manufacturers more precise control of the air/fuel ratio in each cylinder, thereby giving them greater flexibility in how they calibrate their engines. With the addition of an oxygen sensor, electronic controls give manufacturers the ability to use closed-loop control, which is especially valuable when using a catalyst. In addition, manufacturers can achieve $HC+NO_X$ reductions through the use of exhaust gas recirculation. However, the most effective technology for controlling emissions is a three-way catalyst in the exhaust stream.

In SD/I engines, the exhaust manifolds are water-jacketed and the water mixes with the exhaust stream before exiting the vessel. Manufacturers add a water jacket to the exhaust manifold to meet temperature-safety protocol. They route this cooling water into the exhaust to protect the exhaust couplings and to reduce engine noise. Catalysts must therefore be placed upstream of the point where the exhaust and water mix-this ensures the effectiveness and durability of the catalyst. Because the catalyst must be small enough to fit in the exhaust manifold, potential emission reductions are not likely to exceed 90 percent, as is common in land-based applications. However, as discussed in Chapter 4 of the Final RIA, data on catalyst-equipped SD/I engines show that emissions may be reduced by 70 to 80 percent for $HC+NO_X$ and 30 to 50 percent for CO over the test cycle. Larger reductions, especially for CO, have been achieved at lower-speed operation.

There have been concerns that aspects of the marine environment could result in unique durability problems for catalysts. The primary aspects that could affect catalyst durability are sustained operation at high load, saltwater effects on catalyst efficiency, and thermal shock from cold water coming into contact with a hot catalyst. Modern catalysts perform well at temperatures up to 1100 °C, which is much higher than expected in a marine exhaust manifold. These catalysts have also been shown to withstand the thermal shock of being immersed in water. More detail on catalyst durability is presented in the Final RIA. In addition, use of catalysts in automotive, motorcycle, and handheld equipment has shown that catalysts can be packaged to withstand vibration in the exhaust manifold.

Manufacturers already strive to design their exhaust systems to prevent water from reaching the exhaust ports. If too much water reaches the exhaust ports, significant durability problems will result from corrosion or hydraulic lock. As discussed in the Final RIA, industry and government worked on a number of cooperative test programs in which several SD/I engines were equipped with catalysts and installed in vessels to prove out the technology. Early in the development work, a study was performed on an SD/I engine operating in a boat to see if water was entering the part of the manifold where catalysts will be installed. Although some water was collected in the exhaust manifold, it was found that this water came from water vapor that condensed out of the combustion products. This was easily corrected using a thermostat to prevent overcooling from the water jacket.

Four SD/I engines equipped with catalysts were operated in vessels for 480 hours in fresh water. This time period was intended to represent the full expected operating life of a typical SD/I engine. No significant deterioration was observed on any of these catalysts, nor was there any evidence of water reaching the catalysts. In addition, the catalysts were packaged such that the exhaust system met industry standards for maximum surface temperatures.

Testing has been performed on one engine in a vessel on both fresh water and saltwater over a test protocol designed by industry to simulate the worst-case operation for water reversion. No evidence was found of water reaching the catalysts. After the testing, the engine had emission rates below the $HC+NO_X$ standard. We later engaged in a test program to evaluate three additional engines with catalysts in vessels operating on saltwater for extended periods. Early in the program, two of the three manifolds experienced corrosion in the salt-water environment resulting in water leaks and damage to the catalyst. These manifolds were rebuilt with guidance from experts in the marine industry and additional hours were accumulated on the boats. Although the accumulated hours are well below the 480 hours performed on fresh water, the operation completed showed no visible evidence of water reversion or damage to the catalysts.

Three SD/I engine manufacturers have certified SD/I engines to the California ARB standards, and some catalyst-equipped engines are available for purchase nationwide. Manufacturers have indicated that they have successfully completed durability testing, including extended in-use testing on saltwater.

(4) Regulatory Alternatives

In developing the final emission standards, we considered both what was achievable without catalysts and what could be achieved with larger, more efficient catalysts than those used in our test programs. Chapter 4 of the Final RIA presents data on SD/I engines equipped with exhaust gas recirculation (EGR). $HC+NO_X$ emission levels below 10 g/kW-hr were achieved for each of the engines. CO emissions ranged from 25 to 185 g/kW-hr. We believe EGR will be a technologically feasible and cost-effective approach to reducing emissions from SD/I marine engines. However, we believe greater reductions could be achieved through the use of catalysts. We considered basing an interim standard on EGR, but were concerned that this will divert manufacturers' resources away from catalyst development and could have the effect of delaying emission reductions from this sector.

Several of the marine engines with catalysts that were tested as part of the development of the standards had $HC+NO_X$ emission rates appreciably lower that 5 g/kW-hr, even with consideration of expected in-use emissions deterioration associated with catalyst aging. However, we believe a standard of 5 g/kW-hr is still appropriate given the potential variability in in-use performance and in test data. The test programs described in Chapter 4 of the Final RIA did not investigate larger catalysts for SD/I applications. The goal of the testing was to demonstrate catalysts that will work within the packaging constraints associated with water jacketing the exhaust and fitting the engines into engine compartments on boats. However, we did perform testing on engines equipped with both catalysts and EGR. These engines showed emission results in the 2–3 g/kW-hr range. We expect that these same reductions could be achieved more simply through the use of larger catalysts or catalysts with higher precious metal loading. Past experience indicates that most manufacturers will strive to achieve emission reductions well below the final standards to give them certainty that they will pass the standards in-use, especially as catalysts on SD/I engines are a new technology. Therefore, we do not believe it is necessary at this time to set a lower standard for these engines.

For SD/I high-performance engines, we originally proposed a standard based on the use of catalysts and then considered a less stringent alternative based on engine fuel system upgrades, calibration, or other minor changes such as an air injection pump rather than catalytic control. However, manufacturers commented that catalysts are not practical for these engines due to the high exhaust flow rates, high emission rates, and short time between rebuilds. In the final rule, we are establishing standards that can be met through the use of engine controls, similar to the alternative standard that was analyzed in the proposal. Because we do not consider catalyst-based standards to be feasible for high-performance engines at this time, we did not model a more stringent alternative for these engines.

(5) Our Conclusions

We believe the final 2010 exhaust emission standards for SD/I engines represent the greatest degree of emission reduction achievable in this time frame. Manufacturers of conventional SD/I engines can meet the standards through the use of three-way catalysts packaged in the exhaust systems upstream of where the water and exhaust mix. Manufacturers are already selling engines with this technology. By 2010 there will be widespread experience in applying emission controls to a large number of engine models.

As discussed in Section VII, we do not believe the final standards will have negative effects on energy, noise, or safety and may lead to some positive effects.

IV. Outboard and Personal Watercraft Engines

A. Overview

This section applies to spark-ignition outboard and personal watercraft (OB/PWC) marine engines and vessels. OB/PWC engines are currently required to meet the $HC+NO_X$ exhaust emissions and other related requirements under 40 CFR part 91. As a result of these standards, manufacturers have spent the last several years developing new technologies to replace traditional carbureted two-stroke engine designs. Many of these technologies are capable of emission levels well below the current standards. We are adopting new $HC+NO_X$ and CO exhaust emission standards for OB/PWC marine engines reflecting the capabilities of these new technologies.

For outboard and personal watercraft engines, the current emission standards regulate only $HC+NO_X$ emissions. As described in Section II, we are making the finding under Clean Air Act section 213(a)(3) that Marine SI engines cause or contribute to CO nonattainment in two or more areas of the United States.

We believe manufacturers can use readily available technological approaches to design their engines to meet the new standards. In fact, as discussed in Chapter 4 of the Final RIA, manufacturers are already producing several models of four-stroke engines and direction-injection two-stroke engines that meet the new standards. The most important compliance step for the standards will be to retire high-emitting designs that are still available and replace them with these cleaner engines. We are not establishing standards based on the use of catalytic converters in OB/PWC engines. While this may be an attractive technology in the future, we do not believe there has been sufficient development work on the application of catalysts to OB/PWC engines to use as a basis for standards at this time.

Note that we are migrating the regulatory requirements for marine spark-ignition engines from 40 CFR part 91 to 40 CFR part 1045. Manufacturers must comply with the provisions in part 1045 for an engine once the exhaust emission standards begin to apply in 2010. This gives us the opportunity to update the details of our certification and compliance program to be consistent with the comparable provisions that apply to other engine categories and describe regulatory requirements in plain language. Most of the change in regulatory text provides improved clarity without substantially changing procedures or compliance obligations. Where there is a change that warrants further attention, we describe the need for the change below.

Engines and vessels subject to part 1045 are also subject to the general compliance provisions in 40 CFR part 1068. These include prohibited acts and penalties, exemptions and importation provisions, selective enforcement audits, defect reporting and recall, and hearing procedures. See Section VIII of the preamble to the proposed rule for further discussion of these general compliance provisions.

B. Engines Covered by This Rule

(1) Definition of Outboard and Personal Watercraft Engines and Vessels

The final standards are intended to apply to outboard marine engines and engines used to propel personal watercraft. We are changing the definitions of outboard and personal watercraft to reflect this intent. The original definitions of outboard engine and personal watercraft marine engine adopted in 40 CFR part 91 are presented below:

- Outboard engine is a Marine SI engine that, when properly mounted on a marine vessel in the position to operate, houses the engine and drive unit external to the hull of the marine vessel.
- Personal watercraft engine (PWC) is a Marine SI engine that does not meet the definition of outboard engine, inboard engine, or sterndrive engine, except that the Administrator in his or her discretion may classify a PWC as an inboard or sterndrive engine if it is comparable in technology and emissions to an inboard or sterndrive engine.

With the implementation of catalyst-based standards for sterndrive and inboard marine engines, we believe the above definitions could be problematic. Certain applications using SD/I engines and able to apply catalyst control will not be categorized as SD/I under the original definitions in at least two cases. First, an airboat engine, which is often mounted well above the hull of the engine and used to drive an aircraft-like propeller could be misconstrued as an outboard engine. However, like traditional sterndrive and inboard engines, airboat engines are typically derived from automotive-based engines without substantial modifications for marine application. Airboat engines can use the same technologies that are available to sterndrive and inboard engines, so we believe they should be subject to the same standards. To address the concerns about classifying airboats, we are changing the outboard definition to specify that the engine and drive unit be a single, self-contained unit that is designed to be lifted out of the water. This clarifies that air boats are not outboard engines; air boats do not have engines and drive units that are designed to be lifted out of the water. We are adopting the following definition:

- Outboard engine means an assembly of a spark-ignition engine and drive unit used to propel a marine vessel from a properly mounted position external to the hull of the marine vessel. An outboard drive unit is partially submerged during operation and can be tilted out of the water when not in use.

Second, engines used on jet boats (with an open bay for passengers) have size, power, and usage characteristics that are very similar to sterndrive and inboard applications, but these engines may be the same as OB/PWC engines, rather than the marinized automotive engines traditionally used on sterndrive vessels. Because jet boat engines may be the same as OB/PWC engines, the regulations classified them as OB/PWC engines unless the Agency classified them as SD/I due to comparable technology and emissions as SD/I engines. However, as explained in the proposed rule, we believe classifying such engines as personal watercraft engines is inappropriate because it will subject the jet boats to less stringent emission standards than other boats with similar size, power, and usage characteristics, and thus potentially lead to increased use of high-emitting engines in these vessels. Because the current regulations authorize engines powering jet boats to be treated as SD/I engines at the discretion of the Agency, but do not compel such classification, we are finalizing amendments to the definition to explicitly exclude jet boats and their engines from being treated as personal watercraft engines or vessels. Instead, we are classifying jet boat engines as SD/I engines.

The new definition conforms to the definition of personal watercraft established by the International Organization for Standardization (ISO 13590). This ISO standard excludes open-bay vessels and specifies a maximum vessel length of 4 meters. The ISO standard for personal watercraft therefore excludes personal watercraft-like vessels 4 meters or greater and jet boats. Thus, engines powering such vessels will be classified as sterndrive/inboard engines. We believe this definition effectively serves to differentiate vessels in a way that groups propulsion engines into categories that are appropriate for meeting different emission standards. This approach is shown below with the corresponding definition of personal watercraft engine. We are making one change to the ISO definition for domestic regulatory purposes; we are removing the word ''inboard'' to prevent confusion between PWC and inboard engines and state specifically that a vessel powered by an outboard marine engine is not a PWC. We are revising the definitions as follows:

- Personal watercraft means a vessel less than 4.0 meters (13 feet) in length that uses an installed spark-ignition engine powering a water jet pump as its primary source of propulsion and is designed with no open load carrying area that would retain water. The vessel is designed to be operated by a person or persons positioned on, rather than within the confines of the hull. A vessel using an outboard engine as its primary source of propulsion is not a personal watercraft.
- *Personal watercraft engine* means a spark-ignition engine used to propel a personal watercraft.

Section III.C.3 describes special provisions that will allow manufacturers extra flexibility with emission credits if they want to continue using outboard or personal watercraft engines in jet boats. These engines will need to meet the standards for sterndrive/inboard engines, but we believe it is appropriate for them to make this demonstration using emission credits generated by other outboard and personal watercraft engines because these vessels are currently using these engine types.

(2) Exclusions and Exemptions

We are maintaining the current exemptions for OB/PWC engines. These include the testing exemption, the manufacturer-owned exemption, the display exemption, and the national-security exemption. If the conditions for an exemption are met, the engine is not subject to the exhaust emission standards. These exemptions are described in more detail in Section VIII of the preamble to the proposed rule.

The Clean Air Act provides for different treatment of engines used solely for competition. In the initial rulemaking to set standards for OB/PWC engines, we adopted the conventional definitions that excluded engines from the regulations if they had features that were difficult to remove and that made it unsafe, impractical, or unlikely to be used for noncompetitive purposes. We have more recently taken the approach in other programs of more carefully differentiating competition and noncompetition models, and are adopting these kinds of changes in this rule. The changes to the provisions relating to competition engines apply equally to all types of Marine SI engines. See Section III.B and § 1045.620 of the regulations for a full discussion of the new approach.

We are incorporating a new exemption to address individuals who manufacture recreational marine vessels for personal use as described in Section III.B.2.

In the rulemaking for recreational vehicles, we chose not to apply standards to hobby products by exempting all reduced-scale models of vehicles that are not capable of transporting a person (67 FR 68242, November 8, 2002). We are extending that same provision to OB/PWC marine engines (see § 1045.5).

C. Final Exhaust Emission Standards

We are requiring more stringent exhaust emission standards for new OB/PWC marine engines. These standards can be met through expanded reliance on four-stroke engines and two-stroke direct-injection engines. This section describes the new requirements for OB/PWC engines for controlling exhaust emissions. See Section VI for a description of the final requirements related to evaporative emissions.

(1) Standards and Dates

We are requiring new $HC+NO_X$ standards for OB/PWC engines starting in model year 2010 that will achieve more than a 60 percent reduction from the 2006 standards (see § 1045.103). We are also establishing new CO emission standards. These standards will result in meaningful CO reductions from many engines and prevent CO from increasing for engines that already use technologies with lower CO emissions. The new emission standards are largely based on certification data from cleaner-burning four-stroke engines and two-stroke direct-injection engines that are certified under part 91. Section IV.H discusses the technological feasibility of these standards in more detail. Table IV–1 presents the exhaust emission standards for OB/PWC. The $HC+NO_X$ emission standards are the same as those adopted by California ARB for 2008 and later model years. We are also applying not-to-exceed emission standards over a range of engine operating conditions, as described in Section IV.C.2.

TABLE IV–1: OB/PWC EXHAUST EMISSION STANDARDS [G/KW-HR]

Pollutant	Power	Emission standard
$HC+NO_X$	$P \leq 4.3$ kW	30.0
	$P > 4.3$ kW	$2.1 + 0.09 \times (151 + 557/P^{0.9}))$
CO	$P \leq 40$ kW	$500—5.0 \times P$
	$P> 40$ kW	300

Note: P = maximum engine power in kilowatts (kW).

Our implementation date allows two additional years beyond the implementation date of the same standards in California. Manufacturers generally sell their lower-emission engines, which are already meeting the 2008 California standards, nationwide. However, the additional time will give manufacturers time to address any models that may not meet the upcoming California standards or are not sold in California. This also accommodates the lead time concerns with the timing of this final rule as expressed by the commenters.

The emission standards apply at the range of atmospheric pressures represented by the test conditions specified in part 1065. This includes operation at elevated altitudes. Since not all engines have electronic engines with feedback controls to incorporate altitude compensation, we are taking the same approach here as for Small SI engines where a similar dynamic is in place. Specifically, we are requiring that all engines must comply with emission standards in the standard configuration (i.e., without an altitude kit) at barometric pressures above 94.0 kPa, which corresponds to altitudes up to about 2,000 feet above sea level (see § 1045.115). This will ensure that all areas east of the Rocky Mountains and most of the populated areas in Pacific Coast states will have compliant engines without depending on engine adjustments. This becomes more important as we anticipate manufacturers increasingly relying on technologies that are sensitive to controlling air-fuel ratio for reducing emissions. For operation at higher altitudes, manufacturers may rely on an altitude kit that allows their engines to meet emission standards at higher elevations. In this case, engine manufacturers must describe the kit specifications in their application for certification and identify in the owner's manual the altitude ranges for proper engine performance and emission control that are expected with and without the altitude kit. The owner's manual must also state that operating the engine with the wrong engine configuration at a given altitude may increase its emissions and decrease fuel efficiency and performance. The regulations specify that owners may follow the manufacturer's instructions to modify their engines with altitude kits without violating the tampering prohibition. See Section IV.E.8 for further discussion related to the deployment of altitude kits where the manufacturers rely on them for operation at higher altitudes.

The new standards include the same general provisions that apply today. For example, engines must control crankcase emissions. The regulations also require compliance over the full range of adjustable parameters and prohibit the use of defeat devices. (See § 1045.115.)

(2) Not-to-Exceed Standards

We are adopting emission standards that apply over an NTE zone. The NTE standards are in the form of a multiplier times the duty-cycle standard for $HC+NO_X$ and for CO (see § 1045.105). Section IV.D.5 gives an overview of the NTE standards and compliance provisions and describes the NTE test procedures.

Manufacturers commented that certification to the NTE standards requires additional testing even for engine models that are currently certified to emission levels below the new duty-cycle based standards. In addition, they expressed concern that they may need to recalibrate existing engine models to meet the NTE standards. Manufacturers commented that this would not be possible by 2010 because of the large number of engine models. For most engines, manufacturers carry over preexisting certification test data from year to year. Manufacturers commented that additional time would be necessary to retest, and potentially recalibrate, all these engines for certification to the NTE standards. To address these issues regarding lead time needed to retest these engines, we are not applying the NTE standards for 2010–2012 model year engines that are certified using preexisting data (i.e., carryover engine families). For new engine models, manufacturers indicated that they will be able to perform the NTE testing and duty-cycle testing as part of their efforts to certify to the new standards. Therefore the primary implementation date of 2010 applies to these engines. Beginning in the 2013 model year, all conventional OB/PWC engines must be certified to meet the NTE standards.

This NTE approach complements the weighted modal emission tests included in this rule. These steady-state duty cycles and standards are intended to establish average emission levels over several discrete modes of engine operation. Because it is an average, manufacturers design their engines with emission levels at individual points varying as needed to maintain maximum engine performance and still meet the engine standard. The NTE limit will be an additional requirement. It is intended to ensure that emission controls function with relative consistency across the full range of expected operating conditions.

(3) Emission Credit Programs

Engine manufacturers may use emission credits to meet OB/PWC standards under part 91. We are adopting an ABT program for the new $HC+NO_X$ emission standards that is similar to the previous program (see part 1045, subpart H). A description of the ABT provisions for the new OB/PWC standards is described below.

OB/PWC engine manufacturers that have generated $HC+NO_X$ credits under the 2006 standards will be able to use those credits to demonstrate compliance with the new $HC+NO_X$ standards being adopted in this final rule. The credits generated under the 2006 standards are subject to a three-year credit life. Therefore, a manufacturer will be able to use those credits for demonstrating compliance with the new standards as long as the credits have not expired.

We are allowing an indefinite life for emission credits earned under the new standards for OB/PWC engines. We consider these emission credits to be part of the overall program for complying with standards. Given that we may consider further reductions beyond these standards in the future, we believe it will be important to assess the ABT credit situation that exists at the time any further standards are considered. Emission credit balances will be part of the analysis for determining the appropriate level and timing of new standards, consistent with the statutory requirement to establish standards that represent the greatest degree of emission reduction achievable, considering cost, safety, lead time, and other factors. If we were to allow the use of credits generated under the standards adopted in this rule to meet more stringent standards adopt in a future rulemaking, we may need to adopt emission standards at more stringent levels or with an earlier start date than we would absent the continued use of existing emission credits, depending on the level of emission credit banks. Alternatively, we may adopt future standards without allowing the use of existing emission credits.

We are adopting the equation for calculating emission credits for OB/PWC engines as proposed. This equation represents a simpler calculation than is currently used for OB/PWC engines and is based on the equation that is common in many of our other ABT programs. The primary difference is that the regulatory useful life will be used in the credit calculation rather than a discounted useful life function based on engine type and power rating. In addition, the emission credits will be reported in units of kilograms rather than grams.

We are also adopting an averaging program for CO emissions. Under this program, manufacturers can generate credits with engine families that have FELs below the CO emission standard to be used for engine families in their product line in the same model year that are above the CO standard. However, we are not establishing a banking program for CO emissions. As noted in the proposal, we are concerned that a banking program could result in a large accumulation of credits based on a given company's mix of engine technologies. Furthermore, because we generally allow trading only with banked credits, we are not allowing trading of CO emission credits.

EPA proposed that manufacturers would not be able to earn credits for one pollutant while using credits to comply with the emissions standard for another pollutant. We are dropping that provision for the final rule. The proposed restriction was modeled on similar requirements in other ABT programs where there was concern that a manufacturer could use technologies to reduce one pollutant while increasing another pollutant. The types of technologies manufacturers are expected to use to comply with the new standards include direct-injection two-stroke engines or four-stroke engines. Both of these technologies should result in reductions in both $HC+NO_X$ emissions and CO emissions compared to current designs. While the technologies are expected to reduce both $HC+NO_X$ emissions and CO emissions, there could be situations where these technologies are capable of meeting one of the emission standards but not the other. EPA does not want to preclude such engines from being able to certify using the provisions of the ABT program and is therefore dropping the proposed restriction from the final rule.

For OB/PWC engines subject to the new emission standards, we are adopting FEL caps to prevent the sale of very high-emitting engines. For $HC+NO_X$, the FEL cap will be the applicable 2006 and later model year $HC+NO_X$ standard, which is dependent on the average power of an engine family. For CO, the FEL cap will be 150 g/kW-hr above the newly adopted CO standard, which is also dependent on the average power of an engine family. We believe these FEL caps will allow a great deal of flexibility for manufacturers using credits, but will require manufacturers to stop producing engines that emit pollutants at essentially uncontrolled levels.

We are specifying that OB/PWC engines are in a separate averaging set from SD/I engines, with an exception for certain jet boat engines. This means that credits earned by OB/PWC engines may be used only to offset higher emissions from other OB/PWC engines. Likewise, credits earned by SD/I engines may be used only to offset higher emissions from other SD/I engines. As described in Section III.C.2, manufacturers will be able to use credits generated from OB/PWC engines to demonstrate that their jet boat engines meet the $HC+NO_X$ and CO standards for SD/I engines if the majority of units sold in the United States from those related OB/PWC engine families are sold for use as OB/PWC engines.

Finally, manufacturers may include as part of their federal credit calculation the sales of engines in California as long as they don't separately account for those emission credits under the California regulations. We originally proposed to exclude engines sold in California that are subject to the California ARB standards. However, we consider California's current $HC+NO_X$ standards to be equivalent to those we are adopting in this rulemaking, so we would expect a widespread practice of producing and marketing 50-state products. Therefore, as long as a manufacturer is not generating credits under California's averaging program for OB/PWC engines, we would allow manufacturers to count those engines when calculating credits under EPA's program. This is consistent with how EPA allows credits to be calculated in other nonroad sectors, such as recreational vehicles.

(4) Durability Provisions

We are keeping the useful life periods from 40 CFR part 91. The specified useful life for outboard engines is 10 years or 350 hours of operation, whichever comes first. The useful life for personal watercraft engines is 5 years or 350 hours of operation, whichever comes first. (See § 1045.103.)

We are updating the specified emissions warranty periods for outboard and personal watercraft engines to align with our other emission control programs (see § 1045.120). Most nonroad engines have emissions warranty periods that are half of the total useful life period. Accordingly, the new warranty period for outboard engines is five years or 175 hours of operation, whichever comes first. The new warranty period for personal watercraft engines is 30 months or 175 hours, whichever comes first. This contrasts somewhat with the currently specified warranty period of 200 hours or two years (or three years for specified major emission control components). The new approach will slightly decrease the warranty period in terms of hours, but will somewhat increase the period in terms of calendar years (or months).

If the manufacturer offers a longer mechanical warranty for the engine or any of its components at no additional charge, we are requiring that the emission-related warranty for the respective engine or component must be extended by the same amount. The emission-related warranty includes components related to controlling exhaust, evaporative, and crankcase emissions from the engine. This approach to setting warranty requirements is consistent with provisions that apply in most other programs for nonroad engines.

We are keeping the requirements related to demonstrating the durability of emission controls for purposes of certification (see § 1045.235, § 1045.240, and § 1045.245). Manufacturers must run engines long enough to develop and justify full-life deterioration factors. This allows manufacturers to generate a deterioration factor that helps ensure that the engines will continue to control emissions over a lifetime of operation. The new requirement to generate deterioration factors for CO emissions is the same as that for $HC+NO_X$ emissions. For the $HC+NO_X$ standard, we are requiring that manufacturers use a single deterioration factor for the sum of HC and NO_X emissions. However, if manufacturers get our approval to establish a deterioration factor on an engine that is tested with service accumulation representing less than the full useful life for any reason, we will require separate deterioration factors for HC and NO_X emissions. The advantage of a combined deterioration factor is that it can account for an improvement in emission levels with aging. However, for engines that have service accumulation representing less than the full useful life, we believe it is not appropriate to extrapolate measured values indicating that emission levels for a particular pollutant will decrease.

Under the current regulations, emission-related maintenance is not allowed during service accumulation to establish deterioration factors. The only maintenance that may be done must be (1) regularly scheduled, (2) unrelated to emissions, and (3) technologically necessary. This typically includes changing engine oil, oil filter, fuel filter, and air filter. In addition, we are specifying that manufacturers may not schedule critical emission-related maintenance during the useful life period (see § 1045.125). This will prevent manufacturers from designing engines with emission controls that depend on scheduled maintenance that is not likely to occur with in-use engines.

D. Changes to OB/PWC Test Procedures

We are making a number of minor changes to the test procedures for OB/PWC to make them more consistent with the test procedures for other nonroad spark-ignition engines. These test provisions will apply to SD/I marine engines as well.

(1) Duty Cycle

A duty cycle is the set of modes (engine speed and load) over which an engine is operated during a test. For purposes of exhaust emission testing, we are keeping the duty cycle specified for OB/PWC engines, with two adjustments (see § 1045.505). First, we are requiring that manufacturers may choose to run the specified duty cycle as a ramped-modal cycle. Second, we are changing the low-power test mode from a specified 25 percent load condition to 25.3 percent load, which will complete the intended alignment with the E4 duty cycle adopted by the International Organization for Standardization.

(2) Maximum Test Speed

The definition of maximum test speed, where speed is the angular velocity of an engine's crankshaft (usually expressed in revolutions per minute, or rpm), is an important aspect of the duty cycles for testing. Engine manufacturers currently declare the rated speeds for their engines and then used the rated speed as the maximum speed for testing. However, we have established an objective procedure for measuring this engine parameter to have a clearer reference point for an engine's maximum test speed. This is important to ensure that engines are tested at operating points that correspond with in-use operation. This also helps ensure that the NTE zone is appropriately matched to in-use operating conditions.

We are defining the maximum test speed for any engine to be the single point on an engine's maximum-power versus speed curve that lies farthest away from the zero-power, zero-speed point on a normalized maximum-power versus speed plot. In other words, consider straight lines drawn between the origin (speed = 0, load = 0) and each point on an engine's normalized maximum-power versus speed curve. The nominal value of maximum test speed is defined at that point where the length of this line reaches its maximum value.

The engine mapping procedures in part 1065 that we referenced in the proposal allow manufacturers to declare a value for maximum test speed that is within 2.5 percent of the calculated (or measured) nominal value. Based on the manufacturers' descriptions of the way they instruct boat builders to match propellers to their engines, we have included in the final rule a special allowance for manufacturers to declare a value for maximum test speed that is up to 500 rpm below the calculated value. This equates to about 8 percent of the calculated value for most engines; however, we would never expect manufacturers to select a value for maximum test speed that is above the nominal value, so the total allowable range is not much greater than for other engines. We also note that the maximum test speed for a four-stroke engine that remains installed in a vessel is the highest engine speed that can occur. As long as the propeller matching and other vessel characteristics do not take the engine outside of the manufacturer's specified range, the engine would need to meet the Not-to-Exceed standards based on the in-use value for maximum test speed. These provisions related to maximum test speed apply equally to OB/PWC engines and SD/I engines.

(3) 40 CFR Part 1065

We are requiring that OB/PWC engines certified to the new exhaust emission standards use the test procedures in 40 CFR part 1065 instead of those in 40 CFR part 91.[95] Part 1065 includes detailed laboratory and equipment specifications and procedures for equipment calibration and emission measurements. These new procedures will apply starting with the introduction of new exhaust standards,

[95] See our previous rulemakings related to 40 CFR part 1065 for more information about the changes in test provisions (70 FR 40420, July 13, 2005 and 67 FR 68242, November 8, 2002).

though we will allow manufacturers to start using these new procedures earlier as an alternative procedure. The procedures in part 1065 include updated provisions to account for newer measurement technologies and improved calculation and corrections procedures. Part 1065 also specifies more detailed provisions related to alternate procedures, including a requirement to conduct testing representative of in-use operation. In many cases, we allow carryover of emission test data from one year to another. After the implementation of the new standards, we will allow the carryover of any test data generated prior to 2009 under the test procedures in 40 CFR part 91.

(4) Engine Break-in

Testing new engines requires a period of engine operation to stabilize emission levels. The regulations specify two separate figures for break-in periods. First, for certification, we establish a limit on how much an engine may operate and still be considered a ''low-hour'' engine. The results of testing with the low-hour engine are compared with a deteriorated value after some degree of service accumulation to establish a deterioration factor. For Large SI engines, we require that low-hour test engines have no more than 300 hours of engine operation. However, given the shorter useful life for marine engines, this will not make for a meaningful process for establishing deterioration factors, even if there is a degree of commonality between the two types of engines. We are requiring that low-hour marine spark-ignition engines generally have no more than 30 hours of engine operation (see § 1045.801). This allows some substantial time for break-in, stabilization, and running multiple tests, without approaching a significant fraction of the useful life. The current regulation in part 91 specifies that manufacturers perform the low-hour measurement after no more than 12 hours of engine operation (see § 91.408(a)(1)). The new allowance for up to 30 hours of engine operation is consistent with what we have done for recreational vehicles and will give manufacturers more time to complete a valid low-hour test.

For production-line testing there is also a concern about how long an engine should operate to reach a stabilized emission level. We are keeping the provision in part 91 that allows for a presumed stabilization period of 12 hours (see § 90.117(a)). We believe 12 hours is sufficient to stabilize the emissions from the engine.

(5) Not-to-Exceed Test Procedures and Standards

Section III.D.2 discusses the general concept and approach behind NTE standards for Marine SI engines. In addition, Section III.D.2 presents specific zones and limits for catalyst-equipped marine engines. We are applying the same general NTE testing provisions to OB/PWC engines, including the same broad NTE zone and ambient conditions (see § 1045.515).

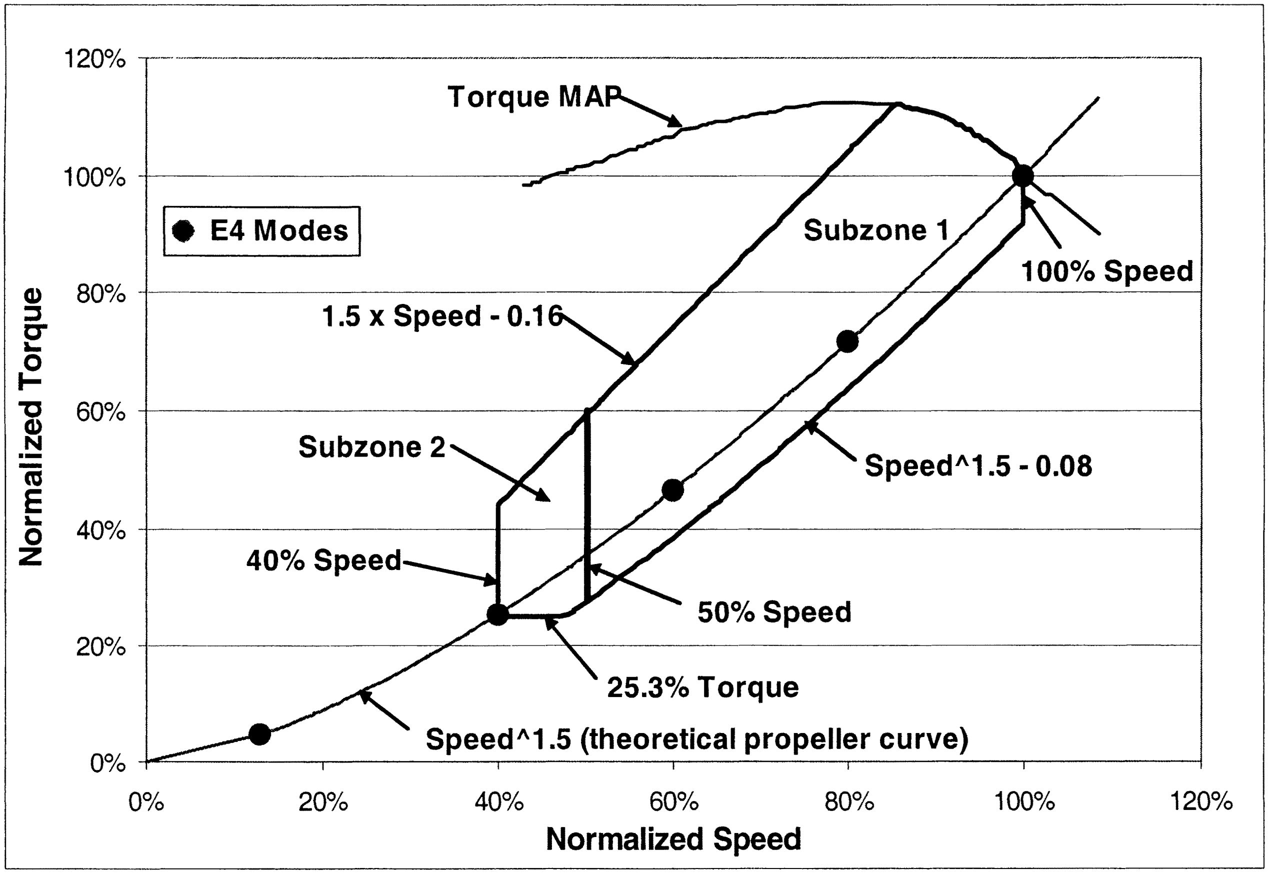
We anticipate that most OB/PWC engines subject to the NTE standards will use engine-based controls to meet the exhaust emission standards. For that reason, this discussion focuses on the NTE zone and subzones for engines not equipped with catalysts. Data presented in Chapter 4 of the RIA suggests that the emissions characteristics of marine engines are largely dependent on technology type. Four-stroke engines tend to have relatively constant emission levels throughout the NTE zone. In contrast, two-stroke engines tend to have high variability in emissions, not only within the NTE zone but between different engine designs as well. Therefore, we developed separate NTE approaches and standards for four-stroke and two-stroke engines. These approaches and standards are discussed below.

(a) Four-Stroke Marine Engines

The NTE approach for four-stroke marine engines without catalysts is similar to that for catalyst-equipped engines as described in Section III. We are applying the same NTE zone; however, we are establishing different subzones and emission limits based on data presented in the Final RIA. Emission data for four-stroke marine engines suggest that brake-specific emission rates are relatively constant throughout the NTE zone. One exception is slightly higher $HC+NO_X$ emissions at low power. To account for this, we are subdividing the NTE zone to have a low-power subzone below 50 percent of maximum test speed. In this low-power subzone, the $HC+NO_X$ NTE limit is 1.6, while it is 1.4 for the remainder of the NTE zone. The CO NTE limit is 1.5 throughout the NTE zone. Figure IV–1 presents the NTE zone and subzones. These limits would apply to all non-catalyzed four-stroke engines. See Section III.D.2 for a detailed discussion of NTE requirements that apply for catalyst-equipped engines (including OB/PWC engines).

As discussed above in Section IV.C.2, we are providing extra lead time for 2010–2012 model year engines certified using preexisting data. The purpose of this provision is to allow testing and calibration work to better fit into product development cycles. We have received an indication that a small subset of existing outboard engines may need additional time to meet the 1.4 NTE limit at mid-range speeds due to technological challenges associated with high-power supercharging. Manufacturers have indicated that a slightly higher limit of 1.6 would be feasible in the 2013 time frame, but additional time would be needed for hardware changes to meet the 1.4 limit. To address this issue, we are temporarily expanding Subzone 2 to include mid-range speeds up to 70 percent of maximum test speed for supercharged outboard engines greater than 150 kW. Beginning with the 2015 model year, these engines would be subject to the same NTE zone and standards as other four-stroke engines.

Figure IV-2: NTE Zone and Subzones for Four-Stroke Engines without Catalysts



(b) Two-Stroke Marine Engines

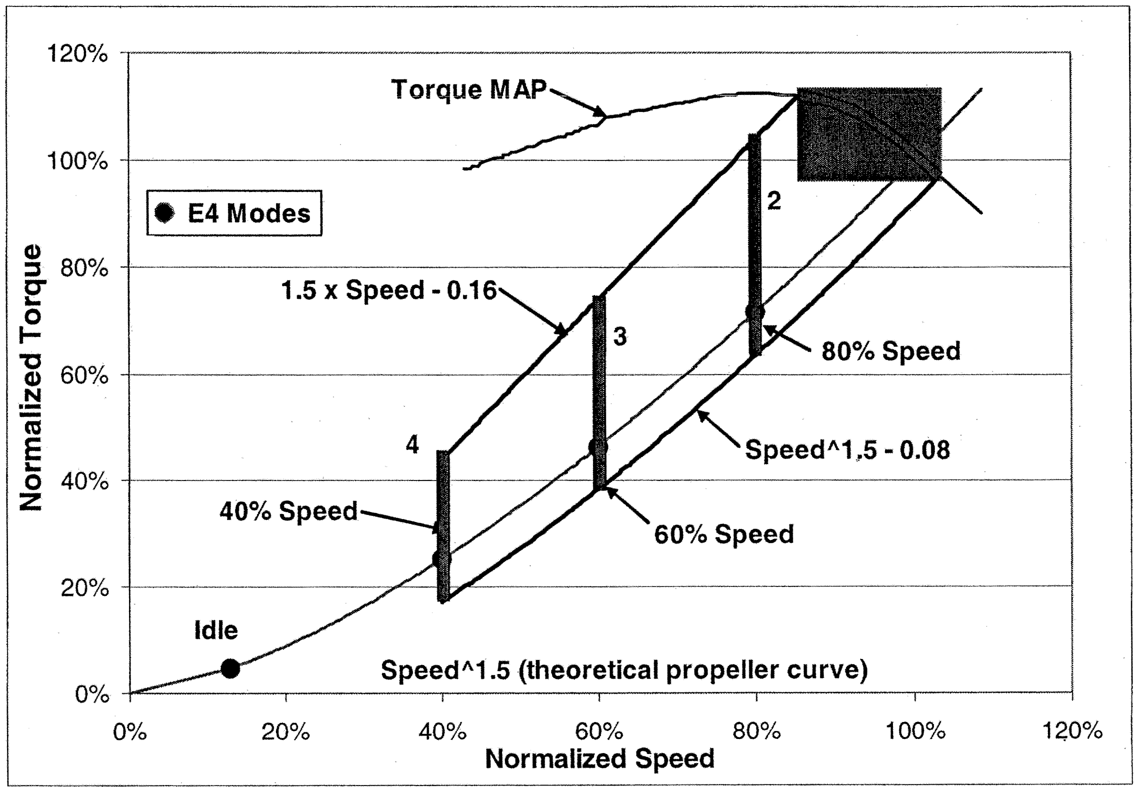
The emission data presented in Chapter 4 of the Final RIA for two-stroke direct-injection marine engines suggest that these engines have high variability in emissions, not only within the NTE zone but between different engine designs as well. Due to this variability, we do not believe that a flat (or stepped) limit in the NTE zone could be effectively used to establish meaningful standards for these engines. At the same time, we continue to believe that NTE standards are valuable for facilitating in-use testing. We therefore developed a weighted NTE approach specifically for these engines. In the long term, we may consider further emission reductions based on catalytic control applied to OB/PWC engines. In this case, we would revisit the appropriateness of the weighted NTE approach in the context of those standards.

Under the weighted NTE approach, emission data is collected at five test points. These test points are idle, full power, and the speeds specified in Modes 2 through 4 of the 5-mode duty cycle. Similar to the 5-mode duty cycle, the five test points are weighted to achieve a composite value. This composite value must be no higher than 1.2 times the FEL for that engine family.

The difference in this approach from the 5-mode duty cycle is that the test torque is not specified. During an in-use test, the engine would be set to the target speed and the torque value would be allowed to float. The actual torque would depend on the propeller design, the weight and condition of the boat, and other factors. In addition, the engine speed at wide open throttle would be based on actual performance on the boat. Because in-use engines installed in boats do not generally operate on the theoretical propeller curve used to define the 5-mode duty cycle, this approach helps facilitate NTE testing.

At each test mode, limits are placed on allowable engine operation. These limits are generally based on the NTE zone presented above for four-stroke engines, but there are two exceptions. First, the lower torque limit at 40 percent speed is lowered slightly to better ensure that an engine on an in-use boat is capable of operating within the NTE zone. Second, the speed range is extended at wide-open throttle for the same reason. Figure IV–3 presents the NTE zone and subzones. These limits would apply to all non-catalyzed two-stroke engines. See Section III.D.2 for a detailed discussion of NTE requirements that apply to catalyst-equipped engines (including OB/PWC engines).

Figure IV-3: Weighted NTE Approach for two-stroke Engines



During laboratory testing, any point within each of the four non-idle subzones may be chosen as test points. These test points do not necessarily need to lie on a propeller curve. Note that measured power should be used in the calculation of the weighted brake-specific emissions.

(6) Test Fuel

As described below in Section V.D.3, we are adopting provisions that will allow manufacturers to use a 10 percent ethanol blend for certification testing of exhaust emissions from Small SI engines as an alternative to the standard gasoline test fuel. We are adopting similar provisions for Marine SI engines in this rule. This option to use a 10 percent ethanol blend will begin with the implementation date of the new exhaust standards for both OB/PWC engines and SD/I engines. The option to use a 10 percent ethanol blend would apply to PLT testing as well if the manufacturer based their certification on the 10 percent ethanol blend. The test fuel specifications are based on using the current gasoline test fuel and adding ethanol until the blended fuel has 10 percent ethanol by volume. While we will allow use of a 10 percent ethanol blend for certification, we expect to use our test fuel without oxygenates for all confirmatory testing for exhaust emissions. Therefore, an engine manufacturer will want to consider the impacts of ethanol on emissions in evaluating the compliance margin for the standard, or in setting the FEL for the engine family if it is participating in the ABT program. We could decide at our own discretion to do exhaust emissions testing using a 10 percent ethanol blend if the manufacturer certified on that fuel.

Ethanol has been blended into in-use gasoline for many years and its use has been increasing in recent years. Under provisions of the Energy Independence and Security Act of 2007, ethanol is required to be used in significantly greater quantities. We project that potentially 80 percent of the national gasoline pool will contain ethanol by 2010, making ethanol blends (up to 10 percent) the de facto in-use fuel. As ethanol blends become the main in-use fuel, we believe it makes sense for manufacturers to optimize their engine designs with regard to emissions, performance, and durability on such a fuel. While limited data on Marine SI engines operated on a 10 percent ethanol blend suggests the HC emissions will decrease and NO_X emission will increase or stay the same, these effects result in small decreases in total $HC+NO_X$ emission levels, with the difference generally being around 10 percent. CARB is currently running a test program to look at the emission impacts of ethanol blends on a range of Marine SI engines. Based on the results of that test program, we may consider changes to the provisions allowing the use of a 10 percent ethanol blend for certification and production-line testing.

E. Additional Certification and Compliance Provisions

(1) Production-Line Testing

We are continuing to require that manufacturers routinely test engines at the point of production to ensure that production variability does not affect the engine family's compliance with emission standards. The final rule includes a variety of amendments and adjustments as described in the proposal. We may also require manufacturers to perform production line testing under the selective enforcement auditing provisions of 40 CFR part 1068, subpart E.

(2) In-Use Testing

We are also continuing the requirements related to the manufacturer-run in-use testing program. Under this program, manufacturers test field-aged engines to determine whether they continue to meet emission standards (see part 1045, subpart E). We are, however, making a variety of changes and clarifications to the current requirements, as described in the following sections.

(a) Adjustments Related to Engine Selection

Both EPA and manufacturers have gained insights from implementing the current program. Manufacturers have expressed a concern that engine families are selected rather late in the model year, which makes it harder to prepare a test fleet for fulfilling testing obligations. On the other hand, we have seen that manufacturers certify some of their engine families well into the model year. By making selections early in the model year, we will generally be foregoing the opportunity to select engine families for which manufacturers don't apply for certification until after the selections occur.

To address these competing interests, we are adopting an approach that allows for early selection of engine families, while preserving the potential to require testing for engines that are certified later in the model year. For complete applications we receive by December 31 of a given calendar year for the following model year, we expect to select engine families for testing by the end of February of the following year. If we have not made a complete selection of engine families by the end of February, manufacturers have the option of making their own selections for in-use testing. The regulations include criteria to serve as guidance for manufacturers to make appropriate selections. For example, we expect manufacturers to most strongly consider those engine families with the highest projected sales volume and the smallest compliance margins. Manufacturers may also take into account past experience with engine families if they have already passed an in-use testing regimen and have not undergone significant design changes since that time.

We will treat engine families differently for in-use testing if we receive the application after December 31. This applies, for example, if we receive a complete application for a 2010 engine family in February 2010. In these cases, the engine family will automatically be subject to in-use testing, without regard to the 25 percent limitation that will otherwise dictate our selections. This may appear to increase the potential test burden, but the clear majority of applications for certification are completed before the end of the calendar year for the following model year. This provision will eliminate the manufacturers' ability to game the testing system by delaying a family of potential concern until the next calendar year. We expect to receive few new applications after the end of the calendar year. This will be consistent with the manufacturers' interest in early family selections, without jeopardizing EPA's interest in being able to select from a manufacturer's full product lineup.

(b) Crankcase Emissions

Because the crankcase requirements are based on a design specification rather than emission measurements, the anticipated crankcase technologies are best evaluated simply by checking whether or not they continue to function as designed. As a result, we intend for an inspection of in-use engines to show whether these systems continue to function properly throughout the useful life, but we are not requiring manufacturers to include crankcase emission measurements as part of the in-use testing program described in this section. This is consistent with the approach we have taken in other programs.

(c) In-Use Emission Credits

Clean Air Act section 213 requires engines to comply with emission standards throughout the regulatory useful life, and section 207 requires a manufacturer to remedy in-use nonconformity when we determine that a substantial number of properly maintained and used engines fail to conform with the applicable emission standards (42 U.S.C. 7541). As described in the original rulemaking, a potential option to address a nonconformity is that manufacturers could use a calculation of emission credits generated under the in-use testing program to avoid a recall determination if an engine family's in-use testing results exceeded emission standards (61 FR 52095, October 4, 1996).

We are adopting a more general approach to addressing potential noncompliance under the in-use testing program than is specified in 40 CFR part 91. The final regulations do not specify how manufacturers could generate emission credits to offset a nonconforming engine family. This new approach is preferred for two primary reasons. First, manufacturers will be able to use emission data generated from field testing to characterize an engine family's average emission level. This becomes necessarily more subjective, but allows us to consider a wider range of information in evaluating the degree to which manufacturers are complying with emission standards across their product line. Second, this approach makes clearer the role of the emission credits in our consideration to recall failing engines. We plan to consider, among other information, average emission levels from multiple engine families in deciding whether to recall engines from a failing engine family. We therefore believe it is not appropriate to have a detailed emission credit program defining precisely how and when to calculate, generate, and use credits that do not necessarily have value elsewhere.

Not specifying how manufacturers generate emission credits under the in-use testing program gives us the ability to consider any appropriate test data in deciding what action to take. In generating this kind of information, some general guidelines will apply. For example, we expect manufacturers to share test data from all engines and all engine families tested under the in-use testing program, including nonstandard tests that might be used to screen engines for later measurement. This allows us to understand the manufacturers' overall level of performance in controlling emissions to meet emission standards. Average emission levels should be calculated over a running three-year period to include a broad range of testing without skewing the results based on old designs. Emission values from engines certified to different tiers of emission standards or tested using different measurement procedures should not be combined to calculate a single average emission level. Average emission levels should be calculated according to the following equation, rounding the results to 0.1 g/kW-hr:

$$\text{Average EL} = \Sigma_i[(STD{-}CL)_i \times (UL)_i \times (Sales)_i \times Power_i \times LF_i] \div \Sigma_i\,[(UL)_i \times (Sales)_i \times Power_i \times LF_i]$$

Where:

Average EL = Average emission level in g/kW-hr.

$Sales_i$ = The number of eligible sales, tracked to the point of first retail sale in the U.S., for the given engine family during the model year.

$(STD{-}CL)_i$ = The difference between the emission standard (or Family Emission Limit) and the average emission level for an in-use testing family in g/kW-hr.

UL_i = Useful life in hours.

$Power_i$ = The sales-weighted average maximum engine power for an engine family in kW.

LF_i = Load factor or fraction of maximum engine power utilized in use; use 0.50 for engine families used only in constant-speed applications and 0.32 for all other engine families.

We have adopted this same approach for the in-use testing program that applies for Large SI engines in 40 CFR part 1048.

(3) Optional Procedures for Field Testing

Outboard engines are inherently portable, so it may be easier to test them in the laboratory than in the field. However, there is a strong advantage to using portable measurement equipment to test personal watercraft and SD/I engines while the engine remains installed to avoid the effort of taking the engine out and setting it up in a laboratory. Field testing will also provide a much better means of measuring emissions to establish compliance with the NTE standards, because it is intended to ensure control of emissions during normal in-use operation that may not occur during laboratory testing over the specified duty cycle. We are adopting the field testing provisions described below as an option for all OB/PWC and SD/I engines.

The regulations at 40 CFR part 1065, subpart J, specify how to measure emissions using portable measurement equipment. To test engines while they remain installed, analyzers are connected to the engine's exhaust to detect emission concentrations during normal operation. Exhaust volumetric flow rate and continuous power output are also needed to convert the analyzer responses to units of g/kW-hr for comparing to emission standards. These values can be calculated from measurements of the engine intake flow rate, the exhaust air-fuel ratio and the engine speed, and from torque information.

Available small analyzers and other equipment may be adapted for measuring emissions in the field. A portable flame ionization detector can measure total hydrocarbon concentrations. A portable analyzer based on zirconia technology can measure NO_X emissions. A nondispersive infrared (NDIR) unit can measure CO. We are requiring manufacturers to specify how they will intend to draw emission samples from in-use engines for testing installed engines. For example, emission samples can be drawn from the exhaust flow directly upstream of the point at which water is mixed into the exhaust flow. This should minimize collection of water in the extracted sample, though a water separator may be needed to maintain a sufficiently dry sample. Mass flow rates also factor into the torque calculation; this may be measured either in the intake or exhaust manifold.

Calculating brake-specific emissions depends on determining instantaneous engine speed and torque levels. We are therefore requiring manufacturers to design their engine control systems to be able to continuously monitor engine speed and torque. We have already adopted this requirement for other mobile source programs where electronic engine control is used. Monitoring speed values is straightforward. For torque, the onboard computer needs to convert measured engine parameters into useful units. Manufacturers generally will need to monitor a surrogate value such as intake manifold pressure or throttle position (or both), then rely on a look-up table programmed into the onboard computer to convert these torque indicators into Newton-meters. Manufacturers may also want to program look-up tables for torque conversion into a remote scan tool. Part 1065 specifies the performance requirements for accuracy, repeatability, and noise related to speed and torque measurements. These tolerances are taken into account in the selection of the new NTE standards. We are adopting the requirement to meet the torque-broadcasting requirements in the 2013 model year, which aligns with the final implementation of the NTE standards.

(4) Other Changes for In-Use Testing

A question has been raised regarding the extent of liability if an engine family is found to be noncompliant during in-use testing. Because it can take up to two years to complete the in-use testing regimen for an engine family, we want to clarify the status of engines produced under that engine family's certificate, and under the certificates of earlier and later engine families that were effectively of the same design. For example, manufacturers in many cases use carryover data to continue certifying new engine families for a subsequent model year; this avoids the need to produce new test data for engines whose design does not change from year to year. For these cases, absent any contrary information from the manufacturer, we will maintain the discretion to include other applicable engine families in the scope of any eventual recall, as allowed by the Act.

In response to comments received from manufacturers, we have agreed to adopt a provision allowing manufacturers to request hardship relief under the in-use testing program if conditions outside their control prevent them from completing the required testing. We would expect this to be a rare occurrence, but this provision will allow us to accommodate manufacturers if extreme unforeseen circumstances prevent a manufacturer from completing a test program.

There are a variety of smaller changes to the in-use testing provisions as a result of updating the regulatory language to reflect the language changes that we adopted for similar testing with Large SI engines. First, we are removing the requirement to select engines that have had service accumulation representing less than 75 percent of the useful life. This gives manufacturers the flexibility to test somewhat older engines if they want to. Second, we are slightly adjusting the description of the timing of the test program, specifying that the manufacturer must submit a test plan within 12 months of EPA selecting the family for testing, with a requirement to complete all testing within 24 months. This contrasts with the current requirement to complete testing within 12 months after the start of testing, which in turn must occur within 12 months of family selection. We believe the modified approach allows additional flexibility without delaying the conclusion of testing. Third, we are requiring that manufacturers explain why they excluded any particular engines from testing. Finally, we are requiring manufacturers to report any noncompliance within 15 days after completion of testing for a family, rather than 15 days after an individual engine fails. This has the advantage for manufacturers and the Agency of a more unified reporting after testing is complete, rather than piecemeal reporting before conclusions can be drawn.

(5) Use of Engines Already Certified to Other Programs

In some cases, manufacturers may want to use engines already certified under our other programs. Engines certified to the emission standards for highway applications in part 86 or Large SI applications in part 1048 are meeting more stringent standards. We are therefore accepting the pre-existing certification for these engines used in marine applications, on the condition that the engine is not changed from its certified configuration in any way (see § 1045.605). We allow this in a similar way for a limited number of engines certified to the Small SI emission standards (see § 1045.610). The number of installed marine engines must generally be less then five percent of the total U.S. sales of that engine model in all applications.

(6) Import-Specific Information at Certification

We are requiring additional information to improve our ability to oversee compliance related to imported engines (see § 1045.205). In the application for certification, the following additional information is necessary: (1) The port or ports at which the manufacturer has imported engines over the previous 12 months, (2) the names and addresses of the agents the manufacturer has authorized to import the engines, and (3) the location of the test facilities in the United States where the manufacturer will test the engines if we select them for testing under a selective enforcement audit. See Section 1.3 of the Summary and Analysis of Comments for further discussion related to naming test facilities in the United States.

(7) Alternate Fuels

The emission standards apply to all spark-ignition engines regardless of the fuel they use. Almost all Marine SI engines operate on gasoline, but these engines may also operate on other fuels, such as natural gas, liquefied petroleum gas, ethanol, or methanol. The test procedures in 40 CFR part 1065 describe adjustments needed for operating test engines with oxygenated fuels.

In some special cases, a single engine is designed to alternately run on different fuels. For example, some engines can switch back and forth between natural gas and LPG. We are adding a clarification to the regulations to describe how manufacturers would submit certification data and divide such engines into engine families. We would expect a manufacturer to submit test data on each fuel type. If manufacturers produce engines that run only on one fuel where that dedicated-fuel engine is identical to a dual-fuel engine with respect to that fuel, those engines could be included in the same family. This is also true for the second fuel. For example, if a manufacturer produces an engine that can run on both gasoline and LPG and also produces that engine model in gasoline-only and LPG-only versions without adjusting the calibration or other aspects of that configuration, those engines may all be included in the same engine family.

Once an engine is placed into service, someone might want to convert it to operate on a different fuel. This would take the engine out of its certified configuration, so we are requiring that someone performing such a fuel conversion to go through a certification process. We will allow certification of the complete engine using normal certification procedures, or the aftermarket conversion kit could be certified using the provisions of 40 CFR part 85, subpart V. This contrasts with the provisions in part 91 that allow for fuel conversions that can be demonstrated not to increase emission levels above the applicable standard. We propose to apply this requirement starting January 1, 2010. (See § 91.1103 and § 1045.645.)

(8) Special Provisions Related to Altitude

As described in Section IV.C.1, we are allowing manufacturers to comply with emission standards at high altitudes using an altitude kit. Manufacturers using altitude kits to comply at altitude must take steps to describe their altitude kits in the application for certification and explain their basis for believing that engines with these altitude kits will comply with emission standards at high altitude. Manufacturers must also describe a plan for making information and parts available such that the widespread use of altitude kits will reasonably be expected in high-altitude areas. For a more thorough description of these compliance provisions, see the discussion in Section V.E.5 for nonhandheld Small SI engines.

F. Other Adjustments to Regulatory Provisions

We are moving the regulatory requirements for marine spark-ignition engines from 40 CFR part 91 to 40 CFR part 1045. This gives us the opportunity to update the details of our certification and compliance program to be consistent with the comparable provisions that apply to other engine categories. The following paragraphs highlight some of the provisions in the new language that may involve noteworthy changes from the current regulations in part 91. All these provisions apply equally to SD/I engines, except that they are not subject to the current requirements in 40 CFR part 91.

We are making some adjustments to the criteria for defining engine families (see § 1045.230). The fundamental principle behind engine families is to group together engines that will have similar emission characteristics over the useful life. As a result, all engines within an engine family must have the same approximate bore diameter and use the same method of air aspiration (for example, naturally aspirated vs. turbocharged). Under the previous regulation, manufacturers were allowed the discretion to consider bore and stroke dimensions and aspiration method for subdividing engine families beyond what was required under the primary criteria in § 91.115. We believe engines with substantially different bore diameters will have combustion and operating characteristics that must be taken into account with unique engineering. Similarly, adding a turbocharger or supercharger changes the engine's combustion and emission control in important ways. We are also requiring that all the engines in an engine family use the same type of fuel. This may have been a simple oversight in the current regulations, since all OB/PWC engines operate on gasoline. However, if a manufacturer were to produce an engine model that runs on natural gas or another alternative fuel, that engine model should be in its own engine family. See Section IV.E.7 for a discussion of dual-fuel engines. Finally we are removing the provision currently in part 91 related to the engine-cooling mechanism. Manufacturers pointed out that raw-water cooling and separate-circuit cooling do not have a significant effect on an engine's emission characteristics.

The new regulatory language related to engine labels remains largely unchanged from the previous requirements (see § 1045.135). We are including a provision to allow manufacturers to print labels that have a different company's trademark. Some manufacturers in other programs have requested this flexibility for marketing purposes.

The warranty provisions are described above. We are adding an administrative requirement to describe the provisions of the emission-related warranty in the owners manual (see § 1045.120). We expect that many manufacturers already do this, but believe it is appropriate to require this as a routine practice.

Certification procedures depend on establishing deterioration factors to predict the degradation in emission controls that occurs over the course of an engine's useful life. This typically involves service accumulation in the laboratory to simulate in-use operation. Since manufacturers do in-use testing to further characterize this deterioration rate, we are specifying that deterioration factors for certification must take into account any available data from in-use testing with similar engines. This provision applies in most of our emission control programs that involve routine in-use testing. To the extent this information is available, it should be factored into the certification process. For example, if in-use testing shows that emission deterioration is substantially higher than that characterized by the deterioration factor, we expect the manufacturer to factor the in-use data into a new deterioration factor, or to revise durability testing procedures to better represent the observed in-use degradation.

Maximum engine power for an engine family is an important parameter. For example, maximum engine power determines the applicable CO standard for engines at or below 40 kW. For bigger engines, emission credits are calculated based on total power output. As a result, we are specifying that manufacturers determine their engines' maximum engine power as the point of maximum engine power on the engine's nominal power curve (see § 1045.140). This value may be established as a design value, but must be determined consistent with the engine mapping procedures in § 1065.510. The manufacturer must adjust the declared value for maximum engine power if it does not fall within the range of values from production engines.

The new requirements related to the application for certification will involve some new information, most of which is described above, such as installation instructions and a description of how engines comply with not-to-exceed standards (see § 1045.205). In addition, we are requiring that manufacturers submit projected sales volumes for each family, rather than allowing manufacturers to keep these records and make them available upon request. Manufacturers already do this routinely and it is helpful to have ready access to this information to maintain compliance oversight for such things as emission credit calculations. We are also requiring that each manufacturer identify an agent for service in the United States. For companies based outside the United States, this ensures that we will be able to maintain contact regarding any official communication that may be required. We have adopted these same requirements for other nonroad programs.

We are requiring that manufacturers use good engineering judgment in all aspects of their effort to comply with regulatory requirements. The regulations at § 1068.5 describe how we will apply this provision and what we will require of manufacturers where we disagree with a manufacturer's judgment.

We are also establishing new defect-reporting requirements. These requirements are described in Section VIII of the preamble to the proposed rule.

It is common practice for one company to produce engine blocks that a second company modifies for use as a marine engine. Since our regulations prohibit the sale of uncertified engines, we are establishing provisions to clarify the status of these engines and defining a path by which these engines can be handled without violating the regulations. See Section VIII.C.1 for more information.

G. Small-Business Provisions

The OB/PWC market has traditionally been made up of large businesses. We anticipate that the OB/PWC standards will be met through the expanded use of existing cleaner engine technologies. Small businesses certifying to standards today are already using technologies that could be used to meet the new standards. As a result, we are adopting only three small business regulatory relief provisions for small business manufacturers of OB/PWC engines. We are allowing small business OB/PWC engine manufacturers to be exempt from PLT testing and to use assigned deterioration factors for certification. (EPA will provide guidance to engine manufacturers on the assigned deterioration factors prior to implementation of the new OB/PWC standards.) We are also extending the economic hardship relief to OB/PWC engine manufacturers that qualify as small businesses (see § 1068.250). We are defining small business eligibility criteria for OB/PWC engine manufacturers based on an employee cut-off of 250 employees.

In addition to the flexibilities noted above, all OB/PWC engine manufacturers, regardless of size, will be able to apply for the unusual circumstances hardship in § 1068.245. Finally, all OB/PWC vessel manufacturers that rely on other companies to provide certified engines or fuel system components for their product will be able to apply for the hardship provisions in § 1068.255.

H. Technological Feasibility

(1) Level of Standards

Over the past several years, manufacturers have demonstrated their ability to achieve significant $HC+NO_X$ emission reductions from outboard and personal watercraft engines. This has largely been accomplished through the introduction of two-stroke direct injection engines and conversion to four-stroke engines. Recent certification data for these types of engines show that these technologies may be used to achieve emission levels significantly below the current exhaust emission standards. In fact, California standards require a 65 percent reduction beyond the current federal standards.

Our own analysis of recent certification data shows that most four-stroke outboard engines and many two-stroke direct injection outboard engines can meet the final $HC+NO_X$ standard. Similarly, although PWC engines tend to have higher $HC+NO_X$ emissions, presumably due to their higher power densities, many of these engines can also meet the new $HC+NO_X$ standard. Although there is currently no CO standard for OB/PWC engines, OB/PWC manufacturers are required to report CO emissions from their engines (see § 91.107(d)(9)). These emissions are based on test data from new engines and do not consider deterioration or compliance margins. Based on this data, all the two-stroke direct injection engines show emissions well below the new standards. In addition, the majority of four-stroke engines meet the new CO standards as well.

We therefore believe the $HC+NO_X$ and CO emission standards will be achieved by phasing out conventional carbureted two-stroke engines and replacing them with four-stroke engines or two-stroke direct injection engines. This has been the market-driven trend over the last five years. Chapter 4 of the Final RIA presents charts that compare certification data to the new standards.

(2) Implementation Dates

We are implementing the new emission standards beginning with the 2010 model year. This gives two additional years beyond the implementation date of the same standards in California. This additional time may be necessary for manufacturers that do not sell engine models in California or that sell less than their full product lineup into the California market. We believe the same technology used to meet the 2008 standards in California could be used nationwide with the additional year allowed for any engine models not sold in California. Low-emission engines sold in California are generally sold nationwide as part of manufacturer compliance strategies for EPA's 2006 standards. Manufacturers have indicated that they are calibrating their four-stroke and direct-injection two-stroke engines to meet the California requirements. To meet the new standards, manufacturers' efforts will primarily center on phasing out their higher-emission carbureted two-stroke engines and producing more of their lower emission engines.

(3) Technological Approaches

Conventional two-stroke engines add a fuel-oil mixture to the intake air with a carburetor, and use the crankcase to force this mixed charge air into the combustion chamber. In the two-stroke design, the exhaust gases must be purged from the cylinder while the fresh charge enters the cylinder. With traditional two-stroke designs, the fresh charge, with unburned fuel and oil, will push the exhaust gases out of the combustion chamber as the combustion event concludes. As a result, 25 percent or more of the fresh fuel-oil could pass through the engine unburned. This is known as scavenging losses. Manufacturers have phased out sales of the majority of their traditional two-stroke engines to meet the federal 2006 OB/PWC exhaust emission standards. However, many of these engines still remain in the product mix as a result of emission credits.

One approach to minimizing scavenging losses in a two-stroke engine is through the use of direct fuel injection into the combustion chamber. The primary advantage of direct injection for a two-stroke engine is that the exhaust gases can be scavenged with fresh air and fuel can be injected into the combustion chamber after the exhaust port closes. As a result, hydrocarbon emissions, fuel economy, and oil consumption are greatly improved. Some users prefer two-stroke direct injection engines over four-stroke engines due to the higher power-to-weight ratio. Most of the two-stroke direct injection engines certified to the current OB/PWC emission standards have $HC+NO_X$ emissions levels somewhat higher than certified four-stroke engines. However, these engines also typically have lower CO emissions due to the nature of a heterogeneous charge. By injecting the fuel directly into a charge of air in the combustion chamber, localized areas of lean air/fuel mixtures are created where CO is efficiently oxidized.

OB/PWC manufacturers are also achieving lower emissions through the use of four-stroke engine designs. Because a single combustion event takes place over two revolutions of the crankshaft, the fresh fuel-air charge can enter the combustion chamber after the exhaust valve is closed. This minimizes scavenging losses. Manufacturers currently offer four-stroke marine engines with maximum engine power ranging from 1.5 to more than 250 kW. These engines are available with carburetion, throttle-body fuel injection, or multi-point fuel injection. Based on the certification data, whether the engine is carbureted or fuel-injected does not have a significant effect on combined $HC+NO_X$ emissions. For PWC engines, the $HC+NO_X$ levels are somewhat higher, primarily due to their higher power-to-weight ratio. CO emissions from PWC engines are similar to those for four-stroke outboard engines.

One manufacturer has certified two PWC engine models with oxidation catalysts. One engine model uses the oxidation catalyst in conjunction with a carburetor while the other uses throttle-body fuel injection. In this application, the exhaust system is shaped in such a way to protect the catalyst from water. The exhaust system is relatively large compared to the size of the engine. We are not aware of any efforts to develop a three-way catalyst system for PWC engines. We are also not aware of any development efforts to package a catalyst into the exhaust system of an outboard marine engine. In current designs, water and exhaust are mixed in the exhaust system to help cool the exhaust and tune the engine. Water can work its way up through the exhaust system because the lower end is under water and varying pressures in the exhaust stream can draw water against the prevailing gas flow. As discussed in Chapter 4 of the Final RIA, saltwater can be detrimental to catalyst performance and durability. In addition, outboard engines are designed with lower units that are designed to be as thin as possible to improve the ability to turn the engine on the back of the boat and to reduce drag on the lowest part of the unit. This raises concerns about the placement and packaging of catalysts in the exhaust stream. Certainly, the success of packaging catalysts in sterndrive and inboard boats in recent development efforts (see Section III) suggests that catalysts may be feasible for outboards with additional effort. However, this has not yet been demonstrated and significant development efforts will be necessary.

(4) Regulatory Alternatives

We considered a level of 10 g/kW-hr $HC+NO_X$ for OB/PWC engines above 40 kW with an equivalent percent reduction below the new standards for engines at or below 40 kW. This second tier of standards could apply in the 2012 or later time frame. Such a standard would be consistent with currently certified emission levels from a significant number of four-stroke outboard engines. We had three concerns with adopting this second tier of OB/PWC standards. First, while some four-stroke engines may be able to meet a 10 g/kW-hr standard with improved calibrations, it is not clear that all engines could meet this standard without applying catalyst technology. As described in Section IV.H.3, we believe it is not appropriate to base standards in this rule on the use of catalysts for OB/PWC engines. Second, certification data for personal watercraft engines show somewhat higher exhaust emission levels, so setting the standard at 10 g/kW-hr would likely require catalysts for many models. Third, it is not clear that two-stroke engines would be able to meet the more stringent standard, even with direct injection and catalysts. These engines operate with lean air-fuel ratios, so reducing NO_X emissions with any kind of aftertreatment is especially challenging.

Therefore, unlike the new standards for sterndrive and inboard engines, we are not adopting OB/PWC standards that require the use of catalysts. Catalyst technology would be necessary for significant additional control of $HC+NO_X$ and CO emissions for these engines. While there is good potential for eventual application of catalyst technology to outboard and personal watercraft engines, we believe the technology is not adequately demonstrated at this point. Much laboratory and in-water work is needed.

(5) Our Conclusions

We believe the final emission standards can be achieved by phasing out conventional carbureted two-stroke engines in favor of four-stroke engines or two-stroke direct injection engines. The four-stroke engines or two-stroke direct injection engines are already widely available from marine engine manufacturers. One or both of these technologies are currently in place for the whole range of outboard and personal watercraft engines.

The new exhaust emission standards represent the greatest degree of emission control achievable in the contemplated time frame. While manufacturers can meet the standards with their full product line in 2010, requiring full compliance with a nationwide program earlier, such as in the same year that California introduces new emission standards, will pose an unreasonable requirement. Allowing two years beyond California's requirements is necessary to allow manufacturers to certify their full product line to the new standards, not only those products they will make available in California. Also, as described above, we believe the catalyst technology that will be required to meet emission standards substantially more stringent than we are adopting has not been adequately demonstrated for outboard or personal watercraft engines. As such, we believe the new standards for $HC+NO_X$ and CO emissions are the most stringent possible in this rulemaking. More time to gain experience with catalysts on sterndrive and inboard engines and a substantial engineering effort to apply that learning to outboard and personal watercraft engines may allow us to pursue more stringent standards in a future rulemaking.

As discussed in Section VII, we do not believe the final standards will have negative effects on energy, noise, or safety and may lead to some positive effects.

V. Small SI Engines

A. Overview

This section applies to new nonroad spark-ignition engines with rated power at or below 19 kW (''Small SI engines''). These engines are most often used in lawn and garden applications, typically by individual consumers; they are many times also used by commercial operators and they provide power for a wide range of other home, industrial, farm, and construction applications. The engines are typically air-cooled single-cylinder models, though Class II engines (with displacement over 225 cc) may have two or three cylinders, and premium models with higher power may be water-cooled.

We have already adopted two phases of exhaust standards for Small SI engines. The first phase of standards for nonhandheld engines generally led manufacturers to convert any two-stroke engines to four-stroke engines. These standards applied only at the time of sale. The second phase of standards for nonhandheld engines generally led manufacturers to apply emission control technologies, such as in-cylinder controls and improved carburetion, with the additional requirement that manufacturers needed to meet emission standards over a useful life period.

As described in Section I, this final rule is the result of a Congressional mandate that springs from the new California ARB standards. In 2003, California ARB adopted more stringent standards for nonhandheld engines. These standards target emission reductions of approximately 35 percent below EPA's Phase 2 standards and are based on the expectation that manufacturers will use relatively low-efficiency three-way catalysts to control $HC+NO_X$ emissions. California ARB did not change the applicable CO emission standard.[96]

We are adding these new regulations for Small SI engines in 40 CFR part 1054 rather than changing the current regulations in 40 CFR part 90. This gives us the opportunity to update the details of our certification and compliance program that are consistent with the comparable provisions that apply to other engine categories and describe regulatory requirements in plain language. Most of the change in regulatory text provides improved clarity without changing procedures or compliance obligations. Where there is a change that warrants further attention, we describe the need for the change below. For nonhandheld engines, manufacturers must comply with all the provisions in part 1054 once the Phase 3 standards begin to apply in 2011 or 2012. For handheld engines, manufacturers must comply with the provisions in part 1054 starting in 2010. Note, however, that part 1054 specifies that certain provisions do not apply for handheld engines until sometime after 2010.

Engines and equipment subject to part 1054 are also subject to the general compliance provisions in 40 CFR part 1068. These include prohibited acts and penalties, exemptions and importation provisions, selective enforcement audits, defect reporting and recall, and hearing procedures. See Section VIII of the preamble to the proposed rule for further discussion of these general compliance provisions.

B. Engines Covered by This Rule

This action includes more stringent exhaust emission standards for new nonroad engines with rated power at or below 19 kW that are sold in the United States. The exhaust standards are for nonhandheld engines (Classes I and II). As described in Section I, handheld Small SI engines (Classes III, IV, and V) are also subject to standards, but we are not changing the level of exhaust emission standards for these engines. As described in Section VI, we are also adopting new standards for controlling evaporative emissions from Small SI engines, including both handheld and nonhandheld engines. Certain of the provisions discussed in this Section V apply to both handheld and nonhandheld engines, as noted. Reference to both handheld and nonhandheld engines also includes marine auxiliary engines subject to the Small SI engine standards for that size engine.

(1) Engines Covered by Other Programs

The Small SI engine standards do not apply to recreational vehicles covered by EPA emission standards in 40 CFR part 1051. The regulations in part 1051 apply to off-highway motorcycles, snowmobiles, all-terrain vehicles, and certain offroad utility vehicles. However, if an amphibious vehicle or other recreational vehicle with an engine at or below 19 kW is not subject to standards under part 1051, its engine will need to meet the Small SI engine standards. We also do not consider vehicles such as go karts or golf carts to be subject to part 1051 because they are not intended for high-speed operation over rough terrain; these engines are also subject to Small SI engine standards. The Small SI engine standards do not apply to engines used in scooters or other vehicles that qualify as motor vehicles.

Consistent with the current regulation under 40 CFR part 90, Small SI engine standards apply to spark-ignition engines used as generators or for other auxiliary power on marine vessels, but not to marine propulsion engines. As described below, we are finalizing more stringent exhaust emission standards that will apply uniquely to marine generator engines.

Engines with rated power above 19 kW are subject to emission standards under 40 CFR part 1048. However, we adopted a special provision under part 1048 allowing engines with total displacement at or below 1000 cc and with rated power at or below 30 kW to meet the applicable Small SI engine standards instead of the standards in part 1048. For any engines that are certified using this provision, any emission standards that we adopt for Class II engines and equipment in this rulemaking (or in later rulemakings) will also apply at the same time. Since these engines are not required to meet the Small SI engine standards we have not included them in the analyses associated with this final rule.

(2) Maximum Engine Power and Engine Displacement

Under the current regulations, ''rated power'' and ''power rating'' are determined by the manufacturer with little or no direction for selecting appropriate values. We are establishing an objective approach to establishing the alternative term ''maximum engine power'' under the regulations (see § 1054.140). This value has regulatory significance for Small SI engines only to establish whether or not engines are instead subject to Large SI engine standards. Determining maximum engine power is therefore relevant only for those engines that are approaching the line separating these two engine categories. We are requiring that manufacturers determine and report maximum engine power if their emission-data engine has a maximum modal power at or above 15 kW (at or

[96] California ARB also adopted new fuel evaporative emission standards for equipment using handheld and nonhandheld engines. These included tank permeation standards for both types of equipment and hose permeation, running loss, and diurnal emission standards for nonhandheld equipment. See Section VI for additional information related to evaporative emissions.

above 25 kW if engine displacement is at or below 1000 cc).

Similarly, the regulations depend on engine displacement to differentiate engines for the applicability of different standards. The regulations currently provide no objective direction or restriction regarding the determination of engine displacement. We are defining displacement as the intended swept volume of the engine to the nearest cubic centimeter, where the engine's swept volume is the product of the internal cross-sectional area of the cylinders, the stroke length, and the number of cylinders.

For both maximum engine power and displacement, the declared values must be within the range of the values from production engines considering normal production variability. This does not imply that production engines need to be routinely tested or measured to verify the declared values, but it serves to define a range of appropriate values and provides a mechanism by which we can ensure that the declared values conform to the production engines in question. If production engines are found to have different values for maximum engine power or displacement, this should be noted in a change to the application for certification.

(3) Exempted or Excluded Engines

Under the Clean Air Act, engines that are used in stationary applications are not nonroad engines. States are generally preempted from setting emission standards for nonroad engines but this preemption does not apply to stationary engines. EPA has adopted emission standards for stationary compression-ignition engines sold or used in the United States (71 FR 39154, July 11, 2006). EPA also recently adopted emission standards for stationary spark-ignition engines in a separate action (73 FR 3568, January 18, 2008). In pursuing emission standards for stationary engines, we have attempted to maintain consistency between stationary and nonroad requirements as much as possible. As explained in the stationary rule, stationary spark-ignition engines below 19 kW are almost all sold into residential applications so we believe it is not appropriate to include requirements for owners or operators that will normally be part of a program for implementing standards for stationary engines. As a result, we indicated in the stationary rule that it is most appropriate to set exhaust and evaporative emission standards for stationary spark-ignition engines and equipment below 19 kW as if they were used in nonroad applications. This will allow manufacturers to make a single product that meets all applicable EPA standards for both stationary and nonroad applications.

The Clean Air Act provides for a different regulatory approach for engines used solely in competition. Rather than relying on engine design features that serve as inherent indicators of dedicated competitive use, we have taken the approach in other programs of more carefully differentiating competition and noncompetition models in ways that reflect the nature of the particular products. In the case of Small SI engines, we believe there are no particular engine design features that allow us to differentiate between engines that are used solely for competition from those with racing-type features that are not used solely for competition. We are requiring that handheld and nonhandheld equipment with engines meeting all the following criteria will be considered as being used solely for competition:

- The engine (or equipment in which the engine is installed) may not be displayed for sale in any public dealership;
- Sale of the equipment in which the engine is installed must be limited to professional competitors or other qualified competitors;
- The engine must have performance characteristics that are substantially superior to noncompetitive models;
- The engines must be intended for use only in competition events sanctioned (with applicable permits) by a state or federal government agency or other widely recognized public organization, with operation limited to competition events, performance-record attempts, and official time trials.

We are also including a provision allowing us to approve an exemption for cases in which an engine manufacturer can provide clear and convincing evidence that an engine will be used solely for competition even though not all the above criteria apply for a given situation. This may occur, for example, if a racing association specifies a particular engine model in the competition rules, where that engine has design features that prevent it from being certified, or from being used for purposes other than competition.

Engine manufacturers will make their request for each new model year and we will deny a request for future production if there are indications that some engines covered by previous requests are not being used solely for competition. Competition engines are produced and sold in very small quantities so manufacturers should be able to identify which engines qualify for this exemption.

In the rulemaking for recreational vehicles, we chose not to apply standards to hobby products by exempting all reduced-scale models of vehicles that were not capable of transporting a person (67 FR 68242, November 8, 2002). We are extending that same provision to handheld and nonhandheld Small SI engines. (See § 1054.5.)

In the rulemaking to establish Phase 2 emission standards, we adopted an exemption for handheld and nonhandheld engines used in rescue equipment. The regulation does not require any request, approval, or recordkeeping related to the exemption. We discovered while conducting the SBAR Panel described in Section VI.G that some companies are producing noncompliant engines under this exemption. As a result, we are keeping this exemption but are adding several provisions to allow us to better monitor how it is used (see § 1054.660). We are also keeping the requirement that equipment manufacturers use certified engines if they are available. We are updating this provision by adding a requirement that equipment manufacturers use an engine that has been certified to less stringent Phase 1 or Phase 2 standards if such an engine is available. We are explicitly allowing engine manufacturers to produce engines for this exemption (with permanent labels identifying the particular exemption), but only if they have a written request for each equipment model from the equipment manufacturer. We are further requiring that the equipment manufacturer notify EPA of the intent to produce emergency equipment with exempted engines. Also, to clarify the scope of this provision, we are defining ‘‘emergency rescue situations’’ as firefighting or other situations in which a person is retrieved from imminent danger. Finally, we are clarifying that EPA may discontinue the exemption on a case-by-case basis if we find that such engines are not used solely for emergency and rescue equipment or if we find that a certified engine is available to power the equipment safely and practically. We are applying the provisions of this section for new equipment built on or after January 1, 2010.

The current regulations also specify an exemption allowing individuals to import up to three nonconforming handheld or nonhandheld engines one time. We are keeping this exemption with three adjustments (see § 1054.630). First, we are allowing this exemption only for used equipment. Allowing importation of new equipment under this exemption is not consistent with the intent of the provision, which is to allow people to move to the United States from another country and continue to use lawn and garden equipment that may already be in their possession. Second, we are allowing such an importation once every five years but are requiring a statement that the person importing the exempted equipment has not used this provision in the preceding five years. The current regulations allow only one importation in a person's lifetime without including any way of making that enforceable. We believe the new combination of provisions represents an appropriate balance between preserving the enforceability of the exemption within the normal flow of personal property for people coming into the country. Third, we are no longer requiring submission of the taxpayer identification number since this is not essential for ensuring compliance. We are applying these changes starting January 1, 2010.

C. Final Requirements

A key element of the new requirements for Small SI engines is the more stringent exhaust emission standards for nonhandheld engines. We are also finalizing several changes to the certification program that will apply to both handheld and nonhandheld engines. For example, we are clarifying the process for selecting an engine family's useful life, which defines the length of time over which manufacturers are responsible for meeting emission standards. We are also adding several provisions to update the program for allowing manufacturers to use emission credits to show that they meet emission standards. The following sections describe the elements of this rule.

The timing for implementation of the new exhaust emission standards is described below. Unless we specify otherwise, all the additional regulatory changes will apply when engines are subject to the emission standards and the other provisions under 40 CFR part 1054. This will be model year 2012 for Class I engines and model year 2011 for Class II engines. For handheld engines, we are generally requiring that manufacturers comply with the provisions of part 1054, including the certification provisions, starting in the 2010 model year. These new requirements apply to handheld engines unless stated otherwise. For convenience we refer to the handheld emission standards in part 1054 as Phase 3 standards even though the numerical values remain unchanged from the Phase 2 standards.

(1) Emission Standards

Extensive testing and dialogue with manufacturers and other interested parties has led us to a much better understanding of the capabilities and limitations of applying emission control technologies to nonhandheld Small SI engines. As described in the Final RIA, we have collected a wealth of information related to the feasibility, performance characteristics, and safety implications of applying catalyst technology to these engines. We have concluded within the context of Clean Air Act section 213 that it is appropriate to establish emission standards that are consistent with those adopted by California ARB. We are finalizing $HC+NO_X$ emission standards of 10.0 g/kW-hr for Class I engines starting in the 2012 model year, and 8.0 g/kW-hr for Class II engines starting in the 2011 model year (see § 1054.105). For both classes of nonhandheld engines we are maintaining the existing CO standard of 610 g/kW-hr.

We are eliminating the defined subclasses for the smallest sizes of nonhandheld engines starting with implementation of the Phase 3 standards. Under the current regulations in part 90, Class I-A is designated for engines with displacement below 66 cc that may be used in nonhandheld applications. To address the technological constraints of these engines, all the current requirements for these engines are the same as for handheld engines. Class I-B is similarly designated for engines with displacement between 66 and 100 cc that may be used in nonhandheld applications. These engines are currently subject to a mix of provisions that result in an overall stringency that lies between handheld and nonhandheld engines. We are revising the regulations such that engines at or below 80 cc are subject to the Phase 3 standards for handheld engines and equipment in part 1054 starting in the 2010 model year. We are allowing engines at or below 80 cc to be used without restriction in nonhandheld equipment. The 80 cc threshold aligns with the California ARB program. For nonhandheld engines above 80 cc, we are treating them in every way as Class I engines. Based on the fact that it is more difficult for smaller displacement engines to achieve the same g/kW-hr emission level as larger displacement engines, it will be more of a challenge for manufacturers to achieve a 10.0 g/kW-hr $HC+NO_X$ level on these smallest Class I engines. However, for those engines unable to achieve the level of the new standards (either with or without a catalyst), manufacturers may elect to rely on emission credits to comply with emission standards. We believe all manufacturers producing engines formerly included in Class I–B also have a wide enough range of engine models that they will be able to generate sufficient credits to meet standards across the full product line. (See § 1054.101 and § 1054.801.)

We are making another slight change to the definition of handheld engines that may affect whether an engine is subject to handheld or nonhandheld standards. The handheld definition relies on a weight threshold for certain engines. As recently as 1999, we affirmed that the regulation should allow for the fact that switching to a heavier four-stroke engine to meet emission standards might inappropriately cause an engine to no longer qualify as a handheld engine (64 FR 5252, February 3, 1999). The regulation accordingly specifies that the weight limit is 20 kilograms for one-person augers and 14 kilograms for other types of equipment, based on the weight of the engine that was in place before applying emission control technologies. We believe it is impractical to base a weight limit on product specifications that have become difficult to establish. We are therefore increasing each of the specified weight limits by two kilograms, representing the approximate additional weight related to switching to a four-stroke engine, and applying the new weight limit to all engines and equipment (see § 1054.801).

Finally, we are revising the list of applications identified in the handheld definition as being subject to the handheld standards. We are specifically adding hand-supported jackhammers or rammer/compactor to the handheld definition as we have approved these types of applications in the past as meeting the attributes laid out in the definition. We are removing the ''one-person'' term from the auger description in the handheld definition because some augers can be operated by two people, but still have other attributes that would lead to the equipment being considered handheld. We are also removing the specific mention of pumps and generators from the handheld definition if they are below the specified weight limit. With the change noted earlier that allows manufacturers to use engines below 80cc in either handheld or nonhandheld applications, we believe these applications no longer need to be cited for special treatment in the handheld definition.

The regulations in part 90 allow manufacturers to rely on altitude kits to comply with emission requirements at high altitude. We are continuing this approach but are clarifying that all nonhandheld engines must comply with Phase 3 standards without altitude kits at barometric pressures above 94.0 kPa, which corresponds to altitudes up to about 2,000 feet above sea level (see § 1054.115). This will ensure that all areas east of the Rocky Mountains and most of the populated areas in Pacific Coast states will have compliant engines without depending on engine modifications. This becomes increasingly important as we anticipate manufacturers relying on technologies that are sensitive to controlling air-fuel ratio for reducing emissions. Engine manufacturers must identify in the owner's manual the altitude ranges for proper engine performance and emission control that are expected with and without the altitude kit. The owner's manual must also state that operating the engine with the wrong engine configuration at a given altitude may increase its emissions and decrease fuel efficiency and performance. See Section V.E.5 for further discussion related to the deployment of altitude kits where the manufacturers rely on them for operation at higher altitudes.

We are adopting a slightly different approach for handheld engines with respect to altitude. Since we are not adopting more stringent exhaust emission standards, we believe it is appropriate to adopt provisions that are consistent with current practice at this time. We are therefore requiring handheld engines to comply with the current standards without altitude kits at barometric pressures above 96.0 kPa, which will allow for testing in most weather conditions at all altitudes up to about 1,100 feet above sea level.

Spark-ignition engines used for marine auxiliary power (i.e., marine generator engines) are covered by the same regulations as land-based engines of the same size. However, the marine generator versions of Small SI engines are able to make use of ambient water for enhanced cooling of the engine and exhaust system. Exhaust systems for these engines are water-jacketed to maintain low surface temperatures to minimize the risk of fires on boats, where the generator is often installed in small compartments within the boat. Manufacturers of marine generator engines have recently developed advanced technology in an effort to improve fuel consumption and CO emission controls for marine generators. This advanced technology includes the use of electronic fuel injection and three-way catalysts. As a result, manufacturers are offering new products with more than a 99 percent reduction in CO and have expressed their intent to offer only these advanced-technology engines in the near future. They have stated that these low-CO engines are responsive to market demand. We are establishing a CO standard of 5.0 g/kW-hr CO for marine generator engines to reflect the recent trend in marine generator engine designs (see § 1054.105). We believe this standard is necessary to prevent backsliding in CO emissions that could occur if new manufacturers were to attempt to enter the market with less expensive, high-CO designs. See Section II for a discussion of air quality concerns related to CO emissions.

At this time, we are continuing the current regulatory approach for wintertime engines (e.g., engines used exclusively to power equipment such as snowthrowers and ice augers). Under this final rule, the $HC+NO_X$ exhaust emission standards will be optional for wintertime engines. However, if a manufacturer chooses to certify its wintertime engines to such standards, those engines will be subject to all the requirements as if the optional standards were mandatory. We are adopting a definition of wintertime engines to clarify which engines qualify for these special provisions.

All engines subject to standards must continue to control crankcase emissions. In the case of snowthrower engines, crankcase emissions may be vented to the ambient air as long as manufacturers take crankcase emissions into account in demonstrating compliance with exhaust emission standards.

(2) Useful Life

The Phase 2 standards for Small SI engines included the concept that manufacturers are responsible for meeting emission standards over a useful life period. The useful life defines the design target for ensuring the durability of emission controls under normal in-use operation for properly maintained engines. Given the very wide range of engine applications, from very low-cost consumer products to commercial models designed for long-term continuous operation, we determined that a single useful life value for all products, which is typical for other engine programs, was not appropriate for Small SI engines. We proposed at that time to determine the useful life for an engine family based on specific criteria, but commenters suggested that such a requirement was overly rigid and unnecessary. The final rule instead specified three alternative useful life values, giving manufacturers the responsibility to select the useful life that was most appropriate for their engines and the corresponding types of equipment. The preamble to the Phase 2 final rule expressed a remaining concern that manufacturers might not select the most appropriate useful life value. This concern related to both ensuring effective in-use emission control and maintaining the integrity of emission-credit calculations. The preamble also stated our intent to periodically review the manufacturers' decisions to determine whether modifications to these rules would be appropriate.

The regulations in § 90.105 provide a benchmark for determining the appropriate useful life value for an engine family. The regulations direct manufacturers to select the useful life value that ''most closely approximates the expected useful lives of the equipment into which the engines are anticipated to be installed.'' To maintain a measure of accountability, we included a requirement that manufacturers document the basis for their selected useful life values. The suggested data included, among other things: (1) Surveys of the life spans of the equipment in which the subject engines are installed; (2) engineering evaluations of field-aged engines to ascertain when engine performance deteriorates to the point where utility and/or reliability is impacted to a degree sufficient to necessitate overhaul or replacement; and (3) failure reports from engine customers. These regulatory provisions identify the median time to retirement for in-use equipment as the marker for defining the useful life period. This allows manufacturers to consider that equipment models may fail before the engine has reached the point of failure and that engines may be installed in different types of equipment with varying usage patterns. Engines used in different types of equipment, or even engines used in the same equipment models used by different operators, may experience widely varying usage rates. The manufacturer is expected to make judgments that take this variability into account when estimating the median life of in-use engines and equipment.

Several manufacturers have made a good faith effort to select appropriate useful life values for their engine families, either by selecting only the highest value, or by selecting higher values for families that appear more likely to be used in commercial applications. At the same time, we have observed several instances in which engine models are installed in commercial equipment and marketed as long-life products but are certified to the minimum allowable useful life period.

After assessing several ideas, we chose to adopt an approach that preserves the fundamental elements of the current provisions related to useful life but clarifies and enhances its implementation (see § 1054.107). Manufacturers will continue to select the most appropriate useful life from the same nominal values to best match the expected in-use lifetime of the equipment into which the engines in the engine family will be installed. Manufacturers must continue to document the information supporting their selected useful life. We are adopting three provisions to address remaining concerns with the process of selecting useful life values.

First, for manufacturers not selecting the highest available nominal value for useful life, we expect to routinely review the information to confirm that it complies with the regulation. Where our review indicates that the selected useful life may not be appropriate for an engine family, we may request further justification. If we determine from available information that a longer useful life is appropriate, the manufacturer must either provide additional justification or select a longer useful life for that engine family. We will encourage manufacturers to use the new provisions related to preliminary approval in § 1054.210 if there is any uncertainty related to the useful life selection. We would rather work together early to establish this in the certification process rather than reviewing a completed application for certification to evaluate whether the completed durability demonstration is sufficient.

Second, we are modifying the regulations to allow nonhandheld engine manufacturers to select a useful life value that is longer than the three specified nominal values. Manufacturers may choose to do this for the marketing advantage of selling a long-life product or they may want to generate emission credits that correspond to an expected lifetime that is substantially longer than we would otherwise allow. We are allowing manufacturers to select longer useful life values in 100-hour increments, up to 3,000 hours for Class I engines and up to 5,000 hours for Class II engines. Durability testing for certification will need to correspond to the selected useful life period. We have considered the possibility that a manufacturer might overstate an engine family's useful life to generate emission credits while knowing that engines may not operate that long. We believe the inherent testing burden and compliance liability is enough to avoid such a problem, but we are including the specified maximum values corresponding with the applicable useful life for comparable diesel engines or Large SI engines. We are not allowing for longer useful life values for handheld engines.

Third, we are requiring that engines and equipment be labeled to identify the applicable useful life period. The current requirement allows manufacturers to identify the useful life with code letters on the engine's emission control information label, with the numerical value of the useful life spelled out in the owner's manual. We believe it is important for equipment manufacturers and consumers to be able to find an unambiguous designation showing the engine manufacturer's expectations about the useful life of the engine. Comments on the proposed rule also indicated an interest in using descriptive terms to identify the useful life on the label. We believe any terminology will communicate less effectively than the numerical value of the useful life, but we will allow manufacturers to use specified descriptive terms in addition to the number of hours.

We are also including a provision in the final rule stating that the useful life is defined as a five-year period if the engine has not yet exceeded the specified number of operating hours during that time. This is consistent with our other engine programs. This does not affect the certification process. If we test an in-use engine within the five-year useful life period and there is no clear indication that it has not yet exceeded the specified number of operating hours, it would need to meet applicable emission standards. Conversely, if an engine has not yet exceeded the number of operating hours but the engine is six years old, it is no longer required to meet emission standards.

(3) Averaging, Banking, and Trading

EPA has included averaging, banking, and trading (ABT) programs in most of the emission control programs for highway and nonroad engines. EPA's existing Phase 2 regulations for Small SI engines include an exhaust ABT program (see 40 CFR 90.201 through 90.211). We are adopting an ABT program for the Phase 3 $HC+NO_X$ exhaust emission standards that is similar to the existing program (see part 1054, subpart H). The new exhaust ABT program is intended to enhance the ability of engine manufacturers to meet more stringent emission standards. The exhaust ABT program is also structured to avoid delay of the transition to the new exhaust emission controls. As described in Section VI.D, we are establishing a separate evaporative ABT program for fuel tanks used in Small SI equipment. Credits may not be exchanged between the exhaust ABT program and the evaporative ABT program.

The exhaust ABT program has three main components. Averaging means the exchange of emission credits between engine families within a given engine manufacturer's product line for a specific model year. Engine manufacturers divide their product line into ''engine families'' that are comprised of engines expected to have similar emission characteristics throughout their useful life. Averaging allows a manufacturer to certify one or more engine families at levels above the applicable emission standard, but below a set upper limit. This level then becomes the applicable standard for all the engines in that engine family, for purposes of certification, in-use testing, and the like. However, the increased emissions must be offset by one or more engine families within that manufacturer's product line that are certified below the same emission standard, such that the average standard from all the manufacturer's engine families, weighted by engine power, regulatory useful life, and production volume, is at or below the level of the emission standard. Banking means the retention of emission credits by the engine manufacturer for use in averaging or trading for future model years. Trading means the exchange of emission credits between engine manufacturers which can then be used for averaging purposes, banked for future use, or traded to another engine manufacturer.

Because we are not adopting any change in the general equation under which emission credits are calculated, EPA is allowing manufacturers to use Phase 2 credits generated under the part 90 ABT program for engines that are certified in the Phase 3 program under part 1054, within the limits described below. Furthermore, even though we are not establishing new exhaust emission standards for handheld engines, the handheld engine regulations are migrating to part 1054. Therefore, handheld engines will be included in the new ABT program under part 1054 with one change in the overall program as described below.

Under an ABT program, averaging is allowed only between engine families in the same averaging set, as defined in the regulations. For the exhaust ABT program, we are separating handheld engines and nonhandheld engines into two distinct averaging sets starting with the 2011 model year. Under the new program, credits may generally be used interchangeably between Class I and Class II engine families, with a limited restriction on Phase 3 credits during model years 2011 and 2012 as noted below. Likewise, credits can be used interchangeably between all three handheld engine classes (Classes III, IV, and V). Because the Phase 2 exhaust ABT program allowed exchange across all engine classes (i.e., allowing exchanges between handheld engines and nonhandheld engines), manufacturers using credits beginning with the 2011 model year will need to show that the credits were generated within the allowed category of engines. For many companies, especially those in the handheld market, this will potentially be straightforward since they are primarily in the handheld market. For companies that have a commingled pool of emission credits generated by both handheld engines and nonhandheld engines, this will take more careful accounting. Because manufacturers have been aware of this new requirement since the proposal, keeping records to distinguish handheld credits and nonhandheld credits will be relatively straightforward for 2006 and later model years.

We are making two exceptions to the provision restricting credit exchanges between handheld engines and nonhandheld engines. Currently, some companies that are primarily nonhandheld engine manufacturers also sell a limited number of handheld engines. Under the Phase 2 program, these engine manufacturers can use credits from nonhandheld engines to offset the higher emissions of their handheld engines. Because we are not adopting new exhaust requirements for handheld engines, we are addressing this existing practice by specifying that an engine manufacturer may use emission credits from their nonhandheld engines for their handheld engines under certain conditions. Specifically, a manufacturer may use credits from their nonhandheld engines for their handheld engines only where the handheld engine family is certified in 2008 and later model years without any design changes from the 2007 model year and the FEL of the handheld engine family does not increase above the level that applied in the 2007 model year, unless such an increase is based on emission data from production engines. Furthermore, we are limiting the number of handheld engines for which a manufacturer can use emission credits from their nonhandheld engines to 30,000 per year. We believe these provisions allow for engine manufacturers to continue producing these handheld engines for use in existing handheld models of low-volume equipment applications while preventing new high-emitting handheld engine families from entering the market through the use of nonhandheld engine credits. (See § 1054.740.)

A second exception to the provision restricting credit exchanges between handheld engines and nonhandheld engines arises because of our handling of engines below 80cc. Under the new Phase 3 program, all engines below 80cc are considered handheld engines for the purposes of the emission standards. However, a few of these engines are used in nonhandheld applications. Therefore, EPA will allow a manufacturer to generate nonhandheld ABT credits from engines below 80cc for those engines a manufacturer has determined are used in nonhandheld applications. (The credits will be generated against the applicable handheld engine standard.) These nonhandheld credits could be used within the Class I and Class II engine classes to demonstrate compliance with the Phase 3 exhaust standards (subject to applicable restrictions). The credits generated by engines below 80cc used in handheld applications could only be used for other handheld engines. (See § 1054.701.)

Under an ABT program, a manufacturer establishes a ''family emission limit'' (FEL) for each participating engine family. This FEL may be above or below the standard. The FEL becomes the enforceable emission limit for all the engines in that family for purposes of compliance testing. FELs that are established above the standard may not exceed an upper limit specified in the ABT regulations. For nonhandheld engines we are establishing FEL caps to prevent the sale of very high-emitting engines. Under the new FEL caps, manufacturers will need to establish FELs at or below the levels of the Phase 2 $HC+NO_X$ emission standards of 16.1 g/kW-hr for Class I engines and 12.1 g/kW-hr for Class II engines. (The Phase 3 FEL cap for Class I engines with a displacement between 80 cc and 100 cc will be 40.0 g/kW-hr since these engines were Class I–B engines under the Phase 2 regulations and subject to this higher level.) For handheld engines, where we are not adopting new exhaust emission standards, we are maintaining the FEL caps as currently specified in the part 90 ABT regulations.

For nonhandheld engines we are adding two special provisions related to the transition from Phase 2 to Phase 3 standards in § 1054.740. First, we are providing incentives for manufacturers to produce and sell engines certified at or below the Phase 3 standards before the standards are scheduled to be implemented. Second, we are establishing provisions to allow the use of Phase 2 credits for a limited time under specific conditions. The following discussions describe each of these provisions in more detail for Class I engines and Class II engines separately.

For Class I engines, engine manufacturers can generate early Phase 3 credits by producing engines with an FEL at or below 10.0 g/kW-hr prior to 2012. These early Phase 3 credits will be calculated and categorized into two distinct types of credits, Transitional Phase 3 credits and Enduring Phase 3 credits. For engines certified with an FEL at or below 10.0 g/kW-hr, the manufacturer will earn Transitional Phase 3 credits. The Transitional Phase 3 credits will be calculated based on the difference between 10.0 g/kW-hr and 15.0 g/kW-hr. (The 15.0 g/kW-hr level is the production-weighted average of Class I FEL values under the Phase 2 program.) Manufacturers could use the Transitional Phase 3 credits from Class I engines in 2012 through 2014 model years. For engines certified with an FEL below 10.0 g/kW-hr, manufacturers will earn Enduring Phase 3 credits in addition to the Transitional Phase 3 credits described above. The Enduring Phase 3 credits will be calculated based on the difference between the FEL for the engine family and 10.0 g/kW-hr (i.e., the applicable Phase 3 standard). The Enduring Phase 3 credits could be used once the Phase 3 standards are implemented without the model year restriction noted above for Transitional Phase 3 credits.

Engine manufacturers may certify their Class I engines using Phase 2 credits generated by Class I or Class II engines for the first two years of the Phase 3 standards (i.e., model years 2012 and 2013) under certain conditions. The manufacturer must first use all of its available transitional Phase 3 credits to demonstrate compliance with the Phase 3 standards, subject to the cross-class credit restriction noted below which applies prior to model year 2013. If these Transitional Phase 3 credits are sufficient to demonstrate compliance, the manufacturer may not use Phase 2 credits. If these Transitional Phase 3 credits are insufficient to demonstrate compliance, the manufacturer could use Phase 2 credits to a limited degree (under the conditions described below) to cover the remaining amount of credits needed to demonstrate compliance. If manufacturers still need credits to demonstrate compliance, they may then use their remaining Phase 3 credits (i.e., their Enduring Phase 3 credits or any other Phase 3 credits generated in 2012 or 2013, subject to the cross-class credit restriction noted below which applies prior to model year 2013).

The maximum number of Phase 2 $HC+NO_X$ exhaust emission credits that manufacturers could use for their Class I engines will be calculated based on the characteristics of Class I engines produced during the 2007, 2008, and 2009 model years. For each of those years, the manufacturer will calculate a Phase 2 credit allowance using the ABT credit equation and inserting 1.6 g/kW-hr for the ''Standard—FEL'' term, and basing the rest of the values on the total production of Class I engines, the production-weighted power for all Class I engines, and production-weighted useful life value for all Class I engines produced in each of those years. Manufacturers will not include their wintertime engines in the calculations unless the engines are certified to meet the otherwise applicable $HC+NO_X$ emission standard. The maximum number of Phase 2 $HC+NO_X$ exhaust emission credits a manufacturer could use for their Class I engines (calculated in kilograms) will be the average of the three values calculated for model years 2007, 2008, and 2009. The calculation described above allows a manufacturer to use Phase 2 credits to cover a cumulative shortfall over the first two years for their Class I engines of 1.6 g/kW-hr above the Phase 3 standard.

The Phase 2 credit allowance for Class I engines could be used all in 2012, all in 2013, or partially in either or both model year's ABT compliance calculations. Because ABT compliance calculations must be done annually, the manufacturer will know its 2013 remaining allowance based on its 2012 calculation. For example, if a manufacturer uses all of its Phase 2 credit allowance in 2012, it will have no use of Phase 2 credits for 2013. Conversely, if a manufacturer doesn't use any Phase 2 credits in 2012, it will have all of its Phase 2 credit allowance available for use in 2013. If a manufacturer uses less than its calculated total credits based on the 1.6 g/kW-hr limit in 2012, the remainder will be available for use in 2013. This provision allows for limited use of Phase 2 emission credits to address the possibility of unanticipated challenges in reaching the Phase 3 emission levels in some cases or selling Phase 3 compliant engines early nationwide, without creating a situation that will allow manufacturers to substantially delay the introduction of Phase 3 emission controls.

For Class II engines, engine manufacturers could generate early Phase 3 credits by producing engines with an FEL at or below 8.0 g/kW-hr prior to 2011. These early Phase 3 credits will be calculated and categorized as Transitional Phase 3 credits and Enduring Phase 3 credits. For engines certified with an FEL at or below 8.0 g/kW-hr, the manufacturer will earn Transitional Phase 3 credits. The Transitional Phase 3 credits will be calculated based on the difference between 8.0 g/kW-hr and 11.0 g/kW-hr. (The 11.0 g/kW-hr level is the production-weighted average of Class II FEL values under the Phase 2 program.) Manufacturers could use the Transitional Phase 3 credits from Class II engines in 2011 through 2013 model years. For engines certified with an FEL below 8.0 g/kW-hr, manufacturers will earn Enduring Phase 3 credits in addition to the Transitional Phase 3 credits described above. The Enduring Phase 3 credits will be calculated based on the difference between the FEL for the engine family and 8.0 g/kW-hr (i.e., the applicable Phase 3 standard). The Enduring Phase 3 credits could be used once the Phase 3 standards are implemented without the model year restriction noted above for Transitional Phase 3 credits.

Engine manufacturers may certify their Class II engines using Phase 2 credits generated by Class I or Class II engines for the first three years of the Phase 3 standards (i.e., model years 2011, 2012 and 2013) under certain conditions. The manufacturer must first use all of its transitional Phase 3 credits to demonstrate compliance with the Phase 3 standards, subject to the cross-class credit restriction noted below which applies prior to model year 2013. If these Transitional credits are sufficient to demonstrate compliance, the manufacturer may not use Phase 2 credits. If these Transitional Phase 3 credits are insufficient to demonstrate compliance, the manufacturer could use Phase 2 credits to a limited degree (under the conditions described below) to cover the remaining amount of credits needed to demonstrate compliance. If the manufacturer still needs credits to demonstrate compliance, they may then use their remaining Phase 3 credits (i.e., their Enduring Phase 3 credits or any other Phase 3 credits generated in 2011, 2012, or 2013, subject to the cross-class credit restriction noted below which applies prior to model year 2013).

The maximum number of Phase 2 $HC+NO_X$ exhaust emission credits a manufacturer could use for their Class II engines will be calculated based on the characteristics of Class II engines produced during the 2007, 2008, and 2009 model years. For each of those years, the manufacturer will calculate a Phase 2 credit allowance using the ABT credit equation and inserting 2.1 g/kW-hr for the ''Standard—FEL'' term, and basing the rest of the values on the total production of Class II engines, the production-weighted power for all Class II engines, and production-weighted useful life value for all Class II engines produced in each of those years. Manufacturers will not include their wintertime engines in the calculations unless the engines are certified to meet the otherwise applicable $HC+NO_X$ emission standard. The maximum number of Phase 2 $HC+NO_X$ exhaust emission credits a manufacturer could use for their Class II engines (calculated in kilograms) will be the average of the three values calculated for model years 2007, 2008, and 2009. The calculation described above allows a manufacturer to use Phase 2 credits to cover a cumulative shortfall over the first three years for their Class II engines of 2.1 g/kW-hr above the Phase 3 standard.

The Phase 2 credit allowance for Class II engines could be used all in 2011, all in 2012, all in 2013, or partially in any or all three model year's ABT compliance calculations. Because ABT compliance calculations must be done annually, the manufacturer will know its remaining allowance based on its previous calculations. For example, if a manufacturer uses all of its Phase 2 credit allowance in 2011, it will have no Phase 2 credits for 2012 or 2013. However, if a manufacturer uses less than its calculated total credits based on the 2.1 g/kW-hr limit in 2011, it will have the remainder of its allowance available for use in 2012 and 2013. This provision allows for some use of Phase 2 emission credits to address the possibility of unanticipated challenges in reaching the Phase 3 emission levels in some cases or selling Phase 3 engines nationwide, without creating a situation that will allow manufacturers to substantially delay the introduction of Phase 3 emission controls.

To avoid the use of credits to delay the introduction of Phase 3 technologies, we are also not allowing manufacturers to use Phase 3 credits from Class I engines to demonstrate compliance with Class II engines in the 2011 and 2012 model years. Similarly, we are not allowing manufacturers to use Phase 3 credits from Class II engines to demonstrate compliance with Class I engines in the 2012 model year. The 1.6 kW-hr and 2.1 g/kW-hr allowances discussed above may not be exchanged across engine classes or traded among manufacturers.

We are making one additional adjustment related to the exhaust ABT program for engines subject to the new emission standards. We are adopting a requirement that lowering an FEL after the start of production may occur only if the manufacturer has emission data from production engines justifying the lower FEL (see § 1054.225). This prevents manufacturers from making FEL changes late in the model year to generate more emission credits (or use fewer emission credits) when there is little or no opportunity to verify whether the revised FEL is appropriate for the engine family. This provision is common in EPA's emission control programs for other engine categories. We are also requiring that any revised FEL can apply only for engines produced after the FEL change. This is necessary to prevent manufacturers from recalculating emission credits in a way that leaves no way of verifying that the engines produced prior to the FEL change met the applicable requirements.

As described below in Section V.E.3, we are allowing equipment manufacturers to install a limited number of Class II engines, certified by engine manufacturers with a catalyst as Phase 3 engines, into equipment without the catalyst. (This is only allowed when the engine is shipped separately from the exhaust system under the provisions described in Section V.E.2.) Because engine manufacturers may be generating emission credits from these engines based on the use of a catalyst, EPA is concerned that engine manufacturers could be earning exhaust ABT credits for engines that are sold but never have the catalyst installed. Therefore, EPA believes it is appropriate to adjust such credits to account for the fact that equipment manufacturers may in many cases legally install a non-catalyzed muffler on an engine that is part of a family whose certification depends on the use of a catalyst. Therefore, EPA is adopting a 0.9 adjustment factor for calculating credits for engine families that are available under the delegated assembly provisions and are also participating in the TPEM program. In addition, EPA is including an option that will allow engine manufacturers to track the final configuration of the engines to determine the actual number of engines that were downgraded under the TPEM program. A manufacturer would need to track sales for all the equipment manufacturers purchasing the given engine family. The engine manufacturer could use the resulting number of engines that were not downgraded in its calculation of ABT credits for that specific engine family. Engine manufacturers may specifically direct equipment manufacturers not to participate in the TPEM program for certain engine models, which would allow for a more straightforward accounting of the number of engines that are downgraded under the TPEM program.

For all emission credits generated by engines under the Phase 3 exhaust ABT program, we are allowing an indefinite credit life. We consider these emission credits to be part of the overall program for complying with Phase 3 standards. Given that we may consider further reductions beyond these standards in the future, we believe it will be important to assess the ABT credit situation that exists at the time any further standards are considered. Emission credit balances will be part of the analysis for determining the appropriate level and timing of new standards, consistent with the statutory requirement to establish standards that represent the greatest degree of emission reduction achievable, considering cost, safety, lead time, and other factors. If we were to allow the use of Phase 3 credits to meet future standards, we may need to adopt emission standards at more stringent levels or with an earlier start date than we would absent the continued (or limited) use of Phase 3 credits, depending on the level of Phase 3 credit banks. Alternatively, we could adopt future standards without allowing the use of Phase 3 credits. The final requirements in this rulemaking describe a middle path in which we allow the use of Phase 2 credits to meet the Phase 3 standards, with provisions that limit the extent and timing of using these credits.

Finally, manufacturers may include as part of their federal credit calculation the sales of engines in California as long as they don't separately account for those emission credits under the California regulations. We originally proposed to exclude engines sold in California which are subject to the California ABR standards. However, we consider California's current $HC+NO_X$ standards to be equivalent to those we are adopting in this rulemaking, so we would expect a widespread practice of producing and marketing 50-state products. Therefore, as long as a manufacturer is not generating credits under California's averaging program for small engines, we would allow manufacturers to count those engines when calculating credits under EPA's program. This is consistent with how EPA allows credits to be calculated in other nonroad sectors, such as recreational vehicles.

D. Testing Provisions

The test procedures provide an objective measurement for establishing whether engines comply with emission standards. The following sections describe a variety of changes to the current test procedures. Except as identified in the following sections, we are preserving the testing-related regulatory provisions that currently apply under 40 CFR part 90 for Phase 2 engines. Note that there is no presumption that any previous approvals, guidance, or judgments related to alternatives, deviations, or interpretations of the testing requirements under the Phase 1 or Phase 2 program will continue to apply; any decisions on such issues will be handled going forward on a case-by-case basis.

(1) Migrating Procedures to 40 CFR Part 1065

Manufacturers have been using the procedures in 40 CFR part 90 to test their engines for certification of Phase 1 and Phase 2 engines. As part of a much broader effort, we have adopted comprehensive testing specifications in 40 CFR part 1065 that are intended to serve as the basis for testing all types of engines. The procedures in part 1065 include updated information reflecting the current state of available technology. We are applying the procedures in part 1065 to nonhandheld engines starting with new certification testing in 2013 and later model years as specified in 40 CFR part 1054, subpart F. The procedures in part 1065 identify new types of analyzers and update a wide range of testing specifications, but leave intact the fundamental approach for measuring exhaust emissions. There is no need to shift to the part 1065 procedures for nonhandheld engines before 2013. This allows manufacturers time to make any necessary adjustments or upgrades in their lab equipment and procedures. While any new certification testing for nonhandheld engines will be subject to the part 1065 procedures starting in model year 2013, manufacturers will be allowed to continue certifying nonhandheld engines using carryover data generated under the part 90 procedures.

We are not setting new exhaust emission standards for handheld engines so there is no natural point in time for shifting to the part 1065 procedures. We nevertheless believe handheld engines should also use the part 1065 procedures for measuring exhaust emissions. We are requiring manufacturers to start using the part 1065 procedures in the 2013 model year as described above for nonhandheld engines. Manufacturers will be allowed to continue certifying handheld engines using carryover data generated under the part 90 procedures, but any new certification testing will be subject to the part 1065 procedures starting with the 2013 model year.

We have taken several steps to address the concerns raised by engine manufacturers related to the specified test procedures in part 1065. First, we have confirmed that the calculations in part 1065 yield the same emission results for a given set of raw data from testing. The two calculation methods resulted in differences that were less than 1 percent for both handheld and nonhandheld engines. We have identified a variety of clarifications and adjustments that we need to make to the equations in § 1065.655 to ensure accurate calculations for engines operating with rich air-fuel mixtures. Second, we have modified the cycle-validation criteria in § 1054.505 to more carefully reflect achievable torque control for small engines. The new criteria are based on a combination of specifications for continuous measurements and mean values, including specification of absolute thresholds where a percentage approach would not work for very small torque values. Third, we are adjusting the fueling instructions in part 1065 to allow for fuel-oil mixtures with two-stroke engines.

We also acknowledge that handheld engines that depend on special fixtures for proper testing should be tested under the provisions of § 1065.10(c) for special test procedures. This would require that manufacturers describe their test fixtures and make them available upon request. Further effort may be required to incorporate more specific requirements or specifications related to these test fixtures. We expect to cooperate with government agencies from California and from other countries in an effort to harmonize Small SI test procedures, for part 1065 procedures generally and for these special test procedures in particular.

(2) Duty Cycle

The regulations under part 90 currently specify duty cycles for testing engines for exhaust emissions. The current requirements specify how to control speeds and loads and describe the situations in which the installed engine governor controls engine speed. We are extending these provisions to testing under the new standards with a few adjustments described below. For engines equipped with an engine speed governor, the current regulations at 40 CFR 90.409(a)(3) state:

For Class I, Class I–B, and Class II engines subject to Phase 2 standards that are equipped with an engine speed governor, the governor must be used to control engine speed during all test cycle modes except for Mode 1 or Mode 6, and no external throttle control may be used that interferes with the function of the engine's governor; a controller may be used to adjust the governor setting for the desired engine speed in Modes 2–5 or Modes 7–10; and during Mode 1 or Mode 6 fixed throttle operation may be used to determine the 100 percent torque value.

In addition, the current regulations at 40 CFR 90.410(b) state:

> For Phase 2 Class I, I–B, and II engines equipped with an engine speed governor, during Mode 1 or Mode 6 hold both the specified speed and load within ± five percent of point, during Modes 2–3, or Modes 7–8 hold the specified load with ± five percent of point, during Modes 4–5 or Modes 9–10, hold the specified load within the larger range provided by ±0.27 Nm (±0.2 lb-ft), or ± ten (10) percent of point, and during the idle mode hold the specified speed within ± ten percent of the manufacturer's specified idle engine speed (see Table 1 in Appendix A of this subpart for a description of test Modes).

Manufacturers have raised questions about the interpretation of these provisions. Our intent is that the current requirements specify that testing be conducted as follows:

- Full-load testing occurs at wide-open throttle to maintain engines at rated speed, which is defined as the speed at which the engine's maximum power occurs (as declared by the manufacturer).
- Idle testing occurs at the manufacturer's specified idle speed with a maximum load of five percent of maximum torque. The regulation allows adjustment to control speeds that are different than will be maintained by the installed governor.
- The installed governor must be used to control engine speed for testing at all modes with torque values between idle and full-load modes. The regulation allows adjustments for nominal speed settings that are different than will be maintained by the installed governor without modification.

We are adopting the Phase 3 standards with adjustments to the regulatory requirements currently described in 40 CFR part 90 (see § 1054.505). Since each of these adjustments may have some effect on measured emission levels, we believe it is appropriate to implement these changes concurrent with the Phase 3 standards. To the extent the adjustments apply to handheld engines, we believe it is appropriate to apply the changes for new testing with 2013 and later model year engines for the reasons described above for adopting the test procedures in part 1065.

First, for engines with installed governors we are requiring the engine speed during the idle mode to be controlled by the governor. We believe there is no testing limitation that will call for engine operation at idle to depart from the engine's governed speed. Allowing manufacturers to arbitrarily declare an idle speed only allows manufacturers to select an idle speed that gives them an advantage in achieving lower measured emission results but not in a way that corresponds to in-use emission control. We are also aware that some production engines have a user-selectable control for selecting high-speed or low-speed idle (commonly identified as ''rabbit/turtle'' settings). We believe this parameter adjustment may have a significant effect on emissions that should be captured in the certification test procedure. As a result, we are requiring that manufacturers conduct testing with user-selectable controls set to keep the engine operating at low-speed idle if any production engines in the engine family have such an option. For engines with no installed governor, part 1065 specifies that the engine should operate at the idle speed declared by the manufacturer.

Second, we are allowing an option in which manufacturers will test their nonhandheld engines using a ramped-modal version of the specified duty cycle. We expect this testing to be equivalent to the modal testing described above but it will have advantages for streamlining test efforts by allowing for a single result for the full cycle instead of relying on a calculation from separate modal results. Under the new requirement we will allow manufacturers the option to select this type of testing. Manufacturers must use the same test method for production-line testing that they use for certifying the engine family. Manufacturers may include results from both types of testing in their application for certification, in which case they could use either method for production-line testing. EPA's confirmatory testing will involve the same type of testing performed by the manufacturers for certification.

Third, the part 90 regulations currently specify two duty cycles for nonhandheld engines: (1) Testing at rated speed; and (2) testing at 85 percent of rated speed. The regulations direct manufacturers simply to select the most appropriate cycle and declare the rated speed for their engines. We are making this more objective by stating that rated speed is 3,600 rpm and intermediate speed is 3,060 rpm, unless the manufacturer demonstrates that a different speed better represents the in-use operation for their engines. This is consistent with the most common in-use settings and most manufacturers' current practice.

In addition, we are adding regulatory provisions to clarify how nonhandheld engines are operated to follow the prescribed duty cycle. As described in part 90, we are requiring that the engines operate ungoverned at wide-open throttle for the full-power mode. This test mode is used to denormalize the rest of the duty cycle. This operation is intentionally not representative of in-use operation, but disabling the governor allows for more uniform testing that is not dependent on the various governing strategies that manufacturers might use. To avoid a situation where engines are designed to control emissions over the test cycle, with less effective controls under similar modes of operation that engines experience in use, we are adding a requirement for manufacturers to provide an explanation in the application for certification if air-fuel ratios are significantly different for governed and ungoverned operation at wide-open throttle, especially for fuel-injected engines. Manufacturers would need to explain why this emission control strategy is not a defeat device. If we test engines governed and ungoverned at wide open throttle, we would expect to see little or no difference in emission rates. If we would observe higher emission rates with governed engine operation, manufacturers would again need to justify why this discrepancy is not a defeat device. Engines with conventional carburetors offer a limited ability to manipulate air-fuel ratios at different operating points, so in these cases manufacturers would simply state that air-fuel ratios do not vary significantly at governed and ungoverned points of full-load operation.

Testing at other modes occurs with the governor controlling engine speed. Before each test mode, manufacturers may adjust the governor to target the same nominal speed used for the full-power mode, with a tolerance limiting the variation in engine speed at each mode. Alternatively, testing may be done by letting the installed governor control engine speed, in which case only the torque value will need to be controlled within an established range. Any EPA testing will be done only with installed governors controlling engine speed in the standard configuration, regardless of the method used by manufacturers for their own testing. Any such engine with test results that exceed applicable emission standards would be considered to fail, without regard to emission results that might be different with testing in which the governor is adjusted to target a given nominal speed.

A different duty cycle applies to handheld engines, which are generally not equipped with governors to control engine speed. The current regulations allow manufacturers to name their operating speed for testing at each of the test modes. However, we are concerned that this approach allows manufacturers too much discretion for selecting a rated speed for high-load testing. We are revising this approach to specify that manufacturers must select a speed that best represents in-use operation for the engine family if the in-use applications involve operation centered on a given nominal speed (±350 rpm). Engine manufacturers generally also make their own equipment, so this can often be established for engines in an engine family. For engine families without such a predominant operating speed, we require that engine manufacturers test their engines within 350 rpm of the speed at which the engine produces maximum power. Some engine families may have a dominant engine speed, but also include a variety of applications that operate at different in-use speeds. We specify for these cases that engine manufacturers must test at both of the test speeds identified above, in which case EPA testing might also involve emission measurements using either (or both) test speeds. We are further requiring manufacturers to describe in their application for certification how they select the value for rated speed.

(3) Test Fuel

We are requiring Phase 3 exhaust emission testing with a standard test fuel consistent with the existing requirements under 40 CFR part 90 (see 40 CFR part 1065, subpart H). The existing regulatory specifications allow for no oxygenates in the test fuel. Because California ARB specifies a test fuel which contains the oxygenate MTBE (but also allows for the use of EPA's test fuel), we understand that some engine manufacturers will have emission data from engines that meet EPA's Phase 3 standards based on testing to meet California's Tier 3 Small Off-Road Engine requirements for 2007 and later model years. In some cases the test data will be based on California's oxygenated test fuel, although manufacturers have the option to certify using a test fuel such as that specified by EPA in 40 CFR part 90. To allow for a quicker transition to the new EPA standards, we will allow for use of this pre-existing exhaust emission test data (based on California's oxygenated test fuel) for EPA certification purposes through the 2012 model year. Manufacturers could also use the California ARB test fuel for their PLT testing, if they based their certification on that fuel. The use of the California ARB data would be subject to the provisions for carryover data for demonstrating compliance with the standards in effect. (The carryover provisions for Phase 3 are specified in § 1054.235.) While we will allow use of California ARB data for certification through the 2012 model year, we will use our test fuel without oxygenates for all confirmatory testing we perform for exhaust emissions. We are limiting the timeframe for such a provision because we ultimately want the exhaust emission test results to be performed using the EPA specified test fuel.

In the proposal we noted our concerns about testing with oxygenated fuels since this could affect an engine's air-fuel ratio, which in turn could affect the engine's combustion and emission characteristics. Because of the relatively recent dramatic increase in the use of ethanol (another oxygenate) in the broad motor gasoline pool, we have reexamined our position (as discussed below) and are adopting provisions that will allow manufacturers to use a 10 percent ethanol blend for certification testing for exhaust emissions from nonhandheld engines, as an alternative to the standard test fuel. This option to use a 10 percent ethanol blend will begin with the implementation date of the Phase 3 exhaust standards. The use of the ethanol blend would apply to production-line testing as well if the manufacturer based their certification on the 10 percent ethanol blend. We are also committing to using a 10 percent ethanol blend for all confirmatory testing we perform for exhaust emissions under the provisions described below.

Ethanol has been blended into in-use gasoline for many years, and until as recently as 2005, was used in less than one-third of the national gasoline pool.

However, ethanol use has been increasing in recent years and, under provisions of the Energy Independence and Security Act of 2007, ethanol will be required in significantly greater quantities. We project that potentially 80 percent of the national gasoline pool will contain ethanol by 2010, making ethanol blends up to 10 percent the de facto in-use fuel. As ethanol blends become the primary in-use fuel, we believe it makes sense for manufacturers to optimize their engine designs with regard to emissions, performance, and durability on such a fuel. We also believe manufacturers need to know that any confirmatory testing we do on their engines will be performed on the same fuel the manufacturer used for certification since the fuel can impact the ability to demonstrate compliance with the emission standards.

Limited data of nonhandheld engine emissions tested on 10 percent ethanol blends suggests the HC emissions will decrease and NO_X emissions will increase compared to emissions from the same engine operated on current certification fuel without oxygenates. Depending on the relative HC and NO_X levels of the engines, these offsetting effects can result in small increases or decreases in total HC+NO_X emission levels. Because the impact on HC+NO_X emissions can vary slightly from engine family to engine family, we do not want manufacturers varying their certification fuel from one family to another to gain advantage with regard to emissions certification.

Therefore, if a manufacturer wishes to use a 10 percent ethanol blend for certification, they should use the 10 percent ethanol blend for all their Phase 3 nonhandheld engines for a given engine class by the third year of the Phase 3 standard (i.e., by the 2014 model year for Class I engines and by the 2013 model year for Class II engines). During the transition period, we will perform any confirmatory testing on the 10 percent ethanol blend if that is the fuel used by the manufacturer for certification. At the end of the transition period, we will perform any confirmatory testing on the 10 percent ethanol blend if that is the fuel used by the manufacturer for certification, but only if the manufacturer has certified all their nonhandheld engines in that engine class on the 10 percent ethanol blend. If the manufacturer has not certified all its engines in a given engine class on the 10 percent ethanol blend, we may decide to test the engine on our current test fuel without oxygenates. (See § 1054.145 and § 1054.501.)

For handheld engines, where we do not have sufficient data on the impact of ethanol blends on emissions, we are adopting a slightly different approach. Manufacturers will have the option to use a 10 percent ethanol blend for certification beginning with the 2010 model year. The option to use a 10 percent ethanol blend would apply to PLT testing as well if the manufacturer based their certification on the 10 percent ethanol blend. While we will allow use of a 10 percent ethanol blend for certification, we expect to use our test fuel without oxygenates for all confirmatory testing for exhaust emissions. Therefore, an engine manufacturer will want to consider the impacts of ethanol on emissions in evaluating the compliance margin for the standard, or in setting the FEL for the engine family if it is participating in the ABT program. We could decide at our own discretion to do exhaust emissions testing using a 10 percent ethanol blend if the manufacturer certified on that fuel. It should be noted that both EPA and the California ARB are currently running test programs to assess the emission impacts of a 10 percent ethanol blend on a range of Small SI engines, including handheld engines. Based on the results of that test program, we may want to consider changes to the provisions allowing the use of a 10 percent ethanol blend for certification and PLT testing for handheld engines. If the results of the handheld engine testing show that emissions are comparable on both fuels, we would expect to revise the provisions for handheld engines and take a similar approach to that described above for nonhandheld engines. (See § 1054.501.)

The test fuel specifications for the 10 percent ethanol blend are based on using the current gasoline test fuel and adding fuel-grade ethanol until the blended fuel contains 10 percent ethanol by volume. In addition, we recognize that in some cases using fuel-grade ethanol may be less practical than using other grades and so we will allow the use of other grades, provided they do not affect a manufacturer's ability to demonstrate compliance with the emission standards. To understand this allowance, it is helpful to remember that one of the main purposes of certification is for the manufacturer to use test data to show that the engines produced will conform to the regulations. Implicit in this is the concept that if EPA were to test an engine in the family according to the specified procedures, its measured emissions would be below the standards. Allowing a manufacturer to deviate from the specified test procedures could potentially hinder our ability to determine whether the engines would meet the standards when tested according to the specified procedures. Nevertheless, it is possible to overcome this concern based on the expected impact of the deviation on measured emissions and on the manufacturer's compliance margin (that is, the degree to which the measured certification emissions are below the standard). For example, we would conclude that a deviation that was expected to change measured emission rates by less than 0.1 g/kW-hr would clearly not affect a manufacturer's ''ability to demonstrate compliance with the emission standards'' if the certified emission level was 1.0 g/kW-hr below the standard (or below the Family Emission Limit). On the other hand, a deviation that was expected to change measured emission rates by 0.1 to 0.5 g/kW-hr would affect a manufacturer's ''ability to demonstrate compliance with the emission standards'' if the compliance margin was only 0.5 g/kW-hr. Another way to show that a deviation will not affect a manufacturer's ''ability to demonstrate compliance with the emission standards'' is to show through engineering analysis that a deviation will actually cause measured emissions to increase relative to the specified procedures.

It should be noted that this is the first time EPA regulations specify the use of an ethanol test fuel for exhaust emissions testing for certification purposes. It is likely that EPA will consider similar test fuel changes in the future for other vehicle and engine categories including those addressed in this final rule. As part of those deliberations, it is possible that EPA could decide that the test fuel specifications for the ethanol blend should be different than those adopted in this rule. Should that occur, EPA would need to consider whether changes to the test fuel specifications adopted in this rule for the 10 percent ethanol blend are appropriate for Small SI engine testing.

E. Certification and Compliance Provisions for Small SI Engines and Equipment

(1) Deterioration Factors

As part of the certification process, manufacturers generate deterioration factors to demonstrate that their engines meet emission standards over the full useful life. We are adopting some changes from the procedures currently included in part 90 (see § 1054.240 and § 1054.245). Much of the basis for these changes comes from the experience gained in testing many different engines in preparation for this final rule. First, we are discontinuing bench aging of emission components. Testing has shown that operating and testing the complete engine is necessary to get accurate deterioration factors. Second, we are allowing assigned deterioration factors for a limited number of small-volume nonhandheld engine *families.* Manufacturers could use assigned deterioration factors for multiple small-volume nonhandheld engine families as long as the total production for all the nonhandheld engine families for which the manufacturer is using assigned deterioration factors is estimated at the time of certification to be no more than 10,000 units per year. Third, we are allowing assigned deterioration factors for all engines produced by small-volume nonhandheld engine *manufacturers.*

For the $HC+NO_X$ standard, we are specifying that manufacturers use a single deterioration factor for the sum of HC and NO_X emissions. However, if manufacturers get approval to establish a deterioration factor on an engine that is tested with service accumulation representing less than the full useful life for any reason, we will require separate deterioration factors for HC and NO_X emissions. The advantage of a combined deterioration factor is that it can account for an improvement in emission levels for a given pollutant with aging. However, for engines that have service accumulation representing less than the full useful life, we believe it is not appropriate to extrapolate measured values indicating that emission levels for a particular pollutant will decrease. This is the same approach we adopted for recreational vehicles.

EPA is not establishing the values for the assigned deterioration factors for small-volume nonhandheld engine manufacturers in this final rule. In an effort to develop deterioration factors that are appropriate for Small SI engines, we plan to evaluate certification data from Phase 3 engines certified early with EPA and from engines certified under California ARB's Tier 3 standards (which began in 2007 and 2008). Because we are not promulgating new exhaust standards for handheld engines, the assigned deterioration factor provisions adopted for Phase 2 handheld engines are being retained.

Although we are not establishing new exhaust standards for handheld engines, handheld engine manufacturers noted that California ARB has approved certain durability cycles for accumulating hours on engines for the purpose of demonstrating the durability of emission controls. The durability cycles approved by California ARB vary from a 30-second cycle for chainsaws to a 20-minute cycle for blowers, with 85 percent of the time operated at wide open throttle and 15 percent of the time operated at idle. Engine manufacturers can run the durability cycles repeatedly until they accumulate the hours of operation equivalent to the useful life for the engine family. Our current regulations state that ''service accumulation is to be performed in a manner using good judgment to ensure that emissions are representative of production engines.'' While we are not changing the regulatory language regarding service accumulation, the California ARB-approved durability cycles are appropriate and acceptable to EPA for accumulating hours on handheld engines for demonstrating the durability of emission controls.

(2) Delegated Final Assembly

The current practice of attaching exhaust systems to engines varies. Class I engines are typically designed and produced by the engine manufacturer with complete emission control systems. Equipment manufacturers generally buy these engines and install them in their equipment, adjusting equipment designs if necessary to accommodate the mufflers and the rest of the exhaust system from the engine manufacturer.

Engine manufacturers generally produce Class II engines without exhaust systems, relying instead on installation instructions to ensure that equipment manufacturers get mufflers that fall within a specified range of backpressures that is appropriate for a given engine model. Equipment manufacturers are free to work with muffler manufacturers to design mufflers that fit into the space available for a given equipment model, paying attention to the need to stay within the design specifications from the engine manufacturers. A similar situation applies for air filters, where equipment manufacturers in some cases work with component manufacturers to use air filters that are tailored to the individual equipment model while staying within the design specifications defined by the engine manufacturer.

The existing regulations require that certified engines be in their certified configuration when they are introduced into commerce. We therefore need special provisions to address the possibility that engines will need to be produced and shipped without exhaust systems or air intake systems that are part of the certified configuration. We have adopted such provisions for heavy-duty highway engines and for other nonroad engines in 40 CFR 85.1713 and 40 CFR 1068.260, respectively. These provisions generally require that engine manufacturers establish a contractual arrangement with equipment manufacturers and take additional steps to ensure that engines are in their certified configuration before reaching the ultimate purchaser.

We are applying delegated-assembly provisions for nonhandheld engines that are similar to those adopted for heavy-duty highway engines. In fact, we have modified the proposed requirements and the requirements that apply to heavy-duty highway engines (and to other nonroad engines) such that a single set of requirements in part 1068 will simultaneously apply to all these engine categories. This combined approach incorporates substantial elements of the program we proposed for Small SI engines.

This approach generally requires that engine manufacturers apply for certification in the normal way, identifying all the engine parts that make up the engine configurations covered by the certification. Equipment manufacturers will be able to work with muffler manufacturers to get mufflers with installed catalysts as specified in the engine manufacturer's application for certification. If equipment manufacturers need a muffler or catalyst that is not covered by the engine manufacturer's certification, the engine manufacturer will need to amend the application for certification. This may require new testing if the data from the original emission-data engine are not appropriate for showing that the new configuration will meet emission standards, as described in § 1054.225. (Alternatively, the equipment manufacturer may take on the responsibility for certifying the new configuration, as described in § 1054.612.) Engine manufacturers will also identify in the application for certification their plans to sell engines without emission-related components. We are adopting several provisions to ensure that engines will eventually be in their certified configuration. For example, engine manufacturers will establish contracts with affected equipment manufacturers, include installation instructions to make clear how engine assembly should be completed, keep records of the number of engines produced under these provisions, and obtain annual affidavits from affected equipment manufacturers to confirm that they are installing the proper emission-related components on the engines and that they have ordered the number of components that corresponds to the number of engines involved.

While the delegated-assembly provisions are designed for direct shipment of engines from engine manufacturers to equipment manufacturers, we are aware that distributors play an important role in providing engines to large numbers of equipment manufacturers. We are requiring that these provisions apply to distributors in one of two ways. First, engine manufacturers may have an especially close working relationship with primary distributors. In such a case, the engine manufacturer can establish a contractual arrangement allowing the distributor to act as the engine manufacturer's agent for all matters related to compliance with the delegated-assembly provisions. This allows the distributor to make arrangements with equipment manufacturers to address design needs and perform oversight functions. We will hold the engine manufacturer directly responsible if the distributor fails to meet the regulatory obligations that will otherwise apply to the engine manufacturer. However, starting in 2015, we are allowing this approach only with our specific approval for individual manufacturers and distributors. While this arrangement is necessary to facilitate making engines available under the Transition Program for Equipment Manufacturers, we are concerned that it will be difficult for EPA and for manufacturers to properly ensure that all engines are built up to a certified configuration when assembly responsibilities are so far removed from the engine manufacturer. This is underscored by a recent finding that an equipment manufacturer was intentionally not following an engine manufacturer's instructions when installing Small SI engines such that the final installation involved an engine that was not in a certified configuration. In the years before 2015, we expect that EPA and manufacturers will learn a lot about delegated assembly, including the extent to which there are cases in which engines are improperly assembled, whether those problems represent intentional violations or mistakes as part of a good-faith effort to meet applicable requirements. We will be prepared to judge individual requests based on the experience gained under the initial years of the Phase 3 standards. However, given the challenges associated with engine manufacturers allowing distributors to act as their agents with respect to delegated assembly, we expect manufacturers to ask us to allow this only in unusual circumstances when the standard approach would be very impractical. Also, depending on the broader experience with this provision before 2015, we may consider changing the regulation to allow this to continue without our specific approval, for Small SI engines or for all types of engines. If we find that there are substantial problems in implementing this provision, we may also consider removing the allowance to continue using distributors this way for delegated assembly past 2014.

Second, other distributors may receive shipment of engines without exhaust systems, but they will add any aftertreatment components before sending the engines on to equipment manufacturers. Engine manufacturers will treat these distributors as equipment manufacturers for the purposes of delegated assembly. Equipment manufacturers buying engines from such a distributor will not have the option of separately obtaining mufflers from muffler manufacturers. However, we would expect distributors to cooperate with small equipment manufacturers to work out any necessary arrangements to specify and design their components and equipment. This second situation involves a more straightforward compliance scenario so this provision does not expire. In both of these scenarios, the engine manufacturer continues to be responsible for the in-use compliance of all their engines.

Engine manufacturers will need to affix a label to the engine to clarify that it needs certain emission-related components before it is in its certified configuration. This labeling information is important for alerting assembly personnel to select mufflers with installed catalysts; the label will also give in-house inspectors or others with responsibility for quality control a tool for confirming that all engines have been properly assembled and installed. Given the large numbers of engine and equipment models and the interchangeability of mufflers with and without catalysts, we believe proper labeling will reduce the possibility that engines will be misbuilt. This labeling can be done with either of two approaches. First, a temporary label may be applied such that it could not be removed without a deliberate action on the part of the equipment manufacturer. We believe it is not difficult to create a label that will stay on the engine until it is deliberately removed. Second, manufacturers may add the words ''delegated assembly'' to the engine's permanent emission control information label (or ''DEL ASSY'' where limited space requires an abbreviation).

In addition, engine manufacturers will need to perform or arrange for audits to verify that equipment manufacturers are properly assembling engines. Engine manufacturers may rely on third-party agents to perform auditing functions. Since the purpose of the audit is to verify that equipment manufacturers are properly assembling products, they may not perform audits on behalf of engine manufacturers. We are requiring that audits involve at a minimum reviewing the equipment manufacturer's production records and procedures, inspecting the equipment manufacturer's production operations, and inspecting the final assembled products. Inspection of final assembled products may occur at any point in the product distribution system. For example, products may be inspected at the equipment manufacturer's assembly or storage facilities, at regional distribution centers, or at retail locations. The audit must also include confirmation that the number of aftertreatment devices shipped was sufficient for the number of engines involved. Engine manufacturers would keep records of the audit results and make these records available to us upon request. These auditing specifications represent a minimum level of oversight. In certain circumstances we may expect engine manufacturers to take additional steps to ensure that engines are assembled and installed in their certified configuration. For example, equipment manufacturers with very low order volumes, an unclear history of compliance, or other characteristics that will cause some concern may prompt us to require a more extensive audit to ensure effective oversight in confirming that engines are always built properly. Engine manufacturers must describe in the application for certification their plan for taking steps to ensure that all engines will be in their certified configuration when installed by the equipment manufacturer. EPA approval of a manufacturer's plan for delegated assembly will be handled as part of the overall certification process.

We are requiring that engine manufacturers annually audit twelve equipment manufacturers, or fewer if they are able to audit all participating equipment manufacturers on average once every four years. These audits will be divided over different equipment manufacturers based on the number of engines sold to each equipment manufacturer. We specify that these auditing rates are reduced to a maximum of four equipment manufacturers per year starting in 2015.

In 2019 and later, manufacturers would continue to perform a maximum of four audits annually, but we specify that audits may be divided evenly to cover all equipment manufacturers over a ten-year period.

We are not adopting the proposed requirement for engine manufacturers to establish an alphanumeric designation to identify each unique catalyst design and instruct equipment manufacturers to stamp this code on the external surface of the exhaust system. However, manufacturers may choose to do this voluntarily as a means of more readily assessing whether engines have been properly assembled.

We are requiring that all the same provisions apply for separate shipment related to air filters if they are part of an engine's certified configuration, except for the auditing. However, this does not apply if manufacturers identify intake systems, including air filters, by simply instructing equipment manufacturers to maintain the pressure drop within a certain range. This is typical of the way many exhaust systems are handled today. We will require auditing related to air filters that are specifically identified in the application for certification only if engine manufacturers are already performing audits related to catalysts. We believe there is much less incentive or potential for problems with equipment manufacturers producing engines with noncompliant air filters so we believe a separate auditing requirement for air filters is unnecessary.

The final regulation specifies that the exemption expires when the equipment manufacturer takes possession of the engine and the engine reaches the point of final equipment assembly. The point of final equipment assembly for purposes of delegated assembly for aftertreatment components is the point at which the equipment manufacturer attaches a muffler to the engine. Engines observed in production or inventory assembled with improper mufflers will be considered to have been built contrary to the engine manufacturer's installation instructions. Catalysts are invariably designed as part of the muffler, so no reason exists for installing a different muffler once a given muffler has been installed using normal production procedures. If equipment manufacturers sell equipment without following these instructions, they will be considered in violation of the prohibited acts i.e., selling uncertified engines). If there is a problem with any given equipment manufacturer, we will disallow continued use of the delegated-assembly provisions for that equipment manufacturer until the engine manufacturer has taken sufficient steps to remedy the problem.

We are aware that the new approach of allowing equipment manufacturers to make their own arrangements to order mufflers results in a situation in which the equipment manufacturer must spend time and money to fulfill their responsibilities under the regulations. This introduces a financial incentive to install mufflers with inferior catalysts, or to omit the catalyst altogether. To address this concern, we are requiring that engine manufacturers get written confirmation from each equipment manufacturer before an initial shipment of engines for a given engine model. This confirmation will document the equipment manufacturer's understanding that they are using the appropriate aftertreatment components. The written confirmation will be due within 30 days after shipping the engines and will be required before shipping any additional engines from that engine family to that equipment manufacturer.

The shipping confirmation included in the rule for heavy-duty highway engines is a very substantial provision to address the fact that vehicle manufacturers will gain a competitive advantage by producing noncompliant products, and that engines in commerce will be labeled as if they were fully compliant even though they are not yet in their certified configuration. This is especially problematic when a muffler with no catalyst can easily be installed and can perform without indicating a problem. To address this concern we are requiring that equipment manufacturers include in their annual affidavits an accounting for the number of aftertreatment components they have ordered relative to the number of engines shipped without the catalysts that the mufflers will otherwise require.

Production-line testing normally involves building production engines using normal assembly procedures. For engines shipped without catalysts under the delegated-assembly provisions, it is not normally possible to do this at the engine manufacturer's facility, where such testing will normally occur. To address this, we are specifying that engine manufacturers must arrange to get a randomly selected catalyst that will be used with the engine. The catalyst must come from any point in the normal distribution from the aftertreatment component manufacturer to the equipment manufacturer. The catalyst may come from the engine manufacturer's own inventory as long as it is randomly procured. Engine manufacturers are required to keep records showing how they randomly selected catalysts.

See Section 2.8 of the Summary and Analysis of Comments for further discussion of issues related to delegated assembly.

(3) Transition Program for Equipment Manufacturers

Given the level of the new Phase 3 exhaust emission standards for Class II engines, we believe there may be situations where the use of a catalyzed muffler could require equipment manufacturers to modify their equipment. We are therefore establishing a set of provisions to provide equipment manufacturers with reasonable lead time for transitioning to the new standards. These provisions are similar to the program we adopted for nonroad diesel engines (69 FR 38958, June 29, 2004).

Equipment manufacturers will not be obligated to use any of these provisions, but all equipment manufacturers that produce Class II equipment are eligible to do so. We are also requiring that all companies under the control of a common entity will be considered together for the purposes of applying these allowances. Manufacturers will be eligible for the allowances described below only if they have primary responsibility for designing and manufacturing equipment, and if their manufacturing procedures include installing engines in the equipment.

(a) General Provisions

Under the final rule, beginning in the 2011 model year and lasting through the 2014 model year, each equipment manufacturer may install Class II engines not certified to the Phase 3 emission standards in a limited number of equipment applications produced for the U.S. market (see § 1054.625). We refer to these here as ''flex engines.'' These flex engines will need to meet the Phase 2 standards. The maximum number of ''allowances'' each manufacturer can use are based on 30 percent of an average year's production of Class II equipment. The number of allowances is calculated by determining the average annual U.S.-directed production of equipment using Class II engines produced from January 1, 2007 through December 31, 2009. Thirty percent of this average annual production level is the total number of allowances an equipment manufacturer may use under this transition program over four years. Manufacturers can use these allowances for their Class II equipment over four model years from 2011 through 2014, with the usage spread over these model years as determined by the equipment manufacturer. Equipment produced under these provisions can use engines that meet the Phase 2 emission standards instead of the Phase 3 standards. If an equipment manufacturer newly enters the Class II equipment market during 2007, 2008 or 2009, the manufacturer will calculate its average annual production level based only on the years during which it actually produced Class II equipment. Equipment manufacturers newly entering the Class II equipment market after 2009 will not receive any allowances under the transition program and will need to incorporate Phase 3 compliant engines into the Class II equipment beginning in 2011.

Equipment using engines built before the effective date of the Phase 3 standards will not count toward an equipment manufacturer's allowances. Equipment using engines that are exempted from the Phase 3 standards for any reason will also not count toward an equipment manufacturer's allowances. For example, we are allowing small-volume engine manufacturers to continue producing Phase 2 engines for two model years after the Phase 3 standards apply. All engines subject to the Phase 3 standards, including those engines that are certified to FELs at higher levels than the standard, but for which an engine manufacturer uses exhaust ABT credits to demonstrate compliance, will count as Phase 3 complying engines and will not be included in an equipment manufacturer's count of allowances.

The choice of the allowances based on 30 percent of one year's production is based on our best estimate of the degree of reasonable lead time needed by the largest equipment manufacturers to modify their equipment designs as needed to accommodate engines and exhaust systems that have changed as a result of more stringent emission standards. We believe this level of allowances responds to the need for lead time to accommodate the workload related to redesigning equipment models to incorporate catalyzed mufflers while ensuring a significant level of emission reductions in the early years of the new program.

As described in Section VI, technologies for controlling running losses may involve a significant degree of integration between engine and equipment designs. In particular, routing a vapor line from the fuel tank to the engine's intake system depends on engine modifications that will allow for this connection. As a result, any equipment using flex engines will not need to meet running loss standards.

(b) Coordination Between Engine and Equipment Manufacturers

We are establishing two separate paths for complying with administrative requirements related to the new transition program, depending on how the engine manufacturer chooses to make flex engines available. Engine manufacturers choosing to use the delegated-assembly provisions described above will be enabling equipment manufacturers to make the decision whether to complete the engine assembly in the Phase 3 configuration or to use a non-catalyzed muffler such that the engine will meet Phase 2 standards and will therefore need to be counted as a flex engine. If engine manufacturers do not use the delegated-assembly provisions, equipment manufacturers will need to depend on engine manufacturers to produce and ship flex engines that are already in a configuration meeting Phase 2 standards and labeled accordingly. Each of these scenarios involves a different set of compliance provisions, which we describe below. Note that in no case may an equipment manufacturer remove a catalyzed muffler from an engine and replace it with a noncatalyzed muffler; this would be a violation of the prohibition against tampering.

(i) Compliance Based on Engine Manufacturers

Engine manufacturers will in many cases produce complete engines. This will be the case if the engine does not require a catalyst or if the engine manufacturer chooses to design their own exhaust systems and ship complete engine assemblies to equipment manufacturers.

Under this scenario, we are requiring that equipment manufacturers request a certain number of flex engines from the engine manufacturer. The regulatory provisions specifically allow engine manufacturers to continue to build and sell Phase 2 engines needed to meet the market demand created by the transition program for equipment manufacturers, provided they receive the written assurance from the equipment manufacturer that such engines are being procured for this purpose. We are requiring that engine manufacturers keep copies of the written assurance from equipment manufacturers for at least five years after the final year in which allowances are available.

Engine manufacturers are currently required to label their certified engines with a variety of information. We are requiring that engine manufacturers producing complete flex engines under this program identify on the engine label that they are flex engines. In addition, equipment manufacturers are required to apply an Equipment Flexibility Label to the engine or piece of equipment that identifies the equipment as using an engine produced under the Phase 3 transition program for equipment manufacturers. These labeling requirements allow EPA to easily identify flex engines and equipment, verify which equipment manufacturers are using these flex engines, and more easily monitor compliance with the transition provisions. Labeling of the equipment could also help U.S. Customs to quickly identify equipment being imported lawfully using the Transition Program for Equipment Manufacturers.

While manufacturers will need to meet Phase 2 standards with their flex engines, they will not need to certify them for the current model year. We are instead applying the provisions of 40 CFR 1068.265, which require manufacturers to keep records showing that they meet emission standards without requiring submission of an application for certification.

(ii) Compliance Based on Equipment Manufacturers

We are adopting a different set of compliance provisions for engine manufacturers that make arrangements to ship engines separately from exhaust-system components. Under this scenario, as discussed above, the engine manufacturers must establish a relationship with the equipment manufacturers allowing the equipment manufacturer to install catalysts to complete engine assembly in compliance with Phase 3 standards.

In this case, engine manufacturers will design and produce their Phase 3 engines and label them accordingly. The normal path for these engines covered by the delegated-assembly provisions will involve shipment of the engine without an exhaust system to the equipment manufacturer. The equipment manufacturer will then follow the engine manufacturer's instructions to add the exhaust system including the catalyst to bring the engine into a certified Phase 3 configuration. Under the transition program, equipment manufacturers will choose for each of these engines to either follow the engine manufacturer's instructions to install a catalyst to make it compliant with Phase 3 standards or install a non-catalyzed muffler to make it compliant with Phase 2 standards. Any such engines downgraded to Phase 2 standards will count toward the equipment manufacturer's total number of allowances under the transition program.

To make this work, engine manufacturers will need to take certain steps to ensure overall compliance. First, engine manufacturers will need to include emission data in the application for certification showing that the engine meets Phase 2 standards without any modification other than installing a non-catalyzed exhaust system. This may include a specified range of backpressures that equipment manufacturers must meet in procuring a non-catalyst muffler. If the Phase 3 engine without a catalyst will otherwise still be covered by the emission data from engines produced in earlier model years under the Phase 2 standards, manufacturers could rely on carryover emission data to make this showing. Second, the installation instructions we specify under the delegated-assembly provisions will need to describe the steps equipment manufacturers must take to make either Phase 3 engines or Phase 2 flex engines. Third, for engine families that generate positive emission credits under the exhaust ABT program, engine manufacturers must generally decrease the number of ABT credits generated by the engine family by 10 percent. We believe the 10 percent decrease should provide an emission adjustment commensurate with the potential use of the equipment manufacturer flexibility provisions. (As described earlier in Section V.C.3, EPA is including an option that will allow engine manufacturers to track the final configuration of the engines to determine the actual number of engines that were downgraded for the TPEM program.)

Equipment manufacturers using allowances under these provisions must keep records that allow EPA or engine manufacturers to confirm that equipment manufacturers followed appropriate procedures and produced an appropriate number of engines without catalysts. In addition, we are requiring that equipment manufacturers place a label on the engine as close as possible to the engine manufacturer's emission control information label to identify it as a flex engine. The location of this label is important since it effectively serves as an extension of the engine manufacturer's label, clarifying that the engine meets Phase 2 standards, not the Phase 3 standards referenced on the original label. This avoids the problematic situation of changing or replacing labels, or requiring engine manufacturers to send different labels.

Engine manufacturers might choose to produce Class II engines that are compliant with the Phase 3 standards before the 2011 model year and set up arrangements for separate shipment of catalyzed mufflers as described in Section V.E.2. We expect any engine manufacturers producing these early Phase 3 engines to continue production of comparable engine models that meet Phase 2 standards rather than forcing all equipment manufacturers to accommodate the new engine design early. We believe it will not be appropriate for equipment manufacturers to buy Phase 3 engines in 2010 or earlier model years and downgrade them to meet Phase 2 emission standards as described above. We are therefore allowing the downgrading of Phase 3 engines only for 2011 and later model years.

Because equipment manufacturers in many cases depend on engine manufacturers to supply certified engines in time to produce complying equipment, we are also adopting a hardship provision for all equipment manufacturers (see § 1068.255). An equipment manufacturer will be required to use all its allowances under the transition program described above before being eligible to use this hardship.

(iii) Reporting and Recordkeeping Requirements

Equipment manufacturers choosing to participate in the transition program will be required to keep records of the U.S-directed production volumes of Class II equipment in 2007 through 2009 broken down by equipment model and calendar year. Equipment manufacturers will also need to keep records of the number of flex engines they use under this program.

We are also establishing certain notification requirements for equipment manufacturers. Any manufacturer wishing to participate in the new transition provisions need to notify EPA before producing equipment with flex engines. They must submit information on production of Class II equipment over the three-year period from 2007 through 2009, calculate the number of allowances available, and provide basic business information about the company. For example, we will want to know the names of related companies operating under the same parent company that are required to count engines together under this program. This early notification will not be a significant burden to the equipment manufacturer and will greatly enhance our ability to ensure compliance. Indeed, equipment manufacturers will need to have the information required in the notification to know how to use the allowances.

We are establishing an ongoing reporting requirement for equipment manufacturers participating in the Phase 3 transition program. Under the program, participating equipment manufacturers will be required to submit an annual report to EPA that shows its annual number of equipment produced with flex engines under the transition provisions in the previous year. Each report must include a cumulative count of the number of equipment produced with flex engines for all years. To ease the reporting burden on equipment manufacturers, EPA intends to work with the manufacturers to develop an electronic means for submitting information to EPA.

(c) Additional Allowances for Small and Medium-Sized Companies

We believe small-volume equipment manufacturers will need a greater degree of lead time than manufacturers that sell large volumes of equipment. The small companies are less likely to have access to prototype engines from engine manufacturers and generally have smaller engineering departments for making the necessary design changes. Allowances representing thirty percent of annual U.S.-directed production provide larger companies with substantial lead time to plan their product development for compliance but smaller companies may have a product mix that requires extensive work to redesign products in a short amount of time. We are therefore specifying that small-volume equipment manufacturers may use this same transition program with allowances totaling 200 percent of the average annual U.S.-directed production of equipment using Class II engines from 2007 through 2009. For purposes of this program, a small-volume equipment manufacturer is defined as a manufacturer that produces fewer than 5,000 pieces of nonhandheld equipment per year subject to EPA regulations in each of the three years from 2007 through 2009 or meets the SBA definition of small business equipment manufacturer (i.e., generally fewer than 500 employees for manufacturers of most types of equipment). These allowances are spread over the same four-year period between 2011 and 2014. For example, a small-volume equipment manufacturer could potentially use Phase 2 engines on all their Class II equipment for two years or they might sell half their Class II equipment with Phase 2 engines for four years assuming production stayed constant over the four years.

Medium-sized equipment manufacturers, i.e., companies that produce too much equipment to be considered a small-volume equipment manufacturer but produce fewer than 50,000 pieces of Class II equipment annually, may also face difficulties similar to that of small-volume equipment manufacturers. These companies may be like small-volume manufacturers if they have numerous product lines with varied approaches to installing engines and mufflers. Other companies may be more like bigger companies if they produce most of their equipment in a small number of high-volume models or have consistent designs related to engine and muffler installations. We are therefore creating special provisions that will enable us to increase the number of transition allowances that are available to these medium-sized companies that have annual U.S.-directed production of Class II equipment of between 5,000 and 50,000 in each of the three years from 2007 through 2009. To obtain allowances greater than 30 percent of average annual production, a medium-sized manufacturer will need to notify us before they produce equipment with flex engines by January 31, 2010 if they believe the standard allowances based on 30 percent of average annual production of Class II equipment do not provide adequate lead time starting in the 2011 model year. Additional allowances may be requested only if the equipment manufacturer can show they are on track to produce a number of equipment models representing at least half of their total U.S.-directed production volume of Class II equipment in the 2011 model year compliant with all exhaust and evaporative emission standards. As part of their request, the equipment manufacturer will need to describe why more allowances are needed to accommodate anticipated changes in engine designs resulting from engine manufacturers' compliance with changing exhaust emission standards. The equipment manufacturer will also need to request a specific number of additional allowances needed with supporting information to show why that many allowances are needed. We may approve additional allowances up to 70 percent of the average annual U.S.-directed production of Class II equipment from 2007 through 2009. If a medium-sized company were granted the full amount of additional allowances, they will have allowances equivalent to 100 percent of the average annual production volume of Class II equipment.

As noted above, the determination of whether a company is a small- or medium-sized manufacturer will be based primarily on production data over the 2007 through 2009 period submitted to EPA before 2011. After a company's status as a small- or medium-sized company has been established based on the data, EPA is requiring that manufactures keep that status even if a company's production volume grows during the next few years, such that the company will no longer qualify as a small- or medium-sized company. EPA believes equipment manufacturers need to know at the beginning of the transition program (i.e., 2011) how many allowances they will receive under the program. Changing a company's size determination during the program, which could affect the number of allowances available, will make it difficult for companies to plan and could lead to situations where a company is in violation of the provisions based on the use of allowances that were previously allowed. Likewise, if a company is purchased by another company or merges with another company after the determination of small- or medium-size status is established in 2010, the combined company could, at its option, keep the preexisting status for the individual portions of the combined company. If the combined company chooses to keep the individual designations, the combined company must submit the annual reports on the use of allowances broken down for each of the previously separate companies.

(d) Requirements for Importers and Imported Equipment

Under this final rule, only companies that manufacture equipment can qualify for the relief provided under the Phase 3 transition provisions. Equipment manufacturers producing equipment outside the United States that comply with the provisions discussed below can enjoy the same transition provisions as domestic manufacturers. Such equipment manufacturers that do not comply with the compliance-related provisions discussed below will not receive allowances. Importers that do not manufacture equipment will not receive any transition relief directly, but could import equipment with a flex engine if it is covered by an allowance or transition provision associated with a foreign equipment manufacturer. This will allow transition provisions to be used by equipment manufacturers producing equipment outside the United States in the same way as equipment manufacturers producing equipment domestically, at the option of the overseas manufacturer, while avoiding the potential for importers to inappropriately use allowances. These regulations apply equally to foreign equipment manufacturers and to domestic equipment manufacturers that build equipment outside the country that is eventually sold in the United States.

All equipment manufacturers wishing to use the transition provisions for equipment produced outside the United States must comply with all the requirements discussed above. Along with the equipment manufacturer's notification described earlier, an overseas equipment manufacturer will have to comply with various compliance related provisions (see § 1054.626). These provisions are similar to those adopted for nonroad diesel engines. As part of the notification, such an equipment manufacturer will have to:

- Agree to provide EPA with full, complete and immediate access to conduct inspections and audits;
- Name an agent in the United States for service;
- Agree that any enforcement action related to these provisions will be governed by the Clean Air Act;
- Submit to the substantive and procedural laws of the United States;
- Agree to additional jurisdictional provisions;
- Agree that the equipment manufacturer will not seek to detain or to impose civil or criminal remedies against EPA inspectors or auditors for actions performed within the scope of EPA employment related to the provisions of this program;
- Agree that the equipment manufacturer becomes subject to the full operation of the administrative and judicial enforcement powers and provisions of the United States without limitation based on sovereign immunity; and
- Submit all reports or other documents in the English language, or include an English language translation.

In addition to these provisions, we are requiring equipment manufacturers producing equipment for importation under the transition program to comply with a bond requirement for equipment imported into the United States. We believe a bond program is an important tool for ensuring that importing equipment manufacturers are subject to the same level of enforcement as equipment manufacturers producing equipment domestically. Specifically, we believe a bonding requirement for these equipment manufacturers is an important enforcement tool for ensuring that EPA has the ability to collect any judgments assessed against an overseas equipment manufacturer for violations of these transition provisions.

Under a bond program, the participating equipment manufacturer will have to maintain a bond in the proper amount that is payable to satisfy judgments that result from U.S. administrative or judicial enforcement actions for conduct in violation of the Clean Air Act. The equipment manufacturer will generally obtain a bond in the proper amount from a third party surety agent that has been listed with the Department of the Treasury. As discussed in Sections V.E.6, EPA is establishing other bond requirements as well. An equipment manufacturer that is required to post a bond under any of these provisions will be required to obtain only one bond of the amount specified for those sections. Equipment manufacturers may avoid the bond requirements based on the level of assets in the United States, as described in Section V.E.6.

In addition to the equipment manufacturer requirements discussed above, EPA is also requiring importers of equipment with flex engines from a complying equipment manufacturer to comply with certain provisions. EPA believes these importer provisions are essential to EPA's ability to monitor compliance with the transition provisions. Therefore, the regulations require each importer to notify EPA prior to their initial importation of equipment with flex engines. Importers will be required to submit their notification before importing equipment with flex engines from a complying equipment manufacturer. The importer's notification will need to include the following information:

- The name and address of importer (and any parent company);
- The name and address of the manufacturers of the equipment and engines the importer expects to import; and
- Number of units of equipment with flex engines the importer expects to import for each year broken down by equipment manufacturer.

In addition, EPA is requiring that any importer electing to import to the United States equipment with flex engines from a complying equipment manufacturer must submit annual reports to EPA. The annual report will include the number of units of equipment with flex engines the importer actually imported to the United States in the previous calendar year; and identify the equipment manufacturers and engine manufacturers whose equipment and engines were imported.

(e) Provisions for Rotation-Molded Fuel Tanks

Equipment manufacturers may face challenges in transitioning to rotation-molded fuel tanks that meet the new permeation standards. These modified fuel tanks may require equipment manufacturers to adjust the designs of their equipment to ensure that the new fuel tanks can be incorporated without problems. We are therefore allowing equipment manufacturers to use noncompliant rotational-molded fuel tanks for two additional years on limited numbers of 2011 and 2012 model year equipment using Class II engines. Equipment manufacturers may use noncompliant rotational-molded fuel tanks if the production volume of the fuel tank design used in Class II equipment models is collectively no more than 5,000 units in the 2011 model year. In the 2012 model year, equipment manufacturers may use noncompliant rotational-molded fuel tanks if the production volume of the fuel tank design used in Class II equipment models is collectively no more than 5,000 units in the 2012 model year, but the total number of exempted rotational-molded fuel tanks across the manufacturer's Class II equipment is limited to 10,000 units. If production volumes are greater than 5,000 for a given fuel tank design (or greater than 10,000 corporate-wide in 2012), all those tanks must comply with emission standards. Tank designs would be considered identical if they are produced under a single part number to conform to a single design or blueprint. In addition, tank designs would be considered identical if they differ only with respect to production variability, post-production changes (such as different fittings or grommets), supplier, color, or other extraneous design variables. We originally proposed to allow noncompliant rotation-molded fuel tanks for any equipment that was counted under the allowances described in this section which used flex engines meeting Phase 2 exhaust emission standards. However, the approach being finalized today could be applied to any equipment using Class II engines (subject to the constraints noted above), whether or not the equipment uses a flex engine.

(4) Equipment Manufacturer Recertification

It has generally been engine manufacturers that certify with EPA for exhaust emissions because the standards are engine-based. However, because the Phase 3 nonhandheld standards are expected to result in the use of catalysts, a number of equipment manufacturers, especially those that make low-volume models, believe it may be necessary to produce their own unique engine/muffler designs, but using the same catalyst substrate already used in a muffler that is part of an engine manufacturers certified configuration. In this situation, the engine will not be covered by the engine manufacturer's certificate, as the engine/muffler design is not within the specifications for the certified engine. The equipment manufacturer is therefore producing a new distinct engine which is not covered by a certificate and therefore needs to be certified with EPA.

To allow the possibility of an equipment manufacturer certifying such an engine/muffler design with EPA, we are establishing a simplified engine certification process for nonhandheld equipment manufacturers (see § 1054.612). Under the simplified certification process, the nonhandheld equipment manufacturer will need to demonstrate that it is using the same catalyst substrate as the approved engine manufacturer's engine family, provide information on the differences between their engine/exhaust system and the engine/exhaust system certified by the engine manufacturer, and explain why the emissions deterioration data generated by the engine manufacturer will be representative for the equipment manufacturer's configuration. The equipment manufacturer will need to perform low-hour emission testing on an engine equipped with their modified exhaust system and demonstrate that it meets the emission standards after applying the engine manufacturer's deterioration factors for the certified engine family. We will not require production-line testing for these engines. The equipment manufacturer will be responsible to meet all the other requirements of an engine manufacturer under the regulations, including labeling, warranty, defect reporting, payment of certification fees, and other things. The useful life period selected for the original certification will also apply for the equipment manufacturer's streamlined certification. This provision is primarily intended for easing the transition to new standards. Starting in the 2015 model year, we are therefore limiting these recertification provisions to small-volume emission families (sales below 5,000 units).

(5) Special Provisions Related to Altitude

For nonhandheld engines we are requiring compliance with our standards at all altitudes, consistent with other engine categories.[97] However, since spark-ignition engines without electronic control of air/fuel ratio cannot compensate for changing air density, their emissions generally change with changing altitude. In recognition of this technological limit, we are adopting special testing and compliance provisions related to altitude. As described in Section V.C.1, we are requiring that nonhandheld engines meet emission standards without an altitude kit, but will allow, in certain cases, testing at barometric pressures below 94.0 kPa (which is roughly equivalent to an elevation of 2,000 feet above sea level) using an altitude kit. (An altitude kit may be as simple as a single replacement part for the carburetor that allows a greater volumetric flow of air into the carburetor to make the engine operate as it would at low altitudes.) Such kits were allowed under part 90 and we are keeping the provisions that already apply in part 90 related to descriptions of these altitude kits in the application for certification. This includes a description of how engines comply with emission standards at varying atmospheric pressures, a description of the altitude kits, and the associated part numbers.

During certification, manufacturers will have two choices regarding testing and compliance at barometric pressures below 94.0 kPa: (1) Test engines for demonstrating compliance with the standards without an altitude kit; or (2) test engines for demonstrating compliance with the standards using an altitude kit. Those manufacturers choosing Option 2 will be required to identify the altitude range for which it expects proper engine performance and emission control will occur with and without the altitude kit, state that engines will comply with applicable emission standards throughout the useful life with the altitude kit installed according to instructions, and include any supporting information. Manufacturers choosing Option 2 will also need to describe a plan for making information and parts available to consumers such that widespread use of altitude kits will reasonably be expected in high-altitude areas. For nonhandheld engines, this will involve all counties with elevations substantially above 4,000 feet (see Appendix III to part 1068). This includes all U.S. counties where 75 percent of the land mass and 75 percent of the population are above 4,000 feet (see 45 FR 5988, January 24, 1980 and 45 FR 14079, March 4, 1980).

Assuming we grant a certificate that includes a manufacturer's reliance on an altitude kit during testing, any compliance testing at higher altitudes (more precisely, lower barometric pressures) would be conducted with the altitude kit installed on the engine according to the manufacturer's instructions. Note that manufacturers would not be required to submit test data from high-altitude testing in their applications, provided they could demonstrate through engineering analysis the basis for knowing the altitude kits will allow the engines to meet the emission standards at high altitude. Any high-altitude testing of an engine family that does not use these high altitude provisions will be tested without an altitude kit installed.

We considered requiring manufacturers relying on altitude kits to ensure that all engines sold in high-altitude areas were sold with altitude kits installed, but determined that such a requirement would have been burdensome to the manufacturers, impractical, and very disruptive to the market, and may not work in practice. Certificate holders will be the engine manufacturers, which generally have little or no control over the location at which the sale to the ultimate purchaser is made. In most cases, the engines will be sold to equipment manufacturers and/or through distributors or large retailers. However, even in cases when a manufacturer might have control over the location at which the sale to the ultimate purchaser is made, it is not clear that the manufacturer could ensure that every piece of equipment sold in a high-altitude area has an engine with an altitude kit installed. In light of these potential problems, we believe the approach being finalized will be effective and is the most appropriate approach. It is not tampering for a consumer not to install the altitude kit. We expect it will be common practice for consumers to install altitude kits because they are inexpensive, easy to install, and improve performance at higher altitudes. Manufacturers have also emphasized that retailers and consumers are well aware of the need to modify engines for proper operation in high-altitude areas. Toward that end, we are requiring manufacturers to make the information and parts sufficiently easy for the consumer to obtain so that the manufacturer ''would reasonably expect that altitude kits would be widely used in the high-altitude counties.'' This approach should result in effective control of emissions in high-altitude areas while still addressing the manufacturers' concerns regarding control over distribution practices and point of sale. In fact, it is worth noting that we expect this overall approach to be more effective in achieving emission reductions than the current regulations under Phase 2. Nevertheless, should we determine that operation of engines in high-altitude areas without altitude kits installed is widespread, we would reconsider the need for additional requirements.

(6) Special Provisions for Compliance Assurance

EPA's experiences in recent years have highlighted the need for more effective tools for preventing the introduction of noncompliant engines into U.S. commerce. These include noncompliant engines sold without engine labels or with counterfeit engine labels. We are adopting the special provisions in the following sections to help us address these problems.

(a) Importation Form

Importation of engines is regulated both by EPA and by U.S. Customs and Border Protection. Current Customs regulations specify that anyone importing a nonroad engine (or equipment containing a nonroad engine) must complete a declaration form before importation. EPA has created Declaration Form 3520–21 for this purpose. Customs requires this in many cases, but there are times when they allow engines to be imported without the proper form. It will be an important advantage for EPA's own compliance efforts to be able to enforce this requirement. We are therefore modifying part 90 to mirror the existing Customs requirement (and the EPA requirement in § 1068.301) for importers to complete and retain the declaration form before importing engines (see § 90.601). This will facilitate a more straightforward processing of cases in which noncompliant products are brought to a U.S. port for importation because currently no requirement exists for measuring emissions or otherwise proving that engines are noncompliant at the port facility. Since this is already a federal requirement, we are making this effective immediately with the final rule.

(b) Assurance of Warranty Coverage

Manufacturers of Small SI engines subject to the standards are required to provide an emission-related warranty so owners are able to have repairs done at no expense for emission-related defects during an initial warranty period. Established companies are able to do

[97] Note that we are not changing exhaust standards for handheld engines and are therefore codifying altitude provisions in the new part 1054 that are consistent with those that apply under part 90.

this with a network of authorized repair facilities that can access replacement parts and properly correct any defects. In contrast, we are aware that some manufacturers are selling certified engines in the United States without any such network for processing warranty claims. As such, owners who find that their engines have an emission-related defect are unable to properly file a warranty claim or get repairs that should be covered by the warranty. In effect, this allows companies to certify their engines and agree to provide warranty coverage without ever paying for legitimate repairs that should be covered by the warranty. We are therefore requiring that all manufacturers demonstrate several things before we will approve certification for their engines (see § 90.1103 and § 1054.120). The following provisions apply to manufacturers who certify engines, and include importers who certify engines. First, we are requiring manufacturers to provide and monitor a toll-free telephone number and an e-mail address for owners to receive information about how to make a warranty claim and how to make arrangements for authorized repairs. Second, we are requiring manufacturers to provide a source of replacement parts within the United States. For imported parts, this will require at least one distributor within the United States.

Finally, we are requiring manufacturers to have a network of authorized repair facilities or to take one of multiple alternate approaches to ensure that owners will be able to get free repair work done under warranty. In the proposal we specified that warranty-related repairs may be limited to authorized repair facilities as long as owners did not have to travel more than 100 miles for repairs (or further in remote areas of the country). For companies without a nationwide repair network, we proposed alternative methods for meeting warranty obligations, including free shipping, free service calls, or reimbursement of costs through local nonauthorized service centers. Manufacturers suggested a different metric for demonstrating a readiness to meet warranty obligations, focusing on maintaining authorized service centers in every metropolitan area with a population of 100,000 or greater (according to the 2000 census). We agree that the suggested approach would provide an effective demonstration of a valid warranty network and are including that in the regulation; however, we believe it is still appropriate to include the proposed provisions related to the 100-mile specification in the final rule. For example, there may be some companies with a regional market that have an effective network of repair facilities in that region, but not in other parts of the country. In this circumstance, it is appropriate to allow the manufacturer multiple paths for showing that it will be able to respond effectively to all warranty claims nationwide. We are therefore including the 100-mile approach as an additional alternative in the regulations, as well as including a variety of adjustments to address the concerns raised in the comments.

We believe these requirements are both necessary and effective for ensuring proper warranty coverage for all owners. At the same time, we are adopting a flexible approach that allows companies to choose from a variety of alternatives for providing warranty service. We therefore believe these requirements are readily achievable for any company. We are therefore implementing these requirements starting with the 2010 model year. This should allow time for the administrative steps necessary to arrange for any of the allowable compliance options described above.

(c) Bond Requirements Related to Enforcement and Compliance Assurance

Certification initially involves a variety of requirements to demonstrate that engines and equipment are designed to meet applicable emission standards. After certification is complete, however, several important obligations apply to the certifying manufacturer or importer. For example, we require ongoing testing of production engines, as well as reporting of recurring defects. Manufacturers may also need to pay penalties if there is a violation and may need to perform a recall if their products are found to be noncompliant. For companies operating within the United States, we are generally able to take steps to communicate clearly and insist on compliance with applicable regulations. For example, in certain circumstances we may meet with specific company representatives, halt production, or seize assets. For companies without staff or assets in the United States, these alternatives are not available. Accordingly, we have limited ability to enforce our requirements or recover any appropriate penalties, which increases the risk of environmental problems as well as problems for owners. This creates the potential for a company to gain a competitive advantage if they do not have substantial assets or operations in the United States by avoiding some of the costs of complying with EPA regulations.

To address this concern, we are adopting a requirement for manufacturers of certified engines and equipment (including importers) to post a bond to cover any potential compliance or enforcement actions under the Clean Air Act. Manufacturers and importers will be exempt from the bond requirement if they are able to sufficiently demonstrate an assurance that they will meet any compliance- or enforcement-related obligations. The bonding requirements apply for companies that do not have fixed assets in the United States meeting the smallest applicable thresholds from the following:

- A threshold of $3 million applies for manufacturers that have been certificate holders in each of the preceding ten years without failing a test conducted by EPA officials or having been found by EPA to be noncompliant under applicable regulations.
- A threshold of $6 million applies for secondary engine manufacturers or for equipment manufacturers that certify no engines with respect to exhaust emission standards. A secondary engine manufacturer is generally a certifying company that buys partially complete engines for final assembly from another engine manufacturer.
- A threshold of $10 million applies for companies that do not qualify for the smaller specified bond thresholds.

The value of the bond must be at least $500,000, though a higher bond value may apply based on multiplying the annual volume of shipments by a per-engine rate. The per-engine bond amount is $25 for handheld engines and Class I engines. Class II engines cover a much wider range of applications, so we further differentiate the bond for those engines. The proposed per-engine bond amounts for Class II engines is $50 for engines between 225 and 740 cc, $100 for engines between 740 and 1,000 cc, and $200 for engines above 1,000 cc. These values are generally scaled to be approximately 10 to 15 percent of the retail value. In the case of handheld engines, this is based on the retail value of equipment with installed engines, since these products are generally marketed that way. Class II engines are very often sold as loose engines to equipment manufacturers, so the corresponding per-engine bond values are based on the retail value of the engine alone. This approach is similar to the bond requirements that apply for nonroad diesel engines (see § 1039.626).

The total bond amount will be based on the value of imported products over a one-year period. If a bond is used to satisfy a judgment, the company will then be required to increase the amount of the bond within 90 days of the date the bond is used to cover the amount that was used. Also, we will require the bond to remain in place for five years after the company no longer imports Small SI engines.

These bonding requirements apply for 2010 and later model year engines and are enforceable for all products introduced into U.S. commerce starting January 1, 2010.

(d) Bond Requirements Related to Warranty

Warranty is an additional potential compliance obligation. Engine manufacturers must service warranty claims for emission-related defects that occur during the prescribed warranty period. We have experience with companies that have faced compliance-related problems where it was clear that they did not have the resources to make warranty repairs if that were necessary. Such companies benefit from certification without bearing the full range of associated obligations. We believe it is appropriate to add a requirement to post a bond to ensure that a company can meet their warranty obligations. The concern for being able to meet these obligations applies equally to domestic and foreign manufacturers. The biggest indicator of a manufacturer's ability to make warranty repairs relates to the presence of repair facilities in the United States. We are therefore adopting a bond requirement starting with the 2010 model year for all manufacturers (including importers) that do not have a repair network in the United States that is available for processing warranty repairs (see § 90.1007 and § 1054.120). Such a repair network will need to involve at least 100 authorized repair facilities in the United States, or at least one such facility for each 5,000 engines sold in the United States, whichever is less. Companies not meeting these criteria will need to post a bond as described above for compliance assurance. We will allow companies that must post bond to arrange for warranty repairs to be done at independent facilities. Note that a single bond payment will be required for companies that must post bond for compliance-related obligations, as described above, in addition to the bond for warranty-related obligations.

(e) Restrictions Related to Naming Model Years

We are adopting the proposed provisions that restrict what model years can be assigned to imported products. Importers can only declare a model year up to one year before the calendar year of importation in cases where new emission standards start to apply. We are adopting this requirement for all engine categories subject to part 1068. See the detailed discussion of this issue in Section VIII.C.

(f) Import-Specific Information at Certification

We are requiring additional information to improve our ability to oversee compliance related to imported engines (see § 90.107 and § 1054.205). In the application for certification, we are requiring the following additional information starting with the 2010 model year: (1) The port or ports at which the manufacturer has imported engines over the previous 12 months, (2) the names and addresses of the agents the manufacturer has authorized to import the engines, and (3) the location of the test facilities in the United States where the manufacturer will test the engines if we select them for testing under a selective enforcement audit. See Section 1.3 of the Summary and Analysis of Comments for further discussion related to naming test facilities in the United States. The current regulations in part 90 do not include these specific requirements; however, we do specify already that we may select imported engines at a port of entry. In such a case, we will generally direct the manufacturer to do testing at a facility in the United States. The new provision allows the manufacturers to make these arrangements ahead of time rather than relying on EPA's selection of a test lab. Also, the current regulations state in § 90.119 that EPA may conduct testing at any facility to determine whether engines meet emission standards.

(g) Counterfeit Emission Labels

We have observed that some importers attempt to import noncompliant products by creating an emission control information label that is an imitation of a valid label from another company. We are not requiring that certifying manufacturers take steps to prevent this, but we are including a provision that specifically allows manufacturers to add appropriate features to prevent counterfeit labels. This may include the engine's serial number, a hologram, or some other unique identifying feature. This provision is effective immediately upon completion of the final rule since it is an allowance and not a requirement (see § 90.114 and § 1054.135).

(h) Partially Complete Engines

As described in Section VIII, we are clarifying the engine manufacturers' responsibilities for certification with respect to partially complete engines. While this is intended to establish a path for secondary engine manufacturers to get their engines from the original engine manufacturer, we are aware that this will also prevent manufacturers from selling partially complete engines as a strategy to circumvent certification requirements. If long blocks or engines without fuel systems are introduced into U.S. commerce, either the original manufacturer or the company completing engine assembly will need to hold a certificate for that engine.

(7) Using Certified Small SI Engines in Marine Applications

Manufacturers have described situations in which Small SI engines are used in marine applications. As described in Section III.E.5, we are allowing limited numbers of certified Small SI engines to be used as marine propulsion engines without certifying to the Marine SI emission standards in part 1045 (see § 1045.610).

(8) Alternate Fuels

The emission standards apply to all spark-ignition engines regardless of the fuel they use. Almost all Small SI engines operate on gasoline, but these engines may also operate on other fuels, such as natural gas, liquefied petroleum gas, ethanol, or methanol. The test procedures in 40 CFR part 1065 describe adjustments needed for operating test engines with oxygenated fuels.

In some special cases, a single engine is designed to alternately run on different fuels. For example, some engines can switch back and forth between natural gas and LPG. We are adding a clarification to the regulations to describe how manufacturers would submit certification data and divide such engines into engine families. Manufacturers would submit test data for each type of fuel. If a manufacturer certifies a dual-fuel engine family, but produces engines that run only on one fuel where that dedicated-fuel engine is identical to the certified dual-fuel engine with respect to that fuel, those engines could be included in the same family. This is also true for the second fuel. For example, if a manufacturer produces an engine that can run on both gasoline and LPG, and also produces that engine model in gasoline-only and LPG-only versions, without adjusting the calibration or other aspects of each respective configuration, those engines may all be included in the same engine family. In effect, these engines are covered by the original certificate because they are made to conform to the description included in the original application for certification except that they do not have the full functionality of the dual-fuel engines.

Once an engine is placed into service, someone might want to convert it to operate on a different fuel. This would take the engine out of its certified configuration, so we are requiring that someone performing such a fuel conversion go through a certification process. We will allow certification of the complete engine using normal certification procedures, or the aftermarket conversion kit could be certified using the provisions of 40 CFR part 85, subpart V. This contrasts with the existing provisions that allow for fuel conversions that can be demonstrated not to increase emission levels above the applicable standard. We are applying this requirement starting January 1, 2010. (See § 90.1003 and § 1054.635.)

(9) Other Provisions

We are also making a variety of changes in the provisions that make up the certification and compliance program. Most of these changes serve primarily to align with the regulations we have started to apply to other types of engines.

The new warranty provisions are based on the requirements that already apply under 40 CFR part 90. We are adding an administrative requirement to describe the provisions of the emission-related warranty in the owners manual. We expect that many manufacturers already do this but believe it is appropriate to require this as a routine practice. (See § 1054.120.)

Testing new engines requires a period of engine operation to stabilize emission levels. The regulations specify two separate figures for break-in periods for purposes of certification testing. First, engines are generally operated long enough to stabilize emission levels. Second, we establish a limit on how much an engine may operate and still be considered a ''low-hour'' engine. The results of testing with the low-hour engine are compared with a deteriorated value after some degree of service accumulation to establish a deterioration factor. For Marine SI engines, we are requiring that the engine can be presumed to have stabilized emission levels after 12 hours of engine operation, with a provision allowing approval for more time if needed, and we generally require that low-hour test engines have no more than 30 hours of engine operation. However, given the shorter useful life for many Small SI engines, this will not make for a meaningful process for establishing deterioration factors. For example, emission levels in Small SI engines may not stabilize before deterioration begins to affect emission levels, which will prevent the engine from ever truly having stabilized emission levels. Also, the low-hour emission test should occur early enough for the deterioration factor to adequately represent the deterioration over the engine's lifetime.

We are requiring that Small SI engines with a useful life above 300 hours can be presumed stable after 12 hours with low-hour testing generally occurring after no more than 24 hours of engine operation. For Small SI engines with useful life below 300 hours, we are requiring a combination of provisions to address this concern. First, we are allowing manufacturers to establish a stabilization period that is less than 12 hours without showing that emission levels have fully stabilized (see § 1054.501). Second, we are specifying that low-hour testing must generally occur after no more than 15 hours of engine operation (see § 1054.801). This allows some substantial time for break-in, stabilization, and running multiple tests, without approaching a significant fraction of the useful life. Third, we are requiring that manufacturers consistently test low-hour production-line engines (and emission-data engines in the case of carryover deterioration factors for certification) using the same degree of service accumulation to avoid inaccurate application of deterioration factors (see § 1054.240 and § 1054.305).

We are clarifying the maintenance that manufacturers may perform during service accumulation as part of the certification process. The general approach is to allow any amount of maintenance that is not emission-related, but to allow emission-related maintenance only if it is a routine practice with in-use engines. In most of our emission control programs we specify that 80 percent of in-use engines should undergo a particular maintenance step before manufacturers can do that maintenance during service accumulation for certification testing. We are aware that Small SI engines are predominantly operated by homeowners with widely varying practices in servicing their lawn and garden equipment. As such, achieving a rate of 80 percent may be possible only for the most obvious maintenance steps. We are therefore adopting a more accommodating approach for Small SI engines. In particular, we are allowing manufacturers to perform a maintenance step during certification based on information showing that 60 to 80 percent of in-use engines get the specified maintenance at the recommended interval. We will approve the use of such maintenance based on the relative effect on performance and emissions. For example, we may allow scheduled fuel-injector replacement if survey data show this is done at the recommended interval for 65 percent of engines and performance degradation is shown to be roughly proportional to the degradation in emission control for engines that do not have their fuel injectors replaced.

One maintenance step of particular interest is replacement of air filters. In larger spark-ignition engines, we do not treat replacement of air filters as critical emission-related maintenance, largely because those engines have feedback controls to compensate for changes in varying pressure drop across the air filter. However, for Small SI engines varying air flow through the air filter has a direct effect on the engine's air-fuel ratio, which in turn directly affects the engine's emission rates for each of the regulated pollutants. Service accumulation generally takes place in laboratory conditions with far less debris, dust, or other ambient particles that will cause filter loading, so filter changes should be unnecessary to address this conventional concern. We are concerned that the greater effect is from fuel and oil that may deposit on the back side of the filter, especially from crankcase ventilation into the intake. This effect will go undetected if there are no measurements with filters that have experienced significant engine operation. We believe it would be appropriate for this rulemaking to allow manufacturers to clean or change air filters as long as manufacturers perform emission measurements before and after these maintenance steps. It would be best to perform testing with each air filter change; however, we would find it acceptable if manufacturers tested engines before and after every other air filter change. This approach allows for continued air filter changes, consistent with our testing to establish the feasibility of the Phase 3 emission standards, but properly identifies the effect on emissions. We are taking a similar approach for maintenance with spark plugs, except that tests must occur before and after each step to clean or replace the spark plugs. We will be interested in a future rulemaking to set emission standards based on less optimistic assumptions regarding the degree of air filter and spark plug maintenance with in-use equipment.

See Section 2.4 of the Summary and Analysis of Comments for a more detailed discussion related to maintenance.

We are defining criteria for establishing engine families that are very similar to what is currently specified in 40 CFR part 90. We are requiring that engines with turbochargers be in a different family than naturally aspirated engines since that will be likely to substantially change the engine's emission characteristics. Very few if any Small SI engines are turbocharged today so this change will not be disruptive for any manufacturer. We are also specifying that engines must have the same number and arrangement of cylinders and approximately the same total displacement. This will help us avoid the situation where manufacturers argue that engines with substantially different engine blocks should be in the same engine family. We will implement this provision consistent with the approach adopted by California ARB in which they limit engine families to include no more than 15 percent variation in total engine displacement. Similarly, the current regulations in part 90 do not provide a clear way of distinguishing engine families by cylinder dimensions (bore and stroke) so we are also changing part 90 to limit the variation in displacement within an engine family to 15 percent. (See § 1054.230 and § 90.116.)

The test procedures for Small SI engines are designed for engines operating in constant-speed applications. This covers the large majority of affected equipment; however, we are aware that engines installed in some types of equipment, such as small utility vehicles or go carts, are not governed to operate only at a single rated speed. These engines will be certified based on their emission control over the constant-speed duty cycle even though they do not experience constant-speed operation in use. We are not prepared to establish a new duty cycle for these engines but we are requiring engine manufacturers to explain how their emission control strategy is not a defeat device in the application for certification. For example, if engines will routinely experience in-use operation that differs from the specified duty cycle for certification, the manufacturer should describe how the fuel-metering system responds to varying speeds and loads not represented by the duty cycle. We are also requiring that engine distributors and equipment manufacturers that replace installed governors must get a new certificate of conformity for those engines to avoid a tampering violation.

F. Small-Business Provisions

(1) Small Business Advocacy Review Panel

On August 17, 2006, we convened a Small Business Advocacy Review Panel (SBAR Panel or the Panel) under section 609(b) of the Regulatory Flexibility Act (RFA), as amended by the Small Business Regulatory Enforcement Fairness Act of 1996 (SBREFA). The purpose of the Panel was to collect the advice and recommendations of representatives of small entities that could be affected by this rule and to prepare a report containing the Panel's recommendations for small entity flexibilities based on those comments, as well as on the Panel's findings and recommendations regarding the elements of the Initial Regulatory Flexibility Analysis (IRFA) under section 603 of the RFA. Those elements of an IRFA are:

- A description of, and where feasible, an estimate of the number of small entities to which the rule will apply;
- A description of projected reporting, recordkeeping, and other compliance requirements of the rule, including an estimate of the classes of small entities that will be subject to the requirements and the type of professional skills necessary for preparation of the report or record;
- An identification, to the extent practicable, of all relevant Federal rules that may duplicate, overlap, or conflict with the rule; and
- A description of any significant alternative to the rule that accomplishes the stated objectives of applicable statutes and that minimizes any significant economic impact of the rule on small entities.

The report of the Panel has been placed in the rulemaking record for this final rule.

In addition to EPA's Director of the Office of Regulatory Management and Information who acted as chairperson, the Panel consisted of the Director of EPA's Assessment and Standards Division of the Office of Transportation and Air Quality, the Administrator of the Office of Management and Budget's Office of Information and Regulatory Affairs, and the Chief Counsel for Advocacy of the Small Business Administration.

Using definitions provided by the Small Business Administration (SBA), companies that manufacture internal-combustion engines and that employ fewer than 1,000 people are considered small businesses for the SBAR Panel. Companies that manufacture equipment and that employ fewer than 500 people, or fewer than 750 people for manufacturers of construction equipment, or fewer than 1,000 people for manufacturers of generators, are considered small businesses for the SBAR Panel. Based on this information, we asked 25 companies that met the SBA small business thresholds to serve as small entity representatives for the duration of the Panel process. Of these 25 companies, 14 of them represented a cross-section of Small SI engine manufacturers, equipment manufacturers, and fuel system component manufacturers. (The rest of the companies were involved in the Marine SI market.)

With input from small entity representatives, the Panel drafted a report providing findings and recommendations to us on how to reduce the potential burden on small businesses that may occur as a result of the proposed rule. The Panel report is included in the rulemaking record for this final rule. In light of the Panel report, and where appropriate, we proposed a number of provisions for small business engine manufacturers and small business equipment manufacturers. We are adopting all the flexibility options as proposed. The following section describes the flexibility options being adopted in this final rule.

(2) Burden Reduction Approaches for Small-Volume Nonhandheld Engine Manufacturers

We are incorporating several provisions for small business nonhandheld engine manufacturers. The purpose of these provisions is to reduce the burden on companies for which fixed costs cannot be distributed over a large number of engines.

Under EPA's current Phase 2 regulations, EPA provided a number of provisions for small-volume engine manufacturers. For the Phase 2 regulations, the criteria for determining if a company was a ''small-volume engine manufacturer'' was based on whether the company projected at certification to have production of no more than 10,000 nonhandheld engines per year (excluding engines sold in California that are subject to the California ARB standards). Based on past experience, EPA believes that determining the applicability of the provisions based on number of employees, as compared to volume of products, can be more problematic given the nature of the workforce in terms of full-time, part-time, contract, overseas versus domestic, and parent companies. EPA believes it can avoid these potential complications and still provide relief to nearly all small businesses by continuing to use the annual sales criteria for determining which entities qualify as a small volume engine manufacturer under the Phase 3 program. For these reasons, EPA is retaining the current production-based criteria for determining who is a small-volume engine manufacturer and, as a result, eligible for the Phase 3 flexibilities described below (see § 1054.801).

Based on confidential sales data provided to EPA by engine manufacturers, the 10,000 unit cut-off for engine manufacturers will include all the small business engine manufacturers currently identified using SBA's employee-based definition. To ensure all small businesses have access to the flexibilities described below, EPA is also allowing engine manufacturers exceeding the production cut-off level noted above but having fewer than 1,000 employees to request treatment as a small-volume engine manufacturer (see § 1054.635). In such a case, the manufacturer will need to provide information to EPA demonstrating that the manufacturer has fewer employees than the 1,000 cut-off level to be approved as a small-volume engine manufacturer.

If a small-volume engine manufacturer grows over time and exceeds the production volume limit of 10,000 nonhandheld engines per year, the engine manufacturer will no longer be eligible for the small-volume flexibilities. However, because some of the flexibilities described below provide manufacturers with the ability to avoid certain testing such as durability testing or production line testing, it may be difficult for a manufacturer to fully comply with all the testing requirements immediately upon losing its small-volume status. In such cases, the engine manufacturer can contact EPA and request additional time, subject to EPA approval, before they would be required to meet the testing requirements that generally apply to engine manufacturers.

(a) Assigned Deterioration Factors

We are allowing small-volume engine manufacturers to rely on an assigned deterioration factor to demonstrate compliance with the standards for the purposes of certification rather than doing service accumulation and additional testing to measure deteriorated emission levels at the end of the regulatory useful life (see § 1054.240). EPA is not establishing actual levels for the assigned deterioration factors with this final rule. EPA intends to analyze emissions deterioration information that becomes available over the next few years to determine what deterioration factors will be appropriate for nonhandheld engines. This is likely to include deterioration data for engines certified to comply with California ARB's Tier 3 standards and engines certified early to EPA's Phase 3 standards. Prior to the implementation date for the Phase 3 standards, EPA will provide guidance to engine manufacturers specifying the levels of the assigned deterioration factors for small-volume engine manufacturers.

(b) Exemption From Production-Line Testing

We are exempting small-volume engine manufacturers from the production-line testing requirements (see § 1054.301). Therefore, small-volume engine manufacturers will not be required to perform production-line testing on any of their engine families.

(c) Additional Lead Time

We are allowing small-volume engine manufacturers to delay implementation of the Phase 3 exhaust emission standards for two years (see § 1054.145). Small-volume engine manufacturers will be required to comply with the Phase 3 exhaust emission standards beginning in model year 2014 for Class I engines and model year 2013 for Class II engines. Under this approach, manufacturers will be able to apply this delay to all their nonhandheld engines or to just a portion of their production. For those engine families that are certified to meet the Phase 3 standards prior to these delayed dates by selecting an FEL at or below the Phase 3 standards, small volume engine manufacturers can generate early Phase 3 credits (as discussed in Section V.C.3) through the 2013 model year for Class I engines and through the 2012 model years for Class II engines. This option provides more lead time for small-volume engine manufacturers to redesign their products. They will also be able to learn from some of the hurdles overcome by larger manufacturers.

(d) Broad Engine Families

We are also allowing small-volume engine manufacturers to use a broader definition of engine family for certification purposes. Under the existing engine family criteria specified in the regulations, manufacturers group their various engine lines into engine families that have similar design characteristics including the combustion cycle, cooling system, cylinder configuration, number of cylinders, engine class, valve location, fuel type, aftertreatment design, and useful life category. We are allowing small-volume engine manufacturers to group all their Small SI engines into a single engine family for certification by engine class and useful life category, subject to good engineering judgment (see § 1054.230).

(e) Hardship Provisions

We are also establishing two types of hardship provisions for nonhandheld engine manufacturers consistent with the Panel recommendations. As has been our experience with similar provisions already adopted, we anticipate that hardship mechanisms will be used sparingly. First, under the unusual circumstances hardship provision, any manufacturer subject to the new standards may apply for hardship relief if circumstances outside their control cause the failure to comply and if failure to sell the subject engines or equipment or fuel system component would have a major impact on the company's solvency (see § 1068.245). An example of an unusual circumstance outside a manufacturer's control may be an ''Act of God,'' a fire at the manufacturing plant, or the unforeseen shutdown of a supplier with no alternative available. The terms and time frame of the relief will depend on the specific circumstances of the company and the situation involved. As part of its application for hardship, a company will be required to provide a compliance plan detailing when and how it will achieve compliance with the standards. This hardship provision will be available to all manufacturers of engines, equipment, boats, and fuel system components subject to the new standards, regardless of business size.

Second, an economic hardship provision allows small businesses subject to the new standards to petition EPA for limited additional lead time to comply with the standards (see § 1068.250). A small business must make the case that it has taken all possible business, technical, and economic steps to comply, but the burden of compliance costs would have a significant impact on the company's solvency. Hardship relief could include requirements for interim emission reductions and/or the purchase and use of emission credits. The length of the hardship relief decided during review of the hardship application will be up to one year, with the potential to extend the relief as needed. We anticipate that one to two years will normally be sufficient. As part of its application for hardship, a company will be required to provide a compliance plan detailing when and how it will achieve compliance with the standards. This hardship provision will be available only to qualifying small businesses.

(3) Burden Reduction Approaches for Small-Volume Nonhandheld Equipment Manufacturers

We are establishing three provisions for small-volume nonhandheld equipment manufacturers. The purpose of these provisions is to reduce the burden on companies for which fixed costs cannot be distributed over large sales volumes. That is useful for small-volume equipment manufacturers that may need more lead time to redesign their equipment to accommodate the new Phase 3 engine designs.

Under EPA's current Phase 2 regulations, EPA provided a number of lead time provisions for small-volume equipment manufacturers. For the Phase 2 regulations, the criteria for determining if a company was a ''small-volume equipment manufacturer'' was based on whether the company produced fewer than 5,000 nonhandheld pieces of equipment per year (excluding equipment sold in California that are subject to the California ARB standards). For the same reasons noted above for engine manufacturers, EPA is retaining the current production-based criteria for determining who is a small-volume equipment manufacturer and, as a result, eligible for the Phase 3 flexibilities described below (see § 1054.801). The determination of which companies qualify as small-volume equipment manufacturers for the purposes of the flexibilities described below will be based on the average annual U.S.-directed production of nonhandheld equipment over three years from 2007 through 2009.

Based on estimated sales data for equipment manufacturers, EPA believes the 5,000 unit cut-off for equipment manufacturers will include almost all the small business equipment manufacturers using SBA's employee-based definition. However, to ensure all small businesses have access to the flexibilities described below, EPA is also allowing equipment manufacturers which exceed the production cut-off level noted above, but comply with SBA's employee-based definition (e.g., 500 employees for equipment manufacturers, 750 employees for construction equipment manufacturers, and 1,000 employees for generator manufacturers), to request treatment as a small-volume equipment manufacturer (see § 1054.635). In such a case, the manufacturer must provide information to EPA demonstrating that the manufacturer has fewer employees than the applicable employee cut-off level to be approved as a small-volume equipment manufacturer.

(a) Additional Lead Time

As described in Section V.E.3., EPA is implementing a transition program for all equipment manufacturers that produce Class II equipment. Under that program, equipment manufacturers can install Phase 2 engines in limited numbers of Class II equipment over the first four years the Phase 3 standards apply (i.e., 2011 through 2014). The number of equipment that can use Phase 2 engines is based on 30 percent of an average annual production level of Class II equipment. However, for small-volume equipment manufacturers, EPA is allowing a higher level of allowances. Small-volume equipment manufacturers can install Phase 2 engines at a level of 200 percent of an average annual production level of Class II equipment. Small-volume equipment manufacturers can use these allowances over the same four year period of the transition program noted above (see § 1054.625). Therefore, a small-volume equipment manufacturer could potentially use Phase 2 engines on all their Class II equipment for two years, consistent with the SBAR Panel's recommendation, or they might, for example, sell half their Class II equipment with Phase 2 engines for four years assuming sales stay constant over time.

(b) Simplified Certification Procedure

We are establishing a simplified engine certification procedure for all equipment manufacturers, including small-volume equipment manufacturers (see § 1054.612). See Section V.E.4 for further discussion of this provision.

(c) Hardship Provisions

Because nonhandheld equipment manufacturers in many cases depend on engine manufacturers to supply certified engines in time to produce complying equipment, we are also establishing a hardship provision for all nonhandheld equipment manufacturers, regardless of size. The provision will allow an equipment manufacturer to request more time if they are unable to obtain a certified engine and they are not at fault and will face serious economic hardship without an extension (see § 1068.255).

G. Technological Feasibility

(1) Level of Standards

We are promulgating new, more stringent exhaust $HC+NO_X$ standards for Class I and II Small SI engines. We are also establishing a new CO standard for Small SI engines used in marine generator applications.

For the 2008 model year manufacturers have certified nearly 500 Class I and II engine families to the Phase 2 standards using a variety of engine designs and emission control technology. All Class I engines were produced using carbureted air-fuel induction systems. A small number of engines used catalyst-based emission control technology. Similarly, Class II engines were predominantly carbureted. A limited number of these engines used catalyst technology, electronic engine controls and fuel injection, or were water-cooled. In both classes, several engine families were certified at levels that will comply with the new Phase 3 standards. Also, several families were very close to the new emission standards. This suggests that, even accounting for the relative increase in stringency associated with the Phase 3 requirements, some families either will not need to do anything or will require only modest reductions in their emission performance to meet the new standards. However, many engine families clearly will have to do more to improve their emission controls.

Based on our own testing of advanced technology for these engines, our engineering assessments, and statements from the affected industry, we believe the new requirements will require many engine manufacturers to adopt exhaust aftertreatment technology using catalyst-based systems. Other likely changes include improved engine designs and fuel delivery systems. Finally, adding electronic controls or fuel injection systems may obviate the need for catalytic aftertreatment for some engine families, with the most likely candidates being multi-cylinder engine designs.

(2) Implementation Dates

We are establishing $HC+NO_X$ exhaust emission standards of 10.0 g/kW-hr for Class I engines starting in the 2012 model year and 8.0 g/kW-hr for Class II engines starting in the 2011 model year. For both classes of nonhandheld engines, we are maintaining the existing CO standard of 610 g/kW-hr. We expect manufacturers to meet these standards by improving engine combustion and adding catalysts on most engines.

For spark-ignition engines used in marine generators, we are promulgating a more stringent Phase 3 CO emission standard of 5.0 g/kW-hr. This will apply equally to all sizes of engines subject to the Class I and II Small SI engine standards, with implementation dates as described above relative to Class I and Class II engines.

(3) Technological Approaches

Our feasibility assessment began by evaluating the emissions performance of current technology for Small SI engines and equipment. These initial efforts focused on developing a baseline for emissions and general engine performance so we could assess the potential for new emission standards for engines and equipment in this category. This process involved laboratory and field evaluations of the current engines and equipment. We reviewed engineering information and data on existing engine designs and their emissions performance. Patents of existing catalyst/muffler designs for Class I engines were also reviewed. We engaged engine manufacturers and suppliers of emission control-related engine components in discussions regarding recent and expected advances in emissions performance beyond that required to comply with the current Phase 2 standards. Finally, we purchased catalyst/muffler units that were already in mass production by an engine manufacturer for use on European walk-behind lawn mowers and conducted engineering and chemical analyses on the design and materials of those units.

We used the information and experience gathered in the above effort, along with the previous catalyst design experience of our engineering staff, to design and build prototype catalyst-based emission control systems that were capable of effectively and safely achieving the new Phase 3 requirement based on dynamometer and field testing. We also used the information and the results of our engine testing to assess the potential need for improvements to engine and fuel system designs, and the selective use of electronic engine controls and fuel injection on some engine types. A great deal of this effort was conducted in association with our more exhaustive study regarding the efficacy and safety of implementing advanced exhaust emission controls on Small SI engines, as well as new evaporative requirements for these engines. In other testing, we evaluated advanced emission controls on a multi-cylinder Class II engine with electronic fuel injection. The results of that study are also discussed in Section VII.

In our test program to assess the feasibility of achieving the Phase 3 $HC+NO_X$ standard, we evaluated 15 Class I engines of varying displacements and valve-train designs. Each of these engines was equipped with a catalyst-based control system and all achieved the applicable standard at the end of their regulatory useful lives. Our work also suggests that manufacturers of Class I engines may need to improve the durability of their basic engine designs, ignition systems, or fuel metering systems for some engines to comply with the emission regulations.

We tested five single-cylinder, overhead-valve Class II engines with prototype catalyst/muffler control systems. Three of the engines were carbureted and two were equipped with electronic engine and fuel controls. This latter technology improves the management of air-fuel mixtures and ignition spark timing. Each of the engines achieved the requisite emission limit for $HC+NO_X$ (i.e., 8.0 g/kW-hr). Based on this work and information from one manufacturer of emission controls, we believe either a catalyst-based system or electronic engine controls appear sufficient to meet the standard. Recent certification data also suggests a number of Class II engines may be able to comply with the new standard with engine modifications only. Finally, similar to Class I engines, we found that manufacturers of Class II engines may also need to improve the durability of their ignition systems or fuel metering systems for some engines to comply with the emission regulations.

Multi-cylinder Class II engines are very similar to their single-cylinder counterparts regarding engine design and combustion characteristics. There are no multi-cylinder Class I engines. Based on these attributes and our testing of two twin-cylinder engines, we conclude that the Phase 3 $HC+NO_X$ standard is technically feasible.

Nonetheless, we also found that multi-cylinder engines may present a unique concern with the application of catalytic control technology under atypical operating conditions. More specifically, the concern relates to the potential consequences of combustion misfire or a complete lack of combustion in one of the two or more cylinders when a single catalyst/muffler design is used. A single muffler is typically used in Class II applications. In a single-catalyst system, the unburned fuel and air mixture from the malfunctioning cylinder could combine with hot exhaust gases from the other, properly operating cylinder. This condition can create high temperatures within the muffler system as the unburned fuel and air charge from the misfiring cylinder combusts within the exhaust system. This could potentially destroy the catalyst.

One solution is simply to have a separate catalyst/muffler for each cylinder. Another solution is to employ electronic engine controls to monitor ignition and put the engine into ''limp-mode'' until necessary repairs are made. For engines using carburetors, this would effectively require the addition of electronic controls. For engines employing electronic fuel injection that may need to add a small catalyst, it will require that the electronic controls incorporate ignition misfire detection if they do not already utilize the inherent capabilities within the engine management system.

As described earlier, we also expect some engine families to use electronic fuel injection to meet the Phase 3 standard without employing catalytic aftertreatment. Engine families that already use these fuel metering systems and are reasonably close to complying with the new requirement are likely to need only additional calibration changes to the engine management system for compliance. In addition, we expect that some engine families that currently use carbureted fuel systems will convert directly to electronic fuel injection. Manufacturers may adopt this strategy to couple achieving the standard without a catalyst and realizing other advantages of using fuel injection such as easier starting, more stable and reliable engine operation, and reduced fuel consumption.

Our evaluation of electronic fuel injection systems that could be used to attain the new standard found that a rather simple, low-cost system should be sufficient. We demonstrated this proof of concept as part of the engine test program we conducted in anticipation of the proposed rule. In that program, we fitted two single-cylinder Class II engines with an electronic control unit and fuel system components developed for motor-scooters and small-displacement motorcycles for Asian markets. The sensors for the system were minimized to include a throttle position sensor, air charge temperature sensor, oil temperature sensor, manifold absolute pressure sensor, and a crankshaft position sensor. This is in contrast to the fuel injection systems currently used in some equipment with two-cylinder Class II engine applications that employ more sophisticated and expensive automotive-based components.

Finally, there are a number of Class II engines that use gaseous fuels (i.e., liquefied petroleum gas or natural gas). Based on our engineering evaluation of current and likely emission control technology for these engines, we conclude that there are no special concerns relative to achieving the Phase 3 $HC+NO_X$ standard.

Turning to the Phase 3 CO standard for Class I and II Small SI engines used in marine generator applications, these engines have several rather unique design considerations that are relevant to achieving the new standard. Marine generator engines are designed to operate for very long periods. Manufacturers generally design the engines to operate at lower loads to accommodate continuous operation. Manufacturers also design them to take advantage of the cooling available from the water in the lake or river where the boat is operating (seawater). By routing seawater through the engine block, or using a heat exchanger that transfers heat from the engine coolant to the seawater, manufacturers are able to maintain engine temperatures as well as or better than automotive engines. Stable temperatures in the engine block make a very significant difference in engine operation, enabling much less distortion of the cylinders and a much more consistent combustion event. These operating characteristics make it possible to introduce advanced technology for controlling emissions. Manufacturers also use this cooling water in a jacketing system around the exhaust in order to minimize surface temperatures and reduce the risk of fires on boats.

The vast majority of gasoline marine generators are produced by two engine manufacturers. Recently, these two manufacturers have converted their marine generator product lines to new designs which can reduce CO emissions by more than 99 percent. These manufacturers stated that this action is to reduce the risk of CO poisoning in response to demands from boat builders. These low-CO emission designs use closed-loop electronic fuel injection and catalytic control. Both of these manufacturers have certified low-CO engines capable of complying with the new standards. These manufacturers also use electronic controls to monitor catalyst function.

(4) Consideration of Regulatory Alternatives

In developing the final emission standards, we considered what was achievable with catalyst technology. Our technology assessment work indicated that the new emission standards are feasible in the context of provisions for establishing emission standards prescribed in section 213 of the Clean Air Act. We also considered what could be achieved with larger, more efficient catalysts and improved fuel induction systems. In particular, Chapter 4 of the Final RIA presents data on Class I engines with more active catalysts and on Class II engines with closed-loop control fuel injection systems in addition to a catalyst. In both cases larger emission reductions were achieved.

Based on this work we considered $HC+NO_X$ standards involving a 50 percent reduction for Class I engines and a 65–70 percent reduction for Class II engines. Chapter 11 of the Final RIA evaluates these alternatives, including an assessment of the overall technology and costs of meeting more stringent standards. For Class I engines a 50 percent reduction standard would require base engine changes not necessarily involved with the standards we are finalizing and the use of a more active catalyst. For Class II engines this would likely require the widespread use of closed-loop fuel injection systems rather than carburetors and some other engine upgrades in addition to the use of three-way catalysts.

We believe it is not appropriate at this time to adopt more stringent exhaust emission standards for Small SI engines. Our key concern is lead time. More stringent standards will require three to five years of lead time beyond the 2011 model year start date we are allowing for the program contained in this final rule. We believe it will be more effective to implement the new Phase 3 standards to achieve near-term emission reductions needed to reduce ozone precursor emissions and to minimize growth in the Small SI exhaust emissions inventory in the post 2010 time frame. More efficient catalysts, engine improvements, and closed-loop electronic fuel injection could be the basis for more stringent Phase 4 emission standards at some point in the future.

(5) Our Conclusions

We believe the Phase 3 exhaust emission standards for nonhandheld Small SI engines will achieve significant emission reductions. Manufacturers will likely meet the new standards with a variety of strategies including catalysts packaged in mufflers, engine modifications, and fuel-injection systems. Test data from readily available technologies have demonstrated the feasibility of achieving the new emission levels.

As discussed in Section VII, we believe the new standards will have no negative effects on energy, noise, or safety and may lead to some positive effects.

VI. Evaporative Emissions

A. Overview

In this final rule, we are also establishing standards for controlling evaporative emissions from fuel systems in marine vessels and equipment powered by Small SI engines. These new standards include requirements for controlling permeation and diurnal emissions from marine vessels and permeation and running loss emissions from Small SI equipment.

Evaporative emissions refer to hydrocarbons released into the atmosphere when gasoline or other volatile fuels escape from a fuel system. The primary source of evaporative emissions from nonroad gasoline engines and equipment is known as *permeation,* which occurs when fuel penetrates the material used in the fuel system and reaches the ambient air. This is especially common through rubber and plastic fuel-system components such as fuel lines and fuel tanks. *Diurnal emissions* are another important source of evaporative emissions. Diurnal emissions occur as the fuel heats up due to increases in ambient temperature. As the fuel heats, liquid fuel evaporates into the vapor space inside the tank. In a sealed tank, these vapors will increase the pressure inside the tank; however, most tanks are vented to prevent this pressure buildup. The evaporating fuel therefore drives vapors out of the tank into the atmosphere. *Running loss emissions* are similar to diurnal emissions except that vapors escape the fuel tank as a result of heating from the engine or some other source of heat during operation rather than from normal daily temperature changes.

Other sources of evaporative emissions include diffusion and refueling. *Diffusion emissions* occur when vapor escapes the fuel tank through an opening as a result of random molecular motion, independent of changing temperature. Although we are not adopting a specific standard for diffusion emissions, we expect that these emissions will be controlled through the running loss and diurnal emission controls. *Refueling losses* are vapors that are displaced from the fuel tank to the atmosphere when someone fills a fuel tank. *Refueling spitback* is the spattering of liquid fuel droplets coming out of the filler neck during a refueling event. *Spillage* is fuel that is spilled while refueling. We are continuing to work with manufacturers to develop industry standards for refueling emission control, and we are adopting a requirement that manufacturers use fuel system designs that will help facilitate a reduction in fuel spillage.

B. Fuel Systems Covered by This Rule

The new evaporative emission standards will apply to fuel systems for both Small SI engines and Marine SI engines. The marine standards apply to fuel systems related to both propulsion and auxiliary engines. In some cases, specific standards are required only for certain types of equipment, as described below. These standards will apply only to new products.

We are incorporating the regulations related to evaporative emission standards in 40 CFR part 1060, as described in Section VI.C. Also, as described in Section VIII, we are allowing component manufacturers and some equipment manufacturers to certify products under the provisions of part 1060 with respect to recreational vehicles and Large SI engine. We have also adopted requirements for controlling evaporative emissions from marine compression-ignition engines that operate on volatile liquid fuels (such as methanol or ethanol). Now that we are adopting final requirements in part 1060, we are including a reference to part 1060 for these marine compression-ignition engines.

The following definitions are important in establishing which components are covered by the new standards: ''evaporative,'' ''fuel system,'' ''fuel line,'' ''portable nonroad fuel tank,'' and ''installed marine fuel tank.'' See the full text of these definitions in the final regulations at § 1060.801.

Note in particular that the new standards will apply to fuel lines, including hose or tubing that contains liquid fuel. This includes fuel supply lines but not vapor lines or vent lines that are not normally exposed to liquid fuel. We consider fuel return lines for handheld engines to be vapor lines, not fuel lines. Data in Chapter 5 of the Final RIA suggest that permeation rates through vapor lines and vent lines are already lower than the new standard; this is due to the low vapor concentration in the vapor line. In contrast, permeation rates for materials that are consistently exposed to saturated fuel vapor are generally considered to be about the same as that for liquid fuel. The new standards also do not apply to primer bulbs exposed to liquid fuel only for priming, but would apply to primer bulbs that are directly in the fuel supply line. This standard will apply to marine filler necks that are filled or partially filled with liquid fuel after a refueling event where the operator fills the tank as full as possible. In the case where the fuel system is designed to prevent liquid fuel from standing in the fill neck, the fill neck will be considered a vapor line and not subject to the new fuel line permeation standard.

A special note applies to fuel systems for auxiliary marine engines. These engines must meet exhaust emission standards that apply to land-based engines. For evaporative emissions, however, it is important that the fuel systems for propulsion and auxiliary engines be subject to the same standards because these engines typically draw fuel from a common fuel tank and share other fuel-system components. We are therefore applying the Marine SI evaporative emission standards and certification requirements to the fuel systems for both auxiliary and propulsion marine engines on marine vessels. We apply a similar approach for nonroad engines installed in motor vehicles (such as generators used to power motor homes). These engines must meet exhaust emission standards for nonroad engines, but the evaporative requirements apply under the motor-vehicle program.

Our evaporative emission standards for automotive applications are based on a comprehensive measurement from the whole vehicle. However, the evaporative standards in this final rule are generally based on individual fuel-system components. For instance, we are promulgating permeation standards for fuel lines and fuel tanks rather than for the equipment as a whole.[98] We have taken this approach for several reasons. First, most production of Small SI equipment and Marine SI vessels is not vertically integrated. In other words, the fuel line manufacturer, the engine manufacturer, the fuel tank manufacturer, and the equipment manufacturer are typically separate companies. In addition, there are several hundred equipment manufacturers and boat builders, many of which are small businesses. Testing the systems as a whole will place the entire certification burden on the equipment manufacturers and boat builders. Specifying emission standards and testing for individual components allows for measurements that are narrowly focused on the source of emissions and on the technology changes for controlling emissions. This correspondingly allows for component manufacturers to certify that their products meet applicable standards. We believe it is most appropriate for component manufacturers to certify their products since they are best positioned to apply emission control technologies and demonstrate compliance. Equipment manufacturers and boat builders will then be able to purchase certified fuel-system components rather than doing all their own testing on individual components or whole systems to demonstrate compliance with every requirement. In contrast, controlling running loss emissions cannot be done on a component basis so we are requiring engine or equipment manufacturers to certify that they meet the running loss standard. We will otherwise expect most equipment manufacturers to simply identify a range of certified components and install the components as directed by the component manufacturer to demonstrate compliance with the final emission standards.

Second, a great deal of diversity exists in fuel-system designs (hose lengths, tank sizes/shapes, number of connections, etc.). In most cases, the specific equipment types are low-volume production runs so sales will not be large enough to cover the expense of SHED-type testing. Third, there are similarities in fuel lines and tanks that allow for component data to be used broadly across products in spite of extensive variety in the geometry and design of fuel systems. Fourth, many equipment types, primarily boats, will not fit in standard-size SHEDs and will require the development of very large, very expensive test facilities if the entire vessel were tested.

Finally, by adopting separate standards for fuel line permeation, fuel tank permeation, diurnal emissions, and running loss emissions, we are able to include simplified certification requirements without affecting the level of the standards. Specifying a comprehensive test with a single standard for all types of evaporative emissions will make it difficult or impossible to rely on design-based certification. Requiring emission tests to cover the wide range of equipment models would greatly increase the cost of compliance with little or no increase in the effectiveness of the certification program. We believe the approach being adopted will allow substantial opportunities for market forces to appropriately divide compliance responsibilities among affected manufacturers and accordingly result in an effective compliance program at the lowest possible cost to society.

The new emission standards generally apply to the particular engines and their associated fuel systems. However, for ease of reference, we may refer to evaporative standards as being related to

[98] An exception to component certification is the design standard for controlling running loss emissions.

Small SI equipment or Marine SI vessels, meaning the relevant evaporative standards for engines and fuel systems used in such equipment or vessels.[99] See Section VI.F for a more detailed description of certification responsibilities for all the new evaporative standards.

C. Final Evaporative Emission Standards

We are establishing permeation standards for Small SI equipment and Marine SI vessels, covering permeation from fuel tanks and fuel lines. We are also adopting diurnal emission standards for Marine SI vessels. In addition, we are promulgating a running loss standard for nonhandheld Small SI equipment (except wintertime engines), with a variety of specified options for manufacturers to demonstrate compliance.

All the new evaporative emission standards apply to new equipment over a useful life period in years that matches the useful life of the corresponding engine (generally five or ten years). Manufacturers have expressed concern that they will not have time to gain five years of in-use experience on low-permeation fuel tanks by the effective dates of the tank permeation standards. Unlike barrier fuel line, which is well established technology, some fuel tanks may use barrier technologies that have not been used extensively in other applications. An example of this technology will be barrier surface treatments that must be properly matched to the fuel tank material. Therefore, we are finalizing a shorter useful life of two years for Marine SI and Small SI fuel tanks through the 2013 model year to allow manufacturers to gain experience in use (see §§ 1045.145 and 1054.145).

Handheld manufacturers have also expressed concerns about the durability of fuel lines used on cold-weather products. As noted below, we are adopting a separate fuel line requirement for cold-weather products. The manufacturers' concerns are similar to those noted in Section VI.C.2 below regarding fuel cap gasket/O-ring materials and how they may degrade in the field such that they have excessively high permeation rates but without leaking liquid fuel. Therefore, we are adopting a shorter useful life of two years for fuel lines used on cold-weather products through the 2013 model year to allow manufacturers to gain experience in use (see § 1054.145). Manufacturers have noted that they plan to gather in-use data on the permeation levels of cold-weather equipment. While we believe manufacturers will be able to design and produce cold-weather products that comply with fuel line permeation requirements for five years, we will review any industry-generated data on in-use fuel lines. Should the data demonstrate concerns with regard to in-use durability, we would consider options for addressing those concerns.

The new requirements for evaporative emissions are described in 40 CFR part 1060, with some category-specific provisions in 40 CFR parts 1045 and 1054, which are referred to as the exhaust standard-setting parts for each category of engine. The regulations in 40 CFR parts 1045 and 1054 highlight the standards that apply and provide any specific directions in applying the general provisions in part 1060. The standards, test procedures, and certification provisions are almost completely uniform across our programs so this combined set of evaporative-related provisions makes it much easier for companies to certify their products if they are not subject to the exhaust emission standards.

The rest of this section summarizes the new standards, additional requirements, and implementation dates. Unless otherwise stated, implementation dates specified below refer to the model year. Section VI.D describes how manufacturers may use emission credits to meet fuel tank permeation standards. Section VI.E describes the test procedures corresponding to each standard. Section VI.F describes how component and equipment manufacturers certify their products and how their responsibilities overlap in some cases. Section VI.F also describes the simplified process of design-based certification for meeting many of the new standards.

(1) Fuel Line Permeation Standards and Dates

Except as noted below, the new fuel line permeation standard is 15 g/m²/day at 23 °C using a test fuel containing 10 percent ethanol and applies to fuel lines intended for use in new Small SI equipment and Marine SI vessels (see § 1060.102 and § 1060.515). The form of the standard refers to grams of permeation over a 24-hour period divided by the inside surface area of the fuel line. This is consistent with the standard we adopted for fuel lines in recreational vehicles.

The move toward low-permeation fuel lines in recreational vehicles—and further development work in this area since the first proposed rule for marine evaporative emissions—demonstrates that low-permeation fuel lines are available on the market today for Small SI equipment and Marine SI vessels. In addition, many manufacturers are already using low-permeation technologies in response to permeation standards in California. We are therefore requiring that this standard apply beginning January 1, 2009 for Marine SI vessels and for nonhandheld Small SI equipment. Manufacturers have expressed concern that these early dates may cause them to have to transition to using new hose designs before they can use up their existing inventory. Under the provisions of § 1060.601(g), manufacturers would be able to use up existing inventory under normal business practices, even beyond the standard date. However, manufacturers would not be permitted to circumvent the standards by stockpiling noncompliant hose prior to the implementation of the standards.

For handheld equipment, we are promulgating a fuel line permeation implementation date of 2012, except that small-volume emission families as defined in § 1054.801 will have until 2013. Although low-permeation fuel line technology is available, handheld equipment is not currently subject to fuel line permeation requirements in California and does not typically use low-permeation fuel lines today. In addition, much of the fuel line used on handheld equipment is not straight-run fuel line for which low-permeation replacements are readily available; thus, more lead time is required.

Fuel line manufacturers have the primary responsibility to certify to the new emission standard. Equipment manufacturers may make arrangements to take on the certification responsibility if they find that to be to their advantage. If equipment manufacturers notify the fuel line manufacturer in writing that they commit to certifying the fuel line, then the fuel line manufacturer may ship uncertified and unlabeled fuel line to the equipment manufacturer.

By specifying standards for fuel-system components rather than the entire fuel system, we are separately addressing appropriate requirements for fuel line fittings that are exposed to liquid fuel but are not part of the fuel line. We are requiring that these fuel

[99] ''Small SI equipment'' includes all nonroad equipment powered by Small SI engines. ''Marine SI vessels'' includes all vessels powered by engines that run on volatile liquid fuels. In almost all cases these engines are powered by gasoline. Note also that volatile liquid fuels include methanol or ethanol, which could be used in a compression-ignition engine. While we are aware of no such equipment or vessels today, they will be covered by the final regulations. In this preamble, we nevertheless refer to all the vessels that fall within the scope of the final regulations as Marine SI vessels. Throughout this section, we generally refer to Small SI equipment and Marine SI vessels as ''equipment,'' consistent with the regulatory text.

line fittings meet the broad specifications described in § 1060.101(f), which generally require that fittings and connections be designed to prevent leaks. As described in Section VI.E.1, we are allowing the fuel line assembly to be tested as a single unit. This includes connecting pieces, primer bulbs, and other fuel line components as a single item (see § 1060.102). For example, manufacturers may certify fuel lines for portable marine fuel tanks as assemblies of fuel line, primer bulbs, and self-sealing end connections. Finally, we are requiring that detachable fuel lines be self-sealing when they are removed from the fuel tank or the engine because this will otherwise result in high evaporative emissions (see § 1060.101). To the extent that equipment manufacturers and boat builders certify their products, they will need to describe how they meet the equipment-based requirements in § 1060.101(f) in their application for certification (see § 1060.202). If boat builders rely on certified components instead of certifying, they will need to keep records describing how they meet the equipment-based requirements contained in § 1060.101(f) (see § 1060.210).

Handheld equipment manufacturers have raised concerns that fuel lines constructed of available low-permeation materials may not perform well in some handheld applications under extreme cold weather conditions such as below −30 °C. These products often use injected molded fuel lines with complex shapes and designs needed to address the unique equipment packaging issues and the high vibration and random movement of the fuel lines within the overall equipment when in use. Industry has expressed concern and the data in Chapter 5 of the Final RIA suggest that durability issues may occur from using certain low-permeation materials in these applications when the weather is extremely cold and that these could lead to unexpected fuel line leaks. Cold-weather equipment is limited to the following types of handheld equipment: chainsaws, cut-off saws, clearing saws, brush cutters with engines at or above 40cc, commercial earth and wood drills, and ice augers. This includes earth augers if they are also marketed as ice augers.

As discussed in the Final RIA, rubbers with high acrylonitrile (ACN) content are used in some handheld applications. These materials have about half the permeation of lower ACN-content rubbers also used in handheld applications. To capture the capability of these materials to reduce permeation emissions without creating other issues for cold-weather products, we are adopting a set of declining fuel line permeation standards for fuel lines used in cold-weather equipment that would phase-in from 2012 to 2016. The standard starts at 290 g/m²/day in 2012 and declines to 275 g/m²/day in 2013, 260 g/m²/day in 2014, and 245 g/m²/day in 2015. The standard for 2016 and later model years is 225 g/m²/day. The standards would apply to all cold-weather products, including small-volume families. Manufacturers would be allowed to demonstrate compliance with the 2012 through 2015 standards with a fuel line averaging program that is limited to cold-weather fuel lines. There would not be any banking or trading of these credits. Manufacturers comply with the averaging standard by naming a Family Emission Limit for each family of fuel lines; this Family Emission Limit serves as the emission standard for the family. Manufacturers may not name a Family Emission Limit higher than 400 g/m²/day during this period. Beginning in the 2016 model year, all fuel lines on cold-weather equipment must meet the 225 g/m²/day standard without averaging.

Outboard engine manufacturers have expressed concern that it will be difficult for them to meet final 2009 date for the sections of fuel lines that are mounted on their engines under the engine cowl. While some sections of straight-run fuel line are used with outboard engines, many of the smaller sections between engine mounted fuel-system components and connectors are preformed or injection-molded parts. Outboard engine manufacturers stated that they will need additional time to redesign and perform testing on low-permeation under-cowl fuel lines. To address this issue, we are finalizing a phase-in of under-cowl fuel line permeation standards. For each engine model, we are adopting a phase-in, by hose length, of 30 percent in 2010, 60 percent in 2011, 90 percent in 2012–2014 and 100 percent in 2015 and later. This will allow manufacturers to transition to the use of low-permeation fuel lines in an orderly fashion. Manufacturers also commented that additional lead time is necessary to develop low permeation primer bulbs such as those in fuel line assemblies for portable marine fuel tanks. To address this development time, we are finalizing an implementation date of 2011 for primer bulbs.

(2) Fuel Tank Permeation Standards and Dates

Except as noted below, we are requiring a fuel tank permeation standard of 1.5 g/m²/day for tanks intended for use in new Small SI equipment and Marine SI vessels based on the permeation rate of gasoline containing 10 percent ethanol at a test temperature of 28 °C (see § 1060.103 and § 1060.520). The emission standard is based on the inside surface area of the fuel tank and is consistent with that adopted for fuel tanks in recreational vehicles.

Many Small SI equipment manufacturers are currently using low-permeation fuel tanks for products certified in California. The California tank permeation test procedures use a nominal test temperature of 40 °C with California certification gasoline while we are requiring testing at 28 °C with gasoline containing 10 percent ethanol. We are allowing manufacturers the alternative of testing their fuel tanks at 40 °C with the EPA test fuel. Because permeation increases as a function of temperature, we are establishing an alternative standard of 2.5 g/m²/day for fuel tanks tested at 40 °C.

We consider three distinct classes of marine fuel tanks: (1) Portable marine fuel tanks (generally used with small outboard engines); (2) personal watercraft (PWC) fuel tanks; and (3) other installed marine fuel tanks (generally used with SD/I engines and larger outboard engines). The fuel tank permeation standards start in 2011 for all Small SI equipment using Class II engines and for personal watercraft and portable marine fuel tanks. For Small SI equipment using Class I engines and for other installed marine fuel tanks (including engine-mounted tanks), we are applying the same standard starting in 2012. Most of the marine fuel tanks with the later standards are produced in low volumes using rotation-molded cross-link polyethylene or fiberglass construction, both of which generally present a greater design challenge. We believe the additional lead time is necessary for these fuel tanks to allow for a smooth transition to low-permeation designs. For Small SI equipment, these dates also align with the schedule for introducing the Phase 3 exhaust emission standards.

For handheld equipment, we are adopting a phased-in implementation of the fuel tank permeation standards. Manufacturers will be required to meet the new fuel tank permeation standards in 2009 for products that they already certify in California (see § 90.129). The remaining equipment, except for structurally integrated nylon fuel tanks and small-volume families, will be subject to the new tank permeation standards in 2010 (see § 1054.110). Structurally integrated nylon fuel tanks will be subject to the new standards in

2011 and small-volume families will have to meet the new tank permeation standards beginning in 2013. Manufacturers will need to start using EPA-specified procedures starting in 2010, except that equipment certified using carryover data will be allowed to use data collected using procedures specified for compliance in California for model years 2010 and 2011 (see § 1054.145).

Fuel tank manufacturers have the primary responsibility to certify to the new emission standard. Equipment manufacturers may make arrangements to take on the certification responsibility if they find that to be to their advantage. If equipment manufacturers notify the fuel tank manufacturer in writing that they commit to certifying the fuel tank, then the fuel tank manufacturer may ship uncertified and unlabeled fuel tanks to the equipment manufacturer. Equipment manufacturers must certify that their fuel tanks meet the new emission standards if they comply using emission credits (whether the fuel tank manufacturer certifies or not), as described in Section VI.F. We are requiring that manufacturers of portable marine fuel tanks certify that their products meet the new permeation standard. This is necessary because portable fuel tanks are not sold to boat builders for installation in a vessel. Therefore, there is no other manufacturer who could be treated as the manufacturer responsible for meeting emission standards that apply to portable marine fuel tanks.

For the purpose of the new fuel tank permeation standards, a fuel cap directly mounted on the fuel tank is considered to be part of the fuel tank. The fuel cap would then be included in the tank permeation standard and test. The cap may optionally be tested separately from the tank and the results combined to determine the total tank permeation rate (see § 1060.521). Cap manufacturers could also test their caps and certify them separately to the 1.5 $g/m^2/day$ permeation standard. Alternatively, manufacturers may use a default cap permeation rate as described in Section IV.F.8.

As discussed above, manufacturers have expressed concerns with the long-term durability of known low-permeation elastomers in cold-weather applications. At the same time, manufacturers have commented that existing fuel cap gasket/O-ring materials may degrade in the field within a one-year period (depending on the weather and the fuel characteristics) such that they have excessively high permeation rates, but without leaking liquid fuel. To address this issue, we are allowing manufacturers to treat fuel cap seals on cold-weather equipment as an annual maintenance item. In the case of an in-use evaluation with cold-weather equipment where the manufacturer specified this scheduled maintenance at certification, any elastomeric fuel cap seal more than one year old would be replaced prior to preconditioning the tank for permeation testing. At the same time, it is not certain that low-permeation materials will deteriorate when used for fuel cap seals in cold-weather equipment. We intend to perform testing on fuel cap seals to determine the appropriateness of allowing manufacturers to specify scheduled maintenance to address these concerns. In the event that durable materials are identified, we may remove the provision allowing for this scheduled maintenance for purposes of compliance with fuel tank permeation standards.

(3) Diurnal Emission Standards and Dates

We are promulgating diurnal emission standards for gasoline fuel tanks intended for use in new Marine SI vessels (see § 1045.107). We consider three distinct classes of marine fuel tanks: (1) Portable marine fuel tanks (used with small outboards); (2) personal watercraft (PWC) fuel tanks; and (3) other installed fuel tanks (including engine-mounted fuel tanks). We believe the new requirements will achieve at least a 50 percent reduction in diurnal emissions from PWC and other installed marine fuel tanks and nearly a 100 percent reduction from portable marine fuel tanks.

For portable fuel tanks, we are adopting a design requirement that the tank remain sealed up to a pressure of 5.0 psi, starting on January 1, 2010 (see § 1060.105). We are also requiring that portable fuel tanks continue to be self-sealing when disconnected from an engine. We are requiring manufacturers of portable marine fuel tanks to certify that they meet the new diurnal emission standards. As described above for permeation standards, this certification responsibility may not be delegated to boat builders.

For installed fuel tanks, we are adopting a general diurnal emission standard of 0.40 g/gal/day based on a 25.6–32.2 °C temperature profile. The applicable test procedures are described in Section VI.E.3. Manufacturers have expressed concerns that some very large boats stay in the water throughout the boating season and therefore will see a much smaller daily swing in fuel temperatures, which corresponds with a smaller degree of diurnal emissions. We are addressing this concern with an alternative standard and test procedure that will apply only for nontrailerable boats. Using available measurements related to fuel temperatures and emission models to relate temperatures to projected diurnal emission levels, we are adopting an alternative standard of 0.16 g/gal/day based on a 27.6–30.2 °C temperature profile for fuel tanks installed in nontrailerable boats. For the purposes of this rule, we are defining a nontrailerable boat as one that is 26.0 feet or more in length, or more than 8.5 feet in width. The length specification is consistent with the U.S. Fish and Wildlife Service definition for ''nontrailerable recreational vessels'' in 50 CFR 86.12. The width specification is consistent with the width limitation specified in 49 CFR 658.15 by the Federal Motor Carrier Safety Administration for vehicles operating on the National Network.

Manufacturers will likely control diurnal emissions from installed marine fuel tanks either by sealing the fuel system up to 1.0 psi or by using a carbon canister in the vent line. As discussed below, we believe PWC manufacturers will likely seal the fuel tank with a pressure-relief valve while manufacturers of other boats with installed fuel tanks are more likely to use carbon canisters. However, either technology will be acceptable for either kind of installed marine fuel tank as long as every system meets the numerical standard applicable to the specific tank.

Personal watercraft currently use sealed fuel systems for preventing fuel from exiting, or water from entering, the fuel tank during typical operation. These vessels use pressure-relief valves for preventing excessive positive pressure in the fuel system; the pressure to trigger the valve may range from 0.5 to 4.0 psi. Such fuel systems also use a low-pressure vacuum-relief valve to allow the engine to draw fuel from the tank during operation without creating negative pressures in the tank. For personal watercraft, we are implementing the diurnal emission standards beginning with the 2010 model year.

Other vessels with installed fuel tanks typically are designed with open vent systems. In their comments, boat builders expressed general support of the feasibility of using carbon canisters on boats. In addition, the marine industry has expressed an interest in developing consensus standards for the installation of carbon canisters in boats. However, they commented that the development of these installation standards will take time and that a phase-in would be needed for an orderly transition to installing diurnal emission controls in their boat models. Therefore, we are giving additional lead time beyond what we specified in the proposal. For fuel tanks installed on a marine engine (such as under-cowl fuel tanks on outboard engines), the diurnal emission standard will apply beginning on July 31, 2011. For other installed fuel tanks we are adopting a phase-in that begins July 31, 2011. In the period from July 31, 2011 through July 31, 2012, 50 percent of the boats produced by each company must meet the diurnal standard described above. Beginning August 1, 2012, all marine fuel tanks and boats must meet the diurnal emission standard.[100]

In addition, the industry expressed concern that there are many small boat builders that may need additional time to become familiar with installation of carbon canisters in their boats. To address this, we will allow small boat builders to make a limited number of boats without diurnal emission controls from July 31, 2011 until July 31, 2013. These allowances would be an alternative to the 50 percent phase-in concept described above. See Section VI.G.2.f for further information about the allowances for small boat builders.

If a manufacturer uses a canister-based system to comply with the standard, we are also requiring that manufacturers design their systems not to allow liquid gasoline to reach the canister during refueling or from fuel sloshing or volume expansion (see § 1060.105). Exposing carbon to liquid gasoline will significantly degrade its ability to capture and release hydrocarbon vapors. Currently, industry consensus standards in ABYC H–24 to some extent address spillage during refueling and due to fuel expansion.[101] However, under these guidelines, the refueling ''blow back'' test is only for a partial fill and does not necessarily prevent fuel from spilling out the vent line (where a canister would likely be installed) during refueling. In addition, although ABYC recommends that a fuel system be designed to contain 5 percent fuel expansion, the actual requirement can be met by the manufacturer by simply lowering the fuel tank capacity rating without designing the fuel system to prevent overfilling. A system that meets the current ABYC requirements in this manner would not adequately demonstrate that liquid fuel will not reach the carbon canister. However, ABYC commented that it intends to revisit its standards to include proper canister installation instructions and an improved fuel spillage performance test. One example of an approach to protect the canister from exposure to liquid gasoline is a design in which the canister is mounted higher than the fuel level and a small orifice or a float valve is installed in the vent line to stop the flow of liquid gasoline to the canister.

Fuel tank manufacturers have the primary responsibility to certify to the new diurnal emission standard. Equipment manufacturers, canister manufacturers, or system integrators may alternatively make arrangements to take on the certification responsibility. If another party notifies the fuel tank manufacturer in writing that it commits to certifying the product, then the fuel tank manufacturer may ship uncertified and unlabeled fuel tanks. We are requiring that manufacturers of portable marine fuel tanks certify that their products meet the new permeation standard. This is necessary because portable fuel tanks are not sold to boat builders for installation in a vessel. Therefore, there is no other manufacturer who could be treated as the manufacturer responsible for meeting emission standards that apply to portable marine fuel tanks.

We are requiring that manufacturers meet certain specifications with their fuel tank caps, including requirements to tether the cap to the equipment and to design the cap to provide visual, audible, or other physical feedback when the vapor seal is established.

Any increase in fuel temperature resulting from engine operation will cause a potential for fuel tank vapor emissions that are generated in a manner similar to fuel tank diurnal emissions. We are therefore not allowing manufacturers to disable their approaches for controlling diurnal emissions during engine operation (see § 1060.105). This will ensure that any running loss emissions that would otherwise occur will be controlled to a comparable degree as diurnal emissions.

Although we are not finalizing diurnal emission standards for Small SI equipment, we are allowing manufacturers the option of using the SHED-based procedures and standards adopted by California ARB for nonhandheld Small SI equipment. We proposed to adopt this provision only on an interim basis to allow for a transition to EPA's standards; however, as recommended by commenters, we are adopting this as a permanent provision. Under this approach, the evaporative emission test would be for the whole equipment rather than the individual components. The SHED-based approach might allow manufacturers to use fuel tanks or fuel lines with emission levels above the component standards, but we believe the overall emission control (including control of diurnal emissions) from SHED-certified systems will be at least as great as we would achieve from requiring manufacturers to comply with the separate permeation standards. We are therefore incorporating the California ARB SHED procedure by reference and allow for certification using those procedures.

(4) Diffusion Standards and Dates

Diffusion emissions occur when vapor escapes the fuel tank through an opening as a result of random molecular motion, independent of changing temperature. Diffusion emissions can be easily controlled by venting fuel tanks in a way that forces fuel vapors to go through a long, narrow path to escape.

We did not propose diffusion standards for handheld equipment or for marine vessels. Handheld equipment use fuel caps that are either sealed or have tortuous venting pathways to prevent fuel from spilling during operation. We believe these fuel cap designs limit diffusion emissions sufficiently so that we do not need to establish a separate diffusion standard. For marine vessels, we believe the diurnal emission standard will lead manufacturers to adopt technologies that automatically limit diffusion losses, so they will also control diffusion emissions without a separate standard.

We are not finalizing the proposed diffusion standards for nonhandheld Small SI equipment. As described below, one of the design options specified in the proposal for controlling running loss emissions was an open vent system with limits on fuel temperature increases during operation. That approach would be effective for limiting running losses, but diffusion emissions could occur through the open vent. However, we believe all the remaining design options for controlling running loss emissions will effectively control diffusion emissions because there will be no direct path for vapor to escape through diffusion. A separate diffusion standard would therefore be redundant.

(5) Running Loss Emission Standards and Dates

We are establishing standards to control running loss emissions from nonhandheld Small SI equipment beginning in the same year as the Phase

[100] In this context, the date of production means the date on which the fuel tank is installed in the vessel. In the case of boats using outboard engines, it is the date that the fuel tank is installed on the vessel.

[101] American Boat and Yacht Council, ''Standards and Technical Information Reports for Small Craft; H–24 Gasoline Fuel Systems,'' July, 2007.

3 exhaust emission standards—2012 for Class I engines and 2011 for Class II engines (see § 1060.104). Equipment manufacturers will need to certify that their equipment models meet the new running loss requirements since component certification is not practical.

We have measured fuel temperatures and found that some types of equipment experience significant fuel heating during engine operation. This was especially true for fuel tanks mounted on or near the engine. This occurs in many types of Small SI equipment.

It is very difficult to define a measurement procedure to consistently and accurately quantify running losses. Also, a performance standard with such a procedure introduces a challenging testing requirement for hundreds of small-volume equipment manufacturers. Moreover, we believe there are several different design approaches that will reliably and effectively control running losses. We are therefore not controlling running losses using the conventional approach of establishing a procedure to measure running losses and adopting a corresponding emission standard. Manufacturers can choose from one of the following approaches to demonstrate control of running loss emissions:

- Vent running loss fuel vapors from the fuel tank to the engine's intake manifold in a way that burns the fuel vapors in the engine instead of venting them to the atmosphere. The use of an actively purged carbon canister would qualify under this approach.
- Use a sealed fuel tank. A fuel bladder could be used to minimize fuel vapor volume in a sealed fuel tank without increasing tank pressure.
- Use a system with an approved executive order from the California Air Resources Board. This might involve a design in which a fuel cap is fitted with a small carbon canister and mounted on a tank that is not exposed to excessive engine heat.

In the NPRM, we proposed another running loss design option whereby manufacturers could demonstrate, through testing, that the fuel temperature in the tank does not increase by more than 8 °C during normal operation. Manufacturers commented that the temperature testing associated with this design option was too complex, the temperature limit was too low, and the associated diffusion requirements were infeasible. In later conversations, industry stated that these objections were significant enough that they were confident they would never use the temperature design option; we are therefore removing this approach from the final rule.

We believe any of the above approaches will ensure that manufacturers will be substantially controlling running losses, either by preventing the vapors from escaping the fuel tank or by directing the flow of running loss vapors to prevent them from escaping to the atmosphere. While none of these approaches are expected to require extensive design changes or lead time, any manufacturer choosing the option to vent running loss fuel vapors into the engine's intake manifold will need to make this change in coordination with the overall engine design. As a result, we believe it is appropriate to align the timing of the running loss standards with the introduction of the Phase 3 standards.

We are not applying the running loss requirements to handheld Small SI engines. We believe running loss emission standards should not apply to handheld engines at this time because the likely approach for controlling running losses could affect the manufacturers' ability to meet the current exhaust emission standards. As described above, we are not changing the exhaust emission standards for handheld engines in this rulemaking. In addition, there are some technical challenges that will require further investigation. For example, the compact nature of the equipment makes it harder to isolate the fuel tank from the engine and the multi-positional nature of the operation may prevent a reliable means of venting fuel vapors into the intake manifold while the engine is running.

We are also not applying the running loss requirements to Marine SI engines. Installed marine fuel tanks are generally not mounted near the engine or other heat sources so running losses should be very low. A possible exception to this is for personal watercraft or other small boats where the fuel tank may be closer to the engine. However, under the new standard for controlling diurnal emissions, we expect that PWC manufacturers will design their fuel tanks to stay pressurized up to 1 psi. This will also help to control running loss emissions. For other applications, the use of a carbon canister for controlling diurnal emissions will also limit the potential for running loss vapors to escape to the atmosphere.

(6) Requirements Related to Refueling

Refueling spitback and spillage emissions represent a substantial additional amount of fuel evaporation that contributes to overall emissions from equipment with gasoline-fueled engines. We are not adopting measurement procedures with corresponding emission standards to address these emission sources. However, we believe equipment manufacturers can take significant steps to address these refueling issues by designing their equipment based on sound practices. For example, designing a marine filler neck with a horizontal segment near the fuel inlet will almost inevitably lead to high levels of spillage since fuel flow will often reach the nozzle, leading to substantial fuel flow out of the fuel system. Maintaining a vertically angled orientation of the filler neck will allow the fuel to flow back into the filler neck and into the tank after the nozzle shuts off. Designing fuel systems for automatic shutoff would also prevent this.

For Small SI equipment, designing fuel inlets that are readily accessible and large enough to see the rising fuel level (either through the tank wall or the fuel inlet) will substantially reduce accidental spillage during refueling. We are therefore requiring that equipment manufacturers design and build their equipment such that operators could reasonably be expected to fill the fuel tank without spitback or spillage during the refueling event (see § 1060.101). This new requirement mirrors the following requirement recently adopted with respect to portable fuel containers (72 FR 8428, February 26, 2007):

> You are required to design your portable fuel containers to minimize spillage during refueling to the extent practical. This requires that you use good engineering judgment to avoid designs that will make it difficult to refuel typical vehicle and equipment designs without spillage. (40 CFR 59.611(c)(3))

While the final requirement is not as objective and quantifiable as the other standards and requirements we are adopting, we believe this is important, both to set a requirement for manufacturers in designing their products and to give EPA the ability to require manufacturers to select designs that are consistent with good engineering practice regarding effective refueling strategies. To the extent that equipment manufacturers and boat builders certify their products to emission standards, they will need to describe how they meet this refueling-related requirement in their application for certification (see § 1060.202). If boat builders rely on certified components instead of applying for certification, they will need to keep records describing how they meet this refueling-related requirement (see § 1060.210); Section VI.F describes how such companies can meet certification requirements without applying for a certificate.

Spitback and spillage are a particular concern for gasoline-fueled boats.

Marine operators have reported that relatively large quantities of gasoline are released into the marina environment during refueling events. The American Boat and Yacht Council (ABYC) has a procedure in place to define a standard practice to address refueling. However, this procedure calls for testing by refueling up to a 75 percent fill level at a nominal flow rate of 5 gallons per minute. This procedure is not consistent with prevailing practices and is clearly not effective in preventing spills. We believe the most effective means of addressing this problem is for ABYC to revise their test procedure to reflect current practices and adopt a standard that would establish appropriate designs for preventing refueling emissions. ABYC and several boat builders announced after the proposal that they have initiated a process to work toward this outcome. The estimated time frame is to have the information and product testing in place to be able to implement these industry standards by 2012.

A variety of technological solutions are available to address spitback and spillage from marine vessels. The simplest will be a system similar to that used on cars. A small-diameter tube could run along the filler neck from the top of the tank to a point near the top of the filler neck. Once liquid fuel reaches the opening of the filler neck and the extra tube, the fuel goes faster up the small-diameter tube and triggers automatic shutoff before the fuel climbs up the filler neck. This design depends on operators using the equipment properly and may not be fully effective, for example, with long filler necks and low refueling rates. An alternative design involves a snug fit between the nozzle's spout and the filler neck, which allows for a tube to run from a point inside the tank (at any predetermined level) directly to the shutoff venturi on the spout. The pressure change from the liquid fuel in the tank reaching the tube's opening triggers automatic shutoff of the nozzle. This system prevents overflowing fuel without depending on the user. These are two of several possible configurations to address fuel spillage from marine vessels.

It is very likely that any effective design for preventing refueling losses would depend on a standardized nozzle geometry for interfacing with the filler neck. Although they have indicated that they are working to address refueling spillage, ABYC does not have the capability to regulate nozzle geometries. Therefore, as described in the proposal, we will require marina operators to transition to standardized nozzles. We are specifying that marine nozzles must have (1) a nominal spout diameter of 0.824 inches, (2) nominal placement of an aspirator hole 0.67 inches from the terminal end of the spout, (3) a straight segment for at least 2.5 inches at the end of the spout, and (4) a spring (if used) that terminates at least 3.0 inches from the end of the spout. These specifications are consistent with the products currently used for refueling motor vehicles. We therefore expect no incompatibilities for vessels that may get fuel at a marina or at a roadside refueling station. These nozzles will also cost no more than other nozzles that would have been available without this regulation. Rather than specifying a date certain by which marinas would need to convert their nozzles, we believe it is appropriate simply to specify that marinas start using compliant nozzles for any new construction or new replacement nozzles. We expect this to result in widespread use of standardized nozzles by 2012, when ABYC expects to have their refueling procedures and specifications in place. To the extent that boat builders start implementing refueling controls, we would expect market forces to accelerate the turnover to standardized nozzles. Depending on the designs selected for preventing refueling losses from vessels, we may need to also consider a maximum flow rate for marine refueling events. We understand that such a limit would need to be higher than 10 gallons per minute (the current requirement for motor vehicles), but a higher limit may be necessary to ensure that refueling controls work properly. We will continue to work with manufacturers to be aware of the need for any further standardization in fuel supply to enable their designs for controlling emissions.

(7) Summary Table of Final Evaporative Emission Standards

Table VI–1 summarizes the new standards and implementation dates discussed above for evaporative emissions from Small SI equipment and Marine SI vessels. Where a standard does not apply to a given class of equipment, "NA" is used in the table to indicate "not applicable."

TABLE VI–1—FINAL EVAPORATIVE EMISSION STANDARDS AND IMPLEMENTATION DATES

Standard/category	Fuel line permeation	Tank permeation	Diurnal	Running loss
Standard level	15 g/m²/day	1.5 g/m²/day	0.40 g/gal/day	Design standard.
Handheld	Model year 2012 [a b]	Model year 2009–2013 [c]	NA	NA.
Class I	January 1, 2009	Model year 2012	NA	Model year 2012.
Class II	January 1, 2009	Model year 2011	NA	Model year 2011.
Portable tanks	January 1, 2009 [d]	January 1, 2011	January 1, 2010 [e]	NA.
Personal watercraft	January 1, 2009	Model year 2011	Model year 2010	NA.
Other vessels with installed tanks.	January 1, 2009 [d]	Model year 2012	July 31, 2011 [f g]	NA.

[a] 2013 for small-volume families not used in cold-weather equipment.
[b] A separate set of declining fuel line permeation standards applies for cold-weather equipment from 2012 through 2016.
[c] 2009 for families certified in California, 2013 for small-volume families, 2011 for structurally integrated nylon fuel tanks, and 2010 for remaining families.
[d] January 1, 2011 for primer bulbs. Phase-in for under-cowl fuel lines on outboard engines, by length: 30% in 2010, 60% in 2011, 90% in 2012–2014, 100% in 2015.
[e] Design standard.
[f] Fuel tanks installed in nontrailerable boats (≥ 26 ft. in length or > 8.5 ft. in width) may meet a standard of 0.16 g/gal/day over an alternative test cycle.
[g] See § 1045.625 for allowances to delay implementation of the diurnal standard for a limited number of vessels over the first two years.

D. Emission Credit Programs

A common feature of emission control programs for motor vehicles and nonroad engines and equipment is an emission credit program that allows manufacturers to generate emission credits based on certified emission levels for engine families that are more stringent than the standard. See Section VII.C.5 of the preamble to the proposed rule for background information and general provisions related to emission credit programs.

We believe it is appropriate to consider compliance based on emission credits relative to fuel tank permeation standards. As described above, the emission standards apply to the fuel tanks directly, such that we generally expect component manufacturers to certify their products. However, we believe it is best to avoid placing the responsibility for demonstrating a proper emission credit balance on component manufacturers for three main reasons. First, it is in many cases not clear whether these components will be produced for one type of application or another. Component manufacturers might therefore be selling similar products into different applications that are subject to different standards—or no standards at all. Component manufacturers may or may not know in which application their products will be used. Second, there will be situations in which equipment manufacturers and boat builders take on the responsibility for certifying components. This may be the result of an arrangement with the component manufacturer, or equipment manufacturers and boat builders might build their own fuel tanks. We believe it will be much more difficult to manage an emission credit program in which manufacturers at different places in the manufacturing chain will be keeping credit balances. There will also be a significant risk of double-counting of emission credits. Third, most component manufacturers will be in a position to use credits or generate credits, but not both. Equipment manufacturers and boat builders are more likely to be in a position where they can keep an internal balance of generating and using credits to meet applicable requirements. Our experience with other programs leads us to believe that an emission credit program that depends on trading is not likely to be successful.

We are therefore promulgating emission credit provisions in which equipment manufacturers and boat builders keep a balance of credits for their product line. Equipment manufacturers and boat builders choosing to comply based on emission credits will need to certify all their products that either generate or use emission credits. Fuel tank manufacturers will be able to produce their fuel tanks with emission levels above or below applicable emission standards but will not be able to generate emission credits and will not need to maintain an accounting to demonstrate a balance of emission credits. Small SI engine manufacturers that provide a complete fuel system may also participate in the fuel tank credit program.

(1) Averaging, Banking, and Trading for Small SI Equipment and Marine SI Vessels

We are establishing averaging, banking, and trading (ABT) provisions for fuel tank permeation from Small SI equipment and Marine SI vessels (see subpart H in parts 1045 and 1054).

We are aware of certain control technologies that will allow manufacturers to produce fuel tanks that reduce emissions more effectively than we are requiring. These technologies may not be feasible or practical in all applications, but we are allowing equipment manufacturers using such low-emission technologies to generate emission credits. In other cases, an equipment manufacturer may want, or need, to use emission credits that will allow for fuel tanks with permeation rates above the applicable standards. Equipment manufacturers can quantify positive or negative emission credits by using the Family Emission Limit (FEL) to define the applicable emission level, then factoring in internal surface area, sales volumes, and useful life to calculate a credit total. This FEL would be established by the tank certifier (generally the fuel tank manufacturer) and would be based on permeation testing done either by the component manufacturer or the equipment or vessel manufacturer. Through averaging, these emission credits could be used by the same equipment or vessel manufacturer to offset other fuel tanks in the same model year that do not have control technologies that control emissions to the level of the standard. Through banking, such an equipment manufacturer could use the emission credits in later model years to offset high-emitting fuel tanks. The emission credits could also be traded to another equipment manufacturer to offset that company's high-emitting fuel tanks.

We believe an ABT program is potentially very advantageous for fuel tanks because of the wide variety of tank designs. The geometry, materials, production volumes, and market dynamics for some fuel tanks are well suited to applying emission controls, but other fuel tanks pose a bigger challenge. The new emission credit program allows us to set a single standard that applies broadly without dictating that all fuel tanks be converted to low-permeation technology at the same time.

Emission credits earned under the evaporative emission ABT program will have an indefinite credit life with no discounting. We consider these emission credits to be part of the overall program for complying with the new standards. Given that we may consider further reductions beyond these standards in the future, we believe it will be important to assess the evaporative ABT credit situation that exists at the time any further standards are considered. We will set such future emission standards based on the statutory direction that emission standards must represent the greatest degree of emission reduction achievable, considering cost, safety, lead time, and other factors. Emission credit balances will be part of the analysis for determining the appropriate level and timing of new standards. If we were to allow the use of credits generated under the standards adopted in this rule for complying with more stringent future standards, we may need to adopt emission standards at more stringent levels or with an earlier start date than we would absent the continued use of existing emission credits, depending on the level of emission credit banks. Alternatively, we could adopt future standards without allowing the use of existing emission credits, or we could place limits on the amount of credits a manufacturer could use.

We are not allowing manufacturers to generate emission credits by using metal fuel tanks. These tanks will have permeation rates well below the standard, but there is extensive use of metal tanks today, so it would be difficult to allow these emission credits without undercutting the stringency of the standard and the expected emission reductions from the standard.

Within an ABT program, manufacturers are allowed to use credits only within a defined averaging set. For the evaporative emission ABT program, we are not allowing the exchange of emission credits between Small SI equipment and Marine SI vessels. The new standards are intended to be technology-forcing for each of these equipment categories. We are concerned that cross-trading may allow marginal credits in one area to hamper technological advances in another area. For Small SI equipment, we will not allow credit exchanges between handheld and nonhandheld equipment. For handheld equipment, we will allow credit exchanges between Class III, Class IV and Class V equipment. For nonhandheld equipment, we will allow credit exchanges between Class I and Class II equipment. For Marine SI vessels, we will allow credit exchanges between all types of vessels, except those using portable marine fuel tanks which, as noted below, are not included in the ABT program.

We are requiring portable marine fuel tanks to meet emission standards without an emission credit program. Emission control technologies and marketing related to portable marine fuel tanks are quite different than for installed tanks. Most, if not all, portable fuel tanks are made using high-density polyethylene in a blow-molding process. The control technologies for these tanks are relatively straightforward and readily available so we do not anticipate that these companies will need emission credits to meet the new standards. In addition, because these fuel tanks are not installed in vessels that are subject to emission standards, the fuel tank manufacturer will need to take on the responsibility for certification. As a result, we will treat these portable fuel tank manufacturers as both the component manufacturer and the equipment manufacturer with respect to their portable fuel tanks.

In the early years of the ABT program we are not establishing an FEL cap. This will give manufacturers additional time to use uncontrolled fuel tanks, primarily in small-volume applications, until they can convert their full product lines to having fuel tanks with permeation control. We are setting an FEL cap of 5.0 $g/m^2/day$ (8.3 $g/m^2/day$ if tested at 40 °C) starting a few years after implementing the tank permeation standards. For Class II equipment and personal watercraft, the FEL cap will begin in 2014. For Class I equipment and other installed marine fuel tanks, the FEL cap will begin in 2015. For handheld equipment, the FEL cap will begin in 2015. (See § 1045.107 and § 1054.110.) For Small SI equipment qualifying as small-volume emission families, we are setting an FEL cap of 8.0 $g/m^2/day$ (13.3 $g/m^2/day$ if tested at 40 °C.) This is generally limited to equipment models where the manufacturer produces no more than 5,000 units with a given fuel tank design. The purpose of the FEL cap will be to prevent the long-term production of fuel tanks with no permeation control while still providing the regulatory flexibility associated with emission credit programs.

Evaporative emission credits under the tank permeation standards will be calculated using the following equation: credits [grams] = (Standard − FEL) × useful life [years] × 365 days/year × inside surface area [m^2]. Both the standard and the FEL are in units of $g/m^2/day$ based on testing at 28°C.

As discussed earlier, we are establishing an alternative standard for tank permeation testing performed at 40°C of 2.5 $g/m^2/day$. Because permeation is higher at this temperature than the primary test temperature, emissions credits and debits calculated at this test temperature will be expected to be higher as well. When determining credits for a tank certified to the alternative standard, manufacturers will use the alternative standard in the credit equation. Plus, we are requiring that credits and debits that are calculated be adjusted using a multiplicative factor of 0.60 to account for the effect of temperature.

We are also allowing handheld equipment manufacturers to earn credits for equipment using fuel tanks certified earlier than required. As noted in Section VI.D.3 below, manufacturers of nonhandheld equipment and Marine SI vessels can also be rewarded for introducing products that comply with evaporative standards earlier than required.

(2) Other Evaporative Sources

We are not promulgating an emission credit program for other evaporative sources. We believe technologies are readily available to meet the applicable standards for fuel line permeation and diurnal emissions (see Section VI.H.). The exception to this is for fuel lines on cold-weather equipment and under-cowl fuel lines on outboard engines, as discussed above in Section VI.C.1, where we are adopting temporary averaging provisions (see § 1045.112 and § 1054.145). In addition, the diurnal emission standards for portable marine fuel tanks and PWC fuel tanks are largely based on existing technology so any meaningful emission credit program with the new standards would result in windfall credits. The running loss standard is not based on emission measurements, and refueling-related requirements are based on design specifications only, so it is not appropriate or even possible to calculate emission credits.

(3) Early-Allowance Programs

In some cases manufacturers may be able to meet the new emission standards earlier than we are requiring. We are adopting provisions for equipment manufacturers using low-emission evaporative systems early to generate allowances before the standards apply. These early allowances could be used for a limited time after the implementation date of the standards to sell equipment or fuel tanks that have emissions above the standards. We are establishing two types of allowances. The first is for Small SI nonhandheld equipment as a whole where for every year a piece of equipment is certified early, another piece of equipment could delay complying with the new standards by an equal time period beyond the implementation date. The second is similar but is just for the fuel tank rather than the whole equipment (nonhandheld Small SI or Marine SI). Equipment or fuel tanks certified for purposes of generating early allowances would need to be certified with EPA and will be subject to all applicable requirements. Manufacturers will be required to report to EPA the number of early allowances generated under these programs and how the allowances are used. These allowances are similar to the emission credit program elements described above but they are based on counting compliant products rather than calculating emission credits. Establishing appropriate credit calculations would be difficult because the early compliance is in some cases based on products meeting different standards using different procedures.

(a) Nonhandheld Small SI Equipment

Many Small SI equipment manufacturers are currently certifying products to evaporative emission standards in California. The purpose of the early-allowance program is to provide an incentive for manufacturers to begin selling low-emission products nationwide. We are providing allowances to manufacturers for equipment meeting the California evaporative emission standards that are sold in the United States outside of California and are therefore not subject to California's emission standards. Manufacturers will need to have California certificates for these equipment types. (See § 1054.145.)

Allowances could be earned in any year before 2012 for Class I equipment and before 2011 for Class II equipment. The allowances may be used through the 2014 model year for Class I equipment and through the 2013 model year for Class II equipment. Allowances cannot be traded between Class I and Class II equipment. To keep this program simple, we are not adjusting the allowances based on the anticipated emission rates from the equipment. Therefore, we believe it is necessary to at least distinguish between Class I and Class II equipment.

(b) Fuel Tanks

We are also providing an early-allowance program for nonhandheld Small SI equipment for fuel tanks (see § 1054.145). This program is similar to the program described above for equipment allowances, except that it will be for fuel tanks only. We will accept California-certified configurations. Allowances could be earned prior to 2011 for Class II equipment and prior to 2012 for Class I equipment; allowances could be used through 2013 for Class II equipment and through 2014 for Class I equipment. Allowances will not be exchangeable between Class I and Class II equipment.

The early-allowance program for marine fuel tanks is similar except that there are no California standards for these tanks (see § 1045.145). Manufacturers certifying early to the new fuel tank permeation standards will be able to earn allowances that they could use to offset high-emitting fuel tanks after the new standards go into place. The early-allowance program would apply to all marine fuel tanks, including portable fuel tanks, personal watercraft, and other installed fuel tanks. For portable fuel tanks, the tank manufacturer would earn the allowances, whereas the vessel manufacturer would earn the allowances for personal watercraft and other installed fuel tanks. We are not allowing the cross-trading of allowances between portable fuel tanks, personal watercraft, and other installed fuel tanks. Each of these categories includes significantly different tank sizes and installed tanks have different implementation dates and are expected to use different permeation control technology. For portable fuel tanks and personal watercraft, allowances could be earned prior to 2011 and may be used through the 2013 model year. For other installed tanks, allowances could be earned prior to 2012 and used through the 2014 model year.

E. Testing Requirements

Compliance with the evaporative emission standards is determined by following specific testing procedures. This section describes the new test procedures for measuring fuel line permeation, fuel tank permeation, and diurnal emissions. As discussed in Section VI.F.8, we are adopting design-based certification as an alternative to testing for certain standards.

(1) Fuel Line Permeation Testing Procedures

We are requiring that fuel line permeation be measured at a temperature of 23 ± 2 °C using a weight-loss method similar to that specified in SAE J30 and J1527 recommended practices (see § 1060.515).[102] [103] We are making two modifications to the SAE recommended practice. The first modification is for the test fuel to contain ethanol; the second modification is to require preconditioning of the fuel line through a fuel soak. These modifications are described below and are consistent with our current requirements for recreational vehicles.

(a) Test Fuel

The recommended practice in SAE J30 and J1527 is to use ASTM Fuel C (defined in ASTM D471–98) as a test fuel. We are requiring the use of a test fuel containing 10 percent ethanol. We believe the test fuel must contain ethanol because it is commonly blended into in-use gasoline and because ethanol substantially increases permeation rates for many materials.

Specifically, we are requiring the use of a test fuel consisting of an ASTM Fuel C blended with ethanol such that the blended fuel contains 10 percent ethanol by volume (CE10).[104] Manufacturers have expressed support for this test fuel because it is more consistent than testing with gasoline and because it is widely used today by industry for permeation testing. In addition, most of the data used to develop the new fuel line permeation standards were collected on this test fuel. This fuel is allowed today as one of two test fuels for measuring permeation from fuel lines under the recreational vehicle standards. California ARB also specifies Fuel CE10 as the test for fuel line permeation measurements with small offroad engines.

One exception is for fuel lines on cold-weather handheld products. In this case, the standard is based on a test fuel of IE10, which is EPA certification gasoline blended with 10 percent ethanol by volume.

We are finalizing specifications for fuel ethanol blended into test gasoline based on standard industry practice. Specifically, we are incorporating by reference ASTM D4806–07, which specifies, among other things, acceptable denaturants and maximum water content.[105]

(b) Preconditioning Soak

The second difference from weight-loss procedures in SAE practices is in fuel line preconditioning. We believe the fuel line should be preconditioned with an initial fuel fill followed by a long enough soak to ensure that the permeation rate has stabilized. Manufacturers may choose one of two alternative specifications for the soak period—either four weeks at 43 ± 5 °C or eight weeks at 23 ± 5 °C. Either of these approaches should adequately stabilize permeation rates for most materials. However, manufacturers may need a longer soak period to stabilize the permeation rate for certain fuel line designs, consistent with good engineering judgment. For instance, a thick-walled fuel line may take longer to reach a stable permeation rate than a thinner-walled fuel line. After this fuel soak, the fuel reservoir and fuel line must be drained and immediately refilled with fresh test fuel prior to the weight-loss test.

(c) Alternative Approaches

California's regulations, in CCR 2754(a)(1)(C), reference SAE J1737 as the method for measuring permeation from fuel lines. These recommended procedures use a recirculation technique whereby nitrogen flows over the test sample to carry the permeating vapors to adsorption canisters. Permeation is determined based on the weight change of the canisters. This method was intended to provide a greater level of sensitivity than the weight loss method specified in SAE J30 and J1527 so that lower rates of permeation could be measured. As an alternative, we will accept permeation data collected using the methodology in SAE J1737 under § 1060.505(c).[106] If this alternative is used, the same test fuel, test temperature, and preconditioning period must be used as for the primary (weight-loss) test method.

We are allowing permeation measurements using alternative equipment and procedures that provide equivalent results (see § 1060.505). To use these alternative methods, manufacturers will first need to get our approval. An example of an alternative approach would be enclosure-type testing such as in 40 CFR part 86. In the case of enclosure-type testing, the manufacturer would need to demonstrate that it is correctly accounting for the ethanol content in

[102] Society of Automotive Engineers Surface Vehicle Standard, ''Fuel and Oil Hoses,'' SAE J30, June 1998 (Docket EPA–HQ–OAR–2004–0008–0176).

[103] SAE Recommended Practice J1527, ''Marine Fuel Hoses,'' 1993, (Docket EPA–HQ–OAR–2004–0008–0195–0177).

[104] ASTM Fuel C is a mix of equal parts toluene and isooctane. We refer to gasoline blended with ethanol as E10.

[105] ASTM International, ''Standard Specification for Denatured Fuel Ethanol for Blending with Gasoline for Use as Automotive Spark-Ignition Engine Fuel,'' ASTM D4806–07, 2007.

[106] SAE Recommended Practice J1737, ''Test Procedure to Determine the Hydrocarbon Losses from Fuel Tubes, Hoses, Fittings, and Fuel Line Assemblies by Recirculation,'' 1997, (Docket EPA–HQ–OAR–2004–0008–0178).

the fuel. Note that the test fuel, test temperatures, and preconditioning soak described above will still apply. Because permeation increases with temperature we will accept data collected at higher temperatures (greater than 23 °C) for a demonstration of compliance.

For portable marine fuel tanks, the fuel line assembly from the engine to the fuel tank typically includes two sections of fuel line with a primer bulb in between and quick-connect assemblies on either end. We are adopting a provision to allow manufacturers to test a full assembly as a single fuel line to simplify testing for these fuel line assemblies (see § 1060.102). This gives manufacturers the flexibility to use a variety of materials as needed for performance reasons while meeting the fuel line permeation standard for the fully assembled product. Measured values will be based on the total measured permeation divided by the total internal surface area of the fuel line assembly. However, where it is impractical to calculate the internal surface area of individual parts of the assembly, such as a primer bulb, we will allow a simplified calculation that treats the full assembly as a straight fuel line. This small inaccuracy will cause reported emission levels (in g/m^2/day) to be slightly higher so it will not jeopardize a manufacturer's effort to demonstrate compliance with the applicable standard.

(2) Fuel Tank Permeation Testing Procedures

The new test procedure for fuel tank permeation includes preconditioning, durability simulation, and a weight-loss permeation test (see § 1060.520). The preconditioning and the durability testing may be conducted simultaneously; manufacturers must put the tank through durability testing while the tank is undergoing its preconditioning fuel soak to reach a stabilized permeation level.

(a) Test Fuel

Similar to the new fuel line testing procedures, we are requiring the use of a test fuel containing 10 percent ethanol to help ensure in-use emission reductions with the full range of in-use fuels. Specifically, we are requiring the use of IE10 as the test fuel which is made up of 90 percent certification gasoline and 10 percent ethanol by volume. This is the same test fuel specified for testing fuel tanks for recreational vehicles. In addition, IE10 is representative of in-use test fuels. We are allowing Fuel CE10 as an alternative test fuel. Data in Chapter 5 of the Final RIA suggest that fuel tank permeation tends to be somewhat higher on CE10 than IE10, so testing on CE10 should be an acceptable demonstration of compliance.

We are finalizing specifications for fuel ethanol blended into test gasoline based on standard industry practice. Specifically, we are incorporating by reference ASTM D4806–07 which specifies, among other things, acceptable denaturants and maximum water content.

(b) Preconditioning Fuel Soak

Before permeation testing, the fuel tank must be preconditioned by allowing it to sit with fuel inside until the hydrocarbon permeation rate has stabilized. Under this step, we are requiring that the fuel tank be filled with test fuel and soaked—either for 20 weeks at 28 ± 5 °C or for 10 weeks at 43 ± 5 °C. Either of these approaches should adequately stabilize permeation rates for most materials. However, manufacturers may need a longer soak period to stabilize the permeation rate for certain fuel tank designs, consistent with good engineering judgment.

The tank will have to be sealed during this fuel soak and any components that are directly mounted to the fuel tank, such as a fuel cap, must be attached. Other openings, such as fittings for fuel lines, openings for grommets, or petcocks, will be sealed with impermeable plugs (or left unmachined so there is no hole in the tested configuration). In addition, if there is a vent path through the fuel cap, that vent path may be sealed. Alternatively, the opening could be sealed for testing and the fuel cap tested separately for permeation (discussed below). If the fuel cap is not directly mounted on the fuel tank (i.e., the fuel tank is designed to have a separate fill neck between the fuel cap and the tank), the tank may be sealed with something other than a production fuel cap.

If the test fuel is dispensed at a temperature below the soak temperature, it would be possible for the fuel tank to pressurize if the tank were sealed prior to the fuel temperature reaching the soak temperature. In this case, it would be acceptable to allow reasonable time for the test fuel to approach the soak temperature, prior to sealing, to prevent over-pressurization of the fuel tank. To prevent gross evaporation of fuel vapors during this period, the venting of the tank should be no greater than needed to prevent over-pressurization of the fuel tank. The regulation specifies that the fuel tank must be sealed within a maximum of eight hours after refueling. Manufacturers should also take steps to minimize vapor losses during the time that the fuel is warming, such as leaving the fuel cap loosely in place or routing vapors through a vent line.

Manufacturers may do the durability testing described below during the time period specified for preconditioning. The time spent in durability testing may count as preconditioning time as long as ambient temperatures are within the specified limits and the fuel tank has fuel inside the entire time. During the slosh testing, a fuel fill level of 40 percent will be considered acceptable for the fuel soak. Otherwise, we are requiring that the fuel tank be filled to nominal capacity during the fuel soak.

(c) Durability Tests

We are adopting three tests for the evaluation of the durability of fuel tank permeation controls: (1) Fuel sloshing; (2) pressure-vacuum cycling; and (3) ultraviolet exposure. The purpose of these deterioration tests is to help ensure that the technology is durable under the wide range of in-use operating conditions. For sloshing, the fuel tank must be filled to 40–50 percent capacity with the specified test fuel and rocked for one million cycles. Pressure-vacuum testing must consist of 10,000 cycles between −0.5 and 2.0 psi with a cycle time of 60 seconds. These two new durability tests are based on draft recommended SAE practice.[107] The third durability test is intended to assess potential impacts of ultraviolet sunlight on the durability of surface treatment. In this test, the tank will be exposed to ultraviolet light wavelength ranging from 300 to 400 nanometers with an intensity of at least 0.40 W-hr/m^2/min on the tank surface for 450 hours. Alternatively, the tank could be exposed to direct natural sunlight for an equivalent period of time.

We do not believe the durability testing requirements are necessary for all fuel tank designs. Therefore, we are excluding metal tanks and other tanks using direct material solutions in the molding process from the durability test procedures. However, these durability procedures will apply to fuel tanks using surface treatments or post-processing barrier coatings as a permeation barrier. We are concerned that improperly applied treatments or coatings may deteriorate. The specified durability demonstrations are necessary to ensure that fuel tanks properly

[107] Draft SAE Information Report J1769, ''Test Protocol for Evaluation of Long Term Permeation Barrier Durability on Non-Metallic Fuel Tanks,'' (Docket EPA–HQ–OAR–2004–0008–0195).

control emissions throughout the useful life.

(d) Weight-loss Test

Following the fuel soak, the fuel tank must be drained and refilled with fresh fuel as described above. The permeation rate from the fuel tanks are determined by comparing mass measurements of the fuel tank over the test period while ambient temperatures are held at 28 ± 2 °C. Testing may alternatively be performed at 40 ± 2 °C, in which case a higher numerical standard applies.

We received several comments that the test procedure should require daily mass measurements similar to the procedures required by CARB in TP–901. We agree with commenters that making daily recordings of the fuel tank weight is consistent with good engineering practices. These daily mass measurements can be used to determine the stability of the permeation rate of the fuel tank and can help identify if anything unusual is occurring during the test such as a lost seal during testing. The test procedures in TP–901 require that the weight loss test continue until the coefficient of determination (r^2), from a plot of the cumulative daily weight loss versus time for 10 consecutive 24-hour cycles, is 95 percent or greater. (California ARB mistakenly refers to the r^2 value as the correlation coefficient.) We believe this approach gives testing facilities flexibility for basing the length of the test on good engineering judgment rather than a fixed time period. We are therefore adopting this general method of using daily measurements to determine the length of the test, with one modification. The CARB method would require test facilities to make measurements over at least one weekend. We believe weight loss measurements can be suspended for short periods of time without a negative impact on the test. We therefore do not require that the 11 weight loss measurements (including the 0-hour measurement) be on consecutive days, provided that measurements are made on at least five different days of any given seven-day period of the test. Measurements must be made at roughly the same time on each test day.

A change in atmospheric pressure over the weeks of testing can affect the accuracy of measured weights for testing due to the buoyancy of the fuel tank. The buoyancy effect on emission measurements is proportional to the volume of the fuel tank, so this procedure is appropriate even for testing very small fuel tanks. To address this we are adopting a procedure in which a reference fuel tank is filled with an amount of glass bead or some other inert material such that the weight of the reference tank is approximately the same as the total weight of the test tank. The reference tank is used to zero the scale before measuring the weight of the test tank. This will result in measured and reported values representing the change in mass from permeation losses rather than a comparison of absolute masses. This is similar to an approach in which weighing will determine absolute masses with a mathematical correction to account for the effects of buoyancy. We believe the specified approach is better because it minimizes the possibility of introducing or propagating error.

We are allowing permeation measurements for certification using alternative equipment and procedures that provide equivalent results. To use these alternative methods, manufacturers would first need to get our approval. An example of an alternative weight-loss measurement procedure would be to test the fuel tank in a SHED and determine the permeation by measuring the concentration of hydrocarbons in the enclosure. In the case of SHED testing, the manufacturer would need to demonstrate that it is correctly accounting for the ethanol content in the fuel.

(e) Fuel Cap Permeation Testing

As discussed above, manufacturers have the option to test the fuel cap separately from the tank and combine the results to determine the total tank permeation rate. In this case, the permeation test must be performed as described above except that the fuel cap will be mounted on an impermeable reservoir such as a metal or glass tank. The volume of the test reservoir must be at least one liter to ensure sufficient fuel vapor exposure. We are requiring that the ''tank'' surface area for calculating the results will be the smallest inside the cross sectional area of the opening on which the cap is mounted. The fuel cap will need to be tested in conjunction with a representative gasket. In the case where the vent path is through grooves in the gasket, another gasket of the same material and dimensions, without the vent grooves, may be used. In the case where the vent is through the cap, that vent must be sealed for testing. Alternatively, manufacturers may use the default cap permeation rate described in Section IV.F.8.

Handheld equipment manufacturers commented that fuel caps should be subject to durability testing and recommended that the cap should be subjected to 300 on-off cycles as a durability test.[108] For handheld products, data in the Final RIA suggests that rubber fuel cap seals may contribute a significant portion of the permeation measured in the fuel tank permeation test. We are concerned that a coating used on the gaskets to reduce the measured permeation during the test may wear off during in-use operation. We are therefore adopting this additional durability testing for fuel caps on handheld tanks.

Handheld equipment manufacturers also commented that cold-weather products cannot use existing low permeation rubbers for their seals due to potential dynamic cracking issues at very low temperatures. In addition, materials used today degrade after a year of exposure to fuel containing ethanol. While this does not appear to lead to fuel leakage, data in the Final RIA suggest that this degradation may have a large effect on tank permeation. To address this issue, EPA intends to conduct a technical study of cold-weather fuel cap seals. For this final rule we are adopting an allowance for manufacturers to specify rubber fuel cap seals on cold-weather equipment as maintenance items. These seals could therefore be replaced prior to the fuel preconditioning soak when permeation testing is performed on in-use fuel tanks if the seals are more than one year old. If the technical study or other information reveals that a fuel resistant material or other solution can safely be used in cold-weather applications, we will consider removing the provision allowing manufacturers to identify gasket replacement as a scheduled maintenance item in the application for certification.

(3) Diurnal Emission Testing Procedures

The new test procedure for diurnal emissions from installed marine fuel tanks involves placing the fuel tank in a SHED, varying the fuel temperature over a prescribed profile, and measuring the hydrocarbons escaping from the fuel tank (see § 1060.525). The final results are reported in grams per gallon where the grams are the mass of hydrocarbons escaping from the fuel tank over 24 hours and the gallons are the nominal fuel tank capacity. The new test procedure is derived from the automotive evaporative emission test

[108] ''OPEI HHPC Comments on EPA Proposed Phase 3 Rule for HH Fuel Tank Permeation,'' Outdoor Power Equipment Institute, February 5, 2008.

with modifications specific to marine applications.[109]

(a) Temperature Profile

We believe it is appropriate to base diurnal measurements on a summer day with ambient temperatures ranging from 72 to 96 °F (22.2 to 35.6 °C). This temperature profile, which is also used for automotive testing, represents a hot summer day when ground-level ozone formation is most prominent. Due to the thermal mass of the fuel and, in some cases, the inherent insulation provided by the boat hull, the fuel temperatures would cover a narrower range. Data presented in Chapter 5 of the Final RIA suggest that the fuel temperature in an installed marine fuel tank will see a total change of about half the ambient temperature swing. We are therefore adopting a test temperature range of 78 to 90 °F (25.6 to 32.2 °C) for installed marine fuel tanks. This testing is based on fuel temperature instead of ambient temperature.

We are adopting an alternative, narrower temperature range for fuel tanks installed in nontrailerable boats (≥ 26 ft. in length or > 8.5 ft. in width). Data presented in Chapter 5 of the Final RIA suggest that the fuel temperature swing for a boat stored in the water is about 20 percent of the ambient temperature swing. Based on this relationship, we are adopting an alternative temperature cycle for tanks installed in nontrailerable boats of 81.6 to 86.4 °F (27.6 to 30.2 °C). This alternative temperature cycle is associated with an alternative standard as described in Section VI.C.3.

Diurnal emission measurements for cars include a three-day temperature cycle to ensure that the carbon canister can hold at least three days of diurnal emissions without substantial escape of hydrocarbon vapors to the atmosphere. For marine vessels using carbon canisters as a strategy for controlling evaporative emissions, we are also requiring a three-day cycle in this final rule. In the automotive test, the canister is loaded and then purged by the engine during a warm-up drive before the first day of testing. We are adopting a different approach for marine vessels because we anticipate that canisters on marine applications will be passively purged. Before the first day of testing, the canister would be loaded to its working capacity and then run over the diurnal test temperature cycle, starting and ending at the lowest temperature, to allow one day of passive purging. The test result would then be based on the highest recorded value during the following three days.

For fuel systems using a sealed system, we believe a three-day test will not be necessary. In this case, the fuel tank would be sealed once the fuel reaches equilibrium at the starting temperature for testing. The SHED would then be purged and the test would consist of a single run through the diurnal temperature cycle. We are establishing this one-day test for the following technologies: sealed systems, sealed systems with a pressure-relief valve, limiting flow orifices, bladder fuel tanks, and sealed fuel tanks with a volume-compensating air bag.

(b) Test Fuel

Consistent with the automotive test procedures, we are specifying a gasoline test fuel with a nominal volatility of 9 psi.[110] We are not requiring that the fuel used in diurnal emission testing include ethanol for two reasons. First, we do not believe that ethanol affects the diurnal emissions or control effectiveness other than the effect that ethanol in the fuel may have on fuel volatility. Second, in many areas of the country, in-use fuels containing ethanol are blended in such a way as to control for ethanol effects in order to meet fuel volatility requirements.

Diurnal emissions from vented systems are a function not only of temperature and fuel volatility, but also of the size of the vapor space in the fuel tank. Consistent with the automotive procedures, we are requiring that the fuel tank be filled at the start of the test to 40 percent of its nominal capacity. Nominal capacity is defined as the fuel tank's volume as specified by the fuel tank manufacturer, using at least two significant figures, based on the maximum volume of fuel the tank can hold with standard refueling techniques. The ''permanent'' vapor space above a fuel tank that has been filled to capacity should not be considered as part of the fuel tank's nominal capacity.

(c) Fuel Tank Configuration

The majority of marine fuel tanks are made of plastic. Plastic fuel tanks designed to meet our new standards will still be expected to have some amount of permeation. However, the effect of permeation on the test results should be very small if the test tank was a new model that had not been previously exposed to fuel. For fuel tanks that have reached a stabilized permeation rate (such as testing on in-use tanks), we believe it is appropriate to correct for permeation. The regulation specifies that manufacturers may measure the permeation rate and subtract it from the final diurnal test result. The fuel tank permeation rate would be measured with the established procedure for measuring permeation emissions, except that the fuel for testing (including preconditioning) would be the same as that used for diurnal emission testing and the permeation testing must occur at a nominal ambient temperature of 28°C. This test measurement would have to be made just before the diurnal emission test to ensure that the permeation rate does not change significantly over the course of the diurnal emission measurement. In no case will we allow a permeation correction higher than that corresponding to the applicable permeation standard for a tank with a given inside surface area. Because not correcting for permeation represents the worst-case test result, we will accept data from manufacturers in which no permeation correction is applied.

As with the permeation test procedures, a manufacturer may request EPA approval of an alternative method provided that this method provides measurements that are equivalent to the primary method.

F. Certification and Compliance Provisions

Sections VII and VIII of the preamble to the proposed rule describe several general provisions for certifying emission families and meeting other regulatory requirements. This section notes several particulars for applying these general provisions to evaporative emissions.

Marine vessels do not always include installed fuel systems. Manufacturers of vessels without installed fuel systems do not have the ability to control engine or fuel system design parameters. We are therefore excluding vessels that do not have installed fuel systems from the new standards (see § 1045.5). As a result, it is necessary for us to treat manufacturers of uninstalled fuel-system components as the equipment manufacturer with respect to evaporative emission standards. This includes manufacturers of outboard engines (including any fuel lines or fuel tanks produced with the engine), portable fuel tanks, and the fuel line assembly (including fuel line, primer bulb, and connectors).

For ease of reference, Small SI equipment manufacturers, Marine SI boat builders, and manufacturers of portable marine fuel tanks (and

[109] See 40 CFR part 86, subpart B, for the automotive evaporative emission test procedures.

[110] Volatility is specified based on a procedure known as Reid Vapor Pressure (see ASTM D 323–99a).

associated fuel-system components) are all referred to as equipment manufacturers in this section.

(1) Liability for Certification and Compliance

The new standards for fuel lines and fuel tanks apply to any such components that are used with or intended to be used with Small SI engines or Marine SI engines (see § 1060.1 and § 1060.601). Section VI.C describes for each standard which manufacturer is expected to certify.

In most cases, nonroad standards apply to the manufacturer of the engine or the manufacturer of the nonroad equipment. Here, the products subject to the standards (fuel lines and fuel tanks) are typically manufactured by a different manufacturer. In most cases the engine manufacturers do not produce complete fuel systems and therefore are not in a position to do all the testing and certification work necessary to cover the whole range of products that will be used. We are therefore providing an arrangement in which manufacturers of fuel-system components are in most cases subject to the standards and are subject to certification and other compliance requirements associated with the applicable standards. We are prohibiting the introduction into commerce of noncompliant fuel-system components that are intended for installation in Small SI equipment or Marine SI vessels unless the component manufacturer either certifies the component or has a contractual arrangement with each equipment manufacturer using its products that the equipment manufacturer will certify those components. As a matter of good practice, any components not intended for installation in Small SI equipment or Marine SI vessels should be labeled accordingly to prevent the possibility of improper installation.

As described in Section VI.D, component manufacturers generally certify their products using measured emission levels showing that the components meet the applicable emission standard. In the case of permeation standards for fuel tanks, component manufacturers may alternatively certify to an FEL above or below the standard. If any fuel tank manufacturer certifies using an FEL, the FEL becomes the emission standard for that emission family for all practical purposes. The fuel tank manufacturer will have the option to certify to an FEL above or below the standard, but will not be required to meet any overall average or maintain a positive balance of credits for their products. This is to facilitate the use of ABT by equipment manufacturers, which must balance their positive and negative credits, as discussed below.

Equipment manufacturers are subject to all the new evaporative emission standards. This applies for the general standards described above with respect to fuel caps, miscellaneous fuel-system components, and refueling (see § 1060.101(f)). These standards generally depend on design specifications rather than emission measurements, so we believe it is appropriate to simply deem these products to be certified if they are designed and produced to meet the standards we specify. The equipment manufacturer will also need to keep records of the components used (see § 1060.210). This will allow us, by operation of the regulation, to have certified products without requiring the paperwork burden associated with demonstrating compliance with these relatively straightforward specifications. Manufacturers could optionally apply for and receive a certificate of conformity with respect to these general standards, but this is not necessary and we will expect this to be a rare occurrence.

Equipment manufacturers will also be subject to all the new permeation, diurnal, and running loss standards that apply. Equipment manufacturers may comply with requirements related to evaporative emission standards in three different situations. First, equipment manufacturers might install only components certified by the component manufacturer, without using emission credits. In this case all the components must meet the emission standard or have an FEL below the standard. Manufacturers of Marine SI vessels will be subject to the fuel line and fuel tank standards (including diurnal standards), but will be able to satisfy their requirements by using certified components. Such a vessel manufacturer will generally need to use certified components, add an emission label, and follow any applicable emission-related installation instructions to ensure that certified components are properly installed. This is similar to an equipment manufacturer that is required to properly install certified engines in its equipment, except that the equipment manufacturer must meet general design standards and shares the liability for meeting emission standards. We are requiring manufacturers of Small SI equipment to certify with respect to evaporative emission standards even if they use certified components, largely because they are still responsible for running loss requirements.

Second, equipment manufacturers may be required to certify certain components based on contractual arrangements with the manufacturer of those components. In this case, the equipment manufacturer's certification causes the component manufacturer to no longer be subject to the standard. This approach might involve the equipment manufacturer relying on test data from the component manufacturer. The equipment manufacturer might also be producing its own fuel tanks for installation in its equipment, in which case it will be subject to the standards and all requirements related to certification and compliance. In either case, the equipment manufacturer will take on all the responsibilities associated with certification and compliance with respect to those components.

Third, equipment manufacturers may comply with evaporative emission requirements by using certified components, some of which are certified to an FEL above the standard. The equipment manufacturer would then comply based on emission credits. In this case, the equipment manufacturer takes on all the certification and compliance responsibilities with respect to any fuel tanks that are part of the equipment manufacturer's emission credit calculations. Equipment manufacturers will generally use only certified components for meeting evaporative emission requirements, but they might also hold the certificate for such components. For purposes of certification, equipment manufacturers will not need to submit new test data if they use certified components. Equipment manufacturers must make an annual accounting to demonstrate a net balance of credits for the model year. Under this approach, the fuel tank manufacturer will continue to be subject to the standards for its products and be required to meet the certification and compliance responsibilities related to the standard. However, as in the first option, the fuel tank manufacturer will not be required to meet any averaging requirements or be required to use emissions credits. Where equipment manufacturers use ABT with fuel tanks that have already been certified by the component manufacturer, there would be overlapping certifications between the two parties. We address this by specifying that all parties are responsible for meeting applicable requirements associated with the standards to which they have certified, but if any specific requirement is met by one company, we will consider the requirement to be met for all companies (see § 1060.5). For example, either the component manufacturer or the equipment manufacturer could honor warranty claims, but we may hold both companies responsible for the violation if there is a failure to meet warranty obligations.

Similarly, if we find that new equipment is sold without a valid certificate of conformity for the fuel lines or fuel tanks, then the equipment manufacturer and all the affected fuel-system manufacturers subject to the standards will be liable for the noncompliance (see § 1060.601).

Liability for recall of noncompliant products will similarly fall to any manufacturer whose product is subject to the standard, as described above. If more than one manufacturer is subject to the standards for a noncompliant product, we will have the discretion to assign recall liability to any one of those manufacturers. In assigning this liability, we will generally consider factors such as which manufacturer has substantial manufacturing responsibility and which manufacturer holds the certificate (see § 1060.5). However, we may hold equipment manufacturers liable for recall even if they do not manufacture or certify the defective product. This will generally be limited to cases where the component manufacturer is unavailable to execute any remedial action. For example, if a foreign component manufacturer discontinues their participation in the U.S. market or a component manufacturer goes out of business, we will turn to the equipment manufacturer.

(2) Regulatory Requirements Related to Certification

The established provisions for implementing exhaust emission standards apply similarly for evaporative emission standards; however, because the control technologies are very different, these requirements require further clarification. For example, scheduled maintenance is an important part of certifying engines to exhaust emission standards. However, there is little or no maintenance involved for the expected technologies for controlling evaporative emissions. The regulations still require manufacturers to identify specified maintenance procedures, if there are any, but there are no specific limitations on the maintenance intervals and there is no distinction for emission-related maintenance. Manufacturers may not do any maintenance during testing for certification. (See § 1060.125 and § 1060.235.) We also do not expect that emission-related warranty claims will be common, but we are requiring a two-year period for emission-related warranties with respect to evaporative emission controls.

Similarly, we do not expect manufacturers to use evaporative emission control technologies that involve adjustable parameters or auxiliary emission control devices. Technologies that control evaporative emissions are generally passive designs that prevent vapors from escaping, in contrast to the active systems engines used to control exhaust emissions. The regulations state the basic expectation that systems must comply with standards throughout any adjustable range without auxiliary emission control devices, but it is clear that these provisions will not apply to most evaporative systems. We also do not allow emission control strategies that cause or contribute to an unreasonable risk to public health or welfare or that involve defeat devices. While these are additional statutory provisions that are meaningful primarily in the context of controlling exhaust emissions, we are including them for evaporative emissions for completeness (see § 1060.101). This also addresses the possibility that future technologies may be different in a way that makes these provisions more meaningful.

The testing specified for certifying fuel systems to the evaporative emission standards includes measurements for evaluating the durability of emission control technologies where appropriate. While we adopted evaporative requirements for recreational vehicles relying on a testing approach that used deterioration factors, we believe it is more appropriate to incorporate the durability testing for each family directly. Therefore, no requirement (or opportunity) exists for generating deterioration factors for any evaporative emission standard.

We are requiring that component manufacturers label the fuel lines, fuel tanks, and other fuel-system components that they certify (see § 1060.137). These labels generally identify the manufacturer, the applicable emission standard (or Family Emission Limit), and family identification. We are including a provision to allow manufacturers to use an abbreviated code that would allow for referring to the information filed for certification under the engine family name. Manufacturers may also design their fuel lines to include a continuous stripe or other pattern to help identify the particular type or grade of fuel line. This would be in addition to the other labeling requirements.

Engine or equipment manufacturers must also add an emission control information label to identify the evaporative emission controls (see § 1060.135). If engine, equipment, or vessel manufacturers also certify fuel-system components separately, they may include that additional information in a combined label. If the equipment is produced by the same company that certifies the engine for exhaust standards, the emission control information label for the engine may include all the appropriate information related to evaporative emissions.

While we are not adopting specific requirements for manufacturers to evaluate production-line or in-use products, we require that manufacturers set up their own quality plan for evaluating their products to ensure compliance. Also, we may pursue testing of certified products to evaluate compliance with evaporative emission standards (see § 1060.301).

(3) Emission Families

To certify equipment or components, manufacturers will first define their emission families. This is generally based on selecting groups of products that have similar emission characteristics throughout the useful life (see § 1060.230). For example, fuel tanks could be grouped together if they were made of the same material (including consideration of additives such as pigments, plasticizers, and UV inhibitors that are expected to affect emissions) and the same control technology. For running loss control for nonhandheld Small SI engines and equipment, emission families are based on the selected compliance demonstration. For example, certifying manufacturers may have one emission family for all their products that vent fuel vapors to the engine's air intake system.

The manufacturer selects a single product from the emission family for certification testing. This product will be the one that is most likely to exceed the applicable emission standard. For instance, the ''worst-case'' fuel tank in a family of monolayer tanks will likely be the tank with the thinnest average wall thickness. For fuel lines or co-extruded fuel tanks with a permeation barrier layer, the worst-case configuration may be the one with the thinnest barrier.

Testing with those products, as specified above, will need to meet applicable emission standards. The manufacturer then sends us an application for certification. After reviewing the information in the application to verify that the manufacturer demonstrates compliance with all applicable requirements, we will issue a certificate of conformity allowing equipment manufacturers to introduce into commerce certified components or equipment.

(4) Compliance Provisions From 40 CFR Part 1068

We are applying the provisions of 40 CFR part 1068 to Small SI and Marine SI engines, equipment, and vessels. This section describes how some of the provisions of part 1068 apply specifically with respect to evaporative emissions.

The provisions of § 1068.101 prohibit introducing into commerce new nonroad engines and equipment unless they are covered by a certificate of conformity and labeled appropriately. Section VI.F.1 describes the responsibilities for engine manufacturers, equipment manufacturers, and manufacturers of fuel-system components with respect to the prohibition against introducing uncertified products into commerce. In the case of portable marine fuel tanks and outboard engines, there is no equipment manufacturer so we are treating manufacturers of these items as equipment manufacturers relative to this prohibition.

While engine rebuilding or extensive engine maintenance is commonplace in the context of exhaust emission controls, there is very little analogous servicing related to evaporative emission controls. Nevertheless, it can be expected that individual fuel lines, fuel tanks, or other fuel-system components may be replaced periodically. While the detailed rebuilding provisions of § 1068.120 have no meaning for evaporative emission controls, the underlying requirement applies generally. Specifically, if someone is servicing a certified system, there must be a reasonable basis to believe that the modified emission control system will perform at least as well as the original system. We are not imposing any recordkeeping requirements related to maintenance of evaporative emission control systems.

There are many instances where we specify in 40 CFR part 1068, subparts C and D, that engines (and the associated equipment) are exempt from emission standards under certain circumstances, such as for testing, national security, or export. Our principle objective in applying these provisions to evaporative emission standards is to avoid confusion. We are therefore adding a provision that any exemption from exhaust emission standards automatically triggers a corresponding exemption from evaporative emission standards for the same products. We believe it is unlikely that an equipment manufacturer will need a separate exemption from evaporative emission standards, but the exemptions related to national security, testing, and economic hardship will apply if such a situation were to occur. We believe the other exemptions available for engines would not be necessary for equipment manufacturers with respect to evaporative emissions.

Given the extended times required to precondition fuel-system components, we have no plans to initiate selective enforcement audits to test for compliance with products coming off the assembly line. On the other hand, we may require certifying manufacturers to supply us with production equipment or components as needed for our own testing or we may find our own source of products for testing.

The defect-reporting requirements of § 1068.501 apply to certified evaporative systems. This requires the certifying manufacturer to maintain information, such as warranty claims, that may indicate an emission-related defect. The regulations describe when manufacturers must pursue an investigation of apparent defects and when to report defects to EPA. These provisions apply to every certifying manufacturer and their certified products, including component manufacturers.

(5) Interim Standards and Provisions for Small SI Equipment

Most Small SI equipment manufacturers are currently certifying products to evaporative emission requirements in California. However, these standards and their associated test procedures differ somewhat from those contained in this final rule. Although the standards are different, we believe evaporative emission control technologies are available to meet the California ARB's standards and our new emission standards. To help manufacturers transition to selling low-emission equipment nationwide, we are accepting California ARB certification of equipment and components in the early years of the new federal program.

As discussed above, we are accepting California ARB certification for nonhandheld equipment and fuel tanks for the purposes of the early-allowance program (see §§ 1045.145 and 1054.145). We are also accepting California ARB certification of handheld fuel tanks through the 2011 model year (see § 90.129).

We are accepting California ARB certification or certain SAE specifications through the 2010 model year for Class II engines and through the 2010 model year for Class I engines (see § 90.127). These SAE specifications include SAE J30 R11A, SAE J30 R12, and SAE J2260 Category 1.

(6) Replacement Parts

We are applying the tampering prohibition in § 1068.101(b)(1) for evaporative systems. This means that it will be a violation to replace compliant fuel tanks or fuel lines with noncompliant products that effectively disable the applicable emission controls. Low-cost replacement products would be easy to make available and it would be difficult to prevent or control their use. We are therefore adopting several provisions to address this concern. In § 1060.610 we clarify the meaning of tampering for evaporative systems and finalize specific labeling requirements. First, for the period from January 1, 2012 to December 31, 2019, we require that manufacturers, distributors, retailers, and importers of replacement parts clearly label their products with respect to the applicable requirements. For example, a package might be labeled as compliant with the requirements in 40 CFR part 1060 or it might be labeled as noncompliant and appropriately used only for applications not covered by EPA standards. Unless the packaging clearly states otherwise, the product is presumed to be intended for applications that are subject to EPA standards. Second, starting in 2020 we are establishing a provision stating that it is presumed that all replacement parts that could be used in applications covered by EPA standards will in fact be installed in such equipment. This presumption significantly enhances our ability to enforce the tampering prohibition because the replacement part is then noncompliant before it is installed in a vessel or a piece of equipment. We believe shifting to a blanket presumption in 2020 is appropriate since in-use vessels and equipment will be almost universally meeting EPA's evaporative emission standards by that time.

The obligation for owners who replace certified fuel tanks or fuel lines with new components is to use components that have been certified under the applicable regulations. We have made a change from the proposal to remove the requirement for owners to use certified tanks that meet or exceed the FEL from the component being replaced, if applicable. Commenters emphasized that the proposed approach would be unworkable. We agree that the best approach for ensuring that we preserve emission controls without adopting unreasonable requirements is to specify simply that new replacement components need to be certified.

(7) Certification Fees

Under our current certification program, manufacturers pay a fee to cover the costs associated with various certification and other compliance activities associated with an EPA issued certificate of conformity. These fees are based on the projected costs to EPA per emission family. For the fees rule published May 2004, we conducted a cost study to assess EPA's costs associated with conducting programs for the industries that we certify (69 FR 26222, May 11, 2004).[111] We are establishing a new fees category for certification related to the new evaporative emission standards. The costs for this category will be determined using the same method used in conducting the previous cost study.

As under the current program, this depends on an assessment of the anticipated number of emission families and the corresponding EPA staffing necessary to perform this work. At this time, EPA plans to perform a basic level of certification review of information and data submitted to issue certificates of conformity for the evaporative emission standards, as well as conducting some testing to measure evaporative emissions. This is especially the case for equipment manufacturers that use only certified components for meeting applicable emission standards. We are establishing a fee of $241 based on Agency costs for half of a federal employee's time and three employees hired through the National Senior Citizens Education and Research Center dedicated to the administration of the evaporative certification program, including the administrative, testing, and overhead costs associated with these people. The total cost to administer the program is estimated to be $362,225. We divided this cost by the estimated number of certificates, 1,503, to calculate the fee.

The fee of $241 per certificate applies through the 2014 model year. Starting in 2015, we will update the fees related to evaporative emission certificates each year when we update the fees for all categories. The fees update will be based upon EPA's costs of implementing the evaporative category multiplied by the consumer price index (CPI), then divided by the average of the number of certificates received in the two years prior to the update. The CPI will be applied to all of EPA's costs except overhead. This is a departure from EPA's current fees program wherein the CPI is applied only to EPA's labor costs. In the most recent fees rulemaking, commenters objected to applying the CPI to EPA's fixed costs. In the new fee program for the evaporative category, however, there are no fixed costs. EPA expects all its costs to increase with inflation and we therefore think it is appropriate to apply the inflation adjustment to all the program costs.

Where a manufacturer holds the certificates for compliance with exhaust emission standards and includes certification for evaporative emissions for the same engine/equipment model, we will assess an additional charge related to compliance with evaporative emission standards to that for the exhaust emission certification.

EPA believes it appropriate to charge less for a certificate related to evaporative emissions relative to the existing charge for certificates of conformity for exhaust emissions from the engines in these same vessels and equipment. The amount of time and level of effort associated with reviewing the latter certificates is higher than that projected for the certificates for evaporative emissions.

(8) Design-Based Certification

Certification of equipment or components that are subject to performance-based emission standards depends on test data showing that products meet the applicable standards. We are adopting a variety of approaches that reduce the level of testing needed to show compliance. As described above, we allow manufacturers to group their products into emission families so that a test on a single worst-case configuration can be used to show that all products in the emission family are compliant. Also, test data from a given year could be ''carried over'' for later years for a given emission control design (see § 1060.235). These steps help reduce the overall cost of testing.

Design-based certification is another method that may be available for reducing testing requirements (see § 1060.240). To certify their products using design-based certification, manufacturers will describe, from an engineering perspective, how their fuel systems meet the applicable design specifications. We believe there are several designs that use established technologies that are well understood to have certain emission characteristics that ensure compliance with applicable emission standards. At the same time, while design-based certification is a useful tool for reducing the test burden associated with certification, this does not remove a manufacturer's liability for meeting all applicable requirements throughout the useful life of the engine, equipment, vessel, or component.

The following sections describe how we propose to implement design-based certification for each of the different performance standards. We are adopting design-based certification provisions for fuel tank permeation and diurnal emissions. The emission data we used to develop these new design-based certification options are presented in Chapter 5 of the Final RIA.

We are not adopting design-based certification provisions for fuel lines. This contrasts with the approach we adopted for recreational vehicles, where we specified that fuel lines meeting certain SAE specifications could be certified by design. That decision was appropriate for recreational vehicles, because we did not include provisions for component certification. Fuel line manufacturers will need to conduct testing anyway to qualify their fuel lines as meeting the various industry ratings for Small SI and marine applications so any testing burden to demonstrate compliance with EPA standards should be minimal. We will allow test data used to meet industry standards to be used to certify to the new standards provided that the data were collected in a manner consistent with this final rule and that the data are available to EPA upon request.

(a) Fuel Tank Permeation

A metal fuel tank automatically meets the design criteria for a design-based certification as a low-permeation fuel tank, subject to the restrictions on fuel caps and seals described below.[112] There is also a body of existing test data showing that co-extruded fuel tanks from automotive applications have permeation rates that are well below the new standard. We are allowing design-based certification for co-extruded high-density polyethylene fuel tanks with a continuous ethylene vinyl alcohol (EVOH) barrier layer. The EVOH barrier layer is required to be at least 2 percent of the wall thickness of the fuel tank. In addition, the ethylene content of the

[111] A copy of the cost worksheets that were used to assess the fees per category may be found on EPA's fees Web site at *http://www.epa.gov/otaq/proprule.htm.*

[112] Manufacturers may also consider metal fuel tanks meeting the gasket- and cap-related specifications to be ''deemed certified,'' in which case no application for certification is necessary. Such a fuel tank is considered compliant independent of any test results from emission measurements. While this would be the most straightforward path, many prefer instead to go through the certification process for their tanks.

EVOH can be no higher than 40 mole percent.

To address the permeability of the gaskets and seals used on metal and co-extruded tanks, the design criteria include a specification that seals (such as gaskets and O-rings) not made of low-permeability materials must have a total exposed surface area less than 0.25 percent of the total inside surface area of the fuel tank. For example, consider a four-gallon fuel tank with an inside surface area of 0.40 square meters. The total exposed surface area of seals on this fuel tank must be smaller than 1000 mm^2 (= 0.25%/100 × 0.40m^2 × 1,000,000 mm^2/m^2). This is consistent with the proposed rule and the current requirements for recreational vehicles, but allows for larger seals for larger tanks. In addition, if a non-metal fuel cap not made of low-permeability material is directly mounted to the fuel tank, the surface area of the fuel cap (determined by the cross-sectional area of the fill opening) may not exceed 3.0 percent of the total inside surface area of the fuel tank.

A metal or co-extruded fuel tank with a fuel cap and seals that meet these design criteria would be expected to reliably pass the standard. However, we believe it is not appropriate to assign an emission level to fuel tanks using design-based certification such that they can generate emission credits. Given the uncertainty of emission rates from the seals and gaskets, we will not consider these tanks to be any more effective than other fuel tanks meeting emission standards for purposes of emission credits.

In the case where the fuel cap is directly mounted on the fuel tank, we consider the cap and associated seals to be part of the fuel tank. As discussed above, we allow fuel caps to be tested either mounted on the fuel tank, or individually. As an alternative to testing the fuel cap, the manufacturer may opt to use a default permeation rate of 30 g/m^2/day (or 50 g/m^2/day for testing at 40 °C). To be eligible for this default rate, the seal on the fuel cap must be made of a low-permeability material, such as a fluoroelastomer. The surface area associated with this default value is the smallest inside cross-sectional area of the opening on which the cap is mounted. If manufacturers use this default value, they would seal the fuel fill area with a non-permeable plug during the tank permeation test and the default permeation rate would be factored into the final result.

(b) Diurnal Emissions

For portable marine fuel tanks, we are establishing a design standard based on automatically sealing the tank to prevent fuel venting while fuel temperatures are rising. The options described below for design-based certification therefore deal only with installed marine fuel tanks (including personal watercraft).

A fuel system sealed to 1.0 psi will meet the criteria for design-based certification relative to the new diurnal emission standards. Such sealed systems reliably ensure that total diurnal emissions over the specified test procedure will be below the new standard. This type of system will allow venting of fuel vapors only when pressures exceed 1.0 psi or when the fuel cap is removed for refueling. Note that systems with anti-siphon valves will have to be designed to prevent fuel releases when the system is under pressure to meet U.S. Coast Guard requirements.

Bladder fuel tanks and tanks with a volume-compensating air bag are specialized versions of tanks that may meet the specifications for systems that remain sealed up to positive pressures of 1.0 psi. In each of these designs, volume changes within a sealed system prevent pressure buildup.

Fuel tanks equipped with a passively purged carbon canister may be certified by design, subject to several technical specifications. To ensure that there is enough carbon to collect a sufficient mass of hydrocarbon vapors, we specify a minimum butane working capacity of 9.0 g/dL based on the test procedures specified in ASTM D5228. The carbon canister will need a minimum carbon volume of 0.040 liters per gallon of nominal fuel tank capacity. For fuel tanks certified to the optional standards for tanks in nontrailerable boats (≥26 ft. in length or >8.5 ft. in width), we are requiring a minimum carbon volume of 0.016 liters per gallon of nominal fuel tank capacity.

We are adopting three additional specifications for the quality of the carbon. We believe these specifications are necessary to ensure that the canister continues to function effectively over the full useful life. First, the carbon must meet a moisture adsorption capacity maximum of 0.5 grams of water per gram of carbon at 90 percent relative humidity and a temperature of 25±5 °C. Second, the carbon must pass a dust attrition test similar to that in ASTM D3802. Third, the carbon granules must have a minimum mean diameter of 3.1 mm based on the procedures in ASTM D2862. These procedures are described in more detail in Chapter 5 of the Final RIA.

We are also requiring that the carbon canister must be properly designed to ensure proper in-use diurnal emission control. The canisters will need to be designed using good engineering judgment to ensure structural integrity. They must include a volume compensator or other device to hold the carbon pellets in place under vibration and changing temperatures and the vapor flow will need to be directed so that it reaches the whole carbon bed rather than just passing through part of the carbon. We are also requiring that the geometry of the carbon canister must have a length-to-diameter ratio of at least 3.5.

(c) Additional Designs

We may establish additional design-based certification options where we find that new test data demonstrate that the use of other technologies will ensure compliance with applicable emission standards. These designs will need to produce emission levels comfortably below the emission standards after considering variability in emission control performance. In addition, all aspects of these designs would need to be publicly available and quantifiable. For instance, we would not create a design-based certification for a material or process without full public disclosure of all the characteristics of that material or process relevant to its emission control characteristics. We would also not include products whose emission control performance is highly variable due to tolerances in materials or manufacturing processes. For instance, barrier treatments and post-processing coatings would generally not be eligible for design-based certification.

Manufacturers wanting to use designs other than those discussed here will have to perform the applicable testing for certification. However, once an additional technology is proven to be inherently low-emitting such that it will without question meet emission standards, we may consider approving its use under the regulations for design-based certification. For example, if several manufacturers were to pool resources to test a diurnal emission control strategy and submit the data to us, we could consider this particular technology, with any appropriate design specifications, as one that qualifies to be considered compliant under design-based certification. We intend to revise the regulations to include any additional technologies we decide are suitable for design-based certification, but we may also approve the use of additional design-based certification with these technologies before changing the regulations.

(9) Coordination With Coast Guard

As part of its compliance assurance program for safety standards, the U.S. Coast Guard regularly visits boat builders to perform inspections on the production of new boats. The frequency of these inspections is such that each boat builder is visited approximately once every two years. The U.S. Coast Guard has indicated a willingness to consider environmental compliance assurance as part of these inspections. For example, the inspections could include checking for certification labels and proper installation of emission control components. We will continue to work with the U.S. Coast Guard to coordinate these efforts.

G. Small-Business Provisions

(1) Small Business Advocacy Review Panel

On May 3, 2001, we convened a Small Business Advocacy Review Panel under section 609(b) of the Regulatory Flexibility Act (RFA) as amended by the Small Business Regulatory Enforcement Fairness Act of 1996. The purpose of the Panel was to collect the advice and recommendations of representatives of small entities that could be affected by the proposal and to report on those comments and the Panel's findings and recommendations as to issues related to the key elements of the Initial Regulatory Flexibility Analysis under section 603 of the Regulatory Flexibility Act. We re-convened the Panel on August 17, 2006 to update our findings for this final rule. The Panel report has been placed in the rulemaking record for this final rule. Section 609(b) of the Regulatory Flexibility Act directs the Panel to report on the comments of small entity representatives and make findings as to issues related to certain elements of an initial regulatory flexibility analysis (IRFA) under RFA section 603. Those elements of an IRFA are:

- A description of, and where feasible, an estimate of the number of small entities to which the rule will apply;
- A description of projected reporting, recordkeeping, and other compliance requirements of the rule, including an estimate of the classes of small entities that will be subject to the requirements and the type of professional skills necessary for preparation of the report or record;
- An identification, to the extent practicable, of all relevant Federal rules that may duplicate, overlap, or conflict with the rule; and
- A description of any significant alternative to the rule that accomplishes the stated objectives of applicable statutes and that minimizes any significant economic impact of the rule on small entities.

In addition to the EPA's Small Business Advocacy Chairperson, the Panel consisted of the Director of the Assessment and Standards Division of the Office of Transportation and Air Quality, the Administrator of the Office of Information and Regulatory Affairs within the Office of Management and Budget, and the Chief Counsel for Advocacy of the Small Business Administration.

EPA used the size standards provided by the Small Business Administration (SBA) at 13 CFR part 121 to identify small entities for the purposes of its regulatory flexibility analysis. Companies that manufacture internal-combustion engines and that employ fewer than 1,000 people are considered small businesses for the purpose of the RFA analysis for this rule. Equipment manufacturers, boat builders, and fuel-system component manufacturers that employ fewer than 500 people are considered small businesses for the purpose of the RFA analysis for this rule. Based on this information, we asked 25 companies that met the SBA small business thresholds to serve as small entity representatives for the duration of the Panel process. These companies represented a cross-section of engine manufacturers, equipment manufacturers, and fuel-system component manufacturers.

With input from small-entity representatives, the Panel drafted a report which provides findings and recommendations to us on how to reduce potential burdens on small businesses that may occur as a result of this final rule. The Panel Report is included in the rulemaking record for this final rule. We are adopting all the recommendations as presented in the Panel Report. The flexibility options recommended to us by the Panel, and any updated assessments, are described below.

(2) Burden Reduction Approaches for Small Businesses Subject to the Final Evaporative Emission Standards

The SBAR Panel Report includes six general recommendations for regulatory flexibility for small businesses affected by the new evaporative emission standards. This section discusses the provisions being established based on each of these recommendations plus one additional provision for small-volume boat builders. In these industry sectors, we believe the burden reduction approaches presented in the Panel Report should be applied to all businesses with the exception of the general economic hardship provision and the marine diurnal allowances, both of which are described below and are designed specifically for small businesses. The majority of fuel tanks produced for the Small SI equipment and Marine SI vessel market are made by small businesses or by companies producing small volumes of these products. The purpose of these options is to reduce the potential burden on companies for which fixed costs cannot be distributed over a large product line. For this reason, we often also consider production volumes when making decisions regarding provisions to reduce compliance burden.

(a) Consideration of Appropriate Lead Time

Small businesses commented that they would need to make significant changes to their plastic fuel tank designs and molding practices to meet the new fuel tank permeation standards. For blow-molded tank designs with a molded-in permeation barrier, new blow-molding machines would be needed that could produce multi-layer fuel tanks. One small business commented that, due to the lead time needed to install a new machine and to perform quality checks on the tanks, they would not be ready to sell multi-layer blow-molded fuel tanks until 2011 for the Small SI and Marine SI markets.

Small businesses that make rotation-molded fuel tanks were divided in their opinion of when they would be ready to produce low-permeation fuel tanks. One manufacturer stated that it is already producing fuel tanks with a low-permeation inner layer that are used in Small SI applications. This company also sells marine fuel tanks, but not with low-permeation technology. However, they have successfully performed Coast Guard durability testing on a prototype 40-gallon marine tank using their low-permeation technology. Two other small businesses that make rotation-molded fuel tanks stated that they have not been able to identify and demonstrate a low-permeation technology that would meet their cost and performance needs. They commented that developing and demonstrating low-permeation technology is especially an issue for the marine industry because of the many different tank designs and Coast Guard durability requirements.

Consistent with the Panel recommendations and in response to the above comments, we are adopting an implementation schedule that we believe provides sufficient lead time for blow-molded and marine rotation-molded fuel tanks. We are establishing tank permeation implementation dates of 2011 for Class II equipment and 2012 for Class I equipment. We are implementing the permeation standards in 2011 for portable marine fuel tanks and for personal watercraft and in 2012 for other installed fuel tanks, which are typically rotation-molded (see § 1060.1).

There was no disagreement on the technological feasibility of the Marine SI diurnal emission standard EPA is considering. The marine industry has expressed a commitment to developing consensus standards for the installation of carbon canisters in boats. However, they have noted that the development of these consensus standards will take time and that time would be needed for an orderly transition to installing the diurnal emission controls to their boat models. Therefore, as noted earlier, we are giving an additional 18 months of lead time, compared to the proposal, which means that the diurnal standard will apply starting on July 31, 2011. In addition, in response to concerns that there are many small boat builders that may need additional time to become familiar with carbon canister technology and learn how to install canisters in their boats, we are adopting interim allowances that will give additional time for a limited number of new boats. Small boat builders could choose between a percentage-based phase-in for one year or an allowance to produce up to 1,200 vessels without diurnal systems over the first two years. The options available to boat builders are described in more detail in Section VI.C.3 and Section VI.G.2.f.

In developing the proposal, the majority of large nonhandheld equipment manufacturers indicated that they would be using low-permeation fuel lines in the near term as part of their current product plans. In addition, the Panel expressed concern that small equipment manufacturers who do not sell products in California may not necessarily be planning on using low-permeation fuel lines in 2008. Therefore, we proposed that the fuel line permeation standards would take effect in 2008 for most nonhandheld equipment manufacturers and in 2009 for small-volume equipment manufacturers. Given that we are not adopting the final rule until mid-2008, we have delayed the implementation of the low-permeation fuel line requirement until January 1, 2009 for nonhandheld equipment. We are keeping the 2009 implementation date for low-permeation fuel line for small businesses producing Small SI nonhandheld equipment. We believe the 2009 date is feasible for all equipment manufacturers, given that fuel line meeting the low permeation standards is already widely available and manufacturers selling most types of nonhandheld equipment in California were required to use such fuel lines starting in 2007 or 2008.

(b) Fuel Tank ABT and Early-Incentive Program

The Panel recommended that we propose ABT and early-allowance programs for fuel tank permeation. We are adopting these programs in this final rule. The provisions of the ABT and early-allowance programs are described above in Section VI.D.

(c) Broad Definition of Emission Family

The Panel recommended that we propose broad emission families for fuel tank emission families similar to the existing provisions for recreational vehicles. As described earlier in Section VI.F.3, we are adopting provisions that allow fuel tank emission families to be based on type of material (including additives such as pigments, plasticizers, and UV inhibitors that are expected to affect control of emissions), emission control strategy, and production methods. This would allow fuel tanks of different sizes, shapes, and wall thicknesses to be grouped into the same emission family (see § 1060.230). In addition, Small SI and Marine SI fuel tanks could be allowed in the same emission family if the tanks meet these criteria. Manufacturers therefore will be able to broadly group similar fuel tanks into the same emission family and then test only the configuration most likely to exceed the emission standard.

(d) Compliance Progress Review for Marine Fuel Tanks

During the development of the proposed rule, we worked closely with the recreational marine fuel tank industry to understand their products, business practices, and production processes. Information gathered from these interactions was used to craft the proposed regulatory provisions related to controlling gasoline fuel tank permeation emissions. During these discussions, important issues were identified with respect to concerns regarding the technical feasibility of controlling permeation emissions from rotation-molded tanks made from cross-link polyethylene (XLPE).

Manufacturers asserted that the availability of rotation-molded fuel tanks is critical to the marine industry. This type of fuel tank is installed in many recreational marine vessels powered by SD/I and outboard engines. The rotation-molding process, which has low capital costs relative to injection molding, facilitates the economical production of fuel tanks in the low production volumes required by boat builders. Furthermore, plastic fuel tanks offer advantages over metal fuel tanks, both in terms of cost and corrosion resistance. The advantages of XLPE over other plastics used in fuel tanks today, such as HDPE, are its compatibility with the rotation-molding process and the ability of XLPE fuel tanks to meet the U.S. Coast Guard safety tests, especially the flame-resistance test. Nearly all manufacturers of rotation-molded marine fuel tanks qualify as small businesses under this rule.

We have concluded that the 2012 fuel permeation standards are technologically feasible for rotation-molded marine fuel tanks. This conclusion is supported by data presented in the Final RIA. As can be seen from the comments on the proposed rule and related information in the public docket, several rotation-molded tank manufacturers support EPA's proposed standards and implementation dates and have provided information to support their positions. We originally proposed tank permeation standards for these fuel tanks in 2002. Since that time, several manufacturers have shown progress in the development of low-permeation, rotation-molded tanks. In addition, this rule provides about 36 months of lead time for these manufacturers to address remaining technology issues, certify their products, and prepare for production of certified fuel tanks.

However, several other rotation-molded tank manufacturers are not as far along in their technological progress toward meeting the standards and are not certain about their ability to meet EPA requirements in 2012. To address this situation, these manufacturers have requested that EPA perform a technical review in 2010 to determine whether the compliance dates should be adjusted. However, for the reasons discussed above, we believe that the tank permeation standards have been demonstrated to be technologically feasible in the 2012 time frame and do not look favorably upon the request for a technology review of the permeation standard.

Nevertheless, we are concerned about the potential long-term impacts on the small businesses that have not yet developed technologies that meet the new emission standards. Although marine fuel tanks must comply with Coast Guard safety regulations, marine fuel tank manufacturers have never been required to certify to permeation standards. The rotation-molded tank manufacturers are generally small businesses with limited engineering staffs and are dependent on materials suppliers for their raw materials.

During the next few years, EPA intends to hold periodic progress reviews with small businesses that make rotation-molded fuel tanks. The purpose of these progress reviews will be to monitor the progress of individual companies towards compliance with the tank permeation standards and to provide feedback as needed. Rather than conducting a broad program with the entire industry, we plan to conduct separate, voluntary reviews with each interested company. These sessions will be instrumental to EPA in following the progress for these companies and assessing their efforts and potential problems.

To help address small business concerns, we are relying on the small-volume manufacturer hardship relief provisions in 40 CFR 1068.250. These provisions are described below. In the event that a small business is unsuccessful in the 2012 model year and seeks hardship relief, the progress reviews described above would provide an important foundation in determining whether a manufacturer has taken all possible steps to comply with the permeation standards in a timely manner.

(e) Design-Based Certification

For recreational vehicles, manufacturers using metal fuel tanks may certify by design to the tank permeation standards. Tanks using design-based certification provisions are not included in the ABT program because they are assigned a certification emission level equal to the standard. The Panel recommended that we propose to allow design-based certification for metal tanks and plastic fuel tanks with a continuous EVOH barrier. The Panel also recommended that we propose design-based certification for carbon canisters. A detailed description of the new design-based certification options we are adopting is presented earlier in Section VI.F.8 of this document.

The National Marine Manufacturers Association (NMMA), the American Boat and Yacht Council (ABYC), and the Society of Automotive Engineers (SAE) have industry-recommended practices for boat designs that must be met as a condition of NMMA membership. NMMA stated that they are working to update these recommended practices to include installation instructions for carbon canisters and design specifications for low-permeation fuel lines. The Panel recommended that EPA accept data used for meeting the voluntary requirements as part of the EPA certification. We will allow this data to be used as part of EPA certification as long as it is collected consistent with the test procedures and other requirements described in this final rule.

(f) Marine Diurnal Allowances

As described above, manufacturers expressed concern that many small-volume boat builders may need additional time to develop installation procedures and install carbon canisters in their boats. To address this, we are establishing an interim allowance program that will give additional time for these manufacturers for a certain number of boats. Under this program, each small-volume boat builder will be allowed to sell these boats without the diurnal emission controls that would otherwise be required. These allowances are intended to help small boat builders engage in an orderly transition to the new standards and will only be available for boats produced in the first two years of the program. This allowance program applies only to boats with installed fuel tanks that are expected to use carbon canisters to meet the diurnal emission standards. Therefore, it does not apply to portable fuel tanks, personal watercraft, or outboard engines with under-cowl fuel tanks. If a small-volume boat builder chooses to use this allowance provision, then the 50 percent phase-in for the first year, as described in Section VI.C.3, would not apply.

Specifically, each small-volume boat builder will have a total of 1,200 allowances that may be used, at the manufacturer's discretion, for boats produced from July 31, 2011 through July 31, 2013.[113] For instance, a small boat builder could produce 800 boats in the first year and 400 in the second year without diurnal emission controls. For most small boat builders, we expect that this allowance program will result in an additional year, or even two years, of lead time for them to address potential installation issues related to carbon canisters.

Under this diurnal allowance approach for small-volume boat builders, such boat builders will only need to place a label on the vessel with a statement acknowledging that an allowance is being used. In addition, the small-volume boat builder must notify EPA of its intent to use the allowances prior to producing any exempted vessels. The small-volume boat builder must also maintain records of the number of allowances used and submit a report to EPA showing the number of allowances used in each year. Note that boats exempted from diurnal requirements must still use fuel lines and fuel tanks that meet permeation standards.

(g) Hardship Provisions

We are adopting two types of hardship provisions consistent with the Panel recommendations. EPA used the SBA size standards for purposes of defining ''small businesses'' for its regulatory flexibility analysis. The eligibility criteria for the hardship provisions described below reflect EPA's consideration of the Panel's recommendations and a reasonable application of existing hardship provisions. As has been our experience with similar provisions already adopted, we anticipate that hardship mechanisms will be used sparingly. First, under the unusual circumstances hardship provision, any manufacturer subject to the new standards may apply for hardship relief if circumstances outside its control cause the failure to comply and if failure to sell the subject engines or equipment or fuel system component would have a major impact on the company's solvency (see § 1068.245). An example of an unusual circumstance outside a manufacturer's control may be an ''Act of God,'' a fire at the manufacturing plant, or the unforeseen shutdown of a supplier with no alternative available. The terms and time frame of the relief will depend on the specific circumstances of the company and the situation involved. As part of its application for hardship, a company will be required to provide a compliance plan detailing when and how it will achieve compliance with the standards. This hardship provision will be available to all manufacturers of engines, equipment, boats, and fuel system components subject to the new standards, regardless of business size.

Second, an economic hardship provision allows small businesses subject to the new standards to petition EPA for limited additional lead time to comply with the standards (see § 1068.250). A small business must make the case that it has taken all possible business, technical, and economic steps to comply, but the burden of compliance costs would have a significant impact on the company's solvency. Hardship relief could include requirements for interim emission reductions and/or the purchase and use of emission credits. The length of the

[113] In this context, the date of production means the date on which the engine is installed in the vessel. In the case of boats using outboard engines, it is the date on which the fuel tank is installed.

hardship relief decided during review of the hardship application will be up to one year, with the potential to extend the relief as needed. We anticipate that one to two years will normally be sufficient. As part of its application for hardship, a company will be required to provide a compliance plan detailing when and how it will achieve compliance with the standards.

The criteria for determining which manufacturers are eligible for the economic hardship (as well as other small-volume manufacturer flexibilities described in this section) are presented in Sections III.F.2 and IV.G for Marine SI engine manufacturers; in Section V.F.2 for nonhandheld engine manufacturers; and in Section V.F.3 for nonhandheld equipment manufacturers. For handheld equipment manufacturers, EPA is using the existing small-volume manufacturer criterion, which relies on a production cut-off of 25,000 pieces of handheld equipment per year. For boat builders and fuel-system component manufacturers, EPA is basing the determination of whether a company is a small business eligible for the hardship provision on the SBA size standards at 13 CFR 121. Under SBA size standards, a boat builder or fuel-system component manufacturer is a small business if it has 500 or fewer employees.

The criteria for determining which manufacturers are eligible for the economic hardship (as well as other small-volume manufacturer flexibilities described in this section) are presented in Sections III.F.2 and IV.G for Marine SI engine manufacturers; in Section V.F.2 for nonhandheld engine manufacturers; and in Section V.F.3 for nonhandheld equipment manufacturers. For handheld equipment manufacturers, EPA is using the existing small-volume manufacturer criterion, which relies on a production cut-off of 25,000 pieces of handheld equipment per year. For boat builders and fuel-system component manufacturers, EPA is basing the determination of whether a company is a small business on the SBA definition. Under SBA regulations, a boat builder or fuel-system component manufacturer is a small business if it has 500 or fewer employees.

Because many boat builders, nonhandheld equipment manufacturers, and handheld equipment manufacturers will depend on fuel tank manufacturers and fuel line manufacturers to supply certified products in time to produce complying vessels and equipment, we are also establishing a hardship provision for all Marine SI vessel manufacturers and Small SI equipment manufacturers, regardless of size. The hardship provision allows the boat builder or equipment manufacturer to request more time if they are unable to obtain a certified fuel-system component and they are not at fault and would otherwise face serious economic hardship (see § 1068.255).

H. Technological Feasibility

We believe there are several strategies that manufacturers can use to meet the new evaporative emission standards. We have collected and will continue to collect emission test data on a wide range of technologies for controlling evaporative emissions. The design-based certification levels discussed above rely on this test data and we may amend the list of approved designs and emission levels as more data become available.

In the following sections we briefly describe how we selected specific emission standards and implementation dates, followed by a more extensive discussion of the expected emission control technologies. A more detailed discussion of the feasibility of the new evaporative requirements, including all the underlying test data, is included in Chapter 5 of the Final RIA. See Table VI–1 for a summary of the new evaporative emission standards.

(1) Level of Standards

The fuel line and fuel tank permeation standards for Small SI equipment and Marine SI vessels are based on the standards already adopted for recreational vehicles. These applications use similar technology in their fuel systems. In cases where the fuel systems differ we have identified technological approaches that could be used to meet these same emission levels. The control strategies are discussed below. For fuel lines used with cold-weather equipment, we are adopting a relaxed set of standards based on available permeation data. In addition, we have new higher numerical standards for fuel tank permeation for tests performed at higher temperature (40 °C vs. 28 °C). These higher numerical standards are based on data described in Chapter 5 of the Final RIA.

For fuel tanks installed in personal watercraft and for portable marine fuel tanks, we are adopting diurnal emission standards based on the current capabilities of these systems. We are basing the new standard for other installed marine fuel tanks on the capabilities of passive systems that store emitted vapors in a carbon canister. The Final RIA describes the test results on passively purged canisters and other technologies that led us to the level of the diurnal emission standard.

We measured running loss emissions and found that some Small SI products have very high emission levels. The large variety of manufacturers and equipment types makes it impractical to design a measurement procedure, which means that we are unable to specify a performance standard. We are instead adopting a design standard for running losses from nonhandheld Small SI equipment by specifying that manufacturers may use any of a variety of specified design solutions, as described in Section VI.C.5. Several of these design options are already in common use today.

We are requiring that equipment and vessel manufacturers use good engineering practices in their designs to minimize refueling spitback and spillage. In general, the regulation simply requires manufacturers to use system designs that are commonly used today. Several refueling spitback and spillage control strategies are discussed in Chapter 5 of the Final RIA.

(2) Implementation Dates

Low-permeation fuel line is widely available today. Many Small SI equipment manufacturers certifying to permeation standards in California are selling products with low-permeation fuel line nationwide. In addition, many boat builders have begun using low-permeation marine fuel lines to feed fuel from the fuel tank to the engine. For this reason, we are implementing the fuel line permeation standards in 2009 for nonhandheld Small SI equipment and for Marine SI vessels. The dates provide more than two years additional lead time beyond the California requirements for Small SI equipment. For handheld equipment, there are no fuel line permeation requirements in California. In addition, injection molded fuel lines are common in many applications rather than straight-run extruded fuel line. For this reason we are delaying implementation of fuel line permeation standards for handheld equipment until 2012 (or 2013 for small volume emission families). Primer bulbs and many of the fuel line segments used under the cowl of outboard marine engines are also injection molded. In addition, these fuel lines are not subject to standards in California. We are providing additional lead time for manufacturers to address emissions from these fuel lines as well. The permeation standard begins in 2011 for primer bulbs used with marine fuel lines; permeation standards for under-cowl fuel lines phase in between 2010 and 2015.

Similar to fuel line technology, low-permeation fuel tank constructions are used today in automotive and portable fuel tank applications. This technology has been developed for use in recreational vehicles and for Small SI equipment sold in California. The available technology options include surface treatment and multi-layer constructions, though rotation-molding presents some unique design challenges. Based on discussions with fuel tank manufacturers, and our own assessment of the lead time necessary to change current industry practices, we believe low-permeation fuel tank technology can be applied in the 2011–2012 model years for Small SI and Marine SI fuel tanks. We are implementing the fuel tank permeation standards in 2011 for Class II equipment, portable marine fuel tanks and personal watercraft. For Class I equipment and other installed marine fuel tanks, the implementation date is 2012. We are phasing in the handheld fuel tank standards on the following schedule: 2009 for equipment models certifying in California, 2011 for structurally integrated nylon tanks, 2013 for small-volume families, and 2010 for the remaining fuel tanks used with handheld equipment. We believe this will facilitate an orderly transition from current fuel tank designs to low-permeation fuel tanks.

We are allowing until 2012 for large marine fuel tanks to meet permeation standards largely due to concerns raised over the application of low-permeation rotation-molded fuel tank technology in marine applications. The majority of these fuel tanks are typically rotation-molded by small businesses. Although low-permeation technology has emerged for these applications, we believe the allotted lead time will be necessary for all manufacturers to be ready to implement this technology. This will give these manufacturers time to make changes to their production processes to comply with the standards and to make any tooling changes that may be necessary. We are similarly implementing the fuel tank permeation standards for Class I fuel tanks installed in Small SI equipment in 2012, mostly to align with the implementation date for the Phase 3 exhaust emission standards. This is especially important for Class I engines where most of the engine manufacturers will also be responsible for meeting evaporative emission standards.

We are implementing the running loss standards for nonhandheld Small SI equipment in the same year as the exhaust emission standards. We believe this is appropriate because the running loss vapor will in some cases be routed to the intake manifold for combustion in the engine. Manufacturers will need to account for the effect of the additional running loss vapor in their engine calibrations.

We are implementing the new diurnal standards for portable marine fuel tanks on January 1, 2010 and for personal watercraft beginning with the 2010 model year. We believe these requirements will not result in a significant change from current practice so the dates will provide sufficient lead time for manufacturers to comply with standards. For other installed fuel tanks, however, we are adopting a later implementation date beginning in mid-2011. The development of canisters as an approach to control diurnal emissions without pressurizing the tanks has substantially reduced the expected level of effort to redesign and retool for making fuel tanks. However, canister technology has not yet been applied commercially to marine applications and the final rule includes added lead time for manufacturers to work out various technical parameters associated with the large variety of boat models and tanks.

(3) Technological Approaches

We believe several emission control technologies can be used to reduce evaporative emissions from Small SI equipment and Marine SI vessels. These emission control strategies are discussed below. Chapter 5 of the Final RIA presents more detail on these technologies and Chapter 6 provides information on the estimated costs.

(a) Fuel Line Permeation

Fuel lines produced for use in Small SI equipment and Marine SI applications are generally extruded nitrile rubber with a cover for abrasion resistance. Fuel lines used in Small SI applications often meet SAE J30 R7 specifications, including a permeation limit of 550 g/m²/day at 23 °C on ASTM Fuel C. Fuel lines for personal watercraft are typically designed to meet SAE J2046, which includes a permeation limit of 300 g/m²/day at 23 °C on ASTM Fuel C.[114] Marine fuel lines subject to Coast Guard requirements under 33 CFR part 183 are designated as either Type A or Type B and either Class 1 or Class 2. SAE J1527 provides detail on these fuel line designs. Type A fuel lines pass the U.S. Coast Guard fire test while Type B designates fuel lines that have not passed this test. Class 1 fuel lines are intended for fuel-feed lines where the fuel line is normally in contact with liquid fuel and has a permeation limit of 100 g/m²/day at 23 °C. Class 2 fuel lines are intended for vent lines and fuel fill necks where liquid fuel is not continuously in contact with the fuel line; it has a permeation limit of 300 g/m²/day at 23 °C. Recently, SAE J1527 has been modified to include a ''−15'' designation for fuel lines meeting a permeation limit of 15 g/m²/day at 23 °C on fuel CE10. In general practice, most boat builders use Class 1 fuel lines for both vent lines and fuel-feed lines to avoid carrying two types of fuel lines. Most fuel fill necks, which have a much larger diameter and are constructed differently, use materials meeting specifications for Class 2 fuel lines.

Low-permeability fuel lines are in production today. One fuel line design, already used in some marine applications, uses a thermoplastic layer between two rubber layers to control permeation. This thermoplastic barrier may be either nylon or ethyl vinyl acetate. Barrier approaches in automotive applications include fuel lines with fluoroelastomers such as FKM and fluoroplastics such as Teflon and THV. In addition to presenting data on low-permeation fuel lines, Chapter 5 of the Final RIA lists several fuel-system materials and their permeation rates. Molded rubber fuel line components, such as conventional primer bulbs and some handheld fuel lines, could meet the standard by using a fluoroelastomer such as FKM. The Final RIA also discusses low-permeation materials that retain their flexibility at low temperatures.

Automotive fuel lines made of low-permeation plastic tubing are generally made from fluoroplastics. An added benefit of these low-permeability fuel lines is that some fluoropolymers can be made to conduct electricity and therefore prevent the buildup of static charges. This type of fuel line can reduce permeation by more than an order of magnitude below the level associated with barrier-type fuel lines, but it is relatively inflexible and will need to be molded in specific shapes for each equipment or vessel design. Manufacturers have commented that they need flexible fuel lines to fit their many designs, resist vibration, prevent kinking, and simplify connections and fittings. An alternative to custom molding is to manufacture fuel lines with a corrugated profile (like a vacuum hose). Producing flexible fluoropolymer fuel lines is somewhat more expensive but the result is a product that meets emission standards without compromising in-use performance or ease of installation.

[114] Society of Automotive Engineers Surface Vehicle Standard, ''Personal Watercraft Fuel Systems,'' SAE J2046, Issues 1993–01–19 (Docket EPA–HQ–OAR–2004–0008–0179).

(b) Fuel Tank Permeation

Blow-molding is widely used for the manufacture of Small SI, portable marine, and PWC fuel tanks. Typically, blow-molding is performed by creating a hollow tube, known as a parison, by pushing high-density polyethylene (HDPE) through an extruder with a screw. The parison is then pinched in a mold and inflated with an inert gas. In highway applications, low-permeation plastic fuel tanks are produced by blow molding a layer of ethylene vinyl alcohol (EVOH) or nylon between two layers of polyethylene. This process is called coextrusion and requires at least five layers: The barrier layer, adhesive layers on either side of the barrier layer, and two outside layers of HDPE that make up most of the thickness of the fuel tank walls. However, multi-layer construction requires additional extruder screws, which significantly increases the cost of the blow-molding process. One manufacturer has developed a two-layer barrier approach using a polyarylamide inner liner. This technology is not in production yet but appears to be capable of permeation levels similar to the traditional EVOH barrier designs. This approach will enable blow-molding of low-permeation fuel tanks with only one additional extruder screw.

Multi-layer fuel tanks can also be formed using injection molding. In this method a low-viscosity polymer is forced into a thin mold to create the two sides of the fuel tank (e.g., top and bottom), which are then fused together. To add a barrier layer, a thin sheet of the barrier material is placed inside the mold before injecting the poleythylene. The polyethylene, which generally has a much lower melting point than the barrier material, bonds with the barrier material to create a shell with an inner liner.

A less expensive alternative to coextrusion is to blend a low-permeation resin with the HDPE and extrude it with a single screw to create barrier platelets. The trade name typically used for this permeation control strategy is Selar. The low-permeability resin, typically EVOH or nylon, creates noncontinuous platelets in the HDPE fuel tank to reduce permeation by creating long, tortuous pathways that the hydrocarbon molecules must navigate to escape through the fuel tank walls. Although the barrier is not continuous, this strategy can still achieve greater than a 90 percent reduction in permeation of gasoline. EVOH has much higher permeation resistance to alcohol than nylon so it will likely be the preferred material for meeting the new standard based on testing with a 10 percent ethanol fuel.

Many fuel tanks for Small SI equipment are injection-molded out of either HDPE or nylon. Injection-molding can be used with lower production volumes than blow-molding due to lower tooling costs. In this method, a low-viscosity polymer is forced into a thin mold to create the two sides of the fuel tank; these are then fused together using vibration, hot plate or sonic welding. A strategy such as Selar has not been demonstrated to work with injection-molding due to high shear forces.

An alternative to injection-molding is thermoforming, which is also cost-effective for lower production volumes. In this process, sheet material is heated and then drawn into two vacuum dies. The two halves are then fused while the plastic is still molten to form the fuel tank. Low-permeation fuel tanks can be constructed using this process by using multi-layer sheet material. This multi-layer sheet material can be extruded using materials similar to those used with multi-layer blow-molded fuel tank designs. A typical barrier construction includes a thin EVOH barrier, adhesion layers on both sides, a layer of HDPE regrind, and outside layers of pure virgin HDPE.

Regardless of the molding process, another type of low-permeation technology for HDPE fuel tanks will be to treat the surfaces with a barrier layer. Two ways of achieving this are known as fluorination and sulfonation. The fluorination process causes a chemical reaction where exposed hydrogen atoms are replaced by larger fluorine atoms, which creates a barrier on the surface of the fuel tank. In this process, batches of fuel tanks are generally processed post-production by stacking them in a steel container. The container is then voided of air and flooded with fluorine gas. By pulling a vacuum in the container, the fluorine gas is forced into every crevice in the fuel tanks. Fluorinating with this process treats both the inside and outside surfaces of the fuel tank, thereby improving the reliability and durability of the permeation-resistance. As an alternative, blow-molded fuel tanks can be fluorinated during production by exposing the inside surface of the fuel tank to fluorine during the molding process. However, this method may not prove as effective as post-production fluorination.

Sulfonation is another surface treatment technology where sulfur trioxide is used to create the barrier by reacting with the exposed polyethylene to form sulfonic acid groups on the surface. Current practices for sulfonation are to place fuel tanks on a small assembly line and expose the inner surfaces to sulfur trioxide, then rinse with a neutralizing agent. However, sulfonation can also be performed using a batch method. Either of these sulfonation processes can be used to reduce gasoline permeation by more than 95 percent.

A fourth method for molding plastic fuel tanks is called rotation-molding. Rotation-molding is a lower-cost alternative for smaller production volumes. In this method, a mold is filled with a powder form of polyethylene with a catalyst material. While the mold is rotated in an oven, the heat melts the plastic. When cross-link polyethylene (XLPE) is used, this heat activates a catalyst in the plastic, which causes a strong cross-link material structure to form. This method is often used for relatively large fuel tanks in Small SI equipment and for installed marine fuel tanks. The advantages of this method are low tooling costs, which allows for smaller production volumes, and increased strength and flame resistance. Flame resistance is especially important for installed marine fuel tanks subject to 33 CFR part 183. At this time, the barrier treatment approaches discussed above for HDPE have not been demonstrated to be effective for XLPE.

We have evaluated two permeation control approaches for rotation-molded fuel tanks. The first is to form an inner layer during the molding process. Historically, the primary approach for this is to use a drop box that opens after the XLPE tank begins to form. However, processes have been developed that eliminate the need for a drop box. With this construction a low-permeation inner liner can be molded into the fuel tank. Manufacturers are currently developing acetyl copolymer, nylon, and polybutylene terephthalate inner liners for this application. In fact, one fuel tank manufacturer is already selling tanks with a nylon inner liner into Class II Small SI equipment applications. Initial testing suggests that these barrier layers could be used to achieve the new standards.

The second approach to creating a barrier layer on XLPE rotation-molded fuel tanks is to use an epoxy barrier coating. One manufacturer has demonstrated that a low-permeation barrier coating can adhere to an XLPE fuel tank resulting in a permeation rate below the new standard. In this case, the manufacturer used a low level of fluorination to increase the surface energy of the XLPE so the epoxy will adhere properly.

Marine fuel tanks are sometimes also fabricated out of either metal or fiberglass. Metal does not permeate so tanks that are constructed and installed properly to prevent corrosion should meet the new standards throughout their full service life. For fiberglass fuel tanks, one manufacturer has developed a composite that has been demonstrated to meet the new fuel tank permeation standard. Permeation control is achieved by incorporating fillers into a resin system and coating the assembled tank interior and exterior. This filler is made up of nanocomposites (very small particles of treated volcanic ash) which are dispersed into a carrier matrix. These particles act like the barrier platelets discussed above by creating a tortuous pathway for hydrocarbon migration through the walls of the fuel tank.

(c) Diurnal

Portable marine fuel tanks are currently equipped with a valve that can be closed by the user when the tank is stored to contain vapor within the fuel tank. These fuel tanks are designed to hold the pressure that builds up when a sealed fuel tank undergoes normal daily warming. This valve must be opened when the engine is operating to prevent a vacuum from forming in the fuel tank as the fuel level in the tank decreases. A vacuum in the fuel tank could prevent fuel from being drawn into the engine. Because the valve is user-controlled, any emission control is dependent on user behavior. This can be corrected by replacing the user-controlled valve with a simple one-way valve in the fuel cap. For instance, a diaphragm valve that is common in many automotive applications seals when under positive pressure but opens at low-vacuum conditions.

Personal watercraft currently use sealed systems with pressure-relief valves that start venting vapors when pressures reach a threshold that ranges from 0.5 to 4.0 psi. We believe the new standard can be met through the use of a sealed fuel system with a 1.0 psi pressure-relief valve. Personal watercraft should therefore be able to meet the new standard with little or no change to current designs.

For other vessels with installed fuel tanks, manufacturers have commented that even 1.0 psi of pressure would be too high for their applications.[115] They expressed concern that their fuel tanks had large, flat surfaces that would deform or leak at pressures of 0.5 psi or higher. This concern led us to consider several technologies for controlling diurnal emissions without pressurizing the tank, including carbon canisters, volume-compensating air bags, and bladder fuel tanks.

The primary evaporative emission control device used in automotive applications is a carbon canister. With this technology, vapor generated in the tank is vented to a canister containing activated carbon. The fuel tank must be sealed such that the only venting that occurs is through the carbon canister. This prevents more than a minimal amount of positive or negative pressure in the tank. The activated carbon collects and stores the hydrocarbons. The activated carbon bed in automotive canisters is refreshed by drawing air over the carbon to purge the hydrocarbon vapors and route them to the engine's air intake where they are eventually burned as fuel for the engine.

In a marine application, routing purged vapors to the engine's intake is not practical because of the potential complications with the engine and tank created by the variety of manufacturers and engine/tank configurations in the fleet each year. Therefore, canisters were not originally considered to be a practical technology for controlling diurnal vapor from boats. Since that time, however, we have collected information showing that the canister is purged sufficiently during cooling periods to substantially reduce diurnal emissions. When the fuel in the tank cools, fresh air is drawn back through the canister into the fuel tank. This fresh air partially purges the canister and returns hydrocarbons to the fuel tank. This creates open sites in the carbon so the canister can again collect vapor during the next heating event. Test data presented in Chapter 5 of the Final RIA show that a canister starting from empty is more than 90 percent effective until it reaches the point of saturation. Once it reaches saturation, a canister is still capable of reducing diurnal emissions by more than 60 percent due to the normal airflow across the canister bed during cooling periods. Adding active purging to route vapors to the engine's air intake during engine operation would improve the level of control somewhat, depending on how often the engine is operated.

Manufacturers have raised the concern that it is common for fuel to pass out the vent line during refueling. If there were a canister in the vent line it would become saturated with fuel. While this would not likely cause permanent damage to the canister, we believe marine fuel systems should prevent liquid fuel from exiting the vent line for both environmental and safety reasons. A float valve or small orifice in the entrance to the vent line from the fuel tank would prevent liquid fuel from reaching the canister or escaping from the tank. Any pressure build-up from such a valve would cause fuel to back up the fill neck and shut off the fuel dispensing nozzle as it now does in automotive applications. In addition, a vapor space should be included to account for fuel expansion. Manufacturers have also expressed concerns for canister durability in marine applications due to vibration, shock, and humidity. However, there are now marine grades of activated carbon that are harder and more moisture-resistant than typical automotive carbon. Manufacturers installed canisters equipped with the marine grade carbon on 14 boats in a pilot program and encountered no problems. This is discussed in more detail in Chapter 5 of the Final RIA.

Another concept for minimizing pressure in a sealed fuel tank is through the use of a volume-compensating air bag. The purpose of the bag is to fill up the vapor space above the liquid fuel. By minimizing the vapor space, the equilibrium concentration of fuel vapors occupies a smaller volume, resulting in a smaller mass of vapors. As the equilibrium vapor concentration increases with increasing temperature, the vapor space expands, which forces air out of the bag through the vent to atmosphere. Because the bag volume decreases to compensate for the expanding vapor space, total pressure inside the fuel tank stays very close to atmospheric pressure. Once the fuel tank cools in response to cooling ambient temperatures the resulting vacuum in the fuel tank would make the bag expand again by drawing air from the surrounding environment. Our test results show that pressure could be kept below 0.8 psi using a bag with a capacity equal to 25 percent of the fuel tank capacity. The use of a volume-compensating air bag, in conjunction with a pressure-relief valve, would be very effective in controlling diurnal emissions.

Probably the most effective technology for reducing diurnal emissions from marine fuel tanks is through the use of a collapsible fuel bladder. In this concept, a low-permeation bladder is installed in the fuel tank to hold the fuel. As fuel is drawn from the bladder the vacuum created collapses the bladder. There is, therefore, no vapor space and no

[115] U.S. Coast Guard regulations in 33 CFR 183.586 require that marine fuel tanks must be designed to withstand 25,000 pressure cycles from 0–3 psi. Even though marine fuel tanks typically can withstand this pressure cycling without damage to the tank, the tanks tend to deform significantly when under pressure.

pressure build-up from fuel heating. No vapors would be vented to the atmosphere since the bladder is sealed. This option could also eliminate running loss emissions and significantly reduce emissions during refueling that would normally result from dispensed fuel displacing vapor in the fuel tank. We have received comments that this would be cost-prohibitive because it could increase costs from 30 to 100 percent, depending on tank size. However, bladder fuel tanks have safety advantages and they are already sold by at least one manufacturer to meet market demand in niche applications.

(d) Running Loss

Running loss emissions can be controlled by sealing the fuel cap and routing vapors from the fuel tank to the engine intake. In doing so, vapors generated by heat from the engine will be burned in the engine's combustion chamber. It may be necessary to use a valve or limited-flow orifice in the purge line to prevent too much fuel vapor from reaching the engine and to prevent liquid fuel from entering the line if the equipment turns over. Depending on the configuration of the fuel system and purge line, a one-way valve in the fuel cap may be desired to prevent a vacuum in the fuel tank during engine operation. We anticipate that a system like this will eliminate running loss emissions. However, higher temperatures during operation and the additional length of vapor line will slightly increase permeation. Considering these effects, we still believe that the system described here will reduce running losses from Small SI equipment by more than 90 percent.

We are not adopting requirements to control running loss emissions from marine vessels. For portable marine fuel tanks and fuel tanks installed in vessels other than personal watercraft we expect the significant distance from the engine and the cooling effect of operating the vessel in water to prevent significant heating of the fuel tanks during engine operation. For personal watercraft, fuel tanks have a sealed system with pressure relief that should help contain running loss emissions. For other installed fuel tanks, we expect the system for controlling diurnal emissions will capture about half of any running losses that would occur.

(e) Diffusion

A secondary benefit of the running loss control described above for Small SI equipment relates to diffusion emissions. In a system that vents running loss vapors to the engine, venting vapors will be routed through the vapor line to the engine intake, rather than through open vents in the fuel cap. This approach should therefore eliminate diffusion emissions.

In the case of marine vessels, diffusion emissions are generally minimal due to long vent lines on the fuel tanks or the use of sealed fuel tanks. Further, the addition of diurnal emission controls will effectively control diffusion emissions.

(4) Regulatory Alternatives

We considered both less and more stringent evaporative emission control alternatives for fuel systems used in Small SI equipment and Marine SI vessels. Chapter 11 of the Final RIA presents details on this analysis of regulatory alternatives. The results of this analysis are summarized below. We believe the new permeation standards are reflective of available technology and represent a step change in emission performance. Therefore, we consider the same permeation control scenario in the less stringent and more stringent regulatory alternatives.

For Small SI equipment, we considered a less stringent alternative without running loss emission standards for Small SI engines. However, we believe controlling running loss emissions from nonhandheld equipment is feasible at a relatively low cost. Running loss emissions can be controlled by sealing the fuel cap and routing vapors from the fuel tank to the engine intake. Not requiring these controls is inconsistent with section 213 of the Clean Air Act. For a more stringent alternative, we considered applying a diurnal emission standard for all Small SI equipment. We believe passively purging carbon canisters could reduce diurnal emissions by 50 to 60 percent from Small SI equipment. However, we believe there would be significant costs to add carbon canisters to all Small SI equipment nationwide, especially when taking packaging and vibration into account. The cost sensitivity is especially noteworthy given the relatively low emissions levels (on a per-equipment basis) from such small fuel tanks.

For marine vessels, we considered a less stringent alternative, where there would be no diurnal emission standard for vessels with installed fuel tanks. However, installed fuel tanks on marine vessels have much higher capacities than those used in Small SI applications. Our analysis indicates that carbon canisters are feasible for boats at relatively low cost. While packaging and vibration are also issues with marine applications, we believe these issues have been addressed. Manufacturers installed carbon canisters in fourteen boats in a pilot program. The results demonstrated the feasibility of this technology. The new standards are achievable through engineering design-based certification with canisters that are much smaller than the fuel tanks. In addition, sealed systems, with pressure-control strategies will be accepted under the provisions for design-based certification. For a more stringent scenario, we considered a standard that would require boat builders to use an actively purged carbon canister. This means that the engine would draw air through the canister during operation to purge the canister of stored hydrocarbons. However, we rejected this option because marine engines operate too infrequently to consistently purge the canister to allow for increased storage of further vapor loading from the fuel tank. The gain in overall efficiency would be quite small relative to the complexity of integrating engine purge strategies and hardware into a vessel-based control strategy. The additional benefit of an actively purged diurnal control system is small in comparison to its cost and complexity.

(5) Our Conclusions

We believe the new evaporative emission standards reflect what manufacturers can achieve through the application of available technology. We believe the lead time is necessary and adequate for fuel tank manufacturers, fuel line manufacturers, engine manufacturers, equipment manufacturers, and boat builders to select, design, and produce evaporative emission control strategies that will work best for their product lines. We expect that meeting these requirements will pose a challenge, but one that is feasible when taking into consideration the availability and cost of technology, lead time, noise, energy, and safety. The role of these factors is presented in detail in Chapters 5 and 6 of the Final RIA. As discussed in Section VII, we do not believe the new standards will have negative effects on energy, noise, or safety and may lead to some positive effects.

VII. Energy, Noise, and Safety

Section 213 of the Clean Air Act directs us to consider the potential impacts on safety, noise, and energy when establishing the feasibility of emission standards for nonroad engines. Furthermore, section 205 of EPA's 2006 Appropriations Act requires us to assess potential safety issues, including the risk of fire and burn to consumers in use, associated with the new emission standards for nonroad spark-ignition engines below 50 horsepower.[116] As detailed in the following sections, we expect that the new exhaust and evaporative emission standards will either have no adverse affect on safety, noise, and energy or will improve certain aspects of these important characteristics. A more in-depth discussion of these topics relative to the new exhaust and evaporative emission standards is contained in Chapters 4 and 5 of the Final RIA, respectively. Also, our conclusions relative to safety are fully documented in our comprehensive safety study which is discussed in the next section.

A. Safety

We conducted a comprehensive, multi-year safety study of spark-ignition engines that focused on the four areas where we are adopting new emission standards.[117] These areas are:

- New catalyst-based HC+NO_X exhaust emission standards for Class I and Class II nonhandheld spark-ignition engines;
- New fuel evaporative emission standards for nonhandheld and handheld equipment;
- New HC+NO_X exhaust emission standards for outboard and personal watercraft engines and vessels, and a new CO exhaust emission standard for nonhandheld engines used in marine auxiliary applications; and
- New fuel evaporative emission standards for outboard and personal watercraft engines and vessels.

Each of these four areas is discussed in greater detail in the next sections.

(1) Exhaust Emission Standards for Small Spark-Ignition Engines

The technology approaches that we assessed for achieving the new Small SI engine standards included exhaust catalyst aftertreatment and improvements to engine and fuel system designs. In addition to our own testing and development effort, we also met with engine and equipment manufacturers to better understand their designs and technology and to determine the state of technological progress beyond EPA's Phase 2 emission standards.

The scope of our safety study included Class I and Class II engine systems that are used in residential walk-behind and ride-on lawn mower applications, respectively. Residential lawn mower equipment was chosen for the following reasons.

- Lawn mowers and the closely-related category of lawn tractors overwhelmingly represent the largest categories of equipment using Class I and Class II engines.
- Consumer Product Safety Commission (CPSC) data indicate that more thermal burn injuries are associated with lawn mowers than occur with other nonhandheld equipment; lawn mowers therefore represent the largest thermal burn risk for these classes of engines.
- General findings regarding advanced emission control technologies for residential lawn and garden equipment carry over to commercial lawn and turf care equipment as well as to other nonhandheld equipment using Class I and Class II engines.

We conducted the technical study of the incremental risk on several fronts. First, working with CPSC, we evaluated their reports and databases and other outside sources to identify those in-use situations which create fire and burn risk for consumers. The outside sources included meetings, workshops, and discussions with engine and equipment manufacturers. From this information, we identified ten scenarios for evaluation that covered a comprehensive variety of in-use conditions or circumstances which potentially could lead to an increased risk in burns or fires.

Second, we conducted extensive laboratory and field testing of both current technology (Phase 2) and prototype catalyst-equipped advanced-technology engines and equipment (Phase 3) to assess the emission control performance and thermal characteristics of the engines and equipment. This testing included a comparison of exhaust system, engine, and equipment surface temperatures using still and full motion video thermal imaging equipment.

Third, we conducted a design and process Failure Mode and Effects Analyses (FMEA) comparing current Phase 2 and Phase 3 compliant engines and equipment to evaluate incremental changes in risk probability as a way of evaluating the incremental risk of upgrading Phase 2 engines to meet Phase 3 emission standards.[118] This is an engineering analysis tool to help engineers and other professional staff to identify and manage risk. In an FMEA, potential failure modes, causes of failure, and failure effects are identified and a resulting risk probability is calculated from these results. This risk probability is used by the FMEA team to rank problems for potential action to reduce or eliminate the causal factors. Identifying these causal factors is important because they are the elements that a manufacturer can consider to reduce the adverse effects that might result from a particular failure mode.

Our technical work and subsequent analysis of all the data and information strongly indicate that effective catalyst-based standards can be implemented without an incremental increase in the risk of fire or burn to the consumer either during or after using the equipment. Similarly, we did not find any increase in the risk of fire during refueling or in storage near typical combustible materials. For example, our testing program demonstrated that properly designed catalyst-mufflers could, in some cases, actually result in systems that were significantly cooler than many current original equipment mufflers. A number of design elements appear useful to properly managing heat loads including: (1) The use of catalyst designs that minimize CO oxidation through careful selection of catalyst size, washcoat composition, and precious metal loading; (2) positioning the catalyst within the cooling air flow of the engine fan or redirecting some cooling air over the catalyst area with a steel shroud; (3) redirecting exhaust flow through multiple chambers or baffles within the catalyst-muffler; and (4) larger catalyst-muffler volumes than the original equipment muffler.

(2) Fuel Evaporative Emission Standards for Nonhandheld and Handheld Engines and Equipment

We reviewed the fuel line and fuel tank characteristics for nonhandheld and handheld equipment and evaluated control technology which could be used to reduce evaporative emissions from these two subcategories. The available technology is capable of achieving reductions in fuel tank and fuel line permeation without an adverse incremental impact on safety. For fuel lines and fuel tanks, the applicable consensus safety standards, manufacturer specific test procedures and EPA requirements are sufficient to

[116] Department of the Interior, Environment, and Related Agencies Appropriations Act, 2006, Pub. L. No. 109–54, Title II, sec. 205, 119 Stat. 499, 532 (August 2, 2005).

[117] ''EPA Technical Study on the Safety of Emission Controls for Nonroad Spark-Ignition Engines < 50 Horsepower,'' Office of Transportation and Air Quality, U.S. Environmental Protection Agency, Washington, DC, EPA420–R–06–006, March 2006. This document is available in Docket EPA–HQ–OAR–2004–0008. This report was also subject to peer review, as described in a peer review report that is also available in the docket.

[118] ''EPA Technical Study on the Safety of Emission Controls for Nonroad Spark-Ignition Engines < 50 Horsepower,'' Office of Transportation and Air Quality, U.S. Environmental Protection Agency, Washington, DC, EPA420–R–06–006, March 2006. This document is available in Docket EPA–HQ–OAR–2004–0008.

ensure that there will be no increase in the types of fuel leaks that lead to fire and burn risk during in-use operation. Instead, these standards will reduce vapor emissions both during operation and in storage. That reduction, coupled with some expected equipment redesign, is expected to lead to reductions in the risk of fire or burn without affecting component durability.

The Failure Mode and Effects Analyses, which was described in the previous section, also evaluated permeation and running loss controls on nonhandheld engines. We found that these controls will not increase the probability of fire and burn risk from those expected with current fuel systems, but could in fact lead to directionally improved systems from a safety perspective. Finally, the running loss control program being promulgated for nonhandheld equipment will lead to changes that are expected to reduce risk of fire during in-use operation. Moving fuel tanks away from heat sources, improving cap designs to limit leakage on tip over, and requiring a tethered cap will all help to eliminate conditions which lead to in-use problems related to fuel leaks and spillage. Therefore, we believe the application of emission control technology to reduce evaporative emissions from these fuel lines and fuel tanks will not lead to an increase in incremental risk of fires or burns and in some cases is likely to at least directionally reduce such risks.

(3) Exhaust Emission Standards for Outboard and Personal Watercraft Marine Engines and Vessels and Marine Auxiliary Engines

Our analysis of exhaust emission standards for OB/PWC engines and marine auxiliary engines found that the U.S. Coast Guard (USCG) has comprehensive safety standards that apply to engines and fuel systems used in these vessels. Additionally, organizations such as the Society of Automotive Engineers, Underwriters Laboratories, and the American Boat and Yacht Council (ABYC) also have safety standards that apply in this area. We also found that the four-stroke and two-stroke direct injection engine technologies which are likely to be used to meet the exhaust emission standards contemplated for OB/PWC engines are in widespread use in the vessel fleet today. These more sophisticated engine technologies are replacing the traditional two-stroke carbureted engines. The four-stroke and two-stroke direct injection engines meet applicable USCG and ABYC safety standards and future products will do so as well. The new emission standards must be complementary to existing safety standards and our analysis indicates that this will be the case. There are no known safety issues with the advanced technologies compared with two-stroke carbureted engines. The newer-technology engines arguably provide safety benefits due to improved engine reliability and range in-use. Based on the applicability of USCG and ABYC safety standards and the good in-use experience with advanced-technology engines in the current vessel fleet, we believe new emission standards will not create an incremental increase in the risk of fire or burn to the consumer.

(4) Fuel Evaporative Emission Standards for Outboard and Personal Watercraft Engines and Vessels

We reviewed the fuel line and fuel tank characteristics for marine vessels and evaluated control technology which could be used to reduce evaporative emissions from boats. With regard to fuel lines, fuel tanks, and diurnal controls, there are rigorous USCG, ABYC, United Laboratories, and Society of Automotive Engineers standards which manufacturers will continue to meet for fuel system components. All these standards are designed to address the in-use performance of fuel systems, with the goal of eliminating fuel leaks. The low-permeation fuel lines and tanks needed to meet the Phase 3 requirements will need to pass these standards and every indication is that they will pass.[119]

Furthermore, the EPA permeation certification requirements related to emissions durability will add an additional layer of assurance. Low-permeation fuel lines are used safely today in many marine vessels. Low-permeation fuel tanks and diurnal emission controls have been demonstrated in various applications for many years without an increase in safety risk. Furthermore, a properly designed fuel system with fuel tank and fuel line permeation controls and diurnal emission controls will reduce the fuel vapor in the boat, thereby reducing the opportunities for fuel related fires. In addition, using improved low-permeation materials coupled with designs meeting USCG and ABYC requirements should reduce the risk of fuel leaks into the vessel. We believe the application of emission control technologies on marine engines and vessels for meeting the new fuel evaporative emission standards will not lead to an increase in incremental risk of fires or burns, and in many cases may incrementally decrease safety risk in certain situations.

B. Noise

As automotive technology demonstrates, achieving low emissions from spark-ignition engines can correspond with greatly reduced noise levels. Direct-injection two-stroke and four-stroke OB/PWC have been reported to be much quieter than traditional carbureted two-stroke engines. Catalysts in the exhaust act as mufflers which can reduce noise. Additionally, adding a properly designed catalyst to the existing muffler found on all Small SI engines can offer the opportunity to incrementally reduce noise.

C. Energy

(1) Exhaust Emission Standards

Adopting new technologies for controlling fuel metering and air-fuel mixing, particularly the conversion of some carbureted engines to advanced fuel injection technologies, will lead to improvements in fuel consumption. This is especially true for OB/PWC engines where we expect the new standards to result in the replacement of old technology carbureted two-stroke engines with more fuel-efficient technologies such as two-stroke direct injection or four-stroke engines. Carbureted crankcase-scavenged two-stroke engines are inefficient in that 25 percent or more of the fuel entering the engine may leave the engine unburned. EPA estimates that conversion to more fuel efficient recreational marine engines will save 61 million gallons of gasoline per year in 2030. The conversion of some carbureted Small SI engines to fuel injection technologies is also expected to improve fuel economy. We estimate approximately 18 percent of the Class II engines will be converted to fuel injection and that this will result in a fuel savings of about 10 percent for each converted engine. This translates to a fuel savings of about 56 million gallons of gasoline in 2030 when all the Class II engines used in the U.S. will comply with the Phase 3 standards. By contrast, the use of catalyst-based control systems on Small SI engines is not expected to change their fuel consumption characteristics.

(2) Fuel Evaporative Emission Standards

We anticipate that the new fuel evaporative emission standards will have a positive impact on energy. By capturing or preventing the loss of fuel

[119] ''EPA Technical Study on the Safety of Emission Controls for Nonroad Spark-Ignition Engines < 50 Horsepower,'' Office of Transportation and Air Quality, U.S. Environmental Protection Agency, Washington, DC, EPA420–R–06–006, March 2006. This document is available in Docket EPA–HQ–OAR–2004–0008.

due to evaporation, we estimate that the lifetime average fuel savings will be about 1.6 gallons for an average piece of Small SI equipment and 32 gallons for an average boat. This translates to a fuel savings of about 41 million gallons for Small SI equipment and 30 million gallons for Marine SI vessels in 2030 when most of the affected equipment used in the U.S. will be expected to have evaporative emission controls.

VIII. Requirements Affecting Other Engine and Vehicle Categories

We are making several regulatory changes that will affect other engines, equipment, vehicles, and vessels in our nonroad and highway programs. These changes are described in the following subsections. As noted in these subsections, those changes that were not proposed are being made in response to the comments we received.

A. State Preemption

Section 209(e) of the Clean Air Act prohibits states and their political subdivisions from adopting or enforcing standards and other requirements relating to the control of emissions from nonroad engines or vehicles. Section 209(e) authorizes EPA to waive this preemption for California for standards and other requirements for nonroad engines and vehicles, excluding new engines that are smaller than 175 horsepower used in farm or construction equipment or vehicles and new locomotives or new engines used in locomotives. States other than California may adopt and enforce standards identical to California standards authorized by EPA.

EPA promulgated regulations implementing section 209(e) on July 20, 1994 (59 FR 36987). EPA subsequently promulgated revised regulations implementing section 209(e) on December 30, 1997 (62 FR 67733). See 40 CFR part 85, subpart Q. As proposed, we are creating a new part 1074 that describes the federal preemption of state and local emission requirements. This is being done as part of EPA's ongoing effort to write its regulations in plain language format in subchapter U of title 40 of the CFR. The final regulations are based directly on the existing regulations in 40 CFR part 85, subpart Q. With the exception of the specific changes described in this section, we are not changing the meaning of these regulations.

Pursuant to section 428 of the 2004 Consolidated Appropriations Act, we are adding regulatory language to implement the legislative restriction on states other than California adopting, after September 1, 2003, standards or other requirements applicable to spark-ignition engines smaller than 50 horsepower. We are also adding, pursuant to that legislation, criteria for EPA's consideration in authorizing California to adopt and enforce standards applicable to such engines.[120]

In addition, on July 12, 2002, the American Road and Transportation Builders Association (ARTBA) petitioned EPA to amend EPA's rules implementing section 209(e) of the Act.[121] In particular, ARTBA petitioned EPA to amend its regulations and interpretive rule regarding preemption of state and local requirements ''that impose in-use and operational controls or fleet-wide purchase, sale or use standards on nonroad engines.'' [122] ARTBA believes such controls should be preempted.

As we were already planning to revise the preemption provisions to a certain extent in this rule, we determined that it was appropriate to respond to ARTBA's petition in the context of this rule, and noticed our review in the proposal for this rule, giving the public the ability to respond to provide comments regarding ARTBA's petition. After reviewing ARTBA's petition and the comments received regarding the petition, EPA is not adopting the changes requested by ARTBA in its petition. While EPA is in agreement with ARTBA regarding some of the observations it makes in the petition regarding preemption of state standards, particularly state fleet average standards, we believe the current regulatory language is sufficient regarding preemption of such standards. In addition, we believe that it would be inappropriate to grant ARTBA's request that we amend the existing regulations to find that restrictions on the use and operation of nonroad engines are preempted under section 209(e) of the Act. For a full discussion and response to ARTBA's petition and the comments we received on the petition, please review ''Response to the Petition of American Road and Transportation Builders Association to Amend Regulations Regarding the Preemption of State Standards Regulating Emissions from Nonroad Engines,'' which has been placed in the docket for this rulemaking.

B. Certification Fees

Under our current certification program, manufacturers pay a fee to cover the costs associated with various certification and other compliance activities associated with an EPA issued certificate of conformity. These fees are based on the actual and/or projected cost to EPA per emission family. We are establishing a new fees category for certification related to the new evaporative emission standards. Sections III and VI describe how the fees apply to sterndrive/inboard marine engines and equipment and vessels subject to evaporative emission standards since manufacturers are not currently required to pay certification fees for these products.

In addition, as proposed, we are creating a new part 1027 in title 40 that incorporates the new and existing fee requirements under a single part in the regulations. This is being done as part of EPA's ongoing effort to write its regulations in plain language format in subchapter U of title 40 of the CFR. The final regulations are based directly on the existing regulations in 40 CFR part 85, subpart Y. Aside from a variety of specific changes, moving this language to part 1027 is not intended to affect the substance of the existing fee provisions. We are making the following adjustments and clarifications to the existing regulations:

- Establishing a new fees category for new evaporative emission standards.
- Eliminating one of the paths for applying for a reduced fee. The existing regulations specify that applications covering fewer than six vehicles or engines, each with an estimated retail sales price below $75,000, shall receive a certificate for five vehicles or engines. Holders of these certificates are required to submit an annual model year reduced fee payment report adjusting the fees paid. We are eliminating this pathway and the associated report, as they are complex and have been rarely used.
- Clarifying the obligation to make additional payment on a reduced fee certificate if the actual final sales price is more than the projected retail sales price for a reduced fee vehicle or engine. As before, the final fee payment must also reflect the actual number of vehicles.
- Applying the calculated fee changes for later years, which are based on the

[120] See section 428 of the Appropriations Act for 2004.

[121] ''Petition to Amend Rules Implementing Clean Air Act section 209(e),'' American Road and Transportation Builders Association (ARTBA), July 12, 2002. Also, EPA received an additional communication from ARTBA urging EPA to grant the petition after the decision of the *U.S. Supreme Court in EMA* v. *SCAQMD,* 541 U.S. 246 (2004). See ''ARTBA Petition,'' L. Joseph, ARTBA, to D. Dickinson & R. Doyle, EPA, April 30, 2004. These documents are available in Docket EPA–HQ–OAR–2004–0008.

[122] In 1994, EPA promulgated an interpretive rule at Appendix A to subpart A of 40 CFR part 89. This interpretive rule was amended as part of the rule promulgated on December 30, 1997 (62 FR 67733). The appendix provides, among other things, that state restrictions on the use and operation of nonroad engines are not preempted under section 209.

Consumer Price Index and the total number of certificates, only after the change in the fee's value since the last reported change has reached $50. The fee change for the ''Other'' category for calendar year 2005 to 2006 changed from $826 to $839 and for non-road compression-ignition engines from $1822 to $1831. Under the final rule, the fee will not change until such time as the fee increase will be $50.00 or greater. This might not occur after one year, but after two or more years the calculated increase in a fee based on the change in the Consumer Price Index might be more than $50.00. The same applies if the price goes up or down. For example, if the fee published in EPA guidance for a category of engine was $1,000 in 2011 and the calculated fee for 2012 is $990 and in 2013 is $1040, the fee in 2013 will remain at $1,000 since the change from the 2011 fee is only $40. This will minimize confusion related to changing fees where the calculated fee is very close to that already established for the previous year. It will also lessen paperwork and administrative burdens for manufacturers and EPA in making adjustments for small fees changes for applications that are completed around the change in a calendar year. The number of certificates may go up or down in any given year, while the Consumer Price Index will generally increase annually. As a result, this change will be revenue-neutral or will perhaps slightly decrease overall revenues.

• Clarifying that all fee-related records need to be kept, not just those related to the ''final reduced fee calculation and adjustment.''

• Adding *www.Pay.gov* or other methods specified in guidance as acceptable alternative methods for payment and filing of fee forms.

• Establishing a single deadline for all types of refunds: Total, partial for reduced fees, and partial for corrections. In all cases, refund requests must be received within six months of the end of the model year. A common type of request is due to an error in the fee amount paid as a result of changed fees for a new calendar year. We frequently apply these overpayments to other pending certification applications. This is less burdensome than applying for a simple refund, both for EPA and for most manufacturers. Applications to apply such refunds to other certification applications must also be received within six months of the end of the model year of the original engine family or test group.

• Emphasizing with additional cross references that the same reduced fee provisions that apply to Independent Commercial Importers also apply to modification and test vehicle certificates under 40 CFR 85.1509 and 89.609: The number of vehicles covered is listed on the certificate, a revision of the certificate must be applied for and additional reduced fee payments made if additional vehicles are to be covered, and the certificate must be revised to show the new total number of vehicles to be covered.

We are making one additional change in the regulations based on comments regarding the limits on fees that apply for locomotive and marine diesel remanufacturing systems or kits. We are specifying that certified remanufacturing systems or kits under these programs are eligible for reduced fees based on the value of the remanufacturing system or kit rather than the value of the whole locomotive or vessel. This is analogous to existing provisions for fuel-conversion kits in which the regulation specifies that the basis for evaluating the one-percent threshold is the value of the kit alone. We are therefore modifying the regulation to allow for reduced fees where the assessed fee is more than one percent of the value of the remanufacturing system or kit. This applies equally to locomotives and marine diesel engines, which are now also subject to remanufacturing certification provisions.

C. Amendments to General Compliance Provisions in 40 CFR Part 1068

We have adopted final rules to apply the provisions of part 1068 for locomotives regulated under part 1033, nonroad diesel engines regulated under 40 CFR part 1039, marine diesel engines regulated under 40 CFR part 1042, Large SI engines regulated under 40 CFR part 1048, and recreational vehicles regulated under 40 CFR part 1051. In this final rule we are applying these provisions for Small SI and Marine SI engines, equipment, and vessels. Any changes we make to part 1068 will apply equally for these other types of engines and vehicles.

The following paragraphs describe several amendments we are making to part 1068, including several changes and clarifications subsequent to the proposed rule. We summarize several of the most important changes since the proposal in Section X.

(3) Partially Complete Engines

We proposed to revise our definition of ''engine'' to be clear that it includes those engines that are only partially complete. We received many comments regarding the impact of this clarification. The final approach described in this subsection includes revisions from the proposal to address these comments.

We are aware that in some cases manufacturers produce nonroad engines by starting with a complete or partially complete engine from another manufacturer and modify it as needed for the particular application. This is especially common for Marine SI and Large SI engines and equipment, but it may also occur for other types of nonroad engines and equipment. We are aware that an interpretation of the prohibited acts in § 1068.101 would disallow this practice because the original engine manufacturer is arguably selling an engine that is not covered by a certificate of conformity even though emission standards apply. We are also concerned that some manufacturers might choose to exploit this ambiguity by importing partially complete engines, contending that these are not subject to standards, where the company receiving the shipment would assemble the engines and sell them without going through the certification process. It would be very difficult to monitor or enforce requirements with this kind of business activity.

We are addressing this first by defining ''engine'' for the purposes of the regulations (see § 1068.30). To do this, we differentiate between complete engines and partially complete engines, both of which need to be covered by a valid certificate or an exemption. An engine block becomes an ''engine'' subject to standards when a crankshaft is installed. This represents a substantial step in the manufacturing process. Selecting a later point in the assembly process would only create the potential for loopholes for companies wanting to sell products that fall just short of what it would take to be subject to standards.

Partially complete engines include any engine that has not been fully assembled or is not yet in its final configuration. This might include short blocks that are shipped to another location for final assembly. It might also include full assembled engines that will be installed in all-terrain vehicles (which are subject to equipment-based standards). Even though these engines are still subject to further assembly or modification, they are subject to standards and certification requirements and therefore may not be introduced into U.S. commerce without an exemption. We are adopting provisions to accommodate various assembly paths reflecting current business practices. For example, we are specifying that manufacturers may ship partially complete engines between two of their facilities (see § 1068.260). We would require manufacturers to notify us that this practice is occurring and get our approval, but they would not need to take any additional steps.

We have greater concerns about ensuring that engines always reach their certified configuration when engines are shipped from one company to another, or anytime a company that is not a certificate holder is introducing partially complete engines into U.S. commerce. To address this, we are adopting detailed provisions in § 1068.262. These provisions clarify and expand on the provisions adopted earlier in § 1068.330 for imported engines. The original engine manufacturer needs a written request from a secondary engine manufacturer who already holds a valid certificate of conformity for the engine based on its final configuration and application. The request from the secondary engine manufacturer would also identify an engine family name. This engine family name could be any valid family name for that engine model and would not necessarily need to be the actual family name for that engine in its final configuration. For example, a secondary engine manufacturer might sell a single engine model into stationary, marine, and industrial applications, each of which might have a different engine family name. As long as there is a valid family name, the original engine manufacturer could be confident that the secondary engine manufacturer will be modifying the engine to be in a certified configuration. The original engine manufacturer would apply a removable label identifying their corporate name and stating that the engines are exempt under these provisions for partially complete engines. The label or the accompanying bill of lading would also name the secondary engine manufacturer as the certificate-holder and identify the destination for the engines being shipped. The labels may be applied to individual engines or they may be applied to the packaging for engines that are shipped together.

We are accommodating the need to start assembling products while the application for certification is pending. We would treat these shipments the same as we would treat early production for a manufacturer building its own engine blocks, as described in Section VIII.C.2.

There are also situations in which a secondary manufacturer would build engines that will continue to be exempt after the point of final assembly. For example, some engines may be intended only for export, for national security, or for developmental or testing purposes. In these cases where the secondary engine manufacturer is unable to identify a valid family name, they would simply inform the original manufacturer of the regulatory cite that allows them to produce exempted engines. Note that this process is generally permitted only in the case where the original engine manufacturer and the secondary engine manufacturer are certificate holders, which means that they have at least one certificate of conformity with EPA (even if that is for a different type of engine).

The regulation includes language to clarify that the original manufacturer is liable for shipment of properly labeled engines to a manufacturer who has applied for or received a valid certificate of conformity or who has an exemption for the engines being shipped. The original engine manufacturer would be in violation if (1) the engines and their labels are separated before reaching the secondary engine manufacturer, (2) if the engines are shipped to the wrong destination, or (3) if the secondary engine manufacturer does not in fact have the certification or exemption in place as prescribed. We expect original engine manufacturers to have a clear relationship with their associated secondary engine manufacturers so they can readily verify the status of any particular certification or exemption; due diligence on the part of the original engine manufacturer should allow for a high degree of confidence that all the applicable conditions are met.

Another situation involving partially complete engines involves the engine block as a replacement part where, for example, the original engine had major structural damage. In this case the engine manufacturer will typically sell an engine block with piston, crankshaft, and other internal components to allow the user to repower with many of the components from the original engine. Under the new definitions, these short blocks or three-quarter blocks are considered new engines subject to emission standards. We have addressed this situation in the regulations with the replacement engine provisions in § 1068.240. This may involve one of two basic situations. In cases where the short block is no different than what is being produced for complete, certified engines in the current model year, there is no need for demonstrations or approval for an exemption from emission standards. We are adding clarifying language that these partially complete engines may be sold to repower failed engines without restriction. We do, however, require that these engines be labeled to prevent someone from circumventing the regulations by using these short blocks to build new noncompliant engines. These labels would serve as a preventive measure and make it easier for EPA inspectors to detect a violation. In cases where the short block is from a previous model year when less stringent emission standards apply, we would want to treat this under the same replacement-engine provisions that apply to complete engines. Section VIII.C.5 describes these provisions related to replacement engines in greater detail.

We are also further clarifying the requirement for engine manufacturers to sell engines in their certified configuration (see § 1068.260). The existing provisions in part 1068 describe how manufacturers may use delegated assembly to arrange for equipment manufacturers to separately source aftertreatment components for engines that depend on aftertreatment to meet emission standards. We are including language to clarify that we will consider an engine to be in its certified configuration in certain circumstances even if emission-related components are not assembled to the engine. This is intended to reflect common practice that has developed over the years. We are also clarifying that engines may be shipped without radiators or other components that are unrelated to emission controls, and that we may approve requests to ship engines without emission-related components in some circumstances. This will generally be limited to equipment-related components such as vehicle-speed sensors. We may specify conditions that we determine are needed to ensure that shipping the engine without such components will not result in the engine being operated outside of its certified configuration.

(4) Provisions Related to Model Year and Date of Manufacture

We proposed definitions of ''model year'' and ''date of manufacture'' in conjunction with our proposed definition of ''engine''. We received a number of comments regarding these definitions. As a result of these comments, we are finalizing the approach described below.

Until now, the regulations have not specified the point in the assembly or procurement process that should serve as the basis for establishing an engine's date of manufacture for purposes of deciding which standards apply. For the large majority of engines, this is not an issue, since total assembly time from start to finish is measured in hours or perhaps days. As a result, it is relatively uncommon for there to be any uncertainty regarding an engine's date of manufacture. Nevertheless, we have learned that there are widely diverging practices for establishing an engine's date of manufacture in several special situations, which means there is a different effective date of new emission standards for different manufacturers. This is especially of interest for larger engines, which are more likely to have longer assembly times and to be assembled in multiple stages at different facilities. We believe it is important to establish a clear requirement in this regard to avoid ambiguity and different interpretations. A consistent approach preserves a level playing field and may prevent some manufacturers from manipulating their build dates to circumvent the regulations.

We expected that the proposed definition of ''date of manufacture,'' based on reaching a final, running configuration, was the most straightforward and logical interpretation. The comments received and the ensuing discussions made clear that this interpretation was not universally held. The diversity of views underscores the need for the regulations to establish a clear and uniform requirement.

We recognize the concern that manufacturers need a high degree of certainty regarding applicable emission standards when they initiate assembly of an engine. Any number of variables in the production process could affect how long it takes to finish building an engine. We therefore believe it is most appropriate to match up the definitions for ''date of manufacture'' and ''engine'' by specifying that an engine's date of manufacture should be based on the date that the crankshaft is installed in the engine. This provides manufacturers with the control they need to determine which emission standards apply when they start to build the engine.

We are aware that secondary engine manufacturers may have inventory and assembly procedures that are not tied to the actual date of crankshaft installation by the original engine manufacturer. We are therefore specifying for this situation that the date of manufacture is generally the date the secondary engine manufacturer receives shipment of the partially complete engine. Alternatively, where the manufacturer knows the date the crankshaft was actually installed in the engine and receives the engine within 30 days of that date, it may use the actual date of crankshaft installation as the date of manufacture. This puts the secondary engine manufacturer in a similar position relative to companies with sole responsibility for assembling complete engines, without placing unreasonable expectations on secondary engine manufacturers to know how engines were assembled by their supplier.

Some manufacturers may want to name a date of manufacture that is later than we specify in the regulation. This may be for marketing purposes, managing inventories of engine components, or for other recordkeeping or product-development reasons. There is no risk of manufacturers gaining an advantage of being subject to less stringent standards by delaying the date of manufacture for an engine, so we would have no objection to that. However, we limit the selection of date of manufacture to a later point *in the assembly process.* Selecting a date of manufacture after the end of the assembly process for an engine would raise concerns about the risk for manipulating emission credits for a given model year and about ensuring that engine assembly and dates of manufacture are always within the production period established for a given engine family, as described in the certificate of conformity or the manufacturer's records. We see no legitimate reason to select a date of manufacture after completing assembly for an engine. Note that since the entire assembly process is complete within no more than a few days for most engines, we would expect this allowance to rarely affect the date of manufacture significantly.

This approach to defining ''date of manufacture'' addresses manufacturers' concerns for knowing which standards apply to an engine, but we are also concerned that manufacturers could ramp up production of engine blocks with installed crankshafts as a method to delay compliance with new emission standards. EPA regulations have always included provisions describing limits on inventory and stockpiling practices for nonroad equipment manufacturers. The regulations until now do not clearly address issues related to stockpiling for engine manufacturers. We agree with the suggestion from commenters that anti-stockpiling provisions that are specific to engine manufacturers would be appropriate. The Clean Air Act contemplates the need for such provisions in section 202(b)(3), where there is direction for EPA to consider establishing a definition of model year that prevents stockpiling. At the same time, we received other comments related to production periods and model year, leading us to adopt a collection of related provisions in § 1068.103.

The new text in § 1068.103 includes three main provisions that are already in place for motor vehicles and heavy-duty highway engines in §§ 85.2304 and 85.2305. First, we are clarifying that the scope of a certificate of conformity may be limited to established engine models, production periods, or production facilities. Any such limits would be included in the manufacturer's application for certification or in the certificate of conformity. Second, we are defining the limits on selecting production periods for purposes of establishing the model year. Third, we are clarifying that engine manufacturers may start producing engines after they submit an application for certification and before the certification is approved. This includes provisions to address the manufacturers' responsibility to ensure (1) that engines are not introduced into U.S. commerce until the certification is approved; (2) that all engines are assembled consistent with the certification, including any changes that may come from the certification review process; and (3) that manufacturers make these early-production engines available for production-line testing or selective enforcement audits, as appropriate.

In addition, we are adding provisions to establish limits on stockpiling for engine manufacturers. We are doing this by stating that manufacturers must use their normal inventory and assembly processes for initiating assembly of their engines. We include a clarifying expectation that we would expect normal assembly processes to involve no more than one week to complete engine assembly once the crankshaft is installed. We understand that assembly processes in some special cases are more complicated, and that engine manufacturers may be unable to complete engine assembly in some cases based on delivery of certain components or other extenuating factors. To put some boundaries on these exceptional situations, the regulation specifies a presumption that the engine manufacturer has violated the stockpiling prohibition if engine assembly is complete more than 30 days after the end of the model. This presumption date is 60 days after the end of the model year for engines with per-cylinder displacement above 2.5 liters. This generally distinguishes engines that may have relatively high sales volumes (including heavy-duty highway engines) from bigger engines that are sold in much lower sales volumes.

Note that the potential burden and disruption related to these provisions is limited in two important ways. First, the restrictions related to date of manufacture and model year in § 1068.103(f) apply only when there is a change in emission standards for the coming model year. We would still expect manufacturers to take this approach in years when there is no change in emission standards, but these requirements would not strictly apply. We are also including hardship provisions to allow manufacturers to request approval to extend the final assembly deadline for their engines if circumstances outside their control prevent them from completing engine assembly in time. We would approve such a request only if the manufacturer could not have avoided the situation and took all possible steps to minimize the extent of the delay.

(5) Restrictions on Naming Model Years Relative to Calendar Year

We proposed restrictions to naming model years for Small SI engines. In response to the comments we received, we are finalizing these restrictions for all engines subject to 40 CFR part 1068.

Exhaust emission standards apply based on the date of engine assembly. We similarly require that equipment manufacturers use engines meeting emission standards in the same model year as equipment based on the equipment assembly date. For example, starting January 1, 2009, an equipment manufacturer must generally use a 2009 model year engine. However, we allow equipment manufacturers to deplete their normal inventories of engines from the previous model year as long as there is no stockpiling of those earlier engines. Note that this restriction does not apply if emission standards are unchanged for the current model year. We have found many instances where companies will import new engines usually installed in equipment and claim that the engine was built before emission standards took effect, even if the start date for emission standards was several years earlier. We believe many of these engines were in fact built later than the named model year, but it is difficult to prove the date of manufacture, which then makes it difficult to properly enforce these requirements. Now that emission standards have been in place for most engines for several years, we believe it is appropriate to implement a provision that prevents new engines manufactured several years previously to be imported when more recent emission standards have been adopted. This will prevent companies from importing noncompliant products by inappropriately declaring a manufacture date that precedes the point at which the current standards started to apply. This also puts a time limit on our existing provisions that allow for normal inventory management to use the supply of engines from previous model years when there has been a change in standards.

We are specifying that engines and equipment will be treated as having a model year at most one year earlier than the calendar year in which the importation occurs when there is a change in emission standards (see § 90.615 and § 1068.360). This requirement will start January 1, 2009 for Small SI engines and it will start immediately when the final rule becomes effective for engines/equipment subject to part 1068. For example, for new standards starting in the 2009 or earlier model years, beginning January 1, 2010, all imported new engines will be considered to have a model year of 2009 or later and will need to comply with new 2009 standards, regardless of the actual build date of the engines or equipment. (Engines or equipment will be considered new unless the importer demonstrates that the engine or equipment had already been placed into service, as described below.) This will allow a minimum of twelve months for manufactured engines to be shipped to equipment manufacturers, installed in equipment and imported into the United States. This time interval will be substantially longer for most engines because the engine manufacturer's model year typically ends well before the end of the calendar year. Also, engines produced earlier in the model year will have that much more time to be shipped, installed, and imported.

Manufacturers have expressed concern that the one-year limitation on imported products may be too short since there are often delays related to shipping, inventory, and perhaps most significantly, unpredictable fluctuations in actual sales volumes. We do not believe it is appropriate to maintain long-term inventories of these products outside the United States for eventual importation when it is clear ahead of time that the new standards are scheduled to take effect. Companies may be able to import these products shortly after manufacturing and keep their inventories in a U.S. distribution network to avoid the situation of being unable to sell these products in the United States.

In years where the standards do not change, this provision will have no practical effect because, for example, a 2004 model year engine meets the 2006 model year standards. We will treat such an engine as compliant based on its 2004 emission label, any emission credit calculations for the 2004 model year, and so on. These engines can therefore be imported anytime until the end of the calendar year in which new standards take effect.

We do not intend for these provisions to delay the introduction of the new emission standards by one year. It is still a violation to produce an engine in the 2011 calendar year and call it a 2010 model year engine to avoid being subject to 2011 standards.

Importation of equipment that is not new is handled differently. These products will not be required to be upgraded to meet new emission standards that started to apply after the engine and equipment were manufactured. However, to avoid the situation where companies simply declare that they are importing used equipment to avoid new standards, we are requiring that they provide clear and convincing evidence that such engines have been placed into service prior to importation. Such evidence will generally include documentary evidence of purchase and maintenance history and visible wear that is consistent with the reported manufacture date. Importing products for resale or importing more than one engine or piece of equipment at a time will generally call for closer evaluation to determine that this degree of evidence has been met. Note that the regulations generally treat engines converted to a different category as new engines, even if they have already been placed into service. For example, if a motor vehicle is modified such that it no longer fits under the definition of motor vehicle, its engine generally becomes a new nonroad engine and is subject to emission standards and other requirements based on its model year as specified in the regulation.

(6) Liability for Causing Violations

In the last few years, there has been a surge in the number of illegal nonroad engines, vehicles and equipment, such as tractors, lawn mowers, generators and all-terrain vehicles, imported into the United States. A significant number of the imported nonroad engines, vehicles and equipment fail to meet EPA requirements and standards under the Clean Air Act. The manufacturers of these illegal goods often are out of the effective reach of United States jurisdiction and enforcement. In 2007, the recall of lead-contaminated toys and more than 5,300 melamine-laced pet food products resulted in heightened interest in what the U.S. government is doing to safeguard the health of its citizens with regard to imported consumer products.

In July 2007, President Bush signed Executive Order 13439 establishing an Interagency Working Group on Import Safety. This Working Group consists of over ten government agencies including EPA and the Departments of Health and Human Services, Homeland Security, State, Treasury, Justice, Agriculture, and Transportation. The wide range of agencies involved in this Working Group illustrates the breadth of import issues.

One of the recommendations of the Interagency Working Group on Import Safety was to consider a strategic focus or initiative, using existing statutory and regulatory authorities, and, based upon Agency priorities, increase enforcement actions against foreign and domestic manufacturers, as well as importers, brokers, distributors, and retailers who introduce illegal goods into the stream of commerce. This rulemaking will help clarify for all regulated parties, including retailers, that liability for the importation of nonroad vehicles, engines and equipment in violation of the Clean Air Act and/or its implementing regulations extends beyond the manufacturer and direct importer of the product.

We requested comments regarding revisions to § 1068.101 to clarify the types of actions for which EPA may pursue enforcement proceedings. In this rule we are finalizing such clarifying provisions in § 1068.101. Section 203 of the Act states that performing certain acts, ''and the causing thereof,'' constitutes a prohibited act. We are adding a new paragraph (c) in § 1068.101 to specifically include this prohibition on the ''causing'' of any of the prohibited acts listed in the statute and the regulations. Adding this clarification will help people who are subject to the regulations to more fully understand what actions are prohibited and may potentially subject them to enforcement proceedings under the Act. The revisions themselves do not add new enforcement authorities beyond what is already specified in the statute.

Since we consider it a violation to cause someone to commit a specified prohibited act, persons causing any such prohibited act would also be subject to the full administrative and judicial enforcement actions allowable under the Act and the regulations. The prohibition on ''causing'' a prohibited act would apply to all persons and would not be limited to manufacturers or importers of regulated engines or equipment.

EPA interprets the ''causation'' aspect of section 203 broadly. In assessing whether a person has caused a prohibited act, EPA will evaluate the totality of the circumstances. For example, in certain circumstances EPA believes that a retailer may be responsible for causing the importation of engines or equipment not covered by a valid certificate of conformity or otherwise in violation of our regulations, such as the emission labeling requirements. In addition to the prohibitions that apply to manufacturers and importers under section 203, EPA will also consider many factors in assessing whether a manufacturer, importer, retailer, distributor or other person has caused a prohibited act. For example, contractual (or otherwise established) business relationships of those persons involved in producing and/or selling new engines and equipment could be evidence of the ability of the person to cause a violation. In addition, we would consider the particular efforts or influence of the alleged violator contributing to, leading to, or resulting in the prohibited act. On the other hand, we would also consider a person's efforts to prevent such a violation as evidence that they did not cause the violation.

EPA will evaluate the entire circumstances in determining whether a person caused another person to commit a prohibited act such as importing engines or equipment in violation of our regulations.

To assist importers, distributors, retailers, and the general public to determine whether the products they are buying or selling comply with EPA regulations, EPA is expanding its compliance assistance efforts. Imports compliance assistance information is available at *http://www.epa.gov/otaq/imports/index.htm* and *http://www.bordercenter.org/chem/vehicles.htm.* Additionally, general certification information may also be found at *http://www.epa.gov/otaq/nonroad.*

(7) Engine rebuilding and replacement engines

We are finalizing the proposed changes to § 1068.240. In addition, we are also making other changes to that section to address manufacturers' concerns for producing short blocks from previous-tier engines as replacement components for engines needing service in the field. (See Section VIII.C.1 for additional discussion.) The current provisions for the replacement-engine exemption in § 1068.240 require that manufacturers take possession of the old engine (or confirm that it has been destroyed) and take steps to confirm that the exemption is needed for each new replacement engine. We acknowledge that these requirements could limit the manufacturers' ability in some cases to respond quickly for operators that would depend on minimizing their downtime.

The most significant change being made in response to the manufacturers comments is the allowance for limited use of partially complete engines as replacement components without the administrative requirements and oversight provisions that currently apply under § 1068.240. We have created a streamlined approach for manufacturers to produce and sell a certain number of replacement engines, including partially complete engines, based on production volumes from preceding years. We are adopting a threshold of 1.0 percent of annual production through 2013 and 0.5 percent for 2014 and later. To calculate the number of engines under this provision, manufacturers would first determine their U.S.-directed production volumes of certified engines each year. This information is generally submitted as part of the reporting for production-line testing or in separate annual reports. The manufacturer would consider the preceding three model years to select the highest total production volume of certified engines across all their models in a given year. Multiplying this production volume by 0.01 (or 0.005 starting in 2014) would give the number of engines that the manufacturer could produce without triggering the administrative requirements currently specified in § 1068.240. (We may approve the use of calculations based on earlier model years in unusual circumstances, such as the case where a manufacturer opts out of a broad category of engine production but continues to supply service parts for those models.) These threshold values should allow manufacturers the flexibility to meet the demand for partially complete replacement engines, but at production levels that clearly will not undermine the expected benefits of the emission standards that otherwise apply to new engines. For any number of noncompliant replacement engines exceeding the specified threshold, manufacturers would need to meet all the requirements that currently apply under § 1068.240.

The engine grouping includes fairly broad aggregation of products to keep similar engines together. For example, all outboard engines, all snowmobiles, and all handheld engines would be counted together as separate groups. Diesel engines are generally sold to distributors in a configuration that could be adapted for use in nonroad applications, either land-based or marine, or in stationary applications. Engine manufacturers should therefore aggregate their sales of these engines without regard to their eventual deployment in any of these applications. However, we are aware that the very wide range in sizes and sales volumes makes it necessary to prevent aggregating large and small engines. Without this, the high sales volumes associated with small engines could allow for unlimited production of high-power replacement engines. Since it is not possible to establish a power rating for a partially complete engine, it is necessary instead to rely on engine displacement to differentiate these products. The selected per-cylinder cutpoints reflect existing regulatory requirements and production and marketing characteristics related to current engine offerings. The situation is similar for spark-ignition engines that may be used in stationary or nonroad applications (including marine), except that there is a much less pronounced range in engine sizes. The engine groupings for calculating allowable numbers of engines under this approach are shown in Table VIII.C–1.

We are also applying the replacement-engine exemption provisions to heavy-duty highway engines. There have been no such exemption provisions in the past; however, we are expecting engine technologies to change significantly in the coming years such that vehicle owners may be unable to replace engines that fail prematurely without being able to access replacement engines that are specifically built to match the earlier configuration. We believe these engines can be accounted for separately from nonroad and stationary engines with respect to production volumes, but we are otherwise applying all the provisions of § 1068.240 equally to heavy-duty highway engines.

TABLE VIII.C–1—AGGREGATING SETS FOR STREAMLINED REPLACEMENT-ENGINE PROVISIONS

Engine category	Standard-setting part	Engine subcategories
Highway CI	40 CFR part 86	disp. < 0.6 L/cyl 0.6 ≤ disp. < 1.2 L/cyl disp. ≥ 1.2 L/cyl
Nonroad CI, Stationary CI, and Marine CI	40 CFR part 1039 or 40 CFR part 1042	disp. < 0.6 L/cyl 0.6 ≤ disp. < 1.2 L/cyl 1.2 ≤ disp. < 2.5 L/cyl 2.5 ≤ disp. < 7.0 L/cyl
Marine SI	40 CFR part 1045	outboard personal watercraft.
Large SI, Stationary SI, and Marine SI (sterndrive/inboard only).	40 CFR part 1048 or 40 CFR part 1045	all engines
Recreational vehicles	40 CFR part 1051	off-highway motorcycle, all-terrain vehicle, snowmobile.
Small SI and Stationary SI	40 CFR part 1054	handheld, Class I, Class II.

There are two special situations to note. First, the replacement-engine provisions do not apply to locomotives, which have already been established in previous rulemakings. Second, the provisions for a streamlined approach for replacement engines do not apply for engines with per-cylinder displacement over 7.0 liters. These are generally very large, custom-built engines with low production volumes, so we believe it is not necessary or appropriate for engine manufacturers to maintain an inventory of these engines (complete or partially complete) on the assumption that someone wanting a replacement engine could not install an engine certified to emission standards for the current model year.

We are making an additional change to the replacement-engine exemption in § 1068.240 to clarify what provisions apply for short blocks from a currently certified engine family. These are considered engines under the new regulatory definitions, so they need to be covered by a certificate of conformity or an exemption. We are specifying that short blocks from an engine model certified for the current model year are exempt under the replacement-engine exemption. These engines do not need an exemption based on their level of emission control since they are identical to certified engines meeting current standards. Rather, these engines need an exemption simply because they are shipped before they reach a certified configuration. Final assembly would typically be performed by the owner or a local service facility rather than an equipment manufacturer. We are therefore applying no conditions or restrictions on the sale of these replacement engines, other than the need for being part of a certified engine family and being labeled appropriately. The regulation specifies how to label the engine blocks to ensure that they can be clearly identified as replacement components. The regulation also clarifies that anyone completing the assembly of such an engine in violation of applicable requirements is a manufacturer who has committed a prohibited act. For example, installing such an engine in a new piece of equipment would violate the conditions of the replacement engine exemption and we may hold responsible any parties involved in assembling or installing the engine.

Simplified labeling requirements apply to current-tier short blocks used as replacement engines and to previous-tier short blocks falling under the streamlined approach for replacement engines described above. The general expectation is that the final, assembled engines continue to have a label describing their certification status (unless they were built before emission standards started to apply). For engines in which the certification label is on the short block or another component that is part of the short-block assembly, we require that the short block includes a permanent label identifying the name of the manufacturer, the part number of the short-block assembly, and a short statement describing this as a replacement engine. For engines in which the certification label is mounted on the equipment or on a part of the engine that will likely be preserved as part of the final assembly, we require similar labeling except that the label does not need to be permanent.

In addition, manufacturers have expressed a concern that the engine rebuilding provisions in § 1068.120 and the replacement engine provisions in § 1068.240 do not clearly address the situation in which rebuilt engines are used to repower equipment where the engine being replaced meets alternate emission standards (such as those produced under the Transition Program for Equipment Manufacturers). These engines are not certified to the emission standards that otherwise apply for the given model year, so there may be some confusion regarding the appropriate way of applying these regulatory requirements. We are therefore adopting clarifying language to make sure the required statements on engine labels and the underlying regulatory requirements reflect this scenario.

(8) Delegated Assembly

We understand that engine manufacturers have competing interests both to maintain the ability to arrange flexible assembly procedures and agreements, and to ensure that their engines are introduced into commerce only after being assembled in the certified configuration. We share those objectives and believe the regulations related to delegated assembly serve the purpose of creating a framework for balancing these different concerns. These regulatory provisions will help manufacturers by defining practices that prevent a situation where competitiveness concerns cause them to take steps to reduce costs at the risk of producing noncompliant products.

We proposed special delegated assembly provisions for Small SI engines, rather than applying the delegated assembly provisions of part 1068. In this final rule, however, we are consolidating the various approaches for different types of engines and integrating them into a single framework that will apply generally for heavy-duty highway engines and for nonroad engines. The main difference between these previously existing programs is the allowance for heavy-duty highway engines to rely either on pricing engines and aftertreatment components together or auditing vehicle manufacturers, but not necessarily both, to ensure that installed engines are in a certified configuration. While we are concerned about the incentive for vehicle and equipment manufacturers to gain a financial advantage if aftertreatment components are not priced together with the engine, we believe requiring engine manufacturers to perform audits of vehicle or equipment manufacturers is generally sufficient to provide the proper assurances that engines are being properly assembled and installed. Conversely, we believe that pricing aftertreatment and engines together is a strong enough assurance of proper assembly and installation procedures that audits are generally not necessary as an additional oversight measure. We note that these provisions spell out a minimum level of oversight for engine manufacturers. There may be instances, such as a new relationship with a vehicle or equipment manufacturer or some other reason to have less confidence in proper assembly procedures, where the engine manufacturer would want or need to take steps beyond what the regulations require to ensure that engines are assembled properly.

We believe there is a strong advantage in implementing requirements uniformly across all the engine programs, both for EPA and for manufacturers. Aside from the pricing and auditing requirements described above, we are making the following provisions part of the final program, which were part of one or more of the programs adopted earlier in parts 85 and 1068, :

- Auditing rates are generally set at four equipment (or vehicle) manufacturers per year, or enough to rotate through all the equipment manufacturers over a four-year period, whichever is less. A reduced rate may apply after several years of successful implementation of these requirements.
- We are continuing the approach already adopted to provide for a streamlined demonstration for integrated manufacturers where the auditing would effectively be an internal practice.
- Engine manufacturers remain responsible for the in-use compliance of engines sold using the delegated-assembly provisions. This means, for example, that these engines would be subject to recall if we find that there are a substantial number of nonconforming engines.

In addition, we are including the following provisions in the unified approach to delegated assembly that were initiated as part of the proposal for Small SI engines:

- Distributors may participate in delegated assembly, but only to the extent that they act as equipment manufacturers, adding aftertreatment devices before shipping the engines to vehicle or equipment manufacturers. Allowing distributors to further delegate engine assembly to another set of companies raises fundamental questions about the ability of engine manufacturers to adequately ensure proper final assembly of their engines. We are making a temporary allowance for this for Small SI engines to accommodate the transitional provisions allowing equipment manufacturers to gradually work toward making Phase 3 products. Starting in 2015, Small SI manufacturers may rely on distributors to act as their agents only with our approval. Note that this restriction on distributors does not apply in cases where the distributor has a financial or administrative role in facilitating a transaction between engine and equipment manufacturers where the engine and equipment manufacturers meet all the requirements that apply under § 1068.261(d).
- If engine manufacturers design their air-intake systems such that they depend on specific parts (identifiable by part number) to achieve proper air flow through the engine, that raises concerns that are similar to aftertreatment devices. In fact, we are currently pursuing an enforcement case where an equipment manufacturer did not follow the engine manufacturer's directions to use a specific air filter. We are specifying that air filters identified by part number must be included in delegated assembly, though we require audits related to air filters only if audits are already occurring for exhaust systems. If manufacturers specify intake air systems by performance parameters such as maximum pressure drop across the air filter, the delegated-assembly provisions do not apply. This is similar to the way we have treated exhaust components for systems not requiring exhaust aftertreatment. See § 1068.260(a).
- Vehicle or equipment manufacturers submitting annual affidavits must include a count of aftertreatment devices received to verify that there were enough of the right models of aftertreatment devices for the number of engines involved.
- Engines need to be labeled to identify their status as delegated-assembly engines, either with a removable label or with ''Delegated Assembly'' noted on the engine's permanent label. This ensures that engines will not be introduced into commerce without an indication of their status relative to the certified configuration.
- Engine manufacturers must confirm that vehicle or equipment manufacturers have ordered aftertreatment devices corresponding to an engine order, but this confirmation is limited to the initial shipment of engines for a new certification and may occur up to 30 days after the engines have been ordered.
- For engines subject to requirements for production-line testing or selective enforcement audits, we specify that aftertreatment components must be randomly procured. We agree with the suggestion in the comments to broaden the allowance for randomly procuring components. As long as manufacturers use a method to randomly select components that are appropriate for the particular engine configuration, these

components may come from any point in the normal distribution chain.

Manufacturers raised a concern regarding the possibility that they may inappropriately be paying Customs duties based on the value of aftertreatment devices that were priced with the engine even though they would be shipped separately. We have confirmed with the U.S. Customs and Border Protection that such an inappropriate payment of import duties can be avoided with documentation showing that the price of the engine includes a charge for components that are not included in that particular shipment. This also applies for importing aftertreatment devices alone where the import duty should not apply based on the value of the engine and aftertreatment together. This could most easily be accomplished by itemizing the invoice to identify the value of the missing components relative to the value of the rest of the engine. The regulations now include these specific instructions regarding invoicing with respect to import duties.

We understand that there may be companies complying with the delegated assembly provisions in § 85.1713 or § 1068.260 today. The changes included in this final rule generally expand the flexibility of complying with regulatory requirements. These regulatory changes generally apply immediately with the effective date of the final rule. However, there may be some need to modify current practices to conform to the revised regulation. If a manufacturer needs additional time to comply, we would expect to use the provisions of § 1068.40 to work out an arrangement under which the manufacturer would be able to make an orderly transition toward complying with the new requirements.

(9) Miscellaneous Changes

The most noticeable change we are making to part 1068 is the proposed clarification to the language throughout to make necessary distinctions between engines, equipment, and fuel-system components—and particularly between equipment using certified engines and equipment that has been certified to meet equipment-based standards. This becomes necessary because the evaporative emission standards apply in some cases to equipment manufacturers and boat builders, while the exhaust emission standards apply only to engine manufacturers. Some provisions in part 1068 apply to equipment manufacturers differently if they hold a certificate of conformity rather than merely installing certified engines (or certified fuel-system components). The changes in regulatory language are intended to help make those distinctions. See § 1068.2 for a description of the new terminology that we intend to use throughout part 1068.

We previously adopted a definition of ''nonroad engine'' that continues to apply today (see § 1068.30). This definition distinguishes between portable or transportable engines that may be considered either nonroad or stationary, depending on the way they will be used. The distinction between nonroad and stationary engines is most often relevant for new engines in determining which emission standards apply. However, we have received numerous questions related to equipment whose usage has changed so that the original designation no longer applies. The text of that original definition did not clearly address these situations. We are therefore adopting the proposed provisions that apply when an engine previously used in a nonroad application is subsequently used in an application other than a nonroad application, or when an engine previously used in a stationary application is moved (see § 1068.31). In response to comments, we are also including language in the final rule to clarify that switching between nonroad and stationary does not change the engine's model year for purposes of establishing applicable standards. The engine would need to meet applicable requirements for its new application (or status), but this would not involve certifying the engine as new for the current model year. Note that the purpose of these changes to regulatory language is to clarify existing provisions rather than change which requirements apply for specific situations.

We are adopting the proposed changes to the thresholds for determining whether to investigate or report emission-related defects. These changes are intended to more carefully reflect the level of investigation and reporting that should apply for very high-volume engine families. In particular, we specify that manufacturers should investigate defects if potential (unscreened) emission-related defects exceed 4 percent for sales volumes between 50,000 and 550,000, with a threshold of 25,000 for all families with sales volumes above 550,000. Similarly, we specify that manufacturers should send a report if confirmed emission-related defects exceed 1 percent for sales volumes between 50,000 and 550,000, with a threshold of 6,000 for all families with sales volumes above 550,000.

Several of the new provisions in part 1068 address fundamental issues for complying with emission standards. Defining ''engine'' and ''date of manufacture,'' clarifying the timing of the transition to new model years, adding requirements for shipping partially complete engines to secondary engine manufacturers, and creating a new path for exempting replacement engines could lead manufacturers to make significant changes in the way they comply with the regulations. However, in many cases we would expect the new regulations to generally reflect current business practices. We are therefore amending the regulatory requirements to part 1068 without identifying a certain lead time before the requirements apply. Instead, to address those situations where manufacturers need time to make a transition toward complying with new requirements, we are adding a general provision allowing us to approve a manufacturer's request to delay implementation of the new requirements in part 1068 for up to 12 months from the effective date of the final rule (see § 1068.40). The changes to part 1068 have a legal effective date of December 8, 2008. We will generally approve these requests if manufacturers can demonstrate that it would be impractical to comply with the new requirements in the given time frame. We may consider the potential for adverse environmental impacts in our decision.

In addition, we proposed several amendments to part 1068 to clarify various items. These are being finalized, including:

- § 1068.101(a)(1): Revising the prohibited act to specify that engines must be ''covered by'' a certificate rather than ''having'' a certificate. The revised language is more descriptive and consistent with the Clean Air Act.
- § 1068.101(a)(1)(i): Clarifying that engines or equipment are considered to be uncertified if they are not in a configuration that is included in the applicable certificate of conformity. This applies even if the product had an emission label stating that it complies with emission standards.
- § 1068.101(a)(2): Clarifying the prohibition on recordkeeping to apply also to submission of records to the Agency.
- § 1068.101(b)(1): Clarifying the prohibition against using engines in a way that renders emission controls inoperative to emphasize that it includes misfueling or failing to use additives that the manufacturer specifies as part of the engine's certified configuration. This is more likely to

apply for compression-ignition engines than spark-ignition engines.

- § 1068.101(b)(7): Clarifying the prohibitions related to warranty to require the submission of specified information in the application for certification; adding language to identify obligations related to recall and installation and maintenance instructions; and preventing the manufacturer from communicating to users that warranty coverage is conditioned on using authorized parts or service facilities. These provisions are consistent with requirements that apply in other EPA programs.
- § 1068.105(a): Revising the regulation to allow equipment manufacturers to use up normal inventories of previous model year engines only if it is a continuation of ongoing production with existing inventories. These provisions do not apply for an equipment manufacturer starting to produce a new equipment model.
- § 1068.105: Eliminating paragraph (b) related to using highway certification for nonroad engines or equipment since these provisions are spelled out specifically for each nonroad program where appropriate.
- § 1068.105(b): Clarifying the requirement to follow emission-related installation instructions to include installation instructions from manufacturers that certify components to evaporative emission standards.
- § 1068.120: Clarifying that the rebuilding provisions apply to maintenance related to evaporative emissions.
- § 1068.240: Clarifying that the scope of the exemption for new replacement engines is limited to certain engines.
- § 1068.250: Revising the applicability of the small-business hardship provisions to address a situation where the standard-setting part does not define criteria for establishing which companies qualify as small-volume manufacturers; where we do not already specify such criteria, we will rely on the criteria established by the Small Business Administration.
- § 1068.250: Clarifying the timing related to hardship approvals and the ability to get extensions under appropriate circumstances.
- § 1068.305: Clarifying that that the requirement to submit importation forms applies to all engines, not just nonconforming engines; also adding a requirement to keep these records for five years. Both of these changes are consistent with the Customs regulations at 19 CFR 12.74.
- Part 1068, Appendix I: Defining emission-related components related to evaporative emission controls.

D. Amendments Related to Large SI Engines (40 CFR Part 1048)

We are making a variety of technical amendments to the regulations in 40 CFR part 1048 for Large SI engines, as described in this section.

As described in Section V.E.1, we are establishing a provision to allow for assigned deterioration factors for small-volume engine families for Small SI engines. We requested comment on applying this kind of provision to Large SI engines, for which manufacturers do more extensive testing to demonstrate compliance over a useful life of 5,000 hours. We are therefore including in the final rule an allowance for manufacturers to use an assigned deterioration factor for engine families with U.S.-directed production volumes up to 300 units. This should provide significant relief in the testing burden for certifying very small engine families.

We are adopting the proposed changes to the provisions related to competition engines to align with the final rule for Small SI engines. Any Small SI engine that is produced under the competition exemption will very likely exceed 19 kW. As a result, we believe it is appropriate to make these provisions identical to avoid confusion.

Manufacturers have notified us that the transient test for constant-speed engines does not represent in-use operation in a way that significantly affects measured emission levels. This notification is required by § 1065.10(c)(1). In particular, manufacturers have pointed out that the specified operation involves light engine loads such that combustion and exhaust temperatures do not rise enough to reach catalyst light-off temperatures. As a result, meeting the standard using the constant-speed transient test will require the use of significantly oversized catalysts, which will add significant costs without a commensurate improvement for in-use emission control. We faced a similar dilemma in the effort to adopt transient standards for nonroad diesel engines, concluding that the transient standards should not apply until we develop a suitable duty cycle that more appropriately reflects in-use operation. As proposed, we are taking this same approach for Large SI engines, waiving the requirement for constant-speed engines to meet the transient standards until we are able to develop a more appropriate duty cycle. We are clarifying that manufacturers certifying constant-speed engines should describe their approach to controlling emissions during transient operation in their application for certification. Manufacturers must continue to meet the standards for steady-state testing and the field-testing standards continue to apply. See Section 1.8 of the Summary and Analysis of Comments for a discussion of the methods for demonstrating compliance with the field-testing standards for certification.

Manufacturers have also pointed out that a multiplicative deterioration factor is problematic for engines with very low emission levels. While the standard allows that $HC+NO_X$ emissions may be as high as 2.7 g/kW-hr, manufacturers are certifying some engine families with deteriorated emission levels below 0.1 g/kW-hr. These very low emission levels are so far below the standard that measurement variability and minor engine-to-engine variability can lead to small absolute differences in emission levels that become magnified by a deterioration factor that reflects the extremely small low-hour measurement. We are therefore finalizing the proposed specification that manufacturers may use an additive deterioration factor if their low-hour emission levels are below 0.3 g/kW-hr for $HC+NO_X$ or 0.5 g/kW-hr for CO. This change accommodates the mathematical and analyzer effects of very low emission levels without changing the current practice for the majority of engines that are certified with emission levels closer to the standard (we increased the threshold from the proposed level of 0.3 g/kW-hr for CO to a level of 0.5 g/kW-hr to reflect the greater variability in CO emissions at this level of control). This change removes the incentive for manufacturers to increase their engine's emission levels to avoid an artificially large deterioration factor. The only exception is for cases in which good engineering judgment dictates that a multiplicative deterioration factor will nevertheless be appropriate for engines with very low emissions. This may be the case if an engine's deterioration can be attributed, even at very low emission levels, to proportionally decreased catalyst conversion of emissions from an aged engine. It is important to note that Large SI engine manufacturers are subject to in-use testing to demonstrate that they meet emission standards throughout the useful life. Should such testing indicate that an additive deterioration factor does not appropriately reflect actual performance, we will require manufacturers to revise their deterioration factors appropriately, as required under the regulations. If such discrepancies appear for multiple manufacturers, we will revise the regulation to again require multiplicative deterioration factors for all aftertreatment-based systems.

Most Large SI engines are installed in equipment that has metal fuel tanks. This formed the basis of the regulatory approach to set evaporative emission standards and certification requirements. Manufacturers have raised questions about the appropriate steps to take for systems that rely on plastic fuel tanks. We have determined that the current emission standards and test procedures do not require manufacturers to account for permeation emissions from plastic fuel tanks. To address this concern, we are revising the regulations to reference the test procedures in part 1060, where preconditioning and measurement procedures clarify how to test plastic fuel tanks. We are also specifying that the design-based certification for plastic fuel tanks meeting the diurnal emission standards must incorporate the technologies specified in 40 CFR 1060.240. For other technologies, the certifying manufacturer must perform tests to demonstrate compliance with the diurnal emission standards. Since manufacturers will need some time to meet these requirements, we are implementing this change starting with the 2010 model year. As a related matter, we are also changing the regulation to allow for component certification of fuel tanks (see 40 CFR 1060.5). This will be necessary to accommodate the situation described above for plastic fuel tanks. This administrative adjustment does not affect the underlying requirement to design and certify products to meet applicable emission standards. We changed the final rule in response to comments, mainly to include more careful specification of canister preconditioning procedures for those systems that certify by testing rather than by design.

In the proposal we requested comment on updating the reference standard for specifying low-permeation fuel lines. The current permeation standards for Large SI equipment references Category 1 fuel lines as defined in the version of SAE J2260 that was issued November 1996. We are adopting by reference the updated version of SAE J2260, which was finalized in November 2004 by the Society of Automotive Engineers. The new procedures have two primary differences related to fuel line permeation. First, the test fuel was changed from CM15 to CE10.[123] Second, the associated limits for the different categories of fuel line permeation were revised. Data presented in Chapter 5 of the Final RIA suggest that permeation rates from low-permeation fuel line materials can be less than half on CE10 than on CM15. The permeation specification for Category 1 fuel line was revised by SAE from 0–25 g/m^2/day to 3–10 g/m^2/day. (A new Category 0 was added at 0–3 g/m^2/day.) Directionally, the new Category 1 permeation limits seem to account for the change in the test fuel. In addition, ethanol fuel blends are common with in-use fuels while methanol fuel blends are much less common. We are revising the regulation to specify that fuel lines must meet the Category 1 specification in the 2004 version of SAE J2260.

We are making several additional technical amendments to part 1048. Many of these simply correct typographical errors or add references to the regulatory cites in part 1054 for Small SI engines. Several changes are intended merely to align regulatory language with that of other programs, including those that are subject to new standards under this final rule. In addition, we are making the changes described below. Note that the changes being made to the production-line and in-use testing requirements are being made in response to comments. As noted, a few others are also being made in response to comments. However, most of these changes are being finalized as proposed.

- § 1048.5: Clarifying that locomotive propulsion engines are not subject to Large SI emission standards, even if they use spark-ignition engines. This is based on the separate provisions that apply to locomotives in Clean Air Act section 213 (including those that use spark-ignition engines).
- § 1048.101: Clarifying manufacturer's responsibility to meet emission standards for different types of testing, especially to differentiate between field-testing standards and duty-cycle standards.
- § 1048.105: Clarifying that only the permeation standards of SAE J2260 apply to fuel lines used with Large SI engines.
- § 1048.105: Clarifying that the requirement to prevent fuel boiling is affected by the pressure in the fuel tank. The regulation currently characterizes the boiling point of fuel only at atmospheric pressure. Pressurizing the fuel tank increases the boiling point of the fuel. We are also adding clarifying language to describe how engine manufacturers may meet their requirements related to fuel boiling by describing appropriate steps or limitations in their installation instructions.
- § 1048.105: Reorganizing the regulatory provisions to align with the new language in 40 CFR part 1060, and relying on those test procedures. This will help to provide uniformity across our nonroad programs.
- § 1048.110: (1) Clarifying that ''malfunctions'' relate to engines failing to maintain emission control and not to diagnostic systems that fail to report signals. (2) Clarifying that the malfunction indicator light needs to stay illuminated for malfunctions or for system errors. (3) Limiting the scope of diagnostic requirement to engines with closed-loop controls and three-way catalysts. This limitation is consistent with the conclusion we have reached for Marine SI engines.
- § 1048.120: Clarifying that the emission-related warranty covers only those components from 40 CFR part 1068, Appendix I, whose failure will increase emissions of regulated pollutants.
- § 1048.125: Giving examples of noncritical emission-related maintenance, such as changing spark plugs and re-seating valves.
- § 1048.135: Revising the engine labeling requirements to allow omission of the manufacturing date only if the date is stamped, engraved or otherwise permanently applied on the engine, rather than allowing manufacturers to keep records of engine build dates. This is important for verifying that engines comply with standards based on their build date. This requirement takes effect starting with the 2010 model year. See Section 1.3 of the Summary and Analysis of Comments for further discussion of issues related to this requirement.
- § 1048.205: Removing detailed specifications for describing auxiliary emission control devices in the application for certification. This responds to the concern expressed by manufacturers that the existing, very prescriptive approach requires much more information than is needed to adequately describe emission control systems. We are leaving in place a broad requirement to describe emission control systems and parameters in sufficient detail to allow EPA to confirm that no defeat devices are employed. Manufacturers should be motivated to include substantial information to make such determinations in the certification process, rather than being subject to this

[123] ''C'' refers to fuel C as specified in ASTM D 412, E10 refers to 10 percent ethanol, and M15 refers to 15 percent methanol.

type of investigation for emission control approaches that are found to be outside of the scope of the application for certification. We may require manufacturers to submit additional information if the description submitted with the application is not adequate for evaluating the appropriateness of the design.

- § 1048.205: Adding a requirement to align projected production volumes with actual production from previous years. This does not imply additional reporting or recordkeeping requirements. It is intended simply to avoid situations where manufacturers intentionally mis-state their projected production volumes to gain some advantage under the regulations.
- § 1048.205: Specifying that manufacturers must submit modal emission results rather than just submitting a weighted average. Since this information is already part of the demonstration related to the field-testing standards, this should already be common practice.
- § 1048.220: Clarifying that if manufacturers change their maintenance instructions after starting production for an engine family, they may not disqualify engines for in-use testing or warranty claims based on the fact that operators did not follow the revised maintenance instructions.
- § 1048.225: Clarifying the terminology to refer to ''new or modified engine configurations'' rather than ''new or modified nonroad engines.'' This is necessary to avoid using the term ''new nonroad engine'' in a way that differs from the definition in § 1048.801.
- § 1048.230: Clarifying that engine families relate fundamentally to emission certification and that we will expect manufacturers to suggest a tailored approach to specifying engine families under § 1048.230(d) to occur only in unusual circumstances.
- § 1048.250: Adding a requirement for manufacturers to report their production volumes for an engine family separate from reports for production-line testing. For example, by excluding small-volume families from production-line testing, the reports of those production volumes would otherwise no longer be available to us. Also, we are clarifying that manufacturers must report total production volumes for an engine family for any production that occurs after submission of the final PLT report for the model year.
- § 1048.301: Allowing small-volume emission families to be exempted from production-line testing requirements. This applies for engine families with sales volumes below 150 units. This level of production does not allow for adequate testing to use the statistical techniques before exceeding specified maximum testing rates.
- § 1048.301: Specifying that manufacturers may use an alternate method for production-line testing by using field-grade analyzers (instead of lab-grade) without prior approval, as long as they double the specified minimum sampling rate.
- § 1048.305: Clarifying that (1) tested engines should be built in a way that represents production engines and (2) the field-testing standards apply for any testing conducted (this may involve simply comparing modal results to the field-testing standards). We are also revising the provision related to repeat testing after an invalidated test to specify that manufacturers do not need our approval before retesting, except that we may require this if we find that tests have been improperly invalidated.
- § 1048.310: Clarifying the relationship between quarterly testing and compliance with the annual testing requirements.
- § 1048.315: Correcting the equation for the CumSum statistic to prevent negative values.
- § 1048.345: Changing the PLT reporting deadline from 30 to 45 days after the end of each calendar quarter. This aligns with change we are making in other programs.
- § 1048.350: Allowing manufacturers to keep electronic records related to production-line testing rather than paper records.
- § 1048.405: Adding a provision allowing for an adjustment of in-use testing plans if unforeseen circumstances prevent completion of the testing effort. This aligns with the change described in Section IV for Marine SI engines.
- § 1048.410: Clarifying that repeat tests with an in-use test engine are acceptable, as long as the same number of repeat tests are performed for all engines.
- § 1048.415: Clarifying that the provisions related to defect reporting in 40 CFR 1068.501 apply for in-use testing.
- § 1048.501: Removing specified mapping procedures, since these are addressed in 40 CFR part 1065.
- § 1048.501: Clarifying the evaporative testing procedures, mainly by describing preconditioning procedures for engines equipped with carbon canisters (loading with vapors, then operating the engine to purge the canister appropriately). These procedures are consistent with the requirements we specify for light-duty vehicles in part 86 and for nonroad equipment in part 1060.
- § 1048.505: (1) Removing redundant text and removing sampling times specified in Table 1, since these are already addressed in § 1048.505(a)(1); (2) correcting the mode sequence listed in the table for ramped-modal testing; (3) clarifying that cycle statistics for discrete-mode testing are defined in § 1065.514. This involves treating the series of modes as if it were continuous operation; and (4) referring to § 1065.510 for idle specifications. These idle specifications provide more detailed instructions; we do not intend to change the way manufacturers test at idle.
- §§ 1048.605 and 1048.610: Requiring some demonstration that the sales restrictions that apply for these sections are met, and clarifying the provisions related to emission credits for vehicles that generate or use emission credits under 40 CFR part 86.
- § 1048.801: (1) Revising several definitions to align with updated definitions adopted for other programs; (2) Expanding the definition of small-volume engine manufacturer to also include companies with annual U.S. production volumes of no more than 2,000 Large SI engines. This aligns with the provisions already adopted by California ARB. (3) Revising (in response to comments) the provision for emission-data engines to specify that the low-hour test result should generally occur after no more than 125 hours of engine operation. The regulations separately specify that engines may be presumed stabilized after 50 hours, so this would allow at least 75 hours to perform testing on various fuels and configurations before the engine is no longer eligible for testing low-hour results. (4) Clarifying that an imported motor vehicle (or motor vehicle engine) that has been converted for nonroad use retains its original model year, but only if it was originally certified under part 86. Converted vehicles and engines that were not certified under part 86 have an assigned model year based on the date of conversion for nonroad use and must therefore meet nonroad standards based on the new model year.

E. Amendments Related to Recreational Vehicles (40 CFR Part 1051)

We are making a variety of technical amendments to the regulations in 40 CFR part 1051 for recreational vehicles, as described in this section.

In the proposal we requested comment on revising the regulation to allow for manufacturers of fuel-system components to certify that their products meet emission standards. For recreational vehicles we adopted a program in which the exhaust and evaporative emission standards apply to the vehicle so we did not set up a process for certifying fuel-system components. We continue to believe that evaporative emission standards should apply to the vehicle. However, we are revising the final rule to include a process by which manufacturers of fuel-system components can opt into this program by certifying their fuel tanks or fuel lines to the applicable standards. While this is a voluntary step, any manufacturer opting into the program in this way will be subject to all the requirements that apply to certificate holders. While manufacturers of recreational vehicles will continue to be responsible for meeting standards and certifying their vehicles, it may be appropriate to simplify their compliance effort by allowing them to rely on the certification of the fuel line manufacturer or fuel tank manufacturer.

We are making several additional technical amendments to part 1051. Many of these simply correct typographical errors or add references to the regulatory cites in part 1054. Several changes are intended merely to align regulatory language with that of other programs, including those that are subject to the standards in this final rule. In addition, we are making the changes described below. Note that the changes being made to the production-line and other testing requirements are being made in response to comments. As noted, a few others are also being made in response to comments or as clarifications of existing text. However, most of these changes are being finalized as proposed.

- § 1051.1: Revising the speed threshold for offroad utility vehicles to be subject to part 1051. Changing from ''25 miles per hour or higher'' to ''higher than 25 miles per hour'' aligns this provision with the similar threshold for qualifying as a motor vehicle in 40 CFR 85.1703.
- § 1051.5: Clarifying the status of very small recreational vehicles to reflect the provisions in the current regulations in 40 CFR part 90 to treat such vehicles with a dry weight under 20 kilograms as Small SI engines.
- § 1051.25: Clarifying that manufacturers of recreational vehicles that use engines certified to meet exhaust emission standards must still certify the vehicle with respect to the evaporative emission standards.
- § 1051.120: Clarifying that the emission-related warranty covers only those components from 40 CFR part 1068, Appendix I, whose failure will increase emissions of regulated pollutants.
- § 1051.125: Giving examples of noncritical emission-related maintenance, such as changing spark plugs and re-seating valves.
- § 1051.135: Revising the labeling requirements to allow omission of the manufacturing date only if the date is stamped, engraved, or otherwise permanently applied on the vehicle, rather than allowing manufacturers to keep records of vehicle build dates. This is important for verifying that vehicles comply with standards based on their build date. This requirement takes effect starting with the 2010 model year. See Section 1.3 of the Summary and Analysis of Comments for further discussion of issues related to this requirement.
- § 1051.135: Adding a requirement to label vehicles as described in part 1060 for evaporative emission controls. Since this change may involve some time for manufacturers to comply, we are applying this requirement starting with the 2010 model year.
- § 1051.137: Clarifying how the labeling requirements apply with respect to the averaging program and selected family emission limits.
- § 1051.140: Allowing (in response to comments) for identification of engine displacement to the nearest whole cubic centimeter (rather than the nearest 0.5 cubic centimeter). This level of precision is adequate for implementing regulatory provisions related to engine displacement.
- § 1051.145: Allowing the continued use of part 91 test procedures (instead of part 1065 procedures) for snowmobiles subject to Phase 2 or Phase 2 standards. We will revisit this provision in the context of adopting revised Phase 3 standards.
- § 1051.205: Removing detailed specifications for describing auxiliary emission control devices in the application for certification. This responds to the concern expressed by manufacturers that the existing, very prescriptive approach requires much more information that is needed to adequately describe emission control systems. We are leaving in place a broad requirement to describe emission control systems and parameters in sufficient detail to allow EPA to confirm that no defeat devices are employed. Manufacturers should be motivated to include substantial information to make such determinations in the certification process, rather than being subject to this type of investigation for emission control approaches that are found to be outside of the scope of the application for certification. We may require manufacturers to submit additional information if the description submitted with the application is not adequate for evaluating the appropriateness of the design.
- § 1051.205: Requirements to align projected production volumes with actual production from previous years. This does not imply additional reporting or recordkeeping requirements. It is intended simply to avoid situations where manufacturers intentionally mis-state their projected production volumes to gain some advantage under the regulations.
- § 1051.220: Clarifying that if manufacturers change their maintenance instructions after starting production for an engine family, they may not disqualify vehicles for warranty claims based on the fact that operators did not follow the revised maintenance instructions.
- § 1051.225: Clarifying the terminology to refer to ''new or modified vehicle configurations'' rather than ''new or modified vehicles.'' This is necessary to avoid confusion with the term ''new vehicle'' as it relates to introduction into commerce.
- § 1051.225: Clarifying the provisions related to changing an engine family's Family Emission Limit after the start of production.
- § 1051.255: Adopting a different SAE standard for specifying low-permeability materials to allow for design-based certification of metal fuel tanks with gaskets made of polymer materials. The previous language does not adequately characterize the necessary testing and material specifications.
- § 1051.230: Clarifying that engine families relate fundamentally to emission certification and that we will expect manufacturers to suggest a tailored approach to specifying engine families under § 1051.230(e) to occur only in unusual circumstances.
- § 1051.245: Revising the specification for fuel lines meeting the specifications of SAE J 2260 to include the 2004 version of this standard as described in Section VIII.D.
- § 1051.250: Adding a requirement for manufacturers to report their production volumes for an engine family separate from reports for production-line testing. For example, by excluding small-volume families from production-line testing, the reports of production volumes would otherwise no longer be available to us. Also, we are clarifying that manufacturers must report total production volumes for an engine family for any production that occurs after submission of the final PLT report for the model year.

• § 1051.301: Allowing small-volume emission families to be exempted from production-line testing requirements. This applies for engine families with production volumes below 150 units. This level of production does not allow for adequate testing to use the statistical techniques before exceeding specified maximum testing rates.

• § 1051.301: Specifying that manufacturers may use an alternate method for production-line testing by using field-grade analyzers (instead of lab-grade) without prior approval, as long as they double the specified minimum sampling rate.

• § 1051.305: Clarifying that tested vehicles should be built in a way that represents production vehicles.

• § 1051.305: Revising the provision related to repeat testing after an invalidated test to specify that manufacturers do not need our approval before retesting, except that we may require this if we find that tests have been improperly invalidated.

• § 1051.310: Clarifying the relationship between quarterly testing and compliance with the annual testing requirements; and clarifying the testing provisions that apply for engine families where the production period is substantially less than a full year.

• § 1051.315: Correcting the equation for the CumSum statistic to prevent negative values.

• § 1051.325: Clarifying the basis on which we will approve retroactive changes to the Family Emission Limit for an engine family that has failed under production-line testing.

• § 1051.345: Changing the PLT reporting deadline from 30 to 45 days after the end of each calendar quarter. This aligns with change we are making in other programs.

• § 1051.350: Allowing manufacturers to keep electronic records related to production-line testing rather than paper records.

• § 1051.501: Adding a specified test fuel for diesel-fueled recreational vehicles that certify under part 1051. This would generally involve either low-sulfur diesel fuel (< 500 ppm sulfur) or ultra low-sulfur diesel fuel (< 15 ppm sulfur).

• § 1051.505: (1) Clarifying that cycle statistics for discrete-mode testing on an engine dynamometer are defined in § 1065.514. This involves treating the series of modes as if it involved continuous operation. (2) Specifying that manufacturers may choose between discrete-mode and ramped-modal measurements for production-line testing if the application for certification includes testing conducted with both types of testing. (3) Referring to § 1065.510 for idle specifications. These idle specifications provide more detailed instructions; we do not intend to change the way manufacturers test at idle.

• §§ 1051.605 and 1051.610: Requiring a demonstration that the sales restrictions that apply for these sections are met.

• § 1051.650: Adding a requirement to certify vehicles that are converted to run on a different fuel. We expect this is a rare occurrence, but one that we should make subject to certification requirements.

• § 1051.701: Clarifying that manufacturers using emission credits to meet emission standards must base their credit calculations on their full product line-up, rather than considering only those engine families with Family Emission Limits above or below the emission standard.

• §§ 1051.710–1051.735: Making various minor revisions to align with regulatory specifications in other programs.

• § 1051.735: Adding a requirement to keep records related to banked emission credits for as long as a manufacturer intends for those credits to be valid. This is necessary for us to verify the appropriateness of credits used for demonstrating compliance with emission standards in later model years.

• § 1051.801: Revising several definitions to align with updated definitions adopted for other programs.

• § 1051.801: Clarifying that an engine's "maximum engine power" does not change if it is installed in a vehicle or piece of equipment that limits the engine's operation. For example, adding a speed limiter to a vehicle does not affect the engine's "maximum engine power" as determined by the engine manufacturer for the engine as it would be tested using the specified procedures.

• § 1051.801: Clarifying that an imported motor vehicle that has been converted for nonroad use retains its original model year, but only if it was originally certified under part 86. Converted vehicles that were not certified under part 86 have an assigned model year based on the date of conversion for nonroad use and must therefore meet nonroad standards based on the new model year.

F. Amendments Related to Heavy-Duty Highway Engines (40 CFR Part 85)

We proposed to make several adjustments to the provisions related to delegated assembly specified in § 85.1713. These proposed adjustments include:

• Removing the provision related to auditing outside the United States since equipment manufactured in other countries will not be subject to these provisions

• Clarifying that the exemption expires when the equipment manufacturer takes possession of the engine, but not before it reaches the point of final assembly

• Clarifying the prohibition related to following installation instructions to ensure that engines are in their certified configuration when installed in a piece of equipment.

We are adopting these proposed provisions as part of a bigger effort to harmonize delegated-assembly across engine categories. See Section VIII.C.6 for further discussion of the changes in delegated assembly in the harmonized approach we are adopting in § 1068.261. Note that the new labeling requirements we are adopting take effect for heavy-duty highway engines starting in the 2010 model year.

Manufacturers also submitted comments describing technical and practical challenges related to the transition to using part 1065 test procedures for heavy-duty highway engines. We have agreed to delay the mandatory use of part 1065 procedures until July 2010. However, there are several areas where part 1065 specifies procedures or methods that are already well established, where those methods represent substantial improvements over the existing procedures specified in part 86. We are therefore not extending the deadline for these specific provisions. See § 86.1305–2010 for additional information.

We have revised the final rule to include new provisions allowing for a replacement-engine exemption for heavy-duty highway engines under § 1068.240 as described in Section VIII.C.5.

G. Amendments Related to Stationary Spark-Ignition Engines (40 CFR part 60)

On January 18, 2008 we promulgated final emission standards for stationary spark-ignition engines (73 FR 3567). The final rule specified that stationary spark-ignition engines at or below 19 kW would be subject to all the same emission standards and certification requirements that apply to Small SI engines. Since we are promulgating new standards for Small SI engines in this rule, these requirements should apply automatically to those stationary engines. However, since the Phase 3 standards are in 40 CFR part 1054, as described in Section V, we are revising the regulatory language for stationary spark-ignition engines in 40 CFR part

60, subpart JJJJ, to directly reference the Phase 3 standards in part 1054, as proposed.

H. Amendments Related to Locomotive, Marine, and Other Nonroad Compression-Ignition Engines (40 CFR parts 89, 92, 94, 1033, 1039, and 1042)

In response to comments, we are making a variety of technical amendments to regulatory provisions for nonroad compression-ignition engines. Several of these changes are intended to align with the changes we are adopting in this rule for spark-ignition engines, either to be consistent with those standard-setting parts, or to fit with changes we are making to the general compliance provisions in part 1068. There are also a variety of changes to correct paragraph references and other typographical errors. We are making the following additional adjustments and clarifications to the regulations:

• Modifying the labeling statement for replacement engines under part 89 to clarify what applies when manufacturer replace an engine that was originally exempted from emission standards.

• Correcting a typographical error to define the alternate emission standard for switch locomotives in § 1033.101(b) to be the same as that for line-haul locomotives, as described in the preamble to that final rule.

• Revising the start date for the certification requirement for automatic engine stop/start in § 1033.115 to provide sufficient lead time following publication of the final rule establishing part 1033. Note that this revision addresses only administrative requirements and does not delay the introduction of the emission control technology.

• Clarifying provisions related to assigned deterioration factors for locomotive remanufacturers in § 1033.150 to be consistent with the description in the preamble to the final rule establishing part 1033.

• Clarifying the need for prior approval of adjustments for automatic shutdown features to be consistent with the description in the preamble to the final rule establishing part 1033 (see § 1033.530).

• Clarifying the definition of ''new'' in § 1033.801 for remanufactured engines that have been certified.

• Revising the definition of ''hobby engine'' in § 1039.5 and § 1042.5 to rely on vehicle characteristics (reduced-scale models that are not capable of transporting a person) rather than engine characteristics (less than 50 cc per cylinder). See Section 1.2 of the Summary and Analysis of Comments for further information.

• Clarifying that compression-ignition engines used in recreational vehicles and certified under part 1051 are not required to certify under part 1039.

• Clarifying the labeling requirements that apply for engines meeting the alternate PM standard specified in § 1039.101(c) (see § 1039.102 and § 1039.135).

• Adding a provision allowing manufacturers to specify scheduled maintenance for crankcase vent filters. This is analogous to servicing PCV valves for engines that have closed crankcases (see § 1039.125).

• Revising the Transition Program for Equipment Manufacturers in § 1039.625 and § 1039.626 to (1) require manufacturers to send only a single report to EPA, (2) allow manufacturers to identify their contact information in their reports or on a publicly accessible Web site rather than on their equipment labels, (3) specify a notification deadline based on the start of using these provisions, rather than tying the deadline only to the start of the year, (4) allow manufacturers to omit the FEL from the engine label if the FEL is below the emission standard that would otherwise apply, (5) identify specific asset thresholds for avoiding bond payments for importing exempted products, (6) clarify the types of penalties and judgments that would be subject to payment from the posted bond, and (7) specify that manufacturers may identify an agent for service anywhere in the United States (rather than specifically in Washington, DC).

• Correcting an error for marine compression-ignition engines in § 1042.101 by noting that the Tier 3 NO_X+HC standards do not apply for engines between 2000 and 3700 kW that have a power density above 35 kW per liter. The footnote in Table 1 of this section denoting this distinction was inadvertently omitted for the high power-density engines.

• Revising the requirements related to evaporative emissions in § 1042.105 to align with the new provisions that apply for Marine SI applications as described in Section VI.

• Removing § 1042.601(g) since this provision is being codified in this rule at § 1068.101(b)(1).

IX. Projected Impacts

A. Emissions from Small Nonroad and Marine Spark-Ignition Engines

As discussed in previous sections, this final rule will reduce exhaust emissions from specific sizes of nonhandheld Small SI and Marine SI engines. It will also reduce evaporative emissions from the fuel systems used on nonhandheld and handheld Small SI equipment and Marine SI vessels (for simplicity we collectively include the evaporative emission requirements from equipment or vessels when referring to Small SI or Marine SI engines in the remainder of this section). The new exhaust and evaporative emission standards will directly affect volatile organic hydrocarbon compounds (VOC), oxides of nitrogen (NO_X), and to a lesser extent carbon monoxide (CO). Also, we anticipate that the emission control technology which is likely to be used to meet the exhaust emission standards will affect directly emitted particulate matter, most importantly particles with diameters of 2.5 micrometers or less (PM2.5). It will also incrementally reduce air toxic emissions. A detailed analysis of the effects of this final rule on emissions and emission inventories can be found in Chapter 3 of the Final RIA.

The contribution of exhaust and evaporative emissions from Small SI and Marine SI engines to total 50-state mobile-source emission inventories is significant and will remain so into the future. Table IX–1 presents the nationwide inventory for these engines for both 2002 and 2030. (The inventories cover all Small SI and Marine SI engines including the portion of Small SI engines regulated by the California ARB.) Table IX–1 shows that for the primary pollutants affected by this final rule, these engines contribute about 25 to 35 percent of the nationwide VOC emissions from all mobile sources. The nationwide contribution to the total mobile source NO_X inventory is about 5 percent or less. Finally, for PM2.5, the contribution is about 10 percent.

TABLE IX–1—CONTRIBUTION OF SMALL NONROAD AND MARINE SI ENGINES TO NATIONAL (50-STATE) MOBILE SOURCE EMISSION INVENTORIES

Pollutant	2002		2030	
	Small SI/marine SI inventory, tons	Percent of mobile source inventory	Small SI/marine SI inventory, tons	Percent of mobile source inventory
VOC	2,169,000	26	1,430,000	35
NO_X	169,700	1	311,300	6
PM2.5	41,960	8	44,040	12
CO	19,607,000	23	15,605,000	30

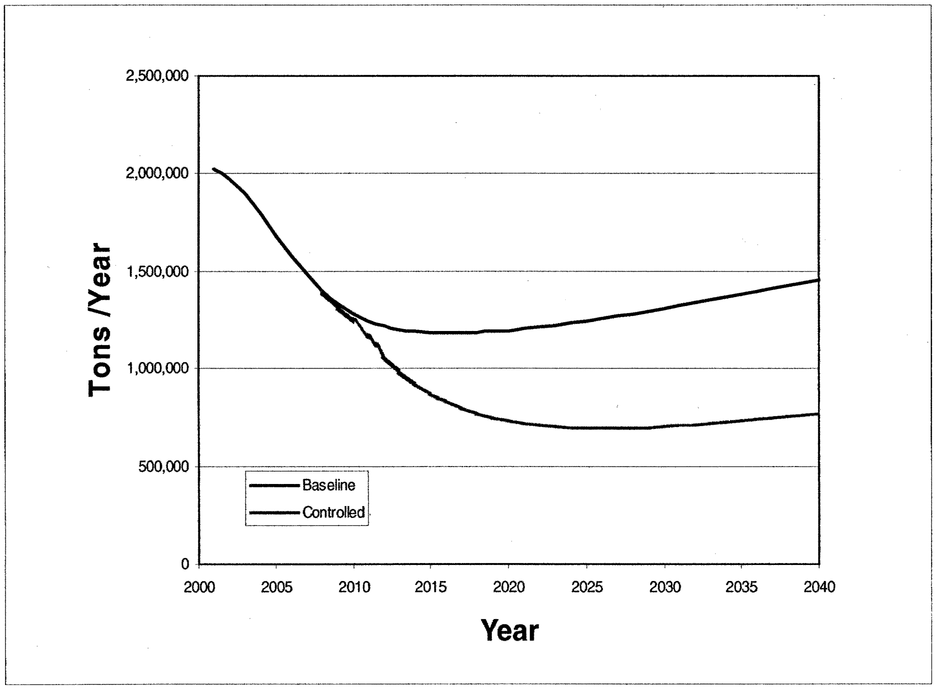
(1) VOC

Table IX–2 shows the VOC emissions and emission reductions we expect both with and without the new standards for engines, equipment, and vessels affected by the final rule. In 2002, Small SI and Marine SI emitted approximately 1,047,000 and 931,000 tons of VOC, respectively. Without the new standards, these emissions will decrease because of the effect of the existing emission control requirements to about 958,000 and 484,000 tons by 2040, respectively. With the new controls, this pollutant will be further reduced by 34 percent for Small SI engines and 73 percent for Marine SI engines by 2040. The VOC emission inventory trends over time for both categories of engines that are subject to the final rule are shown in Figure IX–1.

TABLE IX–2—NATIONAL (50-STATE) VOC EMISSIONS AND EMISSION REDUCTIONS FOR SMALL SI AND MARINE SI ENGINES

Year	Category	Without rule	With rule	Reduction	Percent reduction
	Small Engine	1,047,374	1,047,374		
	Marine	931,132	931,132		
2002	Both	1,978,506	1,978,506		
	Small Engine	675,131	488,517	186,614	28
	Marine	505,981	384,108	121,873	24
2015	Both	1,181,112	872,624	308,487	26
	Small Engine	728,853	242,957	240,948	33
	Marine	460,481	242,957	217,524	47
2020	Both	1,189,334	730,862	458,472	39
	Small Engine	842,970	558,094	284,876	34
	Marine	458,656	139,083	319,573	70
2030	Both	1,301,626	697,177	604,449	46
	Small Engine	958,429	633,050	325,379	34
	Marine	483,949	128,906	355,043	73
2040	Both	1,442,377	761,956	680,422	47

Figure IX-1: Estimated VOC Emissions from Small SI and Marine SI Engines



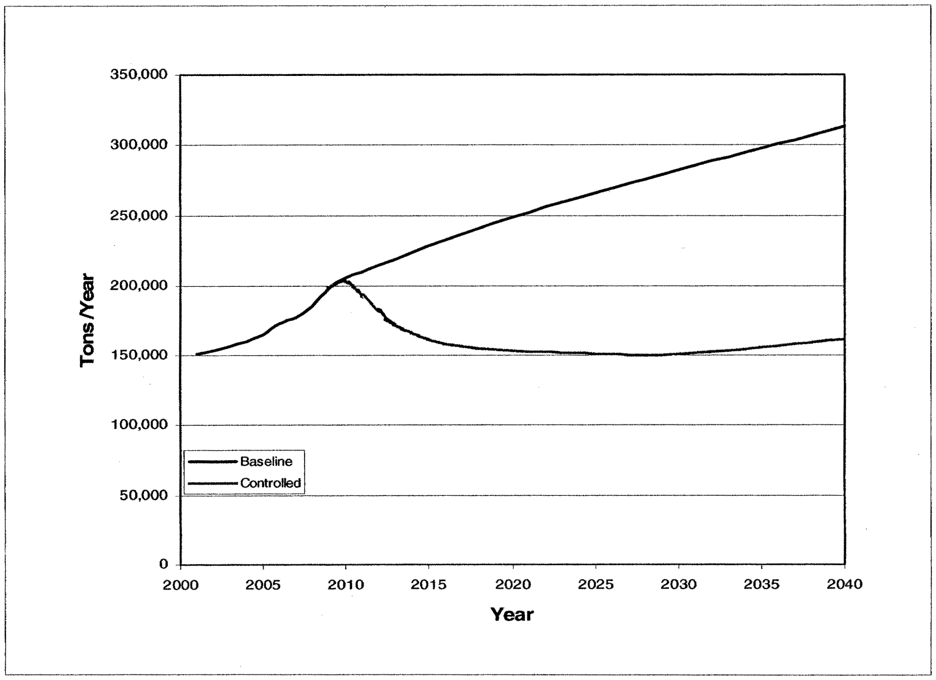
(2) NO_X

Table IX–3 shows the NO_X emissions and emission reductions we expect both with and without the new standards for engines affected by the final rule. In 2002, Small SI and Marine SI emitted approximately 107,000 and 46,300 tons of NO_X, respectively. Without the new standards, these emissions will increase to about 181,000, and 132,000 tons by 2040, respectively. With the new controls, this pollutant will be reduced by 49 percent for Small SI engines and 48 percent for Marine SI engines by 2040. The NO_X emission inventory trends over time for both categories of engines that are subject to the final rule are shown in Figure IX–2.

TABLE IX–3—NATIONAL (50-STATE) NO_X EMISSIONS AND EMISSION REDUCTIONS FOR SMALL SI AND MARINE SI ENGINES

Year	Category	Without rule	With rule	Reduction	Percent reduction
	Small Engine	106,804	106,804		
	Marine	46,311	46,311		
2002	Both	153,115	153,115		
	Small Engine	126,395	76,412	49,983	40
	Marine	101,703	85,334	16,369	16
2015	Both	228,098	161,746	66,353	29
	Small Engine	137,002	72,175	64,827	47
	Marine	111,525	81,398	30,128	27
2020	Both	248,527	153,572	94,954	38
	Small Engine	158,840	81,977	76,863	48
	Marine	123,335	68,639	54,696	44
2030	Both	282,175	150,616	131,559	47
	Small Engine	180,973	93,181	87,792	49
	Marine	131,907	68,461	63,445	48
2040	Both	312,880	161,643	151,237	48

Figure IX-2: Estimated NOx Emissions from Small SI and Marine SI Engines



(3) $PM_{2.5}$

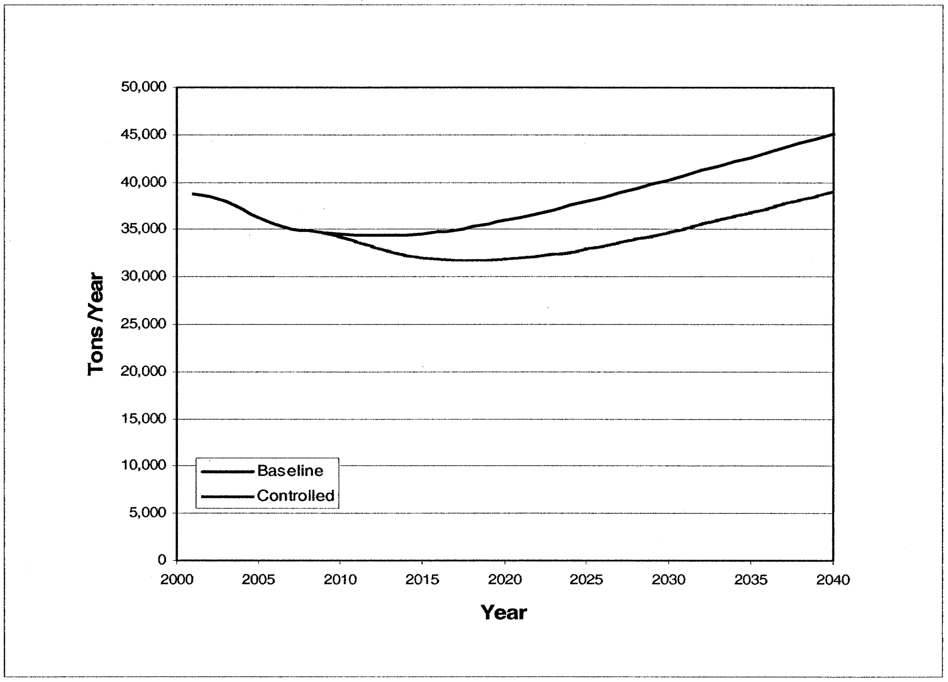
Table IX–4 shows the $PM_{2.5}$ emissions and emission reductions we expect both with and without the new standards for engines affected by the final rule. In 2002, Small SI and Marine SI emitted 23,000 and 15,000 tons of $PM_{2.5}$, respectively. Without the new standards, the $PM_{2.5}$ emissions from Small SI engines will increase to 39,000 by 2040, while those from Marine SI will decrease to about 6,000 tons in that year due to the effects of the existing emission control requirements for certain types of Marine SI engines, such as outboards. With the new controls, this pollutant will be reduced by 3 percent for Small SI engines and an additional 84 percent for Marine SI engines by 2040.

The $PM_{2.5}$ emission inventory trends over time for both categories of engines that are subject to the final rule are shown in Figure IX–3.

TABLE IX–4—NATIONAL (50-STATE) $PM_{2.5}$ EMISSIONS AND EMISSION REDUCTIONS FOR SMALL SI AND MARINE SI ENGINES

Year	Category	Without rule	With rule	Reduction	Percent reduction
	Small Engine	23,382	23,382		
	Marine	15,092	15,092		
2002	Both	38,474	38,474		
	Small Engine	27,747	27,115	632	2
	Marine	6,823	4,951	1,872	27
2015	Both	34,570	32,066	2,504	7
	Small Engine	30,009	29,189	820	3
	Marine	5,908	2,640	3,269	55
2020	Both	35,917	31,828	4,089	11
	Small Engine	34,535	33,572	963	3
	Marine	5,719	1,137	4,582	80
2030	Both	40,255	34,710	5,545	14
	Small Engine	39,079	37,979	1,100	3
	Marine	6,016	989	5,027	84
2040	Both	45,095	38,968	6,127	14

Figure IX-3: Estimated PM2.5 Emissions from Small SI and Marine SI Engines



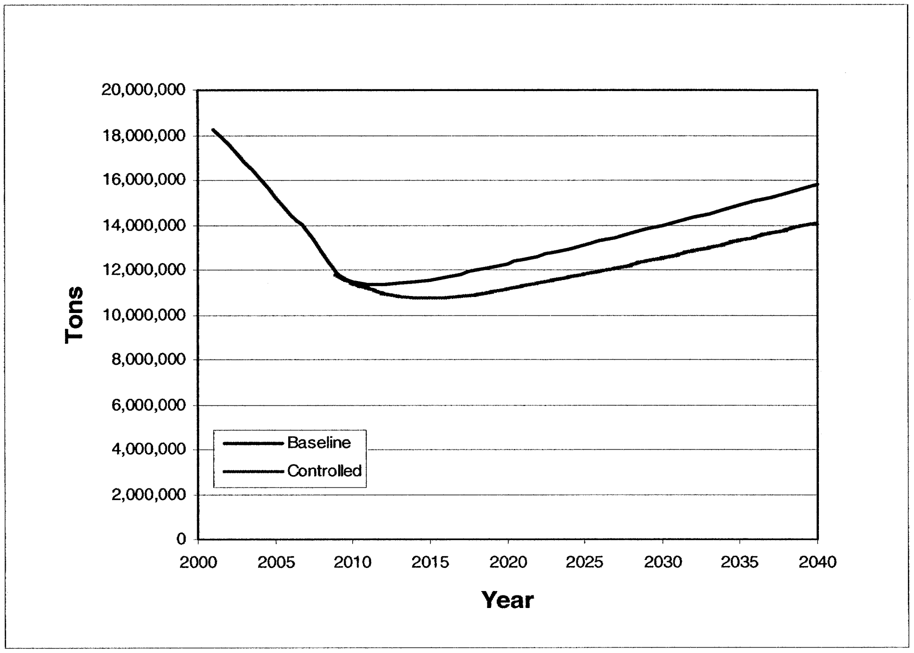
(4) CO

Table IX–5 shows the CO emissions and emission reductions we expect both with and without the new standards for engines affected by the final rule. In 2002, Small SI and Marine SI emitted 15,091,000 and 2,472,000 tons of CO, respectively. Without the new standards, these emissions will decrease because of the effect of the existing emission control requirements to about 14,007,000 and 1,766,000 tons by 2040, respectively. With the new controls, this pollutant will be reduced by an additional 9 percent for Small SI engines and an additional 21 percent for Marine SI engines by 2040. The CO emission inventory trends over time for both categories of engines that are subject to the final rule are shown in Figure IX–4.

TABLE IX–5—NATIONAL (50-STATE) CO EMISSIONS AND EMISSION REDUCTIONS FOR SMALL SI AND MARINE SI ENGINES

Year	Category	Without rule	With rule	Reduction	Percent reduction
	Small Engine	15,091,835	15,091,835		
	Marine	2,472,251	2,472,251		
2002	Both	17,564,086	17,564,086		
	Small Engine	9,879,027	9,135,515	743,512	8
	Marine	1,690,755	1,587,889	102,867	6
2015	Both	11,569,782	10,723,404	846,379	7
	Small Engine	10,645,870	9,679,462	966,407	9
	Marine	1,638,114	1,452,196	185,917	11
2020	Both	12,283,983	11,131,659	1,152,325	9
	Small Engine	12,310,505	11,166,921	1,143,584	9
	Marine	1,671,627	1,353,989	317,638	19
2030	Both	13,982,132	12,520,910	1,461,222	10
	Small Engine	14,007,335	12,701,792	1,305,543	9
	Marine	1,765,651	1,399,715	365,936	21
2040	Both	15,772,986	14,101,507	1,671,479	11

Figure IX-4: Estimated CO Emissions from Small SI and Marine SI Engines



B. Estimated Costs

In assessing the economic impact of setting emission standards, we have made a best estimate of the costs associated with the technologies we anticipate manufacturers will use in meeting the standards. In making our estimates for the final rule, we have relied on our own technology assessment, which includes information developed by EPA's National Vehicle and Fuel Emissions Laboratory (NVFEL). Estimated costs include variable costs (e.g., hardware and assembly time) and fixed costs (e.g., research and development, retooling, engine certification and test cell upgrades to 40 CFR 1065 requirements). We projected that manufacturers will redirect existing research and development funds to invest in the fixed costs associated with changes needed to meet the rulemaking requirements. The analysis also considers total operating costs, including maintenance and fuel consumption. Cost estimates based on the projected technologies represent an expected change in the cost of engines as they begin to comply with new emission standards. All costs are presented in 2005 dollars. Full details of our cost analysis can be found in Chapter 6 of the Final RIA. Estimated costs related to exhaust emissions were also subject to peer review, as described in a set of peer review reports that are available in the docket for this rulemaking.

Cost estimates based on the current projected costs for our estimated technology packages represent an expected incremental cost of equipment in the near term. For the longer term we have identified a factor that will cause cost impacts to decrease over time. We expect that manufacturers will undergo a learning process that will lead to lower variable costs. For instance, the analysis incorporates the expectation that Small SI engine manufacturers will optimize the catalyst muffler offerings available and thereby streamline their production and reduce costs. The cost analysis generally incorporates this learning effect by decreasing estimated variable costs by 20 percent starting in the sixth year of production. The learning curve has not been applied to Small SI EFI systems due to the fact that the technologies are currently well established on similar sized engines in other applications.

We project average costs to comply with the new exhaust emission standards for Small SI engines and equipment to range from $9–$11 per Class I equipment to meet the Phase 3 standards. We anticipate the manufacturers will meet the emission standard with several technologies including engine improvements and catalysts. For Class II equipment, we project average costs to range from $15–$26 per equipment to meet the new emission standards. We anticipate the manufacturers of Class II engines will meet the new exhaust emission standards by engine improvements and adding catalysts and/or electronic fuel injection to their engines. The use of electronic fuel injection is estimated to provide a fuel savings of 10% over the lifetime of a Class II engine. Using an average garden tractor estimated lifetime of 5.8 years, and the estimate that 6.6% of Class II engines will utilize electronic fuel injection, this calculates to be a lifetime savings of 273 gallons. This translates to a discounted lifetime savings of approximately $496 per engine, at an average fuel price of $1.81 per gallon.

For Small SI equipment, we have also estimated a per-unit cost for the new evaporative emission standards. The average short-term costs without fuel savings are projected to be $0.82 for handheld equipment, $3.05 for Class I equipment, and $6.73 for Class II equipment. These costs are based on fuel tank and fuel line permeation control, and for non-handheld equipment, running loss and diffusion control. Because evaporative emissions are composed of otherwise usable fuel that is lost to the atmosphere, measures that reduce evaporative emissions will result in fuel savings. We estimate that the average fuel savings, due to permeation control, be about 1.4 gallons over the 5 year average operating lifetime. This translates to a discounted lifetime savings of more than $2 at an average fuel price of $1.81 per gallon.

For marine engines, we estimated per-engine costs for OB, PWC, and SD/I engines for meeting the new exhaust emission standards. The short-term cost estimates without fuel savings are $290 for OB, $390 for PWC, and $360 for SD/

I engines. For OB/PWC engines, we anticipate that manufacturers will meet the standards through the expanded production of existing low-emission technologies such as four-stroke and direct-injection two-stroke engines. For most SD/I engines, we anticipate that manufacturers will use catalytic control to meet the new standards.

For marine vessels, we have also estimated a per-unit cost for the new evaporative emission standards. The average short-term costs without fuel savings are projected to be $12 for boats with portable fuel tanks, $17 for PWC, and $74 for boats with installed fuel tanks. These costs are based on fuel tank and fuel line permeation control and diurnal emission control. For portable fuel tanks, diurnal emission control is based on an automatic sealing vent, for PWC we estimate that changes will not be necessary from current designs, and for other boats with installed fuel tanks, the estimated costs are based on the use of a passively-purged carbon canister. Because evaporative emissions are composed of otherwise usable fuel that is lost to the atmosphere, measures that reduce evaporative emissions will result in fuel savings. We estimate that the average fuel savings, due to permeation control, to be about 28 gallons over the 15 year average operating lifetime. This translates to a discounted lifetime savings of more than $30 at an average fuel price of $1.81 per gallon.

C. Cost per Ton

We have calculated the cost per ton of the Phase 3 standards contained in this final rule by estimating costs and emission benefits for these engines. We made our best estimates of the combination of technologies that engine manufacturers might use to meet the new standards, best estimates of resultant changes to equipment design, engine manufacturer compliance program costs, and fuel savings in order to assess the expected economic impact of the Phase 3 emission standards for Small SI engines and Marine SI engines. Emission reduction benefits are taken from the results of the Inventory chapter of the RIA (Chapter 3).

A summary of the annualized costs to Small SI and Marine SI engine manufacturers is presented in Table IX–6. These annualized costs are over a 30 year period and presented both with a 3 percent and a 7 percent discount rate. The annualized fuel savings for Small SI engines are due to reduced fuel costs from the use of electronic fuel injection on Class II engines as well as fuel savings from evaporative measures on all Small SI engines. The annualized fuel savings for Marine SI engines are due to reduced fuel costs from the expected elimination of two-stroke outboard motors from the new engine fleet as well as fuel savings from evaporative emission controls on all vessels.

TABLE IX–6—ESTIMATED ANNUALIZED COST TO MANUFACTURERS AND ANNUALIZED FUEL SAVINGS OVER 30 YEARS DUE TO THE PHASE 3 SMALL SI AND MARINE SI ENGINE STANDARDS

[2005$, 3 and 7 percent discount rates]

Engine category	Emissions category	Annualized cost to manufacturers (millions/yr)		Annualized fuel savings (millions/yr)	
		3%	7%	3%	7%
Small SI Engines	Exhaust	$190	$182	$27	$24
	Evaporative	68	65	59	53
	Aggregate	258	247	86	77
Marine SI Engines	Exhaust	123	123	67	56
	Evaporative	23	22	27	22
	Aggregate	146	144	94	78

We have estimated the Small SI and Marine SI engine cost per ton of the Phase 3 $HC+NO_X$ standards over the typical lifetime of the equipment that are covered by this final rule. We have examined the cost per ton by performing a nationwide cost per ton analysis in which the net present value of the cost of compliance per year is divided by the net present value of the $HC+NO_X$ benefits over 30 years. The resultant discounted cost per ton is presented in Table IX–7. The total (exhaust and evaporative) cost per ton, using a 7 percent discount rate, with fuel savings is $856 for Small SI equipment and $360 for marine vessels. For the final rule as a whole, the cost per ton of $HC+NO_X$ reduction is $623. Reduced operating costs offset a portion of the increased cost of producing the cleaner Small SI and Marine SI engines. Reduced fuel consumption also offsets the costs of permeation control. Chapter 7 of the RIA contains a more detailed discussion of the cost per ton analysis.

TABLE IX–7—ESTIMATED COST PER TON OF THE $HC+NO_X$ EMISSION STANDARDS

[2005$, 3 and 7 percent discount rates]

Category	Implementation dates	Discounted cost per ton	
		Without fuel savings (3%/7%)	With fuel savings (3%/7%)
Small SI Exhaust	2011–2012	$1,152/$1,264	$986/$1,097
Small SI Evaporative	2009–2013	690/740	90/140
Marine SI Exhaust	2010–2013	700/830	320/450
Marine SI Evaporative	2009–2012	500/590	(100)/(10)
Aggregate	2009–2013	868/974	519/623

As is discussed above, we are also expecting some reduction in direct PM emissions and carbon monoxide. These reductions will come primarily as a product of the technology being used to meet HC and NO_X standards and not directly as a result of the implementation of specific technology to achieve these gains. Thus, we have elected to focus our cost per ton analysis on HC+NO_X.

One useful purpose of cost per ton analysis is to compare this program to other programs designed to achieve similar air quality objectives. Toward that end, we made a comparison between the HC+NO_X cost per ton values presented in Table C–2 and the HC+NO_X cost per ton of other recent mobile source programs. Table IX–8 summarizes the HC+NO_X cost per ton of several recent EPA actions for controlled emissions from mobile sources. While the analyses for each rule were not completely identical, it is clear that the Small SI and Marine SI values compare favorably with the other recent actions.

TABLE IX–8—COST PER TON OF PREVIOUSLY IMPLEMENTED HC+NO_X MOBILE SOURCE PROGRAMS

[2005$, 7 percent discount with fuel savings]

Program	Discounted cost per ton
2002 HH engines Phase 2	840
2001 NHH engines Phase 2	neg*
1998 Marine SI engines	1900
2004 Comm Marine CI	200
2007 Large SI exhaust	80
2006 ATV exhaust	300
2006 off-highway motorcycle	290
2006 recreational marine CI	700
2010 snowmobile	1430
2006 <50cc highway motorcycle	1860
2010 Class 3 highway motorcycle	1650

*fuel savings outweigh engineering/hardware costs.

D. Air Quality Impact

Information on the air quality impacts of this action can be found in Section II, which includes health effect information on ozone, PM, CO and air toxics. It also includes modeled projections of future ozone concentrations with and without the controls detailed in this final rule. The emission reductions will lead to reductions in ambient concentrations of ozone, PM, CO and air toxics.

E. Benefits

This section presents our analysis of the health and environmental benefits that are estimated to occur as a result of the final Small SI and Marine SI engine standards throughout the period from initial implementation through 2030. Nationwide, the engines that are subject to the emission standards in this rule are a significant source of mobile source air pollution. The standards would reduce exposure to hydrocarbon, CO and NO_X emissions and help avoid a range of adverse health effects associated with ambient ozone and $PM_{2.5}$ levels. In addition, the proposed standards would help reduce exposure to CO, air toxics, and $PM_{2.5}$ for persons who operate or who work with or are otherwise active in close proximity to these engines. As described below, the reductions in PM and ozone from the standards are expected to result in significant reductions in premature deaths and other serious human health effects, as well as other important public health and welfare effects.

EPA typically quantifies and monetizes PM- and ozone-related impacts in its regulatory impact analyses (RIAs) when possible. The RIA for the proposal for this rulemaking only quantified benefits from PM; in the current RIA we quantify and monetize the ozone-related health and environmental impacts associated with the final rule. The science underlying the analysis is based on the current ozone criteria document.[124] To estimate the incidence and monetary value of the health outcomes associated with this final rule, we used health impact functions based on published epidemiological studies, and valuation functions derived from the economics literature.[125] Key health endpoints analyzed include premature mortality, hospital and emergency room visits, school absences, and minor restricted activity days. The analytic approach to characterizing uncertainty is consistent with the analysis used in the RIA for the proposed O3 NAAQS.

The benefits modeling is based on peer-reviewed studies of air quality and health and welfare effects associated with improvements in air quality and peer-reviewed studies of the dollar values of those public health and welfare effects. These methods are consistent with benefits analyses performed for the recent analysis of the final Ozone NAAQS and the final PM NAAQS analysis.[126 127] They are described in detail in the regulatory impact analyses prepared for those rules.

The range of PM benefits associated with the final standards is estimated based on risk reductions estimated using several sources of PM-related mortality effect estimates. In order to provide an indication of the sensitivity of the benefits estimates to alternative assumptions about PM mortality risk reductions, in Chapter 8 of the RIA we present a variety of benefits estimates based on two epidemiological studies (including the ACS Study and the Six Cities Study) and the recent PM mortality expert elicitation.[128] EPA intends to ask the Science Advisory Board to provide additional advice as to which scientific studies should be used in future RIAs to estimate the benefits of reductions in PM-related premature mortality.

In a recent report on the estimation of ozone-related premature mortality published by the National Research Council (NRC),[129] a panel of experts and reviewers concluded that ozone-related mortality should be included in estimates of the health benefits of reducing ozone exposure. The report also recommended that the estimation of ozone-related premature mortality be accompanied by broad uncertainty analyses while giving little or no weight to the assumption that there is no causal association between ozone exposure and premature mortality. Because EPA has yet to develop a coordinated response to the NRC report's findings and recommendations, however, we have retained the approach to estimating ozone-related premature mortality used in RIA for the final Ozone NAAQS. EPA will specifically address the report's findings and recommendations in future rulemakings.

The range of ozone benefits associated with the final standards is based on risk

[124] U.S. Environmental Protection Agency (2006) Air quality criteria for ozone and related photochemical oxidants (second external review draft) Research Triangle Park, NC: National Center for Environmental Assessment; report no. EPA/600R–05/004aB–cB, 3v.Available: *http://cfpub.epa.gov/ncea/cfm/recordisplay.cfm?deid=137307 [March 2006]*.

[125] Health impact functions measure the change in a health endpoint of interest, such as hospital admissions, for a given change in ambient ozone or PM concentration.

[126] U.S. Environmental Protection Agency. March 2008. Final Ozone NAAQS Regulatory Impact Analysis. Prepared by: Office of Air and Radiation, Office of Air Quality Planning and Standards.

[127] U.S. Environmental Protection Agency. October 2006. *Final Regulatory Impact Analysis (RIA) for the Proposed National Ambient Air Quality Standards for Particulate Matter*. Prepared by: Office of Air and Radiation. Available at *HTTP://www.epa.gov/ttn/ecas/ria.html*.

[128] Industrial Economics, Incorporated (IEc). 2006. Expanded Expert Judgment Assessment of the Concentration-Response Relationship Between $PM_{2.5}$ Exposure and Mortality. Peer Review Draft. Prepared for: Office of Air Quality Planning and Standards, U.S. Environmental Protection Agency, Research Triangle Park, NC. August.

[129] National Research Council (NRC). 2002. Estimating the Public Health Benefits of Proposed Air Pollution Regulations. The National Academies Press: Washington, DC.

reductions estimated using several sources of ozone-related mortality effect estimates. This analysis presents four alternative estimates for the association based upon different functions reported in the scientific literature. One estimate is derived from the National Morbidity, Mortality, and Air Pollution Study (NMMAPS),[130] which was used as the primary basis for the risk analysis in the ozone Staff Paper [131] and reviewed by the Clean Air Science Advisory Committee (CASAC).[132] We also use three studies that synthesize ozone mortality data across a large number of individual studies.[133] [134] [135] This approach is not inconsistent with recommendations provided by the NRC in their ozone mortality report (NRC, 2008), ''The committee recommends that the greatest emphasis be placed on estimates from new systematic multicity analyses that use national databases of air pollution and mortality, such as in the NMMAPS, without excluding consideration of meta-analyses of previously published studies.''

The range of total ozone- and PM-related benefits associated with the final standards is presented in Table IX.E–1. We present total benefits based on the PM- and ozone-related premature mortality function used. The benefits ranges therefore reflect the addition of each estimate of ozone-related premature mortality (each with its own row in Table IX.E–1) to estimates of PM-related premature mortality, derived from either the epidemiological literature or the expert elicitation. The estimates in Table IX.E–1, and all monetized benefits presented in this section, are in year 2005 dollars.

[130] Bell, M.L., et al. 2004. Ozone and short-term mortality in 95 U.S. urban communities, 1987–2000. Jama, 2004. 292(19): p. 2372–8.

[131] U.S. EPA (2007) Review of the National Ambient Air Quality Standards for Ozone, Policy Assessment of Scientific and Technical Information. OAQPS Staff Paper. EPA–452/R–07–003. This document is available in Docket EPA–HQ–OAR–2003–0190. This document is available electronically at: *http:www.epa.gov/ttn/naaqs/standards/ozone/s_o3_cr_sp.html*.

[132] CASAC (2007). Clean Air Scientific Advisory Committee's (CASAC) Review of the Agency's Final Ozone Staff Paper. EPA–CASAC–07–002. March 26.

[133] Bell, M.L., F. Dominici, and J.M. Samet. A meta-analysis of time-series studies of ozone and mortality with comparison to the national morbidity, mortality, and air pollution study. Epidemiology, 2005. 16(4): p. 436–45.

[134] Ito, K., S.F. De Leon, and M. Lippmann. Associations between ozone and daily mortality: analysis and meta-analysis. Epidemiology, 2005. 16(4): p. 446–57.

[135] Levy, J.I., S.M. Chemerynski, and J.A. Sarnat. 2005. Ozone exposure and mortality: an empiric bayes metaregression analysis. Epidemiology, 2005. 16(4): p. 458–68.

Table IX.E-1 Estimated 2030 Monetized PM-and Ozone-Related Health Benefits of the Final Small SI and Marine SI Engine Standards[a]

2030 Total Ozone and PM Benefits – PM Mortality Derived from American Cancer Society Analysis[a]			
Premature Ozone Mortality Function or Assumption	Reference	Mean Total Benefits (Billions, 2005$, 3% Discount Rate)[c,d]	Mean Total Benefits (Billions, 2005$, 7% Discount Rate)[c,d]
NMMAPS	Bell et al., 2004	$2.4	$2.2
Meta-analysis	Bell et al., 2005	$3.7	$3.5
	Ito et al., 2005	$4.4	$4.2
	Levy et al., 2005	$4.4	$4.3
Assumption that association is not causal[e]		$1.8	$1.6
2030 Total Ozone and PM Benefits – PM Mortality Derived from Expert Elicitation[b]			
Premature Ozone Mortality Function or Assumption	Reference	Mean Total Benefits (Billions, 2005$, 3% Discount Rate)[c,d]	Mean Total Benefits (Billions, 2005$, 7% Discount Rate)[c,d]
NMMAPS	Bell et al., 2004	$1.7 - $9.7	$1.6 - $8.8
Meta-analysis	Bell et al., 2005	$3.0 - $11	$2.9 - $10
	Ito et al., 2005	$3.7 - $12	$3.6 - $11
	Levy et al., 2005	$3.7 - $12	$3.7 - $11
Assumption that association is not causal[e]		$1.1 - $9.1	$1.0 - $8.2

[a] Total includes ozone and PM2.5 benefits. Range was developed by adding the estimate from the ozone premature mortality function to the estimate of PM2.5-related premature mortality derived from the ACS study (Pope et al., 2002).

[b] Total includes ozone and PM2.5 benefits. Range was developed by adding the estimate from the ozone premature mortality function to both the lower and upper ends of the range of the PM2.5 premature mortality functions characterized in the expert elicitation. The effect estimates of five of the twelve experts included in the elicitation panel fall within the empirically-derived range provided by the ACS and Six-Cities studies. One of the experts fall below this range and six of the experts are above this range. Although the overall range across experts is summarized in this table, the full uncertainty in the estimates is reflected by the results for the full set of 12 experts. The twelve experts' judgments as to the likely mean effect estimate are not evenly distributed across the range illustrated by arraying the highest and lowest expert means.

[c] Note that total benefits presented here do not include a number of unquantified benefits categories. A detailed listing of unquantified health and welfare effects is provided in Table IX.E-6.

[d] Results reflect the use of both a 3 and 7 percent discount rate, as recommended by EPA's Guidelines for Preparing Economic Analyses and OMB Circular A-4. Results are rounded to two significant digits for ease of presentation and computation.

[e] A recent report published by the National Research Council (NRC, 2008) recommended that EPA "give little or no weight to the assumption that there is no causal association between estimated reductions in premature mortality and reduced ozone exposure."

(1) Quantified Human Health and Environmental Effects of the Final Standards

In this section we discuss the ozone and $PM_{2.5}$ health and environmental impacts of the final standards. We discuss how these impacts are monetized in the next section. It should be noted that the emission control scenarios used in the air quality and benefits modeling are slightly different than the final emission control program. The differences reflect further refinements of the regulatory program since we performed the air quality modeling for this rule. Emissions and air quality modeling decisions are made early in the analytical process. Chapter 3 of the RIA describes the changes in the inputs and resulting emission inventories between the preliminary assumptions used for the air quality modeling and the final emission control scenario.

Estimated Ozone and PM Impacts

To model the ozone and PM air quality benefits of this rule we used the Community Multiscale Air Quality (CMAQ) model. CMAQ simulates the numerous physical and chemical processes involved in the formation, transport, and deposition of particulate matter. This model is commonly used in regional applications to estimate the ozone and PM reductions expected to occur from a given set of emissions controls. The meteorological data input into CMAQ are developed by a separate model, the Penn State University/National Center for Atmospheric Research Mesoscale Model, known as MM5. The modeling domain covers the entire 48-State U.S., as modeled in final ozone NAAQS analysis.[136] The grid resolution for the modeling domain was 12 x 12 km.

The modeled ambient air quality data serves as an input to the Environmental Benefits Mapping and Analysis Program (BenMAP).[137] BenMAP is a computer program developed by EPA that integrates a number of the modeling elements used in previous Regulatory Impact Analyses (e.g., interpolation functions, population projections, health impact functions, valuation functions, analysis and pooling

[136] U.S. Environmental Protection Agency. March 2008. Final Ozone NAAQS Regulatory Impact Analysis. Prepared by: Office of Air and Radiation, Office of Air Quality Planning and Standards.

[137] Information on BenMAP, including downloads of the software, can be found at *http://www.epa.gov/air/benmap.*

methods) to translate modeled air concentration estimates into health effects incidence estimates and monetized benefits estimates.

Table IX.E–2 presents the estimates of ozone- and PM-related health impacts for the years 2020 and 2030, which are based on the modeled air quality changes between a baseline, pre-control scenario and a post-control scenario reflecting the final emission control strategy.

The use of two sources of PM mortality reflects two different sources of information about the impact of reductions in PM on reduction in the risk of premature death, including both the published epidemiology literature and an expert elicitation study conducted by EPA in 2006. In 2030, based on the estimate provided by the ACS study, we estimate that PM-related emission reductions related to the final rule will result in 230 fewer premature fatalities annually. The number of premature mortalities avoided increases to 510 when based on the Six Cities study. When the range of expert opinion is used, we estimate between 120 and 1,300 fewer premature mortalities in 2030. We also estimate 220 fewer cases of chronic bronchitis, 530 fewer nonfatal heart attacks, 190 fewer hospitalizations (for respiratory and cardiovascular disease combined), 140,000 fewer days of restricted activity due to respiratory illness and approximately 23,000 fewer work-loss days. This analysis projects substantial health improvements for children from reduced upper and lower respiratory illness, acute bronchitis, and asthma attacks. These results are based on an assumed cutpoint in the long-term mortality concentration-response functions at 10 $\mu g/m^3$, and an assumed cutpoint in the short-term morbidity concentration-response functions at 10 $\mu g/m^3$. The impact using four alterative cutpoints (3 $\mu g/m^3$ 7.5 $\mu g/m^3$, 12 $\mu g/m^3$, and 14 $\mu g/m^3$) has on $PM_{2.5}$-related mortality incidence estimation is presented in Chapter 8 of the RIA.

For ozone, we estimate a range of between 77–350 fewer premature mortalities as a result of the final rule in 2030, assuming that there is a causal relationship between ozone exposure and mortality. We also estimate that by 2030, the final rule will result in over 1,300 avoided respiratory hospital admissions and emergency room visits, 450,000 fewer days of restricted activity due to respiratory illness, and 180,000 school loss days avoided.

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Table IX.E-2 Estimated Reduction in Incidence of Adverse Health Effects Related to the Final Small SI and Marine SI Engine Standards[a]

		2020	2030
Health Effect		Mean Incidence Reduction (5th – 95th %ile)	
PM-Related Endpoints			
Premature Mortality – Derived from Epidemiology Literature	Adult, age 30+ - ACS cohort study (Pope et al., 2002)	150 (60 - 240)	230 (88 – 360)
	Adult, age 25+ - Six-Cities study (Laden et al., 2006)	340 (190 – 500)	510 (280 – 740)
	Infant, age <1 year – Woodruff et al. 1997	0 (0 – 1)	1 (0 – 1)
Premature Mortality – Derived from Expert Elicitation[b]	Adult, age 25+ - Lower Bound (Expert K)	81 (0 – 380)	120 (0 – 580)
	Adult, age 25+ - Upper Bound (Expert E)	840 (420 – 1,300)	1,300 (650 – 1,900)
Chronic bronchitis (adult, age 26 and over)		150 (28 – 270)	220 (40 – 400)
Acute myocardial infarction (adults, age 18 and older)		330 (180 – 480)	530 (280 – 770)
Hospital admissions—respiratory (all ages)[c]		40 (20 – 59)	61 (30 – 88)
Hospital admissions—cardiovascular (adults, age >18)[d]		81 (50 – 110)	130 (82 – 180)
Emergency room visits for asthma (age 18 years and younger)		150 (85 - 210)	210 (120 – 300)
Acute bronchitis (children, age 8–12)		400 (-14 – 810)	580 (-20 – 1,200)
Lower respiratory symptoms (children, age 7–14)		2,700 (1,300 – 4,000)	3,800 (1,800 – 5,800)
Upper respiratory symptoms (asthmatic children, age 9–18)		1,900 (610 – 3,300)	2,800 (880 – 4,700)
Asthma exacerbation (asthmatic children, age 6–18)		2,400 (270 – 7,000)	3,500 (380 – 10,000)
Work loss days (adults, age 18–65)		17,000 (15,000 – 19,000)	23,000 (20,000 – 26,000)
Minor restricted-activity days (adults, age 18–65)		100,000 (86,000 – 120,000)	140,000 (120,000 – 160,000)
Ozone-Related Endpoints			
Premature Mortality, All ages – Derived from NMMAPS	Bell et al., 2004	46 (20 – 72)	77 (34 – 120)
Premature Mortality, All ages – Derived from Meta-analyses	Bell et al., 2005	150 (84 – 210)	250 (140 – 360)
	Ito et al., 2005	200 (140 – 270)	340 (230 – 450)
	Levy et al., 2005	210 (160 – 260)	350 (260 - 440)
Premature Mortality – Assumption that association between ozone and mortality is not causal[e]		0	0
Hospital admissions- respiratory causes (children, under 2; adult, 65 and older)[f]		540 (170 – 900)	1,000 (290 – 1,700)
Emergency room visit for asthma (all ages)		200 (0 – 510)	320 (0 - 810)
Minor restricted activity days (adults, age 18-65)		310,000 (160,000 – 460,000)	450,000 (230,000 – 670,000)
School absence days		110,000 (40,000 – 200,000)	180,000 (62,000 – 320,000)

[a] Incidence is rounded to two significant digits. PM and ozone estimates represent impacts from the final standards nationwide.

[b] Based on effect estimates derived from the full-scale expert elicitation assessing the uncertainty in the concentration-response function for PM-related premature mortality (IEc, 2006).[138] The effect estimates of five of the twelve experts included in the elicitation panel fall within the empirically-derived range provided by the ACS and Six-Cities studies. One of the experts fall below this range and six of the experts are above this range. Although the overall range across experts is summarized in this table, the full uncertainty in the estimates is reflected by the results for the full set of 12 experts. The twelve experts' judgments as to the likely mean effect estimate are not evenly distributed across the range illustrated by arraying the highest and lowest expert means.

[c] Respiratory hospital admissions for PM include admissions for chronic obstructive pulmonary disease (COPD), pneumonia, and asthma.

[d] Cardiovascular hospital admissions for PM include total cardiovascular and subcategories for ischemic heart disease, dysrhythmias, and heart failure.

[e] A recent report published by the National Research Council (NRC, 2008) recommended that EPA "give little or no weight to the assumption that there is no causal association between estimated reductions in premature mortality and reduced ozone exposure."

[f] Respiratory hospital admissions for ozone include admissions for all respiratory causes and subcategories for COPD and pneumonia.

(2) Monetized Benefits

Table IX.E–3 presents the estimated monetary value of reductions in the incidence of health and welfare effects. Tables IX.E–4 and IX.E–5 present the total annual PM- and ozone-related health benefits, which are estimated to be between $1.8 and $4.4 billion in 2030, assuming a 3 percent discount rate, or between $1.6 and $4.3 billion, assuming a 7 percent discount rate, using the ACS-derived estimate of PM-related premature mortality (Pope et al., 2002) and the range of ozone-related premature mortality studies derived from the epidemiological literature. The range of benefits expands to between $1.1 and $12 billion, assuming a 3 percent discount rate, when the estimate includes the opinions of outside experts on PM and the risk of premature death, or between $1.0 and $11 billion, assuming a 7 percent discount rate. All monetized estimates are stated in 2005$. These estimates account for growth in real gross domestic product (GDP) per capita between the present and the years 2020 and 2030. As the tables indicate, total benefits are driven primarily by the reduction in premature fatalities each year.

The estimates of monetized benefits include only one example of nonhealth-related benefits. Changes in the ambient level of $PM_{2.5}$ are known to affect the level of visibility in much of the U.S. Individuals value visibility both in the places they live and work, in the places they travel to for recreational purposes, and at sites of unique public value, such as at National Parks. For the final standards, we present the recreational visibility benefits of improvements in visibility at 86 Class I areas located throughout California, the Southwest, and the Southeast. These estimated benefits are shown in Table IX.E–3.

Tables IX.E–3, IX.E–4 and IX.E–5 do not include those additional health and environmental benefits of the rule that we were unable to quantify or monetize. These effects are additive to the estimate of total benefits, and are related to two primary sources. First, there are many human health and welfare effects associated with PM, ozone, and toxic air pollutant reductions that remain unquantified because of current limitations in the methods or available data. A full appreciation of the overall economic consequences of the final standards requires consideration of all benefits and costs projected to result from the new standards, not just those benefits and costs which could be expressed here in dollar terms. A list of the benefit categories that could not be quantified or monetized in our benefit estimates are provided in Table IX.E–6.

[138] Industrial Economics, Incorporated (IEc). 2006. Expanded Expert Judgment Assessment of the Concentration-Response Relationship Between $PM_{2.5}$ Exposure and Mortality. Peer Review Draft. Prepared for: Office of Air Quality Planning and Standards, U.S. Environmental Protection Agency, Research Triangle Park, NC. August.

[139] Industrial Economics, Incorporated (IEc). 2006. Expanded Expert Judgment Assessment of the Concentration-Response Relationship Between $PM_{2.5}$ Exposure and Mortality. Peer Review Draft. Prepared for: Office of Air Quality Planning and Standards, U.S. Environmental Protection Agency, Research Triangle Park, NC. August.

Table IX.E-3 Estimated Monetary Value in Reductions in Incidence of Health and Welfare Effects (in millions of 2005$) [a,b]

		2020	2030
$PM_{2.5}$-Related Health Effect		Estimated Mean Value of Reductions (5th and 95th %ile)	
Premature Mortality – Derived from Epidemiology Studies[c,d,]	Adult, age 30+ - ACS study (Pope et al., 2002) 3% discount rate 7% discount rate	$1,000 ($240 - $2,100) $910 ($220 - $1,900)	$1,600 ($370 - $3,200) $1,400 ($330 - $2,800)
	Adult, age 25+ - Six-cities study (Laden et al., 2006) 3% discount rate 7% discount rate	$2,300 ($630 - $4,400) $2,100 ($570 - $3,900)	$3,500 ($970 - $6,700) $3,200 ($870 - $6,000)
	Infant Mortality, <1 year – (Woodruff et al. 1997) 3% discount rate 7% discount rate	$3.2 ($0.8 - $6.2) $2.9 ($0.8 - $5.6)	$3.9 ($1.0 - $7.7) $3.5 ($0.9 - $6.9)
Premature mortality – Derived from Expert Elicitation[c,d,e]	Adult, age 25+ - Lower bound (Expert K) 3% discount rate 7% discount rate	$540 ($0 - $2,600) $490 ($0 - $2,400)	$850 ($0 - $4,100) $760 ($0 - $3,700)
	Adult, age 25+ - Upper bound (Expert E) 3% discount rate 7% discount rate	$5,600 ($1,500 - $11,000) $5,100 ($1,4000 - $10,000)	$8,800 ($2,400 - $17,000) $8,000 ($2,100 - $16,000)
Chronic bronchitis (adults, 26 and over)		$70 ($5.7 - $230)	$110 ($8.6 - $350)
Non-fatal acute myocardial infarctions 3% discount rate 7% discount rate		$34 ($10 - $72) $33 ($10 - $70)	$52 ($15 - $110) $51 ($14 - $110)
Hospital admissions for respiratory causes		$0.8 ($0.4 - $1.2)	$1.3 ($0.6 - $1.8)
Hospital admissions for cardiovascular causes		$2.2 ($1.3 - $2.9)	$3.5 ($2.2 - $4.7)
Emergency room visits for asthma		$0.05 ($0.03 - $0.08)	$0.07 ($0.04 - $0.1)
Acute bronchitis (children, age 8–12)		$0.2 ($0 - $0.4)	$0.2 ($0 - $0.6)
Lower respiratory symptoms (children, 7–14)		$0.05 ($0.02 - $0.09)	$0.07 ($0.03 - $0.1)
Upper respiratory symptoms (asthma, 9–11)		$0.06	$0.08

		($0.02 - $0.1)	($0.02 - $0.2)
Asthma exacerbations		$0.1 ($0.01 - $0.4)	$0.2 ($0.02 - $0.5)
Work loss days		$2.5 ($2.2 - $2.8)	$3.4 ($3.0 - $3.8)
Minor restricted-activity days (MRADs)		$2.9 ($0.3 – $5.7)	$4.0 ($0.4 - $7.7)
Recreational Visibility, 86 Class I areas		$17 (na)[f]	$7 (na)
Ozone-related Health Effect			
Premature Mortality, All ages – Derived from NMMAPS	Bell et al., 2004	$340 ($86 - $680)	$590 ($150 - $1,200)
Premature Mortality, All ages – Derived from Meta-analyses	Bell et al., 2005	$1,100 ($310 - $2,100)	$1,900 ($530 - $3,600)
	Ito et al., 2005	$1,500 ($450 - $2,800)	$2,600 ($760 - $4,700)
	Levy et al., 2005	$1,600 ($470 - $2,700)	$2,600 ($800 - $4,700)
Premature Mortality – Assumption that association between ozone and mortality is not causal[f]		$0	$0
Hospital admissions- respiratory causes (children, under 2; adult, 65 and older)		$8.7 ($2.1 - $15)	$17 ($3.8 - $31)
Emergency room visit for asthma (all ages)		$0.07 ($0 - $0.2)	$0.1 ($0 - $0.3)
Minor restricted activity days (adults, age 18-65)		$19 ($8.5 - $31)	$27 ($13 - $46)
School absence days		$9.7 ($3.4 - $17)	$15 ($5.4 - $27)
Worker Productivity		$3.1 (na)[g]	$5.1 (na)[g]

[a] Monetary benefits are rounded to two significant digits for ease of presentation and computation. PM and ozone benefits are nationwide.

[b] Monetary benefits adjusted to account for growth in real GDP per capita between 1990 and the analysis year (2020 or 2030)

[c] Valuation assumes discounting over the SAB recommended 20 year segmented lag structure. Results reflect the use of 3 percent and 7 percent discount rates consistent with EPA and OMB guidelines for preparing economic analyses (EPA, 2000; OMB, 2003).

[d] The valuation of adult premature mortality, derived either from the epidemiology literature or the expert elicitation, is not additive. Rather, the valuations represent a range of possible mortality benefits.

[e] Based on effect estimates derived from the full-scale expert elicitation assessing the uncertainty in the concentration-response function for PM-related premature mortality (IEc, 2006).[139] The effect estimates of five of the twelve experts included in the elicitation panel fall within the empirically-derived range provided by the ACS and Six-Cities studies. One of the experts fall below this range and six of the experts are above this range. Although the overall range across experts is summarized in this table, the full uncertainty in the estimates is reflected by the results for the full set of 12 experts. The twelve experts' judgments as to the likely mean effect estimate are not evenly distributed across the range illustrated by arraying the highest and lowest expert means.

[f] A recent report published by the National Research Council (NRC, 2008) recommended that EPA "give little or no weight to the assumption that there is no causal association between estimated reductions in premature mortality and reduced ozone exposure."

[g] We are unable at this time to characterize the uncertainty in the estimate of benefits of worker productivity and improvements in visibility at Class I areas. As such, we treat these benefits as fixed and add them to all percentiles of the health benefits distribution.

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TABLE IX.E–4—TOTAL MONETIZED BENEFITS OF THE FINAL SMALL SI AND MARINE SI ENGINE RULE—3% DISCOUNT RATE

Ozone mortality function	Reference	Mean total benefits	Ozone mortality function	Reference	Mean total benefits
Total Ozone and PM Benefits (billions, 2005$)—PM Mortality Derived from the ACS Study					
2020: NMMAPS	Bell et al., 2004	$1.5	2030: NMMAPS	Bell et al., 2004	$2.4
Meta-analysis	Bell et al., 2005	2.3	Meta-analysis	Bell et al., 2005	3.7
	Ito et al., 2005	2.7		Ito et al., 2005	4.4
	Levy et al., 2005	2.7		Levy et al., 2005	4.4
Assumption that association is not causal [a]		1.2	Assumption that association is not causal [a]		1.8
Total Ozone and PM Benefits (billions, 2005$)—PM Mortality Derived from Expert Elicitation (Lowest and Highest Estimate)					
2020: NMMAPS	Bell et al., 2004	1.1–6.1	2030: NMMAPS	Bell et al., 2004	1.7–9.7
Meta-analysis	Bell et al., 2005	1.8–6.9	Meta-analysis	Bell et al., 2005	3.0–11
	Ito et al., 2005	2.2–7.3		Ito et al., 2005	3.7–12
	Levy et al., 2005	2.3–7.4		Levy et al., 2005	3.7–12
Assumption that association is not causal [a]		0.7–5.8	Assumption that association is not causal [a]		1.1–9.1

[a] A recent report published by the National Research Council (NRC, 2008) recommended that EPA "give little or no weight to the assumption that there is no causal association between estimated reductions in premature mortality and reduced ozone exposure."

TABLE IX.E–5—TOTAL MONETIZED BENEFITS OF THE FINAL SMALL SI AND MARINE SI ENGINE RULE—7% DISCOUNT RATE

Ozone mortality function	Reference	Mean total benefits	Ozone mortality function	Reference	Mean total benefits
Total Ozone and PM Benefits (billions, 2005$)—PM Mortality Derived from the ACS Study					
2020: NMMAPS	Bell et al., 2004	$1.4	2030: NMMAPS	Bell et al., 2004	$2.2
Meta-analysis	Bell et al., 2005	2.2	Meta-analysis	Bell et al., 2005	3.5
	Ito et al., 2005	2.67		Ito et al., 2005	4.24
	Levy et al., 2005	2.6		Levy et al., 2005	4.3
Assumption that association is not causal [a]		1.1	Assumption that association is not causal [a]		* 1.6
Total Ozone and PM Benefits (billions, 2005$)—PM Mortality Derived from Expert Elicitation (Lowest and Highest Estimate)					
2020: NMMAPS	Bell et al., 2004	1.0–5.6	2030: NMMAPS	Bell et al., 2004	1.6–8.8
Meta-analysis	Bell et al., 2005	1.8–6.4	Meta-analysis	Bell et al., 2005	2.9–10
	Ito et al., 2005	2.2–6.8		Ito et al., 2005	3.6–11
	Levy et al., 2005	2.2–6.8		Levy et al., 2005	3.7–11
Assumption that association is not causal [a]		0.7–5.2	Assumption that association is not causal [a]		1.0–8.2

[a] A recent report published by the National Research Council (NRC, 2008) recommended that EPA "give little or no weight to the assumption that there is no causal association between estimated reductions in premature mortality and reduced ozone exposure."

TABLE IX.E–6—UNQUANTIFIED AND NON-MONETIZED POTENTIAL EFFECTS OF THE FINAL SMALL SI AND MARINE SI ENGINE STANDARDS

Pollutant/effects	Effects not included in analysis—changes in:
Ozone Health [a]	Chronic respiratory damage [b]. Premature aging of the lungs [b]. Non-asthma respiratory emergency room visits. Exposure to UVb (+/−) [e].
Ozone Welfare	Yields for —commercial forests. —some fruits and vegetables. —non-commercial crops. Damage to urban ornamental plants. Impacts on recreational demand from damaged forest aesthetics.

TABLE IX.E–6—UNQUANTIFIED AND NON-MONETIZED POTENTIAL EFFECTS OF THE FINAL SMALL SI AND MARINE SI ENGINE STANDARDS—Continued

Pollutant/effects	Effects not included in analysis—changes in:
	Ecosystem functions.
	Exposure to UVb (+/−)[e].
PM Health[c]	Premature mortality—short term exposures[d].
	Low birth weight.
	Pulmonary function.
	Chronic respiratory diseases other than chronic bronchitis.
	Non-asthma respiratory emergency room visits.
	Exposure to UVb (+/−)[e].
PM Welfare	Residential and recreational visibility in non-Class I areas.
	Soiling and materials damage.
	Damage to ecosystem functions.
	Exposure to UVb (+/-)[e].
Nitrogen and Sulfate Deposition Welfare	Commercial forests due to acidic sulfate and nitrate deposition.
	Commercial freshwater fishing due to acidic deposition.
	Recreation in terrestrial ecosystems due to acidic deposition.
	Existence values for currently healthy ecosystems.
	Commercial fishing, agriculture, and forests due to nitrogen deposition.
	Recreation in estuarine ecosystems due to nitrogen deposition.
	Ecosystem functions.
	Passive fertilization.
CO Health	Behavioral effects.
HC/Toxics Health[f]	Cancer (benzene, 1,3-butadiene, formaldehyde, acetaldehyde).
	Anemia (benzene).
	Disruption of production of blood components (benzene).
	Reduction in the number of blood platelets (benzene).
	Excessive bone marrow formation (benzene).
	Depression of lymphocyte counts (benzene).
	Reproductive and developmental effects (1,3-butadiene).
	Irritation of eyes and mucus membranes (formaldehyde).
	Respiratory irritation (formaldehyde).
	Asthma attacks in asthmatics (formaldehyde).
	Asthma-like symptoms in non-asthmatics (formaldehyde).
	Irritation of the eyes, skin, and respiratory tract (acetaldehyde).
	Upper respiratory tract irritation and congestion (acrolein).
HC/Toxics Welfare	Direct toxic effects to animals.
	Bioaccumulation in the food chain.
	Damage to ecosystem function.
	Odor.

[a] The public health impact of biological responses such as increased airway responsiveness to stimuli, inflammation in the lung, acute inflammation and respiratory cell damage, and increased susceptibility to respiratory infection are likely partially represented by our quantified endpoints.

[b] The public health impact of effects such as chronic respiratory damage and premature aging of the lungs may be partially represented by quantified endpoints such as hospital admissions or premature mortality, but a number of other related health impacts, such as doctor visits and decreased athletic performance, remain unquantified.

[c] In addition to primary economic endpoints, there are a number of biological responses that have been associated with PM health effects including morphological changes and altered host defense mechanisms. The public health impact of these biological responses may be partly represented by our quantified endpoints.

[d] While some of the effects of short-term exposures are likely to be captured in the estimates, there may be premature mortality due to short-term exposure to PM not captured in the cohort studies used in this analysis. However, the PM mortality results derived from the expert elicitation do take into account premature mortality effects of short term exposures.

[e] May result in benefits or disbenefits.

[f] Many of the key hydrocarbons related to this rule are also hazardous air pollutants listed in the Clean Air Act.

(3) What Are the Significant Limitations of the Benefit-Cost Analysis?

Every benefit-cost analysis examining the potential effects of a change in environmental protection requirements is limited to some extent by data gaps, limitations in model capabilities (such as geographic coverage), and uncertainties in the underlying scientific and economic studies used to configure the benefit and cost models. Limitations of the scientific literature often result in the inability to estimate quantitative changes in health and environmental effects, such as potential increases in premature mortality associated with increased exposure to carbon monoxide. Deficiencies in the economics literature often result in the inability to assign economic values even to those health and environmental outcomes which can be quantified. These general uncertainties in the underlying scientific and economics literature, which can lead to valuations that are higher or lower, are discussed in detail in the RIA and its supporting references. Key uncertainties that have a bearing on the results of the benefit-cost analysis of the final standards include the following:

- The exclusion of potentially significant and unquantified benefit categories (such as health, odor, and ecological benefits of reduction in air toxics, ozone, and PM);
- Errors in measurement and projection for variables such as population growth;
- Uncertainties in the estimation of future year emissions inventories and air quality;
- Uncertainty in the estimated relationships of health and welfare

effects to changes in pollutant concentrations including the shape of the C–R function, the size of the effect estimates, and the relative toxicity of the many components of the PM mixture;

- Uncertainties in exposure estimation; and
- Uncertainties associated with the effect of potential future actions to limit emissions.

As Table IX.E–3 indicates, total benefits are driven primarily by the reduction in premature mortalities each year. Some key assumptions underlying the premature mortality estimates include the following, which may also contribute to uncertainty:

- Inhalation of fine particles is causally associated with premature death at concentrations near those experienced by most Americans on a daily basis. Although biological mechanisms for this effect have not yet been completely established, the weight of the available epidemiological, toxicological, and experimental evidence supports an assumption of causality. The impacts of including a probabilistic representation of causality were explored in the expert elicitation-based results of the recently published PM NAAQS RIA. Consistent with that analysis, we discuss the implications of these results in the RIA for the final standards.
- All fine particles, regardless of their chemical composition, are equally potent in causing premature mortality. This is an important assumption, because PM produced via transported precursors emitted from Small SI and Marine SI engines may differ significantly from PM precursors released from electric generating units and other industrial sources. However, no clear scientific grounds exist for supporting differential effects estimates by particle type.
- The C–R function for fine particles is approximately linear within the range of ambient concentrations under consideration (above the assumed threshold of 10 μg/m^3). Thus, the estimates include health benefits from reducing fine particles in areas with varied concentrations of PM, including both regions that may be in attainment with $PM_{2.5}$ standards and those that are at risk of not meeting the standards.
- In a recent report on the estimation of ozone-related premature mortality published by the National Research Council (NRC), a panel of experts and reviewers concluded that ozone-related mortality should be included in estimates of the health benefits of reducing ozone exposure. The report also recommended that the estimation of ozone-related premature mortality be accompanied by broad uncertainty analyses while giving little or no weight to the assumption that there is no causal association between ozone exposure and premature mortality. Because EPA has yet to develop a coordinated response to the NRC report's findings and recommendations, however, we have retained the approach to estimating ozone-related premature mortality used in RIA for the final Ozone NAAQS. EPA will specifically address the report's findings and recommendations in future rulemakings.

Despite these uncertainties, we believe this benefit-cost analysis provides a conservative estimate of the estimated economic benefits of the final standards in future years because of the exclusion of potentially significant benefit categories. Acknowledging benefits omissions and uncertainties, we present a best estimate of the total benefits based on our interpretation of the best available scientific literature and methods supported by EPA's technical peer review panel, the Science Advisory Board's Health Effects Subcommittee (SAB–HES). The National Academies of Science (NRC, 2002) also reviewed EPA's methodology for analyzing the health benefits of measures taken to reduce air pollution. EPA addressed many of these comments in the analysis of the final PM NAAQS.[140, 141] The analysis of the final standards incorporates this most recent work to the extent possible.

(4) Benefit-Cost Analysis

In estimating the net benefits of the final standards, the appropriate cost measure is ''social costs.'' Social costs represent the welfare costs of a rule to society. These costs do not consider transfer payments (such as taxes) that are simply redistributions of wealth. Table XII.E–7 contains the estimates of monetized benefits and estimated social welfare costs for the final rule and each of the final control programs. The annual social welfare costs of all provisions of this final rule are described more fully in Section IX.F.

The results in Table IX.E–7 suggest that the 2020 monetized benefits of the final standards are greater than the expected social welfare costs. Specifically, the annual benefits of the total program will range between $1.2 to $4.0 billion annually in 2020 using a three percent discount rate, or between $1.1 to $3.8 billion assuming a 7 percent discount rate, compared to estimated social costs of approximately $210 million in that same year. These benefits are expected to increase to between $1.8 and $6.4 billion annually in 2030 using a three percent discount rate, or between $1.6 and $6.1 billion assuming a 7 percent discount rate, while the social costs are estimated to be approximately $190 million. Though there are a number of health and environmental effects associated with the final standards that we are unable to quantify or monetize (see Table IX.E–6), the benefits of the final standards outweigh the projected costs. When we examine the benefit-to-cost comparison for the rule standards separately, we also find that the benefits of the specific engine standards outweigh their projected costs.

TABLE IX.E–7—SUMMARY OF ANNUAL BENEFITS, COSTS, AND NET BENEFITS OF THE FINAL SMALL SI AND MARINE SI ENGINE STANDARDS (MILLIONS, 2005$)[a]

Description	2020	2030
Estimated Social Costs:[b]		
Small SI	$163	$185
Marine SI	$44	0.8
Total Social Costs	$210	190
Estimated Health Benefits of the Final Standards:[c, d, e, f]		
Small SI:		

[140] National Research Council (NRC). 2002. Estimating the Public Health Benefits of Proposed Air Pollution Regulations. The National Academies Press: Washington, DC.

[141] U.S. Environmental Protection Agency. October 2006. *Final Regulatory Impact Analysis (RIA) for the Proposed National Ambient Air Quality Standards for Particulate Matter.* Prepared by: Office of Air and Radiation. Available at *HTTP://www.epa.gov/ttn/ecas/ria.html.*

TABLE IX.E–7—SUMMARY OF ANNUAL BENEFITS, COSTS, AND NET BENEFITS OF THE FINAL SMALL SI AND MARINE SI ENGINE STANDARDS (MILLIONS, 2005$)[a]—Continued

Description	2020	2030
3 percent discount rate	$860 to $2,600	$820 to $2,900
7 percent discount rate	$790 to $2,500	$710 to $2,800
Marine SI:		
3 percent discount rate	$340 to $1,400	$980 to $3,500
7 percent discount rate	$310 to $1,300	$890 to $3,300
Total Benefits:		
3 percent discount rate	$1,200 to $4,000	$1,800 to $6,400
7 percent discount rate	$1,100 to $3,800	$1,600 to $6,100
Annual Net Benefits (Total Benefits—Total Costs)		
3 percent discount rate	$990 to $3,800	$1,600 to $6,200
7 percent discount rate	$890 to $3,600	$1,400 to $5,900

[a] All estimates represent annualized benefits and costs anticipated for the years 2020 and 2030. Totals may not sum due to rounding.
[b] The calculation of annual costs does not require amortization of costs over time. Therefore, the estimates of annual cost do not include a discount rate or rate of return assumption (see Chapter 9 of the RIA). In Chapter 9, however, we use both a 3 percent and 7 percent social discount rate to calculate the net present value of total social costs consistent with EPA and OMB guidelines for preparing economic analyses (US EPA, 2000 and OMB, 2003).
[c] Total includes ozone and PM2.5 benefits. Range was developed by adding the estimate from the ozone premature mortality function, including an assumption that the association is not causal, to PM2.5-related premature mortality derived from the ACS (Pope et al., 2002) and Six Cities (Laden et al., 2006) studies.
[d] Annual benefits analysis results reflect the use of a 3 percent and 7 percent discount rate in the valuation of premature mortality and nonfatal myocardial infarctions, consistent with EPA and OMB guidelines for preparing economic analyses (US EPA, 2000 and OMB, 2003).[142, 143]
[e] Valuation of premature mortality based on long-term PM exposure assumes discounting over the SAB recommended 20-year segmented lag structure described in the Regulatory Impact Analysis for the Final Clean Air Interstate Rule (March, 2005).
[f] Not all possible benefits or disbenefits are quantified and monetized in this analysis. Potential benefit categories that have not been quantified and monetized are listed in Table IX.E–6.

F. Economic Impact Analysis

We prepared an Economic Impact Analysis (EIA) to estimate the economic impacts of the final emission control program on the Small SI and Marine SI engine and equipment markets. In this section we briefly describe the Economic Impact Model (EIM) we developed to estimate the market-level changes in price and outputs for affected markets, the social costs of the program, and the expected distribution of those costs across affected stakeholders. As defined in EPA's *Guidelines for Preparing Economic Analyses*, social costs are the value of the goods and services lost by society resulting from a) the use of resources to comply with and implement a regulation and b) reductions in output.[144]

A quantitative Economic Impact Model (EIM) was developed to estimate price and quantity changes and total social costs associated with the emission control program. The EIM is a computer model comprised of a series of spreadsheet modules that simulate the supply and demand characteristics of each of the markets under consideration. The model methodology is firmly rooted in applied microeconomic theory and was developed following the methodology set out in OAQPS's *Economic Analysis Resource Document.* [145] Chapter 9 of the RIA contains a detailed description of the EIM, including the economic theory behind the model and the data used to construct it, the baseline equilibrium market conditions, and the model's behavior parameters. The EIM and the estimated compliance costs presented above are used to estimate the economic impacts of the program. The results of this analysis are summarized below.

(1) Market Analysis Results

In the *market analysis*, we estimate how prices and quantities of goods and services affected by the emission control program can be expected to change once the program goes into effect.

The compliance costs associated with the new Small SI and Marine SI engine and equipment standards are expected to lead to price and quantity changes in these markets. A summary of the market analysis results is presented in Table XII.F–1 for 2014, 2018, and 2030. These years were chosen because 2014 is the year with the highest compliance cost; 2018, the year in which the compliance costs are reduced due to the learning curve, and the market impacts reflect variable costs as well as growth in equipment population; and 2030 illustrates the long-term impacts of the program. Results for all years can be found in Chapter 9 of the RIA.

For all markets, the market impacts for the early years are driven by either the fixed cost or the combination of the fixed and variable costs associated with different standards. This leads to a small increase in estimated price impacts for the years 2008 through 2014, the period during which the costs change over time reflecting the phase-in of different costs (variable and fixed costs) for each standard or the phase-in of different standards. The increase is small because the annual per unit compliance costs from these new standards are relatively smaller than the engine or equipment per unit price.

The Small SI exhaust standards begin in 2011 for Class II and 2012 for Class I. The marine exhaust standards generally begin in 2010. The Small SI evaporative emission standards are staggered beginning in 2008, with regulatory flexibility providing some small delays until 2013. The marine evaporative emission standards are staggered beginning in 2009, with regulatory flexibility providing some small delays until 2015.

[142] U.S. Environmental Protection Agency, 2000. Gidelines for Preparing Economic Analyses. *www.yosemite1.epa.gov/ee/epa/eed/hsf/pages/Guideline.html.*

[143] Office of Management and Budget, The Executive Office of the President, 2003. Circular A–4. *http://www.whitehouse.gov/omb/circulars.*

[144] EPA Guidelines for Preparing Economic Analyses, EPA 240–R–00–003, September 2000, p 113. A copy of this document can be found at *http://yosemite.epa.gov/ee/epa/eed.nsf/webpages/Guidelines.html*

[145] U.S. Environmental Protection Agency, Office of Air Quality Planning and Standards, Innovative Strategies and Economics Group, OAQPS Economic Analysis Resource Document, April 1999. A copy of this document can be found at *http://www.epa.gov/ttn/ecas/econdata/Rmanual2/.*

In the Marine SI market, the average price increase for Marine SI engines in 2014, the high cost year, is estimated to be about 2.4 percent, or $266. In the long term (by 2030), the average price increase is expected to decline to about 1.9 percent, or $213. On the vessel side, the average price change reflects the direct equipment compliance costs plus the portion of the engine costs that are passed on to the equipment purchaser (via higher engine prices). The average price increase in 2014 is expected to be about 1.6 percent, or $285. By 2030, this average price increase is expected to decline to about 1.3 percent, or $231. These price increases are expected to vary across vessel categories. The category with the largest price increase is expected to be personal watercraft engines, with an estimated price increase of about 3.0 percent in 2014; this is expected to decrease to 2.4 percent in 2030. The smallest expected change in 2014 is expected to be for sterndrive/inboards vessels, which are expected to see price increases of about 0.9 percent.

In the Small SI market, the average price increase for Small SI engines in 2014, the high cost year, is estimated to be about 8.3 percent, or $14. By 2030, this average price increase is expected to decline to about 7.4 percent, or $12. On the equipment side, the average price change reflects the direct equipment compliance costs plus the portion of the engine costs that are passed on to the equipment purchaser (via higher engine prices). The average price increase for all Small SI equipment in 2014 is expected to be about 2.6 percent, or $10. By 2030, this average price increase is expected to decline to about 2.3 percent, or $8. The average price increase and quantity decrease differs by category of equipment. For Class I equipment, the price increase is estimated to be about 6.2 percent ($17) in 2014, decreasing to 5.6 percent ($15) in 2030. For Class II equipment, a higher price increase is expected, about 2.6 percent ($24) in 2014, decreasing to 2.2 percent ($20) in 2030.

For the handheld equipment market, prices are expected to increase about 0.2 percent or $0.3 for all years, and quantities are expected to decrease about 0.3 percent.

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Table XII.F-2: Estimated Market Impacts for 2014, 2018, 2030 (2005$)

Market	Change in Price		Change in Quantity	
	Absolute	Percent	Absolute	Percent
2014				
Marine				
Engines	$266	2.4%	-10,883	-2.7%
Equipment	$285	1.6%	-12,229	-3.2%
SD/I	$299	0.9%	-1,578	-1.7%
OB Recreational	$870	1.0%	-144	-2.0%
OB Luxury	$271	1.4%	-5,666	-2.8%
PWC	$253	3.0%	-4,841	-6.0%
Small SI				
Engines	$14	8.3%	-303,992	-1.9%
Equipment	$10	2.6%	-360,310	-1.4%
Class I	$17	6.2%	-209,284	-2.1%
Class II	$24	2.6%	-101,104	-2.8%
HH	$0.3	0.2%	-49,922	-0.3%
2018				
Marine				
Engines	$213	1.9%	-9,055	-2.2%
Equipment	$231	1.3%	-10,145	-2.6%
SD/I	$244	0.7%	-1,318	-1.4%
OB Recreational	$702	0.8%	-119	-1.6%
OB Luxury	$218	1.1%	-4,697	-2.3%
PWC	$204	2.4%	-4,010	-4.8%
Small SI				
Engines	$12	7.4%	-284,995	-1.7%
Equipment	$8	2.3%	-347,189	-1.2%
Class I	$15	5.6%	-200,155	-1.9%
Class II	$20	2.2%	-91,871	-2.4%
HH	$0.3	0.2%	-55,164	-0.3%
2030				
Marine				
Engines	$213	1.9%	-9,802	-2.2%
Equipment	$231	1.3%	-10,981	-2.6%
SD/I	$244	0.7%	-1,426	-1.4%
OB Recreational	$702	0.8%	-129	-1.6%
OB Luxury	$218	1.1%	-5,085	-2.3%
PWC	$204	2.4%	-4,341	-4.8%
Small SI				
Engines	$12	7.4%	-338,346	-1.7%
Equipment	$8	2.3%	-412,103	-1.2%
Class I	$15	5.6%	-237,485	-1.9%
Class II	$20	2.2%	-109,120	-2.4%
HH	$0.3	0.2%	-65,498	-0.3%

(2) Economic Welfare Analysis

In the economic *welfare analysis* we look at the total social costs associated with the program and their distribution across key stakeholders.

The total estimated social costs of the program are about $444 million, $399 million, and 459 million for 2014, 2018 and 2030. These estimated social costs are a slight less than the total compliance costs for those years. The slight reduction in social costs when compared to compliance costs occurs because the total engineering costs do not reflect the decreased sales of the Small SI and Marine SI engines and equipment that are incorporated in the total social costs. Results for all years are presented in Chapter 9 of the RIA.

Table XII.F–2 shows how total social costs are expected to be shared across stakeholders, for selected years.

We estimate the total social costs of the program to be approximately $459 million in 2030. The Marine SI sector is expected to bear about 33.5 percent of the social costs of the programs in 2030, and the Small SI sector is expected to bear 66.5 percent. In each of these two sectors, these social costs are expected to be born primarily by end-users of Marine SI and Small SI equipment (about 86 percent). This will also be offset by the fuel savings. The remaining 14 percent is expected to be borne by Small SI or Marine SI engine and equipment manufacturers.

TABLE XII.F–2—SUMMARY OF ESTIMATED SOCIAL COSTS FOR 2014, 2018, 2030 (2005$, $MILLION)

Stakeholder group	2014		2018		2030	
	Surplus change	Percent	Surplus change	Percent	Surplus change	Percent
Marine SI:						
Engine Manufacturers	−$10.5	2.4	−$8.7	2.2	−$9.4	2.1
Equipment Manufacturers	−$29.7	6.7	−$25.0	6.3	−$27.1	5.9
End User (Households)	−$130.0	29.3	−$108.2	27.1	−$117.2	25.6
Subtotal	−$170.2	38.4	−$142.0	35.6	−$153.7	33.5
Small SI:						
Engine Manufacturers	−$5.4	1.2	−$5.0	1.2	−$5.9	1.3
Equipment Manufacturers	−$18.1	4.1	−$16.9	4.2	−$20.0	4.4
End User (Households)	−$250.2	56.4	−$235.0	58.9	−$278.9	60.8
Subtotal	−$273.6	61.6	−$256.8	64.4	−$304.9	66.5
Total	−$443.8		−$398.8		−$458.6	

Table XII.F–3 contains the distribution of the total surplus losses for the program from 2008 through 2037. This table shows that Small SI and Marine SI equipment manufacturers are expected to bear more of the burden of the program than engine manufacturers. The present value of net social costs of the final standards through 2037 at a 3 percent discount rate, shown in Table XII.F–3, is estimated to be $4.2 billion, taking the fuel savings into account. We also performed an analysis using a 7 percent social discount rate.[146] Using that discount rate, the present value of the net social costs through 2037 is estimated to be $2.7 billion, including the fuel savings.

TABLE XII.F–3—ESTIMATED NET SOCIAL COSTS THROUGH 2037 BY STAKEHOLDER (2005$, $MILLION)

Stakeholder group	Surplus change	Percent of total surplus	Surplus change	Percent of total surplus
	NPV 3%		NPV 7%	
Marine SI:				
Engine Manufacturers	−$167.0	2.2	−$100.8	2.2
Equipment Manufacturers	−$474.5	6.2	−$285.2	6.3
End User (Households)	−$2,079.0	27.3	−$1,257.1	27.9
Subtotal	−$2,720.5	35.7	−$1,643.2	36.5
Small SI:				
Engine Manufacturers	−$94.1	1.2	−$54.8	1.2
Equipment Manufacturers	−$329.9	7.4	−$195.4	7.5
End User (Households)	−$4,472.1	58.7	−$2,612.8	58.0
Subtotal	−$4,896.1	64.3	−$2,863.0	63.5
Total Social Costs	−$7,616.6		−$4,506.2	
Fuel Savings	$3,374.6		$1,774.7	
Net Social Costs	−$4,242.0		−$2,731.5	

(3) What Are the Significant Limitations of the Economic Impact Analysis?

Every economic impact analysis examining the market and social welfare impacts of a regulatory program is limited to some extent by limitations in model capabilities, deficiencies in the economic literatures with respect to estimated values of key variables necessary to configure the model, and data gaps. In this EIA, there are three potential sources of uncertainty: (1) Uncertainty resulting from the way the EIM is designed, particularly from the use of a partial equilibrium model; (2) uncertainty resulting from the values for key model parameters, particularly the price elasticity of supply and demand; and (3) uncertainty resulting from the values for key model inputs, particularly baseline equilibrium price and quantities.

Uncertainty associated with the economic impact model structure arises from the use of a partial equilibrium approach, the use of the national level of analysis, and the assumption of competitive market structure. These features of the model mean it does not take into account impacts on secondary markets or the general economy, and it does not consider regional impacts. The results may also be biased to the extent that firms have some control over market prices, which would result in the modeling over-estimating the impacts on producers of affected goods and services.

The values used for the price elasticities of supply and demand are critical parameters in the EIM. The values of these parameters have an impact on both the estimated change in price and quantity produced expected as a result of compliance with the final

[146] EPA has historically presented the present value of cost and benefits estimates using both a 3 percent and a 7 percent social discount. The 3 percent rate represents a demand-side approach and reflects the time preference of consumption (the rate at which society is willing to trade current consumption for future consumption). The 7 percent rate is a cost-side approach and reflects the shadow price of capital.

standards and on how the burden of the social costs will be shared among producer and consumer groups. In selecting the values to use in the EIM it is important that they reflect the behavioral responses of the industries under analysis.

Finally, uncertainty in measurement of data inputs can have an impact on the results of the analysis. This includes measurement of the baseline equilibrium prices and quantities and the estimation of future year sales. In addition, there may be uncertainty in how similar engines and equipment were combined into smaller groups to facilitate the analysis. There may also be uncertainty in the compliance cost estimations.

While variations in the above model parameters may affect the distribution of social costs among stakeholders and the estimated market impacts, they will not affect the total social costs of the program. This is because the total social costs are directly related to the total compliance costs. To explore the effects of key sources of uncertainty, we performed a sensitivity analysis in which we examine the results of using alternative values for the price elasticity of supply and demand, and alternative baseline prices for certain equipment markets. The results of these analyses are contained in Appendix 9H of the RIA prepared for this rule.

Despite these uncertainties, we believe this economic impact analysis provides a reasonable estimate of the expected market impacts and social welfare costs of the final standards in future. Acknowledging benefits omissions and uncertainties, we present a best estimate of the social costs based on our interpretation of the best available scientific literature and methods supported by EPA's Guidelines for Preparing Economic Analyses and the OAQPS Economic Analysis Resource Document.

X. Public Participation

We published the proposed rule on May 18, 2007 (72 FR 28098) and held a public hearing on June 5, 2007 in Reston, Virginia. The public comment period continued until August 3, 2007. We received written comments from over 100 entities, including manufacturers, state and environmental groups, and individual citizens. The comments covered a wide range of issues, many of which were very specific recommendations related to test procedures and certification and compliance provisions. The comments and our responses are described in the Summary and Analysis of Comments document which has been placed in the docket for this rulemaking. Commenters also raised a variety of broader issues that we highlight in this section.

Diffusion and running loss control for nonhandheld Small SI engines and equipment. We proposed diffusion and running loss standards for nonhandheld Small SI engines and equipment. The diffusion standard included a simple measurement procedure and a corresponding standard that could be met with basic technology to limit venting from fuel tanks. We proposed a variety of methods for controlling running losses. The most common approach expected is for equipment manufacturers to install a vent line to route running loss vapors to the engine's intake. We proposed an alternative approach that would allow equipment manufacturers to demonstrate that fuel temperatures would increase only a small amount during operation, which would minimize the source of running loss vapors. Manufacturers objected to the proposed measurement procedure and standard for diffusion emissions. They also commented that they thought the temperature-based option for controlling running losses was impractical based on the measurement procedures and other implementation provisions. We are therefore removing the temperature-based option for running loss control. Manufacturers must generally either run a vapor line from the fuel tank to the engine's intake or find a way to use a sealed fuel tank. Under any remaining technology scenario for controlling running loss emissions, manufacturers would be designing and producing their fuel tanks with inherently low diffusion emissions. We therefore anticipate that diffusion emissions will be controlled even though we are not adopting standards or measurement requirements for diffusion.

SHED testing for nonhandheld engines and equipment. We proposed to allow certification based on California ARB's SHED testing on an interim basis to ease the transition to EPA's Phase 3 standards. The SHED procedure is intended to measure all evaporative emissions from a piece of equipment rather than separately measuring emissions from fuel lines and fuel tanks. It is also intended to capture diurnal emissions. As described in the proposal, we chose not to apply diurnal emission standards. Manufacturers requested that we include a long-term allowance for SHED testing so they could choose to sell California-certified products nationwide without repeating their certification efforts to comply with EPA's different standards and testing protocol. While there is some chance that manufacturers could concentrate their emission controls, for example, on diurnal and fuel tank permeation such that they would not need low-permeation fuel lines, we believe that on balance a SHED-certified product will invariably be at least as low-emitting as equipment that uses only certified low-permeation fuel lines and fuel tanks. As a result, we are including in the regulations a long-term allowance for manufacturers to meet EPA requirements based on an overall measurement of evaporative emissions from equipment with complete fuel systems.

Bonding requirements for Small SI engines. We described in the proposal that we were considering bonding requirements for Small SI engines. We described our concerns that low-cost products were being sold without the necessary commitment to following through on any obligations that may arise over an engine's operating life, such as warranty, recall, or some other finding of noncompliance with the regulations. Several commenters strongly supported the bonding requirements. No commenters objected to the bonding requirements. We requested comment on defining a threshold for determining which companies had a sufficient presence in the United States and a good compliance history that would allow us to conclude that bonding requirements were not needed. Subsequent discussions with manufacturers led us to narrow our approach to focus on multiple thresholds tailored to specific types of companies. A baseline threshold of $10 million in long-term assets applies for engine manufacturers. A mid-level threshold of $6 million applies to secondary engine manufacturers. These are generally smaller companies with smaller sales volumes. We are also including a reduced threshold of $3 million for companies that have had U.S.-certified engines for at least ten years without any violations. We believe bonding requirements should still apply for companies with a long-term market presence, but a lower asset threshold for these companies is appropriate.

A noteworthy change from the proposal is the inclusion of domestically produced engines. While the proposal focused on imported engines, we concluded that trade rules and good practice dictate that the bonding requirements should apply equally to companies producing product in the United States. Manufacturers of any substantial size would easily meet the asset threshold, so the only additional companies likely to be affected by this change would be very small domestic manufacturers. We may conclude that these companies too should meet bonding requirements if we have reason to believe that they will be unable to meet their obligations related to in-use engines. On the other hand, we believe there will be cases where manufacturers can use something other than a posted bond to demonstrate that they will meet these obligations. We are therefore including provisions for a process by which small manufacturers would be able to request that a different asset threshold (or a different bond value) would apply. We would evaluate these requests on a case-by-case basis and approve changes to the specified approach only if it was clear that manufacturers would meet their in-use obligations.

Transition to exhaust emission standards for sterndrive/inboard engines. Manufacturers expressed concerns before the proposed rule that they were anticipating a change in engine models from General Motors, which supplies most companies with partially complete engines for making sterndrive/inboard engines. With the approaching obsolescence of two of these engine models, engine manufacturers did not want to put in the effort to redesign those engines for one or two years of production before they made the transition to the replacement engine models. We described several possible approaches for addressing this in the proposal. We are adopting a provision to specify directly in the regulation that we are approving a one-year hardship for the affected engine models, which allows the engine manufacturers to produce these engines in the 2010 model year without meeting emission standards. Starting in the 2011 model year, manufacturers would need to meet the new emission standards for their full product line.

Phase-in for marine diurnal requirements. We proposed to apply the diurnal emission standards for marine vessels starting in 2010. Manufacturers recommended delaying this standard until 2011 to allow time for the industry to establish consensus standards related to installation parameters for carbon canisters and other elements of diurnal emission control systems. Manufacturers also pointed out that a one-year delay would be preferable to a phase-in, which would be problematic for boat builders. The U.S. Coast Guard agreed that an extra year would be helpful to ensure that manufacturers had enough time to design and build systems that would not have safety problems. We agreed that starting the diurnal emission standards in 2011 would be appropriate. Late in the rulemaking process, the marine manufacturers raised a concern that small boat builders might need additional time to learn about the regulatory requirements and make the necessary design changes for complying with standards. We agreed to consider a staged approach, similar to what we are adopting for Small SI equipment manufacturers under the Phase 3 standards, in which boat builders would be able to make a certain number of noncompliant boats over the first year or two. Manufacturers emphasized that the best approach was to phase in the diurnal standard (30 percent of boats the first year, 60 percent the second year, 100 percent the third year), including large businesses. We believe a more limited transition will be sufficient to meet the need to modify vessels to comply with the new standards. We are adopting approach that would allow companies to make up to 50 percent of their products between July 2011 and July 2012 that do not yet comply with diurnal emission standards. All boats would need to comply after July 2012. A separate provision for small-volume boat builders would allow for up to 1200 noncompliant boats over the first two years that the standards apply (July 2011 to July 2013).

Definition of ''engine'' We proposed to define the point at which engines became subject to emission standards as the point at which any component was attached to an engine block. This was intended to clarify the relationship between primary and secondary engine manufacturers and to prevent circumvention of the regulations by allowing the importation or other sale of partially complete engines that needed neither certification nor an exemption. Manufacturers pointed out that there were several incidental components added to engines early in the process, many times by the company that cast and/or machined the engine block for shipment to the engine manufacturer. We objected to the idea that an engine should not be subject to emission standards until it reached a running configuration because this would make it difficult or impossible to enforce our requirements. We chose to identify the best point early in the assembly process for making engines subject to standards to be the point of crankshaft installation. This is generally the first major assembly procedure and it involves most of the engine's moving parts.

Setting up the regulations to clearly prohibit the sale of partially complete engines without a certificate or an exemption led us to adopt provisions to accommodate the several legitimate business practices in which manufacturers ship engines before they have reached a certified configuration. First, we proposed a process by which original engine manufacturers could ship partially complete engines to secondary engine manufacturers, including requirements for labeling engines and for secondary engine manufacturers to first obtain a certificate for the engine in question. Commenters objected to the labeling requirements and pointed out that there would sometimes be a need for shipping engines before the secondary engine manufacturer had an approved certificate. We agreed to simplify the labeling requirement such that the primary engine manufacturer would be able to use a single label for all its engines, identifying only its company name and the basis for the exemption, and referring to the bill of lading, which would identify the secondary engine manufacturer. We are also adopting regulatory provisions to clarify that these shipments may occur during the time that we are reviewing an application for certification from the secondary engine manufacturer, subject to certain requirements that are similar to those that apply for traditional engine manufacturers in building up inventory before their certification is approved. We also allow shipment of these engines when the secondary engine manufacturer has a valid exemption; this may occur for example, if the secondary engine manufacturer is developing a new model or is assembling engines only for export.

Second, we proposed and are finalizing a provision to allow manufacturers broad discretion to ship partially complete engines between two of their own facilities. Manufacturers would only need to get our approval by describing their plans for this type of shipment in their application for certification. We may set certain reasonable conditions to ensure that manufacturers do not use these provisions to circumvent the regulations, but we would generally not require any specific labeling or recordkeeping steps for this practice.

Third, we proposed to include partially complete engines sold as replacement components under the replacement-engine exemption in § 1068.240. Manufacturers expressed a concern that these engines were needed as replacement components and should therefore not be subject to standards. We noted that the existing replacement-engine exemption does not fit well with partially complete engines that are identical to engines currently being produced under a valid certificate of conformity (up to that stage of completion). As a result, we have included language in § 1068.240 describing a streamlined path for these engines. The more difficult question relates to partially complete engines specially produced for replacement or repower where the old engine is subject to a previous tier of emission standards. We are concerned, as described above, that manufacturers could exploit this as a loophole if we did not specify that these engines are subject to emission standards. We are modifying the replacement-engine exemption to allow for very limited use of replacement engines without the administrative requirements and oversight provisions that currently apply under § 1068.240. Under this approach we specify that manufacturers may produce and sell a certain number of replacement engines, including partially complete engines, based on production volumes from preceding years without making a determination that a new engine meeting current standards is unavailable to repower the equipment. Manufacturers would also not need to take possession of the old engine block (or confirm that it has been destroyed). For any number of noncompliant replacement engines exceeding the specified threshold, manufacturers would need to meet all the requirements that currently apply under § 1068.240. See Section VIII above and Chapter 1 of the Summary and Analysis of Comments for further information and discussion related to replacement engines.

XI. Statutory and Executive Order Reviews

A. Executive Order 12866: Regulatory Planning and Review

Under section 3(f)(1) of Executive Order (EO) 12866 (58 FR 51735, October 4, 1993), this action is an ''economically significant regulatory action'' because it is likely to have an annual effect on the economy of $100 million or more. Accordingly, EPA submitted this action to the Office of Management and Budget (OMB) for review under EO 12866 and any changes made in response to OMB recommendations have been documented in the docket for this rulemaking.

In addition, EPA prepared an analysis of the potential costs and benefits associated with this action. This analysis is contained in the Final Regulatory Impact Analysis, which is available in the docket and is summarized in Section IX.

B. Paperwork Reduction Act

The information collection requirements in this final rule have been submitted for approval to the Office of Management and Budget (OMB) under the *Paperwork Reduction Act*, 44 U.S.C. 3501 *et seq.* The Information Collection Request (ICR) documents prepared by EPA have been assigned EPA ICR numbers 2251.02 and 1722.06.

The Agency will collect information to ensure compliance with the provisions in this rule. This includes a variety of requirements, both for engine manufacturers, equipment manufacturers and manufacturers of fuel system components. Section 208(a) of the Clean Air Act requires that manufacturers provide information the Administrator may reasonably require to determine compliance with the regulations; submission of the information is therefore mandatory.

As shown in Table XIV–1, the total annual burden associated with this final rule is about 131,000 hours and $17 million based on a projection of 1,031 respondents. The estimated burden for engine manufacturers is a total estimate for both new and existing reporting requirements. Most information collection is based on annual reporting. Burden means the total time, effort, or financial resources expended by persons to generate, maintain, retain, or disclose or provide information to or for a Federal agency. This includes the time needed to review instructions; develop, acquire, install, and utilize technology and systems for the purposes of collecting, validating, and verifying information, processing and maintaining information, and disclosing and providing information; adjust the existing ways to comply with any previously applicable instructions and requirements; train personnel to be able to respond to a collection of information; search data sources; complete and review the collection of information; and transmit or otherwise disclose the information.

TABLE XIV–1—ESTIMATED BURDEN FOR REPORTING AND RECORDKEEPING REQUIREMENTS

Industry sector	Number of respondents	Average burden per respondent	Annual burden hours	Annualized capital costs	Annual labor costs	Annual operation and maintenance costs
Small SI engine manufacturers	58	885	51,301	$4,829,036	$2,065,643	$3,268,306
Small SI equipment (evaporative)	500	19	9,500	0	412,500	120,500
Tank and hose component mfr's. (evaporative)	53	68	3,615	0	97,670	12,773
Marine SI engine manufacturers	38	1,596	60,640	0	3,110,584	6,462,307
Marine SI equipment & fuel system component mfr. (evaporative)	343	29	10,020	0	730,450	120,232
TOTAL	992	2,597	135,076	5,829,036	6,416,847	9,984,118
	Total Annual Cost = 16,400,965					

An agency may not conduct or sponsor, and a person is not required to respond to a collection of information unless it displays a currently valid OMB control number. The OMB control numbers for EPA's regulations in 40 CFR are listed in 40 CFR part 9.

C. Regulatory Flexibility Act

(1) Overview

The Regulatory Flexibility Act (RFA) generally requires an agency to prepare a regulatory flexibility analysis of any rule subject to notice and comment rulemaking requirements under the Administrative Procedure Act or any other statute unless the agency certifies that the rule will not have a significant economic impact on a substantial number of small entities. Small entities include small businesses, small organizations, and small governmental jurisdictions.

For purposes of assessing the impacts of this action on small entities, small entity is defined as: (1) A small business as defined by the Small Business Administration's (SBA) regulations at 13 CFR 121.201 (see Table XIV–2, below); (2) a small governmental jurisdiction that is a government of a city, county, town, school district or special district with a population of smaller than 50,000; and (3) a small organization that is any not-for-profit enterprise which is independently owned and operated and is not dominant in its field. The following table provides an overview of the primary SBA small business categories potentially affected by this regulation.

TABLE XIV–2—SMALL BUSINESS DEFINITIONS FOR ENTITIES AFFECTED BY THIS RULE

Industry	NAICS [a] Codes	Threshold Definitions for Small Business [b]
Small SI and Marine SI Engine Manufacturers	333618	1,000 employees.
Equipment Manufacturers:		
Farm Machinery	333111	500 employees.
Lawn and Garden	333112	500 employees.
Construction	333120	750 employees.
Sawmill and Woodworking	333210	500 employees.
Pumps	333911	500 employees.
Air and Gas Compressors	333912	500 employees.
Generators	335312	1,000 employees.
Boat Builders	336612	500 employees.
Fuel Tank Manufacturers:		
Other Plastic Products	326199	500 employees.
Metal Stamping	332116	500 employees.
Metal Tank (Heavy Gauge)	332420	500 employees.
Fuel Line Manufacturers:		
Rubber and Plastic Fuel Lines	326220	500 employees.

[a] North American Industry Classification System.

[b] According to SBA's regulations (13 CFR 121), businesses with no more than the listed number of employees are considered "small entities" for RFA purposes.

After considering the economic impacts of this final rule on small entities, I certify that this action will not have a significant economic impact on a substantial number of small entities. The small entities directly regulated by this final rule cover a wide range of small businesses including engine manufacturers, equipment manufacturers, boat manufacturers, fuel tank manufacturers, and fuel hose manufacturers. Small governmental jurisdictions and small organizations as described above will not be impacted. We have determined that the estimated effect of the rule is to impact 43 companies with costs between one and three percent of revenues, and 18 additional companies with costs over three percent of revenues. These 61 companies represent less than 5 percent of the total number of small businesses impacted by the new regulations. All remaining companies (over 1,000 of them) would be impacted with costs by less than one percent of revenues. It should be noted that this estimate is based on the highest level of estimated cost in the first years of the program. We estimate substantially lower long-term costs as manufacturers learn to produce compliant products at a lower cost over time.

Pursuant to section 603 of the RFA, EPA prepared an initial regulatory flexibility analysis (IRFA) for the May 18, 2007 proposed rule (72 FR 28098). Pursuant to section 609(b) of the RFA, EPA convened a Small Business Advocacy Review Panel to obtain advice and recommendations from representatives of small entities that would potentially be regulated by the rule. A detailed discussion of the Panel's advice and recommendations is found in the Panel Reports, which have been placed in the docket for this rule.[147] A summary of the Panel's recommendations is presented in the May 2007 proposal (72 FR 28245).

In the final rule, EPA has made some changes to the proposal that reduced the level of impact to small entities directly regulated by the rule. As described in Section III.C.1, EPA is adopting less stringent standards for SD/I high-performance engines than originally proposed, based in part on the comments from SD/I engine manufacturers, most of which are small businesses. This change has resulted in a reduction in the number of entities projected to be impacted by more than 1 percent.

Despite the determination that this rule will not have a significant economic impact on a substantial number of small entities, EPA prepared a Small Business Flexibility Analysis that has all the components of a final regulatory flexibility analysis (FRFA). A FRFA examines the impact of the rule on small businesses along with regulatory alternatives that could reduce that impact. The Small Business Flexibility Analysis (which is presented in Chapter 10 of the Final RIA) is available for review in the docket, and is summarized below.

(2) Need for and Objective of the Rulemaking

Air pollution is a serious threat to the health and well-being of millions of Americans and imposes a large burden on the U.S. economy. Ground-level ozone and carbon monoxide are linked to potentially serious respiratory health problems, especially respiratory effects and environmental degradation, including visibility impairment in and around our national parks. (Section II and Chapter 2 of the Final RIA for this rule describe these pollutants and their health effects.) Over the past quarter century, state and federal representatives have established emission control programs that significantly reduce emissions from individual sources. Many of these sources now pollute at only a small fraction of their pre-control rates.

This final rule includes standards that will require manufacturers to substantially reduce exhaust emissions and evaporative emissions from Marine SI engines and vessels and from Small SI engines and equipment. We are promulgating the standards under

[147] "Panel Report of the Small Business Advocacy Review Panel on EPA's Planned Proposed Rule, Control of Emissions from Nonroad Spark-Ignition Engines and Equipment," October 10, 2006, Docket EPA–HQ–OAR–2004–0008–0562.

section 213(a)(3) of the Clean Air Act, which directs EPA to set emission standards that ''achieve the greatest degree of emission reduction achievable through the application of technology'' giving appropriate consideration to cost, noise, energy, safety, and lead time. In addition to the general authority to regulate nonroad engines under the Clean Air Act, section 428 of the 2004 Consolidated Appropriations Act requires EPA to propose and finalize regulations for new nonroad spark-ignition engines below 50 horsepower.

(3) Summary of Significant Public Comments

In the proposal, EPA proposed provisions consistent with each of the Panel's recommendations and sought comments on all the small business provisions (see 72 FR 28245, May 18, 2007). We received a number of comments during the comment period after we issued the proposal. The following section summarizes the most significant comments received. A summary of all comments pertaining to the small business provisions can be found in our Summary and Analysis of Comments document contained in the public docket for this rulemaking.

With regard to marine exhaust emission standards, NMMA and several SD/I engine manufacturers commented on EPA's proposed criteria for which SD/I engine manufacturers would be eligible for the small business flexibilities. They recommended that EPA should base the criteria on number of employees rather than engine production level. They recommended a 500 employee threshold for small businesses with the option to qualify as a small-volume manufacturer if the 5,000 unit level is not exceeded.

With regard to marine evaporative emission standards, NMMA, which represents many vessel manufacturers, noted that EPA acknowledged the challenges faced by the small boat builders and even requested comment on a three-year phase-in (33–66–100 percent) for the diurnal emission standards over model years 2010–2012. Rather than a phase-in, NMMA supported an additional two years of lead time for compliance (i.e., until model year 2013) for small businesses to allow for sufficient time for these businesses to gain experience with carbon canisters.

(4) Type and Numbers of Small Entities Affected

The standards being promulgated for Small SI engines and equipment will affect manufacturers of both handheld equipment and nonhandheld equipment. Based on EPA certification records, the Small SI nonhandheld engine industry is made up primarily of large manufacturers including Briggs and Stratton, Tecumseh, Honda, Kohler and Kawasaki. The Small SI handheld engine industry is also made up primarily of large manufacturers including Electrolux Home Products, MTD, Homelite, Stihl and Husqvarna. EPA has identified 10 Small SI engine manufacturers that qualify as a small business under SBA definitions. Half of these small manufacturers certify gasoline engines and the other half certify liquefied petroleum gas (LPG) engines.

The Small SI equipment market is dominated by a few large businesses including Toro, John Deere, MTD, Briggs and Stratton, and Electrolux Home Products. While the Small SI equipment market may be dominated by just a handful of companies, there are many small businesses in the market; however these small businesses account for less than 10 percent of equipment sales. We have identified over three hundred equipment manufacturers that qualify as a small business under the SBA definitions. More than 90 percent of these small companies manufacture fewer than 5,000 pieces of equipment per year. The median employment level is 65 employees for nonhandheld equipment manufacturers and 200 employees for handheld equipment manufacturers. The median sales revenue is approximately $9 million for nonhandheld equipment manufacturers and $20 million for handheld equipment manufacturers.

EPA has identified 25 manufacturers that produce fuel tanks for the Small SI equipment market that meet the SBA definition of a small business. Fuel tank manufacturers rely on three different processes for manufacturing plastic tanks—rotational molding, blow molding and injection molding. EPA has identified small business fuel tank manufacturers using the rotational molding and blow molding processes but has not identified any small business manufacturers using injection molding. In addition, EPA has identified two manufacturers that produce fuel lines for the Small SI equipment market that meet the SBA definition of a small business. The majority of fuel line in the Small SI market is made by large manufacturers including Avon Automotive and Dana Corporation.

The standards being promulgated for Marine SI engines and vessels will affect manufacturers in the OB/PWC market and the SD/I market. Based on EPA certification records, the OB/PWC market is made up primarily of large manufacturers including, Brunswick (Mercury), Bombardier Recreational Products, Yamaha, Honda, Kawasaki, Polaris, Briggs & Stratton, and Nissan. Two companies qualify as a small business under the SBA definition. Tohatsu makes outboard engines. The other small business is Surfango which makes a small number of motorized surfboards and has certified their product as a PWC.

The SD/I market is made up mostly of small businesses; however, these businesses account for less than 20 percent of engine sales. Two large manufacturers, Brunswick (Mercruiser) and Volvo Penta, dominate the market. We have identified 28 small entities manufacturing SD/I marine engines. The third largest company is Indmar, which has much fewer than the SBA threshold of 1,000 employees. Based on sales estimates, number of employees reported by Thomas Register, and typical engine prices, we estimate that the average revenue for the larger small SD/I manufacturers is about $50–60 million per year. However, the vast majority of the SD/I engine manufacturers produce low production volumes of engines and typically have fewer than 50 employees.

The two largest boat building companies are Brunswick and Genmar. Brunswick owns approximately 25 boat companies and Genmar owns approximately 12 boat companies. Based on a manufacturer list maintained by the U.S. Coast Guard, there are over 1,600 boat builders in the United States. We estimate that, based on manufacturer identification codes, more than 1,000 of these companies produce boats using gasoline marine engines. According to the National Marine Manufacturers Association (NMMA), most of these boat builders are small businesses. These small businesses range from individuals building one boat per year to businesses near the SBA small business threshold of 500 employees.

We have identified 14 marine fuel tank manufacturers in the United States that qualify as small businesses under the SBA definition. These manufacturers include five rotational molders, two blow molders, six aluminum fuel tank manufacturers, and one specialty fuel tank manufacturer. The small rotational molders average fewer than 50 employees while the small blow-molders average over 100 employees.

We have only identified one small fuel line manufacturer that produces for the Marine SI market. Novaflex primarily distributes fuel lines made by other manufacturers but does produce its own filler necks. Because we expect vessel manufacturers will design their fuel systems such that there will not be standing liquid fuel in the fill neck (and therefore the new low-permeation fuel line requirements will not apply to the fill neck), we have not included this manufacturer in our analysis. The majority of fuel line in the Marine SI market is made by large manufacturers including Goodyear and Parker-Hannifin.

To gauge the impact of the new standards on small businesses, EPA employed a cost-to-sales ratio test to estimate the number of small businesses that will be impacted by less than one percent, between one and three percent, and above three percent. For this analysis, EPA assumed that the costs of complying with the final standards are completely absorbed by the regulated entity. Overall, EPA projects that 43 small businesses will be impacted by one to three percent, 18 small businesses will be impacted by over three percent, and the remaining companies (over 1,000 small businesses) will be impacted by less than one percent. Table XIV–3 summarizes the impacts on small businesses from the new exhaust and evaporative emission standards for Small SI engines and equipment and Marine SI engines and vessels. A more detailed description of the inputs used for each affected industry sector and the methodology used to develop the estimated impact on small businesses in each industry sector is included in the Small Business Flexibility Analysis as presented in Chapter 10 of the Final RIA for this rulemaking.

TABLE XIV–3—SUMMARY OF IMPACTS ON SMALL BUSINESSES

Industry sector	0–1 percent	1–3 percent	>3 percent
Manufacturers of Marine OB/PWC engines	2	0	0
Manufacturers of Marine SD/I engines < 373 kW	4	5	0
Manufacturers of Marine SD/I engines ≥ 373 kW (high-performance)	19	0	0
Boat Builders	>1,000	0	0
Manufacturers of Fuel Lines and Fuel Tanks for Marine SI Vessels	14	0	0
Small SI engines and equipment	314	38	18
Manufacturers of Fuel Lines and Fuel Tanks for Small SI Applications	27	0	0
Total	380 plus >1,000 boat builders	43	18

(5) Reporting, Recordkeeping, and Compliance Requirements

For any emission control program, EPA must have assurances that the regulated products will meet the standards. Historically, EPA's programs for Small SI engines and Marine SI engines have included provisions requiring that engine manufacturers be responsible for providing these assurances. The program that EPA is adopting for manufacturers subject to this final rule include testing, reporting, and recordkeeping requirements for manufacturers of engines, equipment, vessels, and fuel system components including fuel tanks, fuel lines, and fuel caps.

For Small SI engine manufacturers and OB/PWC engine manufacturers, EPA is continuing the same reporting, recordkeeping, and compliance requirements prescribed in the current regulations. For SD/I engine manufacturers, which are not currently subject to EPA regulation, EPA is applying similar reporting, recordkeeping, and compliance requirements to those for OB/PWC engine manufacturers. Testing requirements for engine manufacturers will include certification emission (including deterioration factor) testing and production-line testing. Reporting requirements will include emission test data and technical data on the engines. Manufacturers will also need to keep records of this information.

Because of the new evaporative emission requirements, there will be new reporting, recordkeeping and compliance requirements for Small SI equipment manufacturers. Small SI equipment manufacturers participating in the transition program will also be subject to reporting, recordkeeping and compliance requirements. There will also be new reporting, recordkeeping and compliance requirements for fuel tank manufacturers, fuel line manufacturers, fuel cap manufacturers and marine vessel manufacturers choosing to certify their products with EPA. Testing requirements for these manufacturers would include certification emission testing. Reporting requirements would include emission test data and technical data on the designs. Manufacturers will also need to keep records of this information.

(6) Steps Taken To Minimize the Impact on Small Entities

The Panel recommended that EPA consider and seek comment on a wide range of regulatory alternatives to mitigate the impacts of the rulemaking on small businesses, including those flexibility options described below. A copy of the Final Panel Report is included in the docket for this final rule. A summary of the Panel's recommendations for the various groups of small businesses affected by the rule is presented in the May 2007 proposal (72 FR 28245).

In response to the Panel's recommendations, we proposed a range of small business flexibilities for the various groups of small businesses affected by the proposed standards. As noted earlier, we received a number of comments during the comment period after we issued the proposal. A complete summary of the comments pertaining to the small business provisions can be found in our Summary and Analysis of Comments document contained in the public docket for this rulemaking.

EPA is adopting several small business flexibilities as part of this rule. A few changes have been made to some of the proposed flexibilities in response to the comments received on the proposal as well as other changes made in the rulemaking. The flexibilities available to small businesses affected by the new exhaust emission standards for SD/I engines are summarized in Section III.F. The flexibilities available to small businesses affected by the new exhaust emission standards for OB/PWC engines are summarized in Section IV.G. The flexibilities available to small businesses affected by the new exhaust emission standards for Small SI engines are summarized in Section V.F. Finally, the flexibilities available to small businesses affected by the new evaporative emission standards for both Marine SI engines and vessels and

Small SI engines and equipment are summarized in Section VI.G.

D. Unfunded Mandates Reform Act

Title II of the Unfunded Mandates Reform Act of 1995 (UMRA), Public Law 104–4, establishes requirements for federal agencies to assess the effects of their regulatory actions on state, local, and tribal governments and the private sector. Under section 202 of the UMRA, EPA generally must prepare a written statement, including a cost-benefit analysis, for proposed and final rules with ''federal mandates'' that may result in expenditures to state, local, and tribal governments, in the aggregate, or to the private sector, of $100 million or more in any one year. Before promulgating an EPA rule for which a written statement is needed, section 205 of the UMRA generally requires that EPA identify and consider a reasonable number of regulatory alternatives and adopt the least costly, most cost-effective, or least burdensome alternative that achieves the objectives of the rule. The provisions of section 205 do not apply when they are inconsistent with applicable law. Moreover, section 205 allows EPA to adopt an alternative other than the least costly, most cost-effective, or least burdensome alternative if the Administrator publishes with the final rule an explanation of why that alternative was not adopted.

Before EPA establishes any regulatory requirements that may significantly or uniquely affect small governments, including tribal governments, it must have developed under section 203 of the UMRA a small government agency plan. The plan must provide for notifying potentially affected small governments, enabling officials of affected small governments to have meaningful and timely input in the development of EPA regulatory proposals with significant federal intergovernmental mandates, and informing, educating, and advising small governments on compliance with the regulatory requirements.

This rule contains no federal mandates for state, local, or tribal governments as defined by the provisions of Title II of the UMRA. The rule imposes no enforceable duties on any of these governmental entities. Nothing in the rule will significantly or uniquely affect small governments.

EPA has determined that this rule contains federal mandates that may result in expenditures of more than $100 million to the private sector in a single year. EPA believes that the final rule represents the least costly, most cost-effective approach to achieve the air quality goals of the rule. The costs and benefits associated with the final rule are discussed in Section IX and in the Final Regulatory Impact Analysis as required by the UMRA.

E. Executive Order 13132: Federalism

Executive Order 13132, entitled ''Federalism'' (64 FR 43255, August 10, 1999), requires EPA to develop an accountable process to ensure ''meaningful and timely input by State and local officials in the development of regulatory policies that have federalism implications.'' ''Policies that have federalism implications'' is defined in the Executive Order to include regulations that have ''substantial direct effects on the States, on the relationship between the national government and the States, or on the distribution of power and responsibilities among the various levels of government.''

Under section 6 of Executive Order 13132, EPA may not issue a regulation that has federalism implications, that imposes substantial direct compliance costs, and that is not required by statute, unless the Federal government provides the funds necessary to pay the direct compliance costs incurred by State and local governments, or EPA consults with State and local officials early in the process of developing the proposed regulation. EPA also may not issue a regulation that has federalism implications and that preempts State law, unless the Agency consults with State and local officials early in the process of developing the regulation.

Section 4 of the Executive Order contains additional requirements for rules that preempt State or local law, even if those rules do not have federalism implications (i.e., the rules will not have substantial direct effects on the States, on the relationship between the national government and the states, or on the distribution of power and responsibilities among the various levels of government). Those requirements include providing all affected State and local officials notice and an opportunity for appropriate participation in the development of the regulation. If the preemption is not based on express or implied statutory authority, EPA also must consult, to the extent practicable, with appropriate State and local officials regarding the conflict between State law and Federally protected interests within the agency's area of regulatory responsibility.

This final rule has federalism implications because it preempts State law. It does not include any significant revisions from current statutory and regulatory requirements, but it codifies existing statutory requirements. Prior to the passage of Public Law 108–199, the various states could adopt and enforce nonroad emission control standards previously adopted by the state of California under section 209(e) of the Clean Air Act, once California had received authorization from EPA to enforce such standards. As part of directing EPA to undertake this rulemaking, section 428 of Public Law 108–199 has taken away the authority of states' to adopt California standards for any nonroad spark-ignition engine under 50 horsepower that they had not already adopted by September 1, 2003. No state had done so by that date. No current state law is affected by the provisions of Public Law 108–199 mentioned above. This rule codifies the statutory provision prohibiting other states from adopting California standards for nonroad spark-ignition engines under 50 horsepower. It does not affect the independent authority of California.

EPA did consult with representatives of various State and local governments in developing this rule. EPA has also consulted representatives from the National Association of Clean Air Agencies (NACAA), which represents state and local air pollution officials. These officials participated in two EPA workshops regarding the Small SI safety study in which they expressed concern about the language of section 428 of Public Law 108–199 limiting the states' ability to adopt the California standards for nonroad spark-ignition engines under 50 horsepower and urged EPA to move expeditiously in adopting new Federal emission standards for this category.

As required by section 8(a) of Executive Order 13132, EPA included a certification from its Federalism Official stating that EPA had met the Executive Order's requirements in a meaningful and timely manner, when it sent the draft of this final rule to OMB for review pursuant to Executive Order 12866. A copy of this certification has been included in the public version of the official record for this final rule.

F. Executive Order 13175: Consultation and Coordination With Indian Tribal Governments

Executive Order 13175, entitled ''Consultation and Coordination with Indian Tribal Governments'' (65 FR 67249, November 9, 2000), requires EPA to develop an accountable process to ensure ''meaningful and timely input by tribal officials in the development of regulatory policies that have tribal implications.''

This final rule does not have tribal implications as specified in Executive Order 13175. This rule will be implemented at the Federal level and impose compliance costs only on engine and equipment manufacturers. Tribal governments will be affected only to the extent they purchase and use equipment with regulated engines. Thus, Executive Order 13175 does not apply to this rule.

G. Executive Order 13045: Protection of Children From Environmental Health and Safety Risks

Executive Order 13045, ''Protection of Children from Environmental Health Risks and Safety Risks'' (62 FR 19885, April 23, 1997) applies to any rule that (1) is determined to be ''economically significant'' as defined under Executive Order 12866, and (2) concerns an environmental health or safety risk that EPA has reason to believe may have a disproportionate effect on children. If the regulatory action meets both criteria, section 5–501 of the Order directs the Agency to evaluate the environmental health or safety effects of the planned rule on children, and explain why the planned regulation is preferable to other potentially effective and reasonably feasible alternatives considered by the Agency.

This final rule is not subject to the Executive Order because it does not involve decisions on environmental health or safety risks that may disproportionately affect children.

The effects of ozone on children's health were addressed in detail in EPA's rulemaking to establish the NAAQS for these pollutants, and EPA is not revisiting those issues here. EPA believes, however, that the emission reductions from the strategies in this rulemaking will further reduce air toxic emissions and the related adverse impacts on children's health.

H. Executive Order 12898: Federal Actions To Address Environmental Justice in Minority Populations and Low-Income Populations

Executive Order (EO) 12898 (59 FR 7629 (Feb. 16, 1994)) establishes federal executive policy on environmental justice. Its main provision directs federal agencies, to the greatest extent practicable and permitted by law, to make environmental justice part of their mission by identifying and addressing, as appropriate, disproportionately high and adverse human health or environmental effects of their programs, policies, and activities on minority populations and low-income populations in the United States.

EPA has determined that this final rule will not have disproportionately high and adverse human health or environmental effects on minority or low-income populations because it increases the level of environmental protection for all affected populations without having any disproportionately high and adverse human health or environmental effects on any population, including any minority or low-income population. This final rule will reduce air pollution from mobile sources in general and thus decrease the amount of such emissions to which all affected populations are exposed.

I. Executive Order 13211: Actions That Significantly Affect Energy Supply, Distribution, or Use

This rule is not a ''significant energy action'' as defined in Executive Order 13211, ''Actions Concerning Regulations That Significantly Affect Energy Supply, Distribution, or Use'' (66 FR 28355, May 22, 2001), because it is not likely to have a significant adverse effect on the supply, distribution, or use of energy. If promulgated, this final rule is expected to result in the use of emission control technologies that are estimated to reduce nationwide fuel consumption by around 100 million gallons per year by 2020.

J. National Technology Transfer Advancement Act

Section 12(d) of the National Technology Transfer and Advancement Act of 1995 (''NTTAA''), Public Law 104–113, section 12(d) (15 U.S.C. 272 note) directs EPA to use voluntary consensus standards in its regulatory activities unless doing so will be inconsistent with applicable law or otherwise impractical. Voluntary consensus standards are technical standards (e.g., materials specifications, test methods, sampling procedures, and business practices) that are developed or adopted by voluntary consensus standards bodies. NTTAA directs EPA to provide Congress, through OMB, explanations when the Agency decides not to use available and applicable voluntary consensus standards.

This final rulemaking involves technical standards. EPA will use the test procedures specified in 40 CFR part 1065. While the Agency identified the test procedures specified by the International Organization for Standardization (ISO 8178) as being potentially applicable, we are not adopting them in this final rulemaking. The use of this voluntary consensus standard will be impractical because we have been working with engine manufacturers and other interested parties in comprehensive improvements to test procedures for measuring engine emissions, as reflected by the provisions in part 1065. We expect these procedures to form the basis for internationally harmonized test procedures that will be adopted by ISO, other testing organizations, and other national governments.

K. Congressional Review Act

The Congressional Review Act, 5 U.S.C. 801 *et seq.*, as added by the Small Business Regulatory Enforcement Fairness Act of 1996, generally provides that before a rule may take effect, the agency promulgating the rule must submit a rule report, which includes a copy of the rule, to each House of the Congress and to the Comptroller General of the United States. EPA will submit a report containing this rule and other required information to the U.S. Senate, the U.S. House of Representatives, and the Comptroller General of the United States prior to publication of the rule in the **Federal Register**. A Major rule cannot take effect until 60 days after it is published in the **Federal Register**. This action is a ''major rule'' as defined by 5 U.S.C. 804(2). This rule will be effective December 8, 2008.

List of Subjects

40 CFR Part 9

Reporting and recordkeeping requirements.

40 CFR Part 60

Administrative practice and procedure, Air pollution control, Incorporation by reference, Intergovernmental relations, Reporting and recordkeeping requirements.

40 CFR Part 80

Environmental protection, Air pollution control, Fuel additives, Gasoline, Imports, Incorporation by reference, Labeling, Motor vehicle pollution, Penalties, Reporting and recordkeeping requirements.

40 CFR Part 85

Confidential business information, Imports, Labeling, Motor vehicle pollution, Reporting and recordkeeping requirements, Research, Warranties.

40 CFR Part 86

Environmental protection, Administrative practice and procedure, Air pollution control, Reporting and recordkeeping requirements, Motor vehicle.

40 CFR Part 89

Environmental protection, Administrative practice and procedure, Confidential business information, Imports, Labeling, Motor vehicle pollution, Reporting and recordkeeping requirements, Research, Vessels, Warranty.

40 CFR Part 90

Environmental protection, Administrative practice and procedure, Confidential business information, Imports, Labeling, Reporting and recordkeeping requirements, Research, Warranty.

40 CFR Part 91

Environmental protection, Administrative practice and procedure, Air pollution control, Confidential business information, Imports, Labeling, Penalties, Reporting and recordkeeping requirements, Warranties.

40 CFR Part 92

Environmental protection, Administrative practice and procedure, Air pollution control, Confidential business information, Imports, Incorporation by reference, Labeling, Penalties, Railroads, Reporting and recordkeeping requirements, Warranties.

40 CFR Part 94

Environmental protection, Administrative practice and procedure, Air pollution control, Confidential business information, Imports, Incorporation by reference, Labeling, Penalties, Vessels, Reporting and recordkeeping requirements, Warranties.

40 CFR Part 1027

Environmental protection, Administrative practice and procedure, Air pollution control, Imports, Reporting and recordkeeping requirements.

40 CFR Parts 10333 and 1039

Environmental protection, Administrative practice and procedure, Air pollution control, Confidential business information, Imports, Incorporation by reference, Labeling, Penalties, Reporting and recordkeeping requirements, Warranties.

40 CFR Part 1042

Environmental protection, Administrative practice and procedure, Air pollution control, Confidential business information, Imports, Incorporation by reference, Labeling, Penalties, Vessels, Reporting and recordkeeping requirements, Warranties.

40 CFR Parts 1045, 1048, 1051, 1054, and 1060

Environmental protection, Administrative practice and procedure, Air pollution control, Confidential business information, Imports, Incorporation by reference, Labeling, Penalties, Reporting and recordkeeping requirements, Warranties.

40 CFR Part 1065

Environmental protection, Administrative practice and procedure, Incorporation by reference, Reporting and recordkeeping requirements, Research.

40 CFR Part 1068

Environmental protection, Administrative practice and procedure, Confidential business information, Imports, Incorporation by reference, Motor vehicle pollution, Penalties, Reporting and recordkeeping requirements, Warranties.

40 CFR Part 1074

Environmental protection, Administrative practice and procedure, Motor vehicle pollution.

Dated: September 4, 2008.

Stephen L. Johnson,

Administrator.

■ For the reasons set out in the preamble, title 40, chapter I of the Code of Federal Regulations is amended as set forth below.

PART 9—OMB APPROVALS UNDER THE PAPERWORK REDUCTION ACT

■ 1. The authority citation for part 9 continues to read as follows:

Authority: 7 U.S.C. 135 *et seq.*, 136–136y; 15 U.S.C. 2001, 2003, 2005, 2006, 2601–2671; 21 U.S.C. 331j, 346a, 348; 31 U.S.C. 9701; 33 U.S.C. 1251 *et seq.*, 1311, 1313d, 1314, 1318 1321, 1326, 1330, 1342 1344, 1345 (d) and (e), 1361; E.O. 11735, 38 FR 21243, 3 CFR, 1971–1975 Comp. p. 973; 42 U.S.C. 241, 242b, 243, 246, 300f, 300g, 300g–1, 300g–2, 300g–3, 300g–4, 300g–5, 300g–6, 300j–1, 300j–2, 300j–3, 300j–4, 300j–9, 1857 *et seq.*, 6901–6992k, 7401–7671q, 7542, 9601–9657, 11023, 11048.

■ 2. In § 9.1 the table is amended as follows:

■ a. By adding a new center heading and entry in numerical order for ''1027.140''.

■ b. By adding a new center heading and entry in numerical order for ''1045.825''.

■ c. By removing ''1048.20'', ''1048.201–250'', ''1048.345'', ''1048.350'', ''1048.420'', and ''1048.425'' and adding a new entry in numerical order under that center heading for ''1048.825''.

■ d. By removing ''1051.201–255'', ''1051.345'', ''1051.350'', ''1051.725'', and ''1051.730'' and adding a new entry in numerical order under that center heading for ''1051.825''.

■ e. By adding a new center heading and entry in numerical order for ''1054.825''.

■ f. By adding a new center heading and entry in numerical order for ''1060.825''.

§ 9.1 OMB approvals under the Paperwork Reduction Act.

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40 CFR citation	OMB control No.
* * * *	* * *
Fees for Engine, Vehicle, and Equipment Compliance Programs	
1027.140	2060–0104, 2060–0545
* * * *	* * *
Control of Emissions from Spark-ignition Propulsion Marine Engines	
1045.825	2060–0321
Control of Emissions from New, Large Nonroad Spark-ignition Engines	
1048.825	2060–0338

40 CFR citation	OMB control No.
Control of Emissions from Recreational Engines and Vehicles	
1051.825	2060–0338
Control of Emissions from New, Small Nonroad Spark-ignition Engines and Equipment	
1054.825	2060–0338
Control of Evaporative Emissions from New and In-use Nonroad and Stationary Equipment	
1060.825	2060–0321, 2060–0338

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PART 60—STANDARDS OF PERFORMANCE FOR NEW STATIONARY SOURCES

■ 3. The authority citation for part 60 continues to read as follows:

Authority: 42 U.S.C. 7401, *et seq.*

Subpart JJJJ—[Amended]

■ 4. Section 60.4231 is amended as follows:

■ a. By revising the section heading.

■ b. By revising paragraph (a).

■ c. By revising paragraph (b).

■ d. By revising paragraph (c).

■ e. By revising paragraph (d).

■ f. By adding paragraph (f).

§ 60.4231 What emission standards must I meet if I am a manufacturer of stationary SI internal combustion engines or equipment containing such engines?

(a) Stationary SI internal combustion engine manufacturers must certify their stationary SI ICE with a maximum engine power less than or equal to 19 KW (25 HP) manufactured on or after July 1, 2008 to the certification emission standards and other requirements for new nonroad SI engines in 40 CFR part 90 or 1054, as follows:

If engine replacement is . . .	and manufacturing dates are . . .	the engine must meet emission standards and related requirements for nonhandheld engines under . . .
(1) below 225 cc	July 1, 2008 to December 31, 2011	40 CFR part 90.
(2) below 225 cc	January 1, 2012 or later	40 CFR part 1054.
(3) at or above 225 cc	July 1, 2008 to December 31, 2010	40 CFR part 90.
(4) at or above 225 cc	January 1, 2011 or later	40 CFR part 1054.

(b) Stationary SI internal combustion engine manufacturers must certify their stationary SI ICE with a maximum engine power greater than 19 KW (25 HP) (except emergency stationary ICE with a maximum engine power greater than 25 HP and less than 130 HP) that use gasoline and that are manufactured on or after the applicable date in § 60.4230(a)(2), or manufactured on or after the applicable date in § 60.4230(a)(4) for emergency stationary ICE with a maximum engine power greater than or equal to 130 HP, to the certification emission standards and other requirements for new nonroad SI engines in 40 CFR part 1048. Stationary SI internal combustion engine manufacturers must certify their emergency stationary SI ICE with a maximum engine power greater than 25 HP and less than 130 HP that are manufactured on or after the applicable date in § 60.4230(a)(4) to the Phase 1 emission standards in 40 CFR 90.103, applicable to class II engines, and other requirements for new nonroad SI engines in 40 CFR part 90. Stationary SI internal combustion engine manufacturers may certify their stationary SI ICE with a maximum engine power less than or equal to 30 KW (40 HP) with a total displacement less than or equal to 1,000 cubic centimeters (cc) to the certification emission standards and other requirements for new nonroad SI engines in 40 CFR part 90 or 1054, as appropriate.

(c) Stationary SI internal combustion engine manufacturers must certify their stationary SI ICE with a maximum engine power greater than 19 KW (25 HP) (except emergency stationary ICE with a maximum engine power greater than 25 HP and less than 130 HP) that are rich burn engines that use LPG and that are manufactured on or after the applicable date in § 60.4230(a)(2), or manufactured on or after the applicable date in § 60.4230(a)(4) for emergency stationary ICE with a maximum engine power greater than or equal to 130 HP, to the certification emission standards and other requirements for new nonroad SI engines in 40 CFR part 1048. Stationary SI internal combustion engine manufacturers must certify their emergency stationary SI ICE with a maximum engine power greater than 25 HP and less than 130 HP that are manufactured on or after the applicable date in § 60.4230(a)(4) to the Phase 1 emission standards in 40 CFR 90.103, applicable to class II engines, and other requirements for new nonroad SI engines in 40 CFR part 90. Stationary SI internal combustion engine manufacturers may certify their stationary SI ICE with a maximum engine power less than or equal to 30 KW (40 HP) with a total displacement less than or equal to 1,000 cc to the certification emission standards and other requirements for new nonroad SI engines in 40 CFR part 90 or 1054, as appropriate.

(d) Stationary SI internal combustion engine manufacturers who choose to certify their stationary SI ICE with a maximum engine power greater than 19 KW (25 HP) and less than 75 KW (100 HP) (except gasoline and rich burn engines that use LPG and emergency stationary ICE with a maximum engine power greater than 25 HP and less than 130 HP) under the voluntary manufacturer certification program described in this subpart must certify those engines to the certification emission standards for new nonroad SI engines in 40 CFR part 1048. Stationary SI internal combustion engine manufacturers who choose to certify their emergency stationary SI ICE greater than 25 HP and less than 130 HP, must certify those engines to the Phase 1 emission standards in 40 CFR 90.103, applicable to class II engines, for new nonroad SI engines in 40 CFR part 90. Stationary SI internal combustion engine manufacturers may certify their stationary SI ICE with a maximum engine power less than or equal to 30 KW (40 HP) with a total displacement less than or equal to 1,000 cc to the certification emission standards for new nonroad SI engines in 40 CFR part 90 or 1054, as appropriate. For stationary SI ICE with a maximum engine power greater than 19 KW (25 HP) and less than 75 KW (100 HP) (except gasoline and rich burn engines that use LPG and emergency stationary ICE with a maximum engine power greater than 25 HP and less than 130 HP) manufactured prior to January 1, 2011, manufacturers may choose to certify these engines to the standards in Table 1 to this subpart applicable to engines with a maximum engine power greater than or equal to 100 HP and less than 500 HP.

* * * * *

(f) Manufacturers of equipment containing stationary SI internal combustion engines meeting the provisions of 40 CFR part 1054 must meet the provisions of 40 CFR part 1060, to the extent they apply to equipment manufacturers.

■ 5. Section 60.4238 is revised to read as follows:

§ 60.4238 What are my compliance requirements if I am a manufacturer of stationary SI internal combustion engines ≤19 KW (25 HP) or a manufacturer of equipment containing such engines?

Stationary SI internal combustion engine manufacturers who are subject to the emission standards specified in § 60.4231(a) must certify their stationary SI ICE using the certification procedures required in 40 CFR part 90, subpart B, or 40 CFR part 1054, subpart C, as applicable, and must test their engines as specified in those parts. Manufacturers of equipment containing stationary SI internal combustion engines meeting the provisions of 40 CFR part 1054 must meet the provisions of 40 CFR part 1060, subpart C, to the extent they apply to equipment manufacturers.

■ 6. Section 60.4239 is revised to read as follows:

§ 60.4239 What are my compliance requirements if I am a manufacturer of stationary SI internal combustion engines >19 KW (25 HP) that use gasoline or a manufacturer of equipment containing such engines?

Stationary SI internal combustion engine manufacturers who are subject to the emission standards specified in § 60.4231(b) must certify their stationary SI ICE using the certification procedures required in 40 CFR part 1048, subpart C, and must test their engines as specified in that part. Stationary SI internal combustion engine manufacturers who certify their stationary SI ICE with a maximum engine power less than or equal to 30 KW (40 HP) with a total displacement less than or equal to 1,000 cc to the certification emission standards and other requirements for new nonroad SI engines in 40 CFR part 90 or 40 CFR part 1054, and manufacturers of stationary SI emergency engines that are greater than 25 HP and less than 130 HP who meet the Phase 1 emission standards in 40 CFR 90.103, applicable to class II engines, must certify their stationary SI ICE using the certification procedures required in 40 CFR part 90, subpart B, or 40 CFR part 1054, subpart C, as applicable, and must test their engines as specified in those parts. Manufacturers of equipment containing stationary SI internal combustion engines meeting the provisions of 40 CFR part 1054 must meet the provisions of 40 CFR part 1060, subpart C, to the extent they apply to equipment manufacturers.

■ 7. Section 60.4240 is revised to read as follows:

§ 60.4240 What are my compliance requirements if I am a manufacturer of stationary SI internal combustion engines >19 KW (25 HP) that are rich burn engines that use LPG or a manufacturer of equipment containing such engines?

Stationary SI internal combustion engine manufacturers who are subject to the emission standards specified in § 60.4231(c) must certify their stationary SI ICE using the certification procedures required in 40 CFR part 1048, subpart C, and must test their engines as specified in that part. Stationary SI internal combustion engine manufacturers who certify their stationary SI ICE with a maximum engine power less than or equal to 30 KW (40 HP) with a total displacement less than or equal to 1,000 cc to the certification emission standards and other requirements for new nonroad SI engines in 40 CFR part 90 or 40 CFR part 1054, and manufacturers of stationary SI emergency engines that are greater than 25 HP and less than 130 HP who meet the Phase 1 emission standards in 40 CFR 90.103, applicable to class II engines, must certify their stationary SI ICE using the certification procedures required in 40 CFR part 90, subpart B, or 40 CFR part 1054, subpart C, as applicable, and must test their engines as specified in those parts. Manufacturers of equipment containing stationary SI internal combustion engines meeting the provisions of 40 CFR part 1054 must meet the provisions of 40 CFR part 1060, subpart C, to the extent they apply to equipment manufacturers.

■ 8. Section 60.4241 is amended by revising the section heading, paragraph (b) and adding paragraph (i) to read as follows:

§ 60.4241 What are my compliance requirements if I am a manufacturer of stationary SI internal combustion engines participating in the voluntary certification program or a manufacturer of equipment containing such engines?

* * * * *

(b) Manufacturers of engines other than those certified to standards in 40 CFR part 90 or 40 CFR part 1054 must certify their stationary SI ICE using the certification procedures required in 40 CFR part 1048, subpart C, and must follow the same test procedures that apply to large SI nonroad engines under 40 CFR part 1048, but must use the D–1 cycle of International Organization of Standardization 8178–4: 1996(E) (incorporated by reference, see 40 CFR 60.17) or the test cycle requirements specified in Table 5 to 40 CFR 1048.505, except that Table 5 of 40 CFR 1048.505 applies to high load engines only. Stationary SI internal combustion engine manufacturers who certify their stationary SI ICE with a maximum engine power less than or equal to 30 KW (40 HP) with a total displacement less than or equal to 1,000 cc to the certification emission standards and other requirements for new nonroad SI engines in 40 CFR part 90 or 40 CFR part 1054, and manufacturers of emergency engines that are greater than 25 HP and less than 130 HP who meet the Phase 1 standards in 40 CFR 90.103, applicable to class II engines, must certify their stationary SI ICE using the certification procedures required in 40 CFR part 90, subpart B, or 40 CFR part 1054, subpart C, as applicable, and must test their engines as specified in those parts. Manufacturers of equipment containing stationary SI internal combustion engines meeting the provisions of 40 CFR part 1054 must meet the provisions of 40 CFR part 1060, subpart C, to the extent they apply to equipment manufacturers.

* * * * *

(i) For engines being certified to the voluntary certification standards in Table 1 of this subpart, the VOC measurement shall be made by following the procedures in 40 CFR 1065.260 and 1065.265 in order to determine the total NMHC emissions by using a flame-ionization detector and non-methane cutter. As an alternative to the nonmethane cutter, manufacturers may use a gas chromatograph as allowed under 40 CFR 1065.267 and may measure ethane, as well as methane, for excluding such levels from the total VOC measurement.

■ 9. Section 60.4242 is amended by revising the section heading, paragraphs (a) and (b) and adding paragraph (f) to read as follows:

§ 60.4242 What other requirements must I meet if I am a manufacturer of stationary SI internal combustion engines or equipment containing stationary SI internal combustion engines or a manufacturer of equipment containing such engines?

(a) Stationary SI internal combustion engine manufacturers must meet the provisions of 40 CFR part 90, 40 CFR part 1048, or 40 CFR part 1054, as applicable, as well as 40 CFR part 1068 for engines that are certified to the emission standards in 40 CFR part 1048 or 1054, except that engines certified pursuant to the voluntary certification procedures in § 60.4241 are subject only to the provisions indicated in § 60.4247 and are permitted to provide instructions to owners and operators allowing for deviations from certified configurations, if such deviations are consistent with the provisions of paragraphs § 60.4241(c) through (f). Manufacturers of equipment containing stationary SI internal combustion engines meeting the provisions of 40 CFR part 1054 must meet the provisions of 40 CFR part 1060, as applicable. Labels on engines certified to 40 CFR part 1048 must refer to stationary engines, rather than or in addition to nonroad engines, as appropriate.

(b) An engine manufacturer certifying an engine family or families to standards under this subpart that are identical to standards applicable under 40 CFR part 90, 40 CFR part 1048, or 40 CFR part 1054 for that model year may certify any such family that contains both nonroad and stationary engines as a single engine family and/or may include any such family containing stationary engines in the averaging, banking and trading provisions applicable for such engines under those parts. This provision also applies to equipment or component manufacturers certifying to standards under 40 CFR part 1060.

* * * * *

(f) For manufacturers of gaseous-fueled stationary engines required to meet the warranty provisions in 40 CFR 90.1103 or 1054.120, we may establish an hour-based warranty period equal to at least the certified emissions life of the engines (in engine operating hours) if we determine that these engines are likely to operate for a number of hours greater than the applicable useful life within 24 months. We will not approve an alternate warranty under this paragraph (f) for nonroad engines. An alternate warranty period approved under this paragraph (f) will be the specified number of engine operating hours or two years, whichever comes first. The engine manufacturer shall request this alternate warranty period in its application for certification or in an earlier submission. We may approve an alternate warranty period for an engine family subject to the following conditions:

(1) The engines must be equipped with non-resettable hour meters.

(2) The engines must be designed to operate for a number of hours substantially greater than the applicable certified emissions life.

(3) The emission-related warranty for the engines may not be shorter than any published warranty offered by the manufacturer without charge for the engines. Similarly, the emission-related warranty for any component shall not be shorter than any published warranty offered by the manufacturer without charge for that component.

■ 10. Section 60.4245 is amended by revising paragraph (a)(3) to read as follows:

§ 60.4245 What are my notification, reporting, and recordkeeping requirements if I am an owner or operator of a stationary SI internal combustion engine?

* * * * *

(a) * * *

(3) If the stationary SI internal combustion engine is a certified engine, documentation from the manufacturer that the engine is certified to meet the emission standards and information as required in 40 CFR parts 90, 1048, 1054, and 1060, as applicable.

* * * * *

■ 11. Section 60.4247 is amended by revising the section heading, paragraphs (a) and (b) to read as follows:

§ 60.4247 What parts of the mobile source provisions apply to me if I am a manufacturer of stationary SI internal combustion engines or a manufacturer of equipment containing such engines?

(a) Manufacturers certifying to emission standards in 40 CFR part 90, including manufacturers certifying emergency engines below 130 HP, must meet the provisions of 40 CFR part 90. Manufacturers certifying to emission standards in 40 CFR part 1054 must meet the provisions of 40 CFR part 1054. Manufacturers of equipment containing stationary SI internal combustion engines meeting the provisions of 40 CFR part 1054 must meet the provisions of 40 CFR part 1060 to the extent they apply to equipment manufacturers.

(b) Manufacturers required to certify to emission standards in 40 CFR part 1048 must meet the provisions of 40 CFR part 1048. Manufacturers certifying to emission standards in 40 CFR part 1048 pursuant to the voluntary certification program must meet the requirements in Table 4 to this subpart as well as the standards in 40 CFR 1048.101.

* * * * *

■ 12. Section 60.4248 is amended by revising the definitions for ''Certified emissions life'' and ''Certified stationary internal combustion engine'' to read as follows:

§ 60.4248 What definitions apply to this subpart?

* * * * *

Certified emissions life means the period during which the engine is designed to properly function in terms of reliability and fuel consumption, without being remanufactured, specified as a number of hours of operation or calendar years, whichever comes first. The values for certified emissions life for stationary SI ICE with a maximum engine power less than or equal to 19 KW (25 HP) are given in 40 CFR 90.105, 40 CFR 1054.107, and 40 CFR 1060.101, as appropriate. The values for certified emissions life for stationary SI ICE with a maximum engine power greater than 19 KW (25 HP) certified to 40 CFR part 1048 are given in 40 CFR 1048.101(g). The certified emissions life for stationary SI ICE with a maximum engine power greater than 75 KW (100 HP) certified under the voluntary manufacturer certification program of this subpart is 5,000 hours or 7 years, whichever comes first.

Certified stationary internal combustion engine means an engine that belongs to an engine family that has a certificate of conformity that complies with the emission standards and requirements in this part, or of 40 CFR part 90, 40 CFR part 1048, or 40 CFR part 1054, as appropriate.

* * * * *

PART 80—REGULATION OF FUELS AND FUEL ADDITIVES

■ 13. The authority citation for part 80 continues to read as follows:

Authority: 42 U.S.C. 7414, 7521(1), 7545 and 7601(a).

Subpart B—[Amended]

■ 14. Section 80.22 is amended by revising paragraph (f) and adding paragraph (g) to read as follows:

§ 80.22 Controls and prohibitions.

* * * * *

(f) Every retailer and wholesale purchaser-consumer shall equip all gasoline pumps from which gasoline is dispensed into motor vehicles with a nozzle spout that meets all the following specifications:

(1) The outside diameter of the terminal end shall not be greater than 0.840 inches (2.134 centimeters).

(2) The terminal end shall have a straight section of at least 2.5 inches (6.34 centimeters).

(3) The retaining spring shall terminate at least 3.0 inches (7.6 centimeters) from the terminal end.

(g) The specifications in this paragraph (g) apply for any new nozzle installations used primarily for dispensing gasoline into marine vessels beginning January 1, 2009. (Note that nozzles meeting the specifications of this paragraph (g) also meet the specifications of paragraph (f) of this section. Note also that the additional specifications in this paragraph (g) do not apply for nozzles used primarily for dispensing gasoline into motor vehicles rather than marine vessels.) Every retailer and wholesale purchaser-consumer shall use nozzles meeting these specifications for any new construction or for nozzle replacements. This does not require replacement of existing nozzles for refueling marine vessels before they would be replaced for other reasons. The following specifications apply to spouts on new or replacement nozzles intended for dispensing gasoline into marine vessels:

(1) The outside diameter of the terminal end shall have a diameter of 0.824 ± 0.017 inches (2.093 ± 0.043 centimeters).

(2) The spout shall include an aspirator hole for automatic shutoff positioned with a center that is 0.67 ± 0.05 inches (1.70 ± 0.13 centimeters) from the terminal end of the spout.

(3) The terminal end shall have a straight section of at least 2.5 inches (6.34 centimeters) with no holes or grooves other than the aspirator hole.

(4) The retaining spring (if applicable) shall terminate at least 3.0 inches (7.6 centimeters) from the terminal end.

* * * * *

PART 85—CONTROL OF AIR POLLUTION FROM MOBILE SOURCES

■ 15. The authority citation for part 85 continues to read as follows:

Authority: 42 U.S.C. 7401–7671q.

Subpart Q—[Removed and reserved]

■ 16. Remove and reserve Subpart Q, consisting of §§ 85.1601 through 85.1606.

Subpart R—[Amended]

§ 85.1703 [Amended]

■ 17. Section 85.1703 is amended by removing and reserving paragraph (b).

■ 18. Section 85.1713 is revised to read as follows:

§ 85.1713 Delegated-assembly exemption.

The provisions of 40 CFR 1068.261 related to shipping engines that are not yet in their certified configuration apply for manufacturers of heavy-duty highway engines starting in the 2010 model year, with the following exceptions and clarifications:

(a) The relevant prohibitions are in Clean Air Act section 203 (42 U.S.C. 7522), rather than 40 CFR 1068.101.

(b) References to equipment should be understood as references to vehicles.

(c) The provisions related to reduced auditing rates in 40 CFR 1068.261(d)(3)(iii) apply starting with the 2014 model year.

(d) The provisions related to supplemental labeling described in 40 CFR 1068.261(c)(7)(i) and (ii) apply starting with the 2010 model year.

(e) The engine's model year does not change based on the date the vehicle manufacturer adds the aftertreatment device.

■ 19. A new § 85.1714 is added to subpart R to read as follows:

§ 85.1714 Replacement-engine exemption.

(a) Engine manufacturers may use the provisions of 40 CFR 1068.240 to exempt new replacement heavy-duty highway engines as specified in this section.

(b) The following provisions from 40 CFR part 1068 apply for all complete and partially complete engines produced by an engine manufacturer choosing to produce any exempt replacement engines under this section:

(1) The definition of *engine* in 40 CFR 1068.30.

(2) The provisions of 40 CFR 1068.260 and 1068.262.

(c) Notify us in writing that you intend to use the provisions of this section prior to producing such engines. An authorized representative of your company must approve and sign the notification. Your notification is considered to be your agreement to comply with all the requirements of this section.

(d) Engine manufacturers choosing to use the provisions of this section may opt out by sending us written notice that they will no longer introduce into U.S. commerce engines exempted under this section.

■ 20. Subpart Y is revised to read as follows:

Subpart Y—Fees for the Motor Vehicle and Engine Compliance Program

§ 85.2401 Assessment of fees.

See 40 CFR part 1027 for the applicable fees associated with certifying engines, vehicles, and equipment under this chapter.

PART 86—CONTROL OF EMISSIONS FROM NEW AND IN-USE HIGHWAY VEHICLES AND ENGINES

■ 21. The authority citation for part 86 continues to read as follows:

Authority: 42 U.S.C. 7401–7671q.

Subpart N—[Amended]

■ 22. Section 86.1305–2010 is amended by adding paragraph (h) to read as follows:

§ 86.1305–2010 Introduction; structure of subpart.

* * * * *

(h) This paragraph (h) describes how testing performed prior to July 1, 2010 may be conducted using the test procedures of this subpart N rather than the corresponding provisions of 40 CFR part 1065 otherwise required by this section. You must use good engineering judgment when testing under this paragraph (h), and must comply with the following provisions of 40 CFR part 1065:

(1) Generate a map of your engine according to 40 CFR 1065.510(b)(5)(ii) and generate test cycles according to 40 CFR 1065.610. Validate your cycle according to 40 CFR 1065.514.

(2) Follow the provisions of 40 CFR 1065.342 to verify the performance of any sample dryers in your system. Correct your measurements according to 40 CFR 1065.659, except use the value

of K_w in § 1342–90(i) as the value of $(1 - x_{H2Oexh})$ in Equation 1065.659–1.

(3) Verify your NO_2-to-NO converter according to 40 CFR 1065.378.

(4) For diesel engine testing, correct NO_X emissions for intake-air humidity according to 40 CFR 1065.670.

(5) You must comply with the provisions related to analyzer range and drift in 40 CFR 1065.550. If drift correction is required, correct your measurements according to 40 CFR 1065.672, but use the emission calculations specified in this subpart N rather than those specified in 40 CFR 1065.650.

(6) You must comply with 40 CFR 1065.125, 1065.127, and 1065.130, except for references to 40 CFR 1065.530(a)(1)(i), 1065.640, and 1065.655.

(7) Follow the provisions of 40 CFR 1065.370 to verify the performance of your CLD analyzer with respect to CO_2 and H_2O quench. You are not required to follow 40 CFR 1065.145(d)(2), 1065.248, or 1065.750, which are referenced in 40 CFR 1065.370.

PART 89—CONTROL OF EMISSIONS FROM NEW AND IN-USE NONROAD COMPRESSION-IGNITION ENGINES

■ 23. The authority citation for part 89 continues to read as follows:

Authority: 42 U.S.C. 7401–7671q.

Subpart G—[Amended]

§ 89.614 [Removed]

■ 24. Section 89.614 is removed.

Subpart K—[Amended]

■ 25. Section 89.1003 is amended by revising paragraphs (b)(7)(iii), (b)(7)(iv), and (b)(7)(v) to read as follows:

§ 89.1003 Prohibited acts.

* * * * *

(b) * * *

(7) * * *

(iii) If the engine being replaced was not subject to any emission standards under this part, the replacement engine must have a permanent label with your corporate name and trademark and the following language, or similar alternate language approved by the Administrator: THIS ENGINE DOES NOT COMPLY WITH FEDERAL NONROAD OR ON-HIGHWAY EMISSION REQUIREMENTS. SALE OR INSTALLATION OF THIS ENGINE FOR ANY PURPOSE OTHER THAN AS A REPLACEMENT ENGINE FOR AN ENGINE MANUFACTURED PRIOR TO JANUARY 1 [INSERT APPROPRIATE YEAR] IS A VIOLATION OF FEDERAL LAW SUBJECT TO CIVIL PENALTY.

(iv) If the engine being replaced was subject to emission standards less stringent than those in effect when you produce the replacement engine, the replacement engine must have a permanent label with your corporate name and trademark and the following language, or similar alternate language approved by the Administrator:

THIS ENGINE COMPLIES WITH U.S. EPA NONROAD EMISSION REQUIREMENTS FOR [Identify the appropriate emission standards (by model year, tier, or emission levels) for the replaced engine] ENGINES UNDER 40 CFR 89.1003(b)(7). SELLING OR INSTALLING THIS ENGINE FOR ANY PURPOSE OTHER THAN TO REPLACE A [Identify the appropriate emission standards (by model year, tier, or emission levels) for the replaced engine] ENGINE MAY BE A VIOLATION OF FEDERAL LAW SUBJECT TO CIVIL PENALTY.

(v) If the old engine was subject to emission standards less stringent than those in effect when you produce the replacement engine, you must make the replacement engine in a configuration identical in all material respects to the old engine. You may alternatively make the replacement engine in a configuration identical in all material respects to another certified engine of the same or later model year, as long as the engine is not certified with a family emission limit higher than that of the engine being replaced.

* * * * *

PART 90—CONTROL OF EMISSIONS FROM NONROAD SPARK-IGNITION ENGINES AT OR BELOW 19 KILOWATTS

■ 26. The authority citation for part 90 continues to read as follows:

Authority: 42 U.S.C. 7401–7671q.

Subpart A—[Amended]

■ 27. Section 90.1 is amended by revising paragraphs (d)(1) and (d)(5) and adding paragraph (d)(8) to read as follows:

§ 90.1 Applicability.

* * * * *

(d) * * *

(1) Engines that are certified to meet the requirements of 40 CFR part 1051 or are otherwise subject to 40 CFR part 1051 (for example, engines used in snowmobiles and all-terrain vehicles). This part nevertheless applies to engines used in recreational vehicles if the manufacturer uses the provisions of 40 CFR 1051.145(a)(3) to exempt them from the requirements of 40 CFR part 1051. Compliance with the provisions of this part is a required condition of that exemption.

* * * * *

(5) Engines certified to meet the requirements of 40 CFR part 1048 or are otherwise subject to 40 CFR part 1048, subject to the provisions of § 90.913.

* * * * *

(8) Engines that are subject to emission standards under 40 CFR part 1054. See 40 CFR 1054.1 to determine when part 1054 applies. Note that certain requirements and prohibitions apply to engines built on or after January 1, 2010 if they are installed in equipment that will be used solely for competition, as described in 40 CFR 1054.1 and 40 CFR 1068.1; those provisions apply instead of the provisions of this part 90.

* * * * *

■ 28. Section 90.2 is amended by adding paragraphs (d) and (e) to read as follows:

§ 90.2 Effective dates.

* * * * *

(d) Engines used in emergency and rescue equipment as described in § 90.1(d)(7) are subject to the provisions of this part through December 31, 2009. Starting January 1, 2010 the provisions in 40 CFR 1054.660 apply instead of those in § 90.1(d)(7).

(e) Engines imported for personal use are subject to the provisions of § 90.611 through December 31, 2009. Starting January 1, 2010 the provisions in 40 CFR 1054.630 apply instead of those in § 90.611.

■ 29. Section 90.3 is amended by adding a definition for ''Fuel line'' in alphabetical order to read as follows:

§ 90.3 Definitions.

* * * * *

Fuel line has the meaning given in 40 CFR 1054.801.

* * * * *

Subpart B—[Amended]

■ 30. Section 90.101 is revised to read as follows:

§ 90.101 Applicability.

(a) The requirements of this subpart B are applicable to all nonroad engines and vehicles subject to the provisions of subpart A of this part.

(b) In a given model year, you may ask us to approve the use of procedures for certification, labeling, reporting and recordkeeping, or other administrative requirements specified in 40 CFR part 1054 or 1068 instead of the comparable procedures specified in this part 90. We may approve the request as long as it does not prevent us from ensuring that you fully comply with the intent of this part.

■ 31. Section 90.107 is amended as follows:

■ a. By revising paragraph (d)(11)(ii).

■ b. By revising paragraph (d)(12).

■ c. By adding paragraphs (d)(13) and (d)(14) to read as follows:

§ 90.107 Application for certification.

* * * * *

(d) * * *

(11) * * *

(ii) Provide the applicable useful life as determined under § 90.105;

(12) A statement indicating whether you expect the engine family to contain only nonroad engines, only stationary engines, or both;

(13) Identification of an agent for service located in the United States. Service on this agent constitutes service on you or any of your officers or employees for any action by EPA or otherwise by the United States related to the requirements of this part; and

(14) For imported engines, identification of the following starting with the 2010 model year:

(i) The port(s) at which the manufacturer has imported engines over the previous 12 months.

(ii) The names and addresses of the agents authorized to import the engines.

(iii) The location of test facilities in the United States where the manufacturer can test engines if EPA selects them for testing under a selective enforcement audit, as specified in subpart F of this part.

* * * * *

■ 32. Section 90.114 is amended by revising paragraph (g) to read as follows:

§ 90.114 Requirement of certification—engine information label.

* * * * *

(g) Manufacturers may add appropriate features to prevent counterfeit labels. For example, manufacturers may include the engine's unique identification number on the label.

■ 33. Section 90.116 is amended by revising paragraph (d)(5) and removing and reserving paragraph (e)(1) to read as follows:

§ 90.116 Certification procedure—determining engine displacement, engine class, and engine families.

* * * * *

(d) * * *

(5) The engine class. Engines of different displacements that are within 15 percent of the largest displacement may be included within the same engine family as long as all the engines are in the same class;

* * * * *

(e) * * *

(1) [Reserved]

* * * * *

■ 34. Section 90.120 is amended by adding paragraph (b)(3) to read as follows:

§ 90.120 Certification procedure—use of special test procedures.

* * * * *

(b) * * *

(3) A manufacturer may elect to use the test procedures in 40 CFR part 1065 as an alternate test procedure without getting advance approval by the Administrator or meeting the other conditions of paragraph (b)(1) of this section. The manufacturer must identify in its application for certification that the engines were tested using the procedures in 40 CFR part 1065. For any EPA testing with Phase 1 or Phase 2 engines, EPA will use the manufacturer's selected procedures for mapping engines, generating duty cycles, and applying cycle-validation criteria. For any other parameters, EPA may conduct testing using either of the specified procedures.

* * * * *

■ 35. A new § 90.127 is added to subpart B to read as follows:

§ 90.127 Fuel line permeation from nonhandheld engines and equipment.

The following permeation standards apply to new nonhandheld engines and equipment with respect to fuel lines:

(a) *Emission standards and related requirements.* New nonhandheld engines and equipment with a date of manufacture of January 1, 2009 or later that run on a volatile liquid fuel (such as gasoline) must meet the emission standards specified in paragraph (a)(1) or (a)(2) of this section as follows:

(1) New nonhandheld engines and equipment must use only fuel lines that meet a permeation emission standard of 15 $g/m^2/day$ when measured according to the test procedure described in 40 CFR 1060.515.

(2) Alternatively, new nonhandheld engines and equipment must use only fuel lines that meet standards that apply for these engines and equipment in California for the same model year (see 40 CFR 1060.810). This may involve SHED-based measurements for equipment or testing with fuel lines alone. If this involves SHED-based measurements, all elements of the emission control system must remain in place for fully assembled engines and equipment.

(3) The emission standards in this section apply with respect to discrete fuel line segments of any length. Compliance may also be demonstrated using aggregated systems that include multiple sections of fuel line with connectors, and fittings. The standard applies with respect to the total permeation emissions divided by the wetted internal surface area of the assembly. Where it is not practical to determine the wetted internal surface area of the assembly, the internal surface area per unit length of the assembly may be assumed to be equal to the ratio of internal surface area per unit length of the hose section of the assembly.

(4) The emission standards in this section apply over a useful life of five years.

(5) Starting with the 2010 model year, fuel lines must be labeled in a permanent and legible manner with one of the following approaches:

(i) By meeting the labeling requirements that apply for these engines and equipment in California.

(ii) By identifying the certificate holder's corporate name or trademark, or the fuel line manufacturer's corporate name or trademark, and the fuel line's permeation level. For example, the fuel line may identify the emission standard from this section, the applicable SAE classification, or the family number identifying compliance with California standards. A continuous stripe or other pattern may be added to help identify the particular type or grade of fuel line.

(6) The requirements of this section do not apply to auxiliary marine engines.

(b) *Certification requirements.* Fuel lines subject to the requirements in this section must be covered by a certificate of conformity. Fuel line manufacturers or equipment manufacturers may apply for certification. Certification under this section must be based on emission data using the appropriate procedures that demonstrate compliance with the standard, including any of the following:

(1) Emission data demonstrating compliance with fuel line permeation requirements for model year 2008 equipment sold in California. You may satisfy this requirement by presenting an approved Executive Order from the California Air Resources Board showing that the fuel lines meet the applicable standards in California. This may include an Executive Order from the previous model year if a new certification is pending.

(2) Emission data demonstrating a level of permeation control that meets any of the following industry standards:

(i) R11A specifications in SAE J30 as described in 40 CFR 1060.810.

(ii) R12 specifications in SAE J30 as described in 40 CFR 1060.810.

(iii) Category 1 specifications in SAE J2260 as described in 40 CFR 1060.810.

(iv) Emission data demonstrating compliance with the fuel line permeation standards in 40 CFR 1051.110.

(c) *Prohibitions.* (1) Except as specified in paragraph (c)(2) of this section, introducing engines or equipment into U.S. commerce without meeting all the requirements of this section violates § 90.1003(a)(1).

(2) It is not a violation to introduce your engines into U.S. commerce if equipment manufacturers add fuel lines when installing your engines in their equipment. However, you must give equipment manufacturers any appropriate instructions so that fully assembled equipment will meet all the requirements in this section, as described in § 90.128.

■ 36. A new § 90.128 is added to subpart B to read as follows:

§ 90.128 Installation instructions.

(a) If you sell an engine for someone else to install in a piece of nonroad equipment, give the engine installer instructions for installing it consistent with the requirements of this part. Include all information necessary to ensure that an engine will be installed in its certified configuration. In particular, describe the steps needed to control evaporative emissions, as described in § 90.127. This may include information related to the delayed requirements for small-volume equipment manufacturers.

(b) You do not need installation instructions for engines you install in your own equipment.

(c) Provide instructions in writing or in an equivalent format. For example, you may post instructions on a publicly available Web site for downloading or printing. If you do not provide the instructions in writing, explain in your application for certification how you will ensure that each installer is informed of the installation requirements.

(d) Equipment manufacturers failing to follow the engine manufacturer's emission-related installation instructions will be considered in violation of § 90.1003.

■ 37. A new § 90.129 is added to subpart B to read as follows:

§ 90.129 Fuel tank permeation from handheld engines and equipment.

The permeation standards of this section apply to certain new handheld engines and equipment with respect to fuel tanks. For the purposes of this section, fuel tanks do not include fuel caps.

(a) Emission standards and related requirements. (1) New handheld engines and equipment with a date of manufacture of January 1, 2009 or later that run on a volatile liquid fuel (such as gasoline) and have been certified to meet applicable fuel tank permeation standards in California must meet one of the following emission standards:

(i) Engines and equipment must use only fuel tanks that meet a permeation emission standard of 2.0 g/m2/day when measured according to the applicable test procedure specified by the California Air Resources Board.

(ii) Engines and equipment must use only fuel tanks that meet the fuel tank permeation standards in 40 CFR 1060.103.

(iii) Engines and equipment must use only fuel tanks that meet standards that apply for these engines in California for the same model year. This may involve SHED-based measurements for equipment or testing with fuel tanks alone. If this involves SHED-based measurements, all elements of the emission-control system must remain in place for fully assembled engines and equipment.

(2) Engine and equipment manufacturers may generate or use emission credits to show compliance with the requirements of this section under the averaging program as described in 40 CFR part 1054, subpart H.

(3) The emission standards in this section apply over a useful life of two years.

(4) Equipment must be labeled in a permanent and legible manner with one of the following approaches:

(i) By meeting the labeling requirements that apply for equipment in California.

(ii) By identifying the certificate holder's corporate name or trademark, or the fuel tank manufacturer's corporate name or trademark. Also include the family number identifying compliance with California standards or state: "THIS FUEL TANK COMPLIES WITH U.S. EPA STANDARDS." This label may be applied to the fuel tank or it may be combined with the emission control information label required in § 90.114. If the label information is not on the fuel tank, the label must include a part identification number that is also permanently applied to the fuel tank.

(5) The requirements of this section do not apply to engines or equipment with structurally integrated nylon fuel tanks (as defined in 40 CFR 1054.801).

(b) *Certification requirements.* Fuel tanks subject to the requirements in this section must be covered by a certificate of conformity. Fuel tank manufacturers or equipment manufacturers may apply for certification. Certification under this section must be based on emission data using the appropriate procedures that demonstrate compliance with the standard. You may satisfy this requirement by presenting an approved Executive Order from the California Air Resources Board showing that the fuel tanks meet the applicable standards in California. This may include an Executive Order from the previous model year for cases where new certification based on carryover of emission data from the previous model year is pending.

(c) *Prohibitions.* Introducing equipment into U.S. commerce without meeting all the requirements of this section violates § 90.1003(a)(1).

Subpart C—[Amended]

■ 38. Section 90.201 is revised to read as follows:

§ 90.201 Applicability.

(a) The requirements of this subpart C are applicable to all Phase 2 spark-ignition engines subject to the provisions of subpart A of this part except as provided in § 90.103(a). These provisions are not applicable to any Phase 1 engines. Participation in the averaging, banking and trading program is voluntary, but if a manufacturer elects to participate, it must do so in compliance with the regulations set forth in this subpart. The provisions of this subpart are applicable for HC+NO_X (NMHC+NO_X) emissions but not for CO emissions.

(b) See 40 CFR 1054.740 for special provisions for using emission credits generated under this part 90 from Phase 2 engines to demonstrate compliance with engines certified under 40 CFR part 1054.

(c) To the extent specified in 40 CFR part 60, subpart JJJJ, stationary engines certified under this part and subject to the standards of 40 CFR part 60, subpart JJJJ, may participate in the averaging, banking and trading program described in this subpart.

■ 39. Section 90.210 is amended by adding paragraph (i) to read as follows:

§ 90.210 End-of-year and final reports.

* * * * *

(i) For 2007 and later model years, include in your end-of-year and final reports an accounting to show a separate balance of emission credits for handheld and nonhandheld engines. Use your best judgment to differentiate your current balance of banked credits for handheld and nonhandheld engines. You may exchange handheld and nonhandheld credits to demonstrate compliance with the requirements of this part 90. However, emission credits you generate for banking under this part 90 will be restricted for engines subject to the requirements of 40 CFR part 1054.

Subpart E—[Amended]

■ 40. Section 90.426 is amended as follows:
■ a. By revising paragraph (b).
■ b. By revising paragraph (c)(1).
■ c. By revising paragraph (d).
■ d. By revising paragraph (i).
■ e. By adding paragraph (j).

§ 90.426 Dilute emission sampling calculations—gasoline fueled engines.

* * * * *

(b) The mass flow rate, W_i in g/hr, of an emission for mode i is determined from the following equation:

$$W_i = Q_i \cdot \text{Density} \cdot \left[\frac{C_{Di}}{10^6} - \frac{C_{Bi}}{10^6} \cdot \left(1 - \frac{1}{DF_i}\right) \right]$$

Where:

Q_I = Volumetric flow rate [m^3/HR at stp].
Density = Density of a specific emission (DensityHC, DensityCO, $DensityCO_2$, Density NO_X) [g/m^3].
DF_i = Dilution factor of the dilute exhaust during mode i.
C_{Di} = Concentration of the emission (HC, CO, NO_X) in dilute exhaust extracted from the CVS during mode i [ppm].
C_{Bi} = Concentration of the emission (HC, CO, NO_X) in the background sample during mode i [ppm].
STP = Standard temperature and pressure. All volumetric calculations made for the equations in this section are to be corrected to a standard temperature of 20 °C and a standard pressure of 101.3 kPa.

(c) * * *

(1) The value of $Density_{HC}$ above is calculated based on the assumption that the fuel used has a hydrogen to carbon ratio of 1:1.85. For other fuels $Density_{HC}$ can be calculated from the following formula:

$$Density_{HC} = \frac{M_{HC}}{R_{STP}}$$

Where:

M_{HC} = The molecular weight of the hydrocarbon molecule divided by the number of carbon atoms in the molecule [g/mole].
R_{STP} = Ideal gas constant for a gas at STP = 0.024065 [m^3·mole]

* * * * *

(d) The dilution factor, DF, is teh ratio of the volumetric flow rate of the background air to that of the raw engine exhaust. The following formula is used to determine DF:

$$DF = \frac{\left(13.4 \cdot 10^4\right)}{\left(C_{DHC} + C_{DCO} + C_{DCO2}\right)}$$

Where:

C_{DHC} = Concentration of HC in the dilute sample [ppm].
C_{DCO} = Concentration of CO in the dilute sample [ppm].
C_{DCO2} = Concentration of CO_2 in the dilute sample [ppm].

* * * * *

(i) The mass of fuel consumed during the mode smpling period, M_{FUEL}, can be calculated from the following equation:

$$M_{FUEL} = \frac{G_S}{R_2}$$

Where:

G_S = Mass of carbon measured during the mode sampling period [g].
R_2 = The fuel carbon weight fraction, which is the mass of carbon in fuel per mass of fuel [g/g].

(j) The grams of carbon measured during the mode, G_S, can be calculated from the following equation:

$$G_S = \frac{\left(12.011 \cdot HC_{mass}\right)}{\left(12.011 + 1.008 \cdot \alpha\right)} + 0.429 \cdot CO_{mass} + 0.273 \cdot CO_{2mass}$$

Where:

HC_{mass} = mass of hydrocarbon emissions for the mode sampling period [grams].
CO_{mass} mass of carbon monoxide emissions for the mode sample period [grams].
CO_{2mass} = mass of carbon dioxide emissions for the mode sample period [grams].
α = The atomic hydrogen-to-carbon ratio of the fuel.

Subpart G—[Amended]

■ 41. Section 90.601 is amended by adding paragraph (c) to read as follows:

§ 90.601 Applicability.

* * * * *

(c) Importers must complete the appropirate EPA declaration form before importing an engine. These forms are available on the Internet at *http://www.epa.gov/OTAQ/imports/* or by phone at 734–214–4100. Importers must keep the forms for five years and make them available promptly upon request.

■ 42. Section 90.615 is revised to read as follows:

§ 90.615 Model year restrictions related to imported engines and equipment.

The provisions of 40 CFR 1068.360 apply starting January 1, 2009. These provisions limit the importation of engines or equipment after new emission standards have started to apply if the engines or equipment were built before the emission standards took effect.

Subpart K—[Amended]

■ 43. Section 90.1003 is amended by revising paragraph (b)(3) to read as follows:

§ 90.1003 Prohibited acts.

* * * * *

(b) * * *

(3) The followiong provisions apply for converting nonroad engines to use alternative fuels.

(i) Until December 31, 2009, converting an engine to use a clean alternative fuel (as defined in Title II of the Act) is not considered a prohibited act under paragraph (a) of this section if the engine complies with the applicable standard when operating on the alternative fuel. Also, in the case of engines converted to dual fuel or flexible use, the action must result in the proper functioning of the nonroad engine when it operates on conventional fuel.

(ii) The provisions of 40 CFR 1054.645 apply starting January 1, 2010.

* * * * *

■ 44. A new § 90.1007 is added to subpart K to read as follows:

§ 90.1007 Bonding requirements related to compliance, enforcement, and warranty assurance.

The bonding provisions of 40 CFR 1054.120(f)(4) and 1054.690 apply for all 2010 and later model year engines starting January 1, 2010. These provisions include measures to ensure that certifying manufacturers are able to cover any potential compliance or enforcement actions under the Clean Air Act and to meet their warranty obligations.

Subpart L—[Amended]

■ 45. Section 90.1103 is amended by adding paragraph (e) to read as follows:

§ 90.1103 Emission warranty, warranty period.

* * * * *

(e) Starting with the 2010 model year, you must meet the conditions specified in 40 CFR 1054.120(f) to ensure that owners will be able to promptly obtain warranty repairs.

Describe in your application for certification how you will meet these conditions.

PART 91—CONTROL OF EMISSIONS FROM MARINE SPARK-IGNITION ENGINES

■ 46. The authority citation for part 91 continues to read as follows:

Authority: 42 U.S.C. 7401–7671q.

Subpart A—[Amended]

■ 47. Section 91.1 is amended by adding paragraph (d) to read as follows:

§ 91.1 Applicability.

* * * * *

(d) This part does not apply to engines that are subject to emission standards under 40 CFR part 1045. See 40 CFR 1045.1 to determine when that part 1045 applies. Note that certain requirements and prohibitions apply to engines built on or after January 1, 2010 if they are installed in equipment that will be used solely for competition, as described in 40 CFR 1045.1 and 40 CFR 1068.1; those provisions apply instead of the provisions of this part 91.

Subpart B—[Amended]

■ 48. Section 91.101 is revised to read as follows:

§ 91.101 Applicability.

(a) The requirements of this subpart B are applicable to all engines subject to the provisions of subpart A of this part.

(b) In a given model year, you may ask us to approve the use of procedures for certification, labeling, reporting and recordkeeping, or other administrative requirements specified in 40 CFR part 1045 or 1068 instead of the comparable procedures specified in this part 91. We may approve the request as long as it does not prevent us from ensuring that you fully comply with the intent of this part.

■ 49. Section 91.107 is amended by adding paragraph (d)(12) to read as follows:

§ 91.107 Application for certification.

* * * * *

(d) * * *

(12) Identification of an agent for service located in the United States. Service on this agent constitutes service on you or any of your officers or employees for any action by EPA or otherwise by the United States related to the requirements of this part.

* * * * *

■ 50. Section 91.119 is amended by adding paragraph (b)(3) to read as follows:

§ 91.119 Certification procedure—use of special test procedures.

* * * * *

(b) * * *

(3) A manufacturer may elect to use the test procedures in 40 CFR part 1065 as an alternate test procedure without getting advance approval by the Administrator or meeting the other conditions of paragraph (b)(1) of this section. The manufacturer must identify in its application for certification that the engines were tested using the procedures in 40 CFR part 1065. For any EPA testing with engines subject to standards under this part, EPA will use the manufacturer's selected procedures for mapping engines, generating duty cycles, and applying cycle-validation criteria. For any other parameters, EPA may conduct testing using either of the specified procedures.

* * * * *

Subpart H—[Amended]

§ 91.707 [Removed]

■ 51. Section 91.707 is removed.

Subpart K—[Amended]

■ 52. A new § 91.1013 is added to subpart K to read as follows:

§ 91.1013 Exemption for certified Small SI engines.

The provisions of 40 CFR 1045.605 and 1045.610 apply for engines subject to the standards of this part 91. This generally allows manufacturers to use marine engines that have been certified to emission standards for nonroad spark-ignition engines below 19 kW without recertifying those engines under this part 91.

Subpart L—[Amended]

■ 53. Section 91.1103 is amended by revising paragraph (b)(3) to read as follows:

§ 91.1103 Prohibited acts.

* * * * *

(b) * * *

(3) The following provisions apply for converting marine SI engines to use alternative fuels:

(i) Until December 31, 2009, converting an engine to use a clean alternative fuel (as defined in Title II of the Act) is not considered a prohibited act under paragraph (a) of this section if the engine complies with the applicable standard when operating on the alternative fuel. Also, in the case of engines converted to dual fuel or flexible use, the action must result in the proper functioning of the engine when it operates on conventional fuel.

(ii) The provisions of 40 CFR 1045.645 apply starting January 1, 2010.

* * * * *

PART 92—CONTROL OF AIR POLLUTION FROM LOCOMOTIVES AND LOCOMOTIVE ENGINES

■ 54. The authority citation for part 92 continues to read as follows:

Authority: 42 U.S.C. 7401–7671q.

Subpart A—[Amended]

■ 55. Section 92.9 is amended by revising paragraph (b)(1)(ii) to read as follows:

§ 92.9 Compliance with emission standards.

* * * * *

(b) * * *

(1) * * *

(ii) The emission values to compare with the standards shall be the emission values of a low mileage locomotive, or development engine, or low hour locomotive engine, adjusted by the deterioration factors developed in accordance with the provisions of paragraph (b)(2) of this section. Before any emission value is compared with the standard, it shall be rounded, in accordance with ASTM E 29–93a (incorporated by reference at § 92.5), to the same number of decimal places as contained in the applicable standard.

* * * * *

Subpart D—[Amended]

■ 56. Section 92.304 is amended by revising paragraph (n)(1) to read as follows:

§ 92.304 Compliance requirements.

* * * * *

(n) * * *

(1) All locomotives that are certified to an FEL that is different from the emission standard that would otherwise apply to the locomotive or locomotive engine are required to comply with that FEL for the remainder of their service lives, except as allowed by § 92.8(a)(4)(iii) and this subpart.

* * * * *

Subpart I—[Amended]

§ 92.806 [Removed]

■ 57. Section 92.806 is removed.

PART 94—CONTROL OF EMISSIONS FROM MARINE COMPRESSION-IGNITION ENGINES

■ 58. The authority citation for part 94 continues to read as follows:

Authority: 42 U.S.C. 7401–7671q.

Subpart C—[Amended]

■ 59. Section 94.201 is revised to read as follows:

§ 94.201 Applicability.

(a) The requirements of this subpart are applicable to manufacturers of engines subject to the standards of subpart A of this part.

(b) In a given model year, you may ask us to approve the use of procedures for certification, labeling, reporting and recordkeeping, or other administrative requirements specified in 40 CFR part 1042 or 1068 instead of the comparable procedures specified in this part 94. We may approve the request as long as it does not prevent us from ensuring that you fully comply with the intent of this part.

Subpart I—[Amended]

§ 94.806 [Removed]

■ 60. Section 94.806 is removed.

■ 61. A new part 1027 is added to subchapter U of chapter I to read as follows:

PART 1027—FEES FOR ENGINE, VEHICLE, AND EQUIPMENT COMPLIANCE PROGRAMS

Sec.

Authority: 42 U.S.C. 7401–7671q.

§ 1027.101 To whom do these requirements apply?

(a) This part prescribes fees manufacturers must pay for activities related to EPA's engine, vehicle, and equipment compliance program (EVECP). This includes activities related to approving certificates of conformity and performing tests and taking other steps to verify compliance with emission standards. You must pay fees as described in this part if you are a manufacturer of any of the following products:

(1) Motor vehicles and motor vehicle engines we regulate under 40 CFR part 86. This includes light-duty vehicles, light-duty trucks, medium-duty passenger vehicles, highway motorcycles, and heavy-duty highway engines and vehicles.

(2) The following nonroad engines and equipment:

(i) Locomotives and locomotive engines we regulate under 40 CFR part 92 or 1033.

(ii) Nonroad compression-ignition engines we regulate under 40 CFR part 89 or 1039.

(iii) Marine compression-ignition engines we regulate under 40 CFR part 94 or 1042.

(iv) Marine spark-ignition engines and vessels we regulate under 40 CFR part 91, 1045, or 1060. We refer to these as Marine SI engines.

(v) Nonroad spark-ignition engines above 19 kW we regulate under 40 CFR part 1048. We refer to these as Large SI engines.

(vi) Recreational vehicles we regulate under 40 CFR part 1051.

(vii) Nonroad spark-ignition engines and equipment at or below 19 kW we regulate under 40 CFR part 90, 1054, or 1060. We refer to these as Small SI engines.

(3) The following stationary internal combustion engines:

(i) Stationary compression-ignition engines we certify under 40 CFR part 60, subpart IIII.

(ii) Stationary spark-ignition engines we certify under 40 CFR part 60, subpart JJJJ.

(b) This part applies to applications for certification that we receive on or after December 8, 2008. Earlier applications are subject to the provisions of 40 CFR part 85, subpart Y, as that provision read before December 8, 2008.

(c) Nothing in this part limits our authority to conduct testing or to require you to conduct testing as provided in the Act, including our authority to require you to conduct in-use testing under section 208 of the Act (42 U.S.C. 7542).

(d) Paragraph (a) of this section identifies the parts of the CFR that define emission standards and other requirements for particular types of engines and vehicles. This part 1027 refers to each of these other parts generically as the "standard-setting part." For example, 40 CFR part 1051 is always the standard-setting part for recreational vehicles. For some nonroad engines, we allow for certification related to evaporative emissions separate from exhaust emissions. In this case, 40 CFR part 1060 is the standard-setting part for the equipment or fuel system components you produce.

§ 1027.105 How much are the fees?

(a) Fees are determined based on the date we receive a complete application for certification. Each reference to a year in this subpart refers to the calendar year, unless otherwise specified. Paragraph (b) of this section specifies baseline fees, which applied for certificates received in 2005. For engine and vehicles not yet subject to standards in 2005, these values represent the fees that apply initially based on available information to characterize what the fees would have been in 2005. See paragraph (c) of this section for provisions describing how we calculate fees for future years.

(b) The following baseline fees for each application for certification:

(1) Except as specified in paragraph (b)(2) of this section for Independent Commercial Importers, the following fees apply for motor vehicles and motor vehicle engines:

Category	Certificate type	Fee
(i) Light-duty vehicles and trucks	Federal	$33,883
(ii) Light-duty vehicles and trucks	California-only	16,944
(iii) Medium-duty passenger vehicles	Federal	33,883
(iv) Medium-duty passenger vehicles	California-only	16,944
(v) Highway motorcycle	All	2,414
(vi) Heavy-duty highway engine	Federal	21,578
(vii) Heavy-duty highway engine	California-only	826
(viii) Complete heavy-duty highway vehicles	Federal	33,883
(ix) Complete heavy-duty highway vehicles	California-only	16,944

Category	Certificate type	Fee
(x) Heavy-duty vehicle	Evap	826

(2) A fee of $8,387 applies for Independent Commercial Importers with respect to the following motor vehicles:

(i) Light-duty vehicles and light-duty trucks.

(ii) Medium-duty passenger vehicles.

(iii) Complete heavy-duty highway vehicles.

(3) The following fees apply for nonroad and stationary engines, vehicles, equipment, and components:

Category	Certificate type	Fee
(i) Locomotives and locomotive engines	All	$826
(ii) Marine compression-ignition engines and stationary compression-ignition engines with per-cylinder displacement at or above 10 liters.	All, including Annex VI	826
(iii) Other nonroad compression-ignition engines and stationary compression-ignition engines with per-cylinder displacement below 10 liters.	All	1,822
(iv) Large SI engines	All	826
(v) Stationary spark-ignition engines above 19 kW	All	826
(vi) Marine SI engines and Small SI engines	Exhaust only	826
(vii) Stationary spark-ignition engines at or below 19 kW	Exhaust only	826
(viii) Recreational vehicles	Exhaust (or combined exhaust and evap)	826
(ix) Equipment and fuel system components associated with nonroad and stationary spark-ignition engines.	Evap (where separate certification is required).	241

(c) We will calculate adjusted fees for later years based on changes in the Consumer Price Index and the number of certificates. We will announce adjusted fees for a given year by January 31 of the preceding year.

(1) We will adjust the values specified in paragraph (b) of this section for later years as follows:

(i) Use the fee identified in § 1027.105(b)(3) through 2014 for certification related to evaporative emissions from nonroad and stationary engines when a separate fee applies for certification to evaporative emission standards. Use the following equation starting with 2015:

$$\text{Certificate Fee}_{CY} = \left[\left((Op + L)\cdot\frac{CPI_{CY-2}}{CPI_{2006}}\right)\right]\cdot\frac{1.169}{\left[\left(cert\#_{MY-2} + cert\#_{MY-3}\right)\cdot 0.5\right]}$$

Where:

Certificate Fee_{CY} = Fee per certificate for a given year.

Op = operating costs are all of EPA's nonlabor costs for each category's compliance program, including any fixed costs associated with EPA's testing laboratory, as described in paragraph (d)(1) of this section.

L = the labor costs, to be adjusted by the Consumer Price Index, as described in paragraph (d)(1) of this section.

CPI_{CY-2} = the Consumer Price Index for the month of November two years before the applicable calendar year, as described in paragraph (d)(2) of this section.

CPI_{2006} = 201.8. This is based on the October 2006 value of the Consumer Price Index.

OH = 1.169. This is based on EPA overhead, which is applied to all costs.

$cert\#_{MY-2}$ = the total number of certificates issued for a fee category in the model year two years before the calendar year for the applicable fees as described in paragraph (d)(3) of this section.

$cert\#_{MY-3}$ = the total number of certificates issued for a fee category in the model year three years before the calendar year for the applicable fees as described in paragraph (d)(3) of this section.

(ii) Use the following equation for all other certificates for 2006 and later:

$$\text{Certificate Fee}_{CY} = \left[\left((Op + L)\cdot\frac{CPI_{CY-2}}{CPI_{2002}}\right)\right]\cdot\frac{1.169}{\left[\left(cert\#_{MY-2} + cert\#_{MY-3}\right)\cdot 0.5\right]}$$

Where:

CPI_{2002} = 180.9. This is based on the December 2002 value of the Consumer Price Index as described in paragraph (d)(2) of this section.

(2) The fee for any year will remain at the previous year's amount until the value calculated in paragraph (c)(1) of this section differs by at least $50 from the amount specified for the previous year.

(d) Except as specified in § 1027.110(a) for motor vehicles and motor vehicle engines, we will use the following values to determine adjusted fees using the equation in paragraph (c) of this section:

(1) The following values apply for operating costs and labor costs:

Engine or Vehicle Category	Op	L
(i) Light-duty, medium-duty passenger, and complete heavy-duty highway vehicle certification	$3,322,039	$2,548,110

Engine or Vehicle Category	Op	L
(ii) Light-duty, medium-duty passenger, and complete heavy-duty highway vehicle in-use testing	2,858,223	2,184,331
(iii) Independent Commercial Importers identified in § 1027.105(b)(2)	344,824	264,980
(iv) Highway motorcycles	225,726	172,829
(v) Heavy-duty highway engines	1,106,224	1,625,680
(vi) Nonroad compression-ignition engines that are not locomotive or marine engines, and stationary compression-ignition engines with per-cylinder displacement below 10 liters	486,401	545,160
(vii) Evaporative certificates related to nonroad and stationary engines	5,039	236,670
(viii) All other	177,425	548,081

(2) The applicable Consumer Price Index is based on the values published by the Bureau of Labor Statistics for all U.S. cities using the ''U.S. city average'' area, ''all items,'' and ''not seasonally adjusted'' numbers (see *ftp://ftp.bls.gov/pub/special.requests/cpi/cpiai.txt*). For example, we calculated the 2006 fees using the Consumer Price Index for November 2004, which is 191.0.

(3) Fee categories for counting the number of certificates issued are based on the grouping shown in paragraph (d)(1) of this section.

(e) The following example for calculating the 2006 complete federal heavy duty highway vehicle fee illustrates the fee adjustment:

O_p = $1,106,224

L = $1,625,680

CPI_{2002} = 180.9

CPI_{2004} = 191.0

cert $\#_{2004}$ = 131

cert$\#_{2003}$ = 95

Fee_{06} = [$1,106,224 + $1,625,680 . (191.0/180.9)] . 1.169/[(131+95) . 0.5] = $29,200.88

Assessed Fee = $29,201

§ 1027.110 What special provisions apply for certification related to motor vehicles?

(a) We will adjust fees for 2006 and later years for light-duty, medium-duty passenger, and complete heavy-duty highway vehicles as follows:

(1) *California-only certificates.* Calculate adjusted fees for California-only certificates by applying the light-duty, medium-duty passenger, and complete heavy-duty highway vehicle certification Op and L values to the equation in § 1027.105(c). The total number of certificates issued will be the total number of California-only and federal light-duty, medium-duty passenger, and complete heavy-duty highway vehicle certificates issued during the appropriate model years.

(2) *Federal certificates.* Calculate adjusted fees for federal certificates with the following three steps:

(i) Apply the light-duty, medium-duty passenger, and complete heavy-duty highway vehicle certification Op and L values to the equation in § 1027.105(c) to determine the certification portion of the light-duty fee. The total number of certificates issued will be the total number of California-only and federal light-duty, medium-duty passenger and complete heavy-duty highway vehicle certificates issued during the appropriate model years.

(ii) Apply the light-duty, medium-duty passenger, and complete heavy-duty highway vehicle in-use testing Op and L values to the equation in § 1027.105(c) to determine the in-use testing portion of the fee. The total number of certificates issued will be the total number of federal light-duty, medium-duty passenger, and complete heavy-duty highway vehicle certificates issued during the appropriate model years.

(iii) Add the certification and in-use testing portions determined in paragraphs (a)(2)(i) and (ii) of this section to determine the total light-duty, medium-duty passenger, and complete heavy-duty highway vehicle fee for each federal certificate.

(b) For light-duty vehicles, light-duty trucks, medium-duty passenger vehicles, highway motorcycles, and complete heavy-duty highway vehicles subject to exhaust emission standards, the number of certificates issued as specified in § 1027.105(d)(3) is based only on engine families with respect to exhaust emissions. A separate fee applies for each evaporative family for heavy-duty engines.

(c) If you manufacture a heavy-duty vehicle that another company has certified as an incomplete vehicle such that you exceed the maximum fuel tank size specified by the original manufacturer in the applicable certificate of conformity, you must submit a new application for certification and certification fee for the vehicle.

§ 1027.115 What special provisions apply for certification related to nonroad and stationary engines?

(a) For spark-ignition engines above 19 kW that we regulate under 40 CFR part 1048 and for all compression-ignition engines, the applicable fee is based only on engine families with respect to exhaust emissions.

(b) For manufacturers certifying recreational vehicles with respect to both exhaust and evaporative emission standards, fees are determined using one of the following approaches:

(1) If your engine family includes demonstration of compliance with both exhaust and evaporative emission standards, the applicable fee is based on certification related to the combined family. No separate fee applies for certification with respect to evaporative emission standards. These are all considered engine families complying with exhaust emissions for determining the number of certificates for calculating fees for later years.

(2) If you have separate families for demonstrating compliance with exhaust and evaporative emission standards, a separate fee from the appropriate fee category applies for each unique family. Also, the number of certificates issued as specified in § 1027.105(d)(3) is based on a separate count of emission families for exhaust and evaporative emissions for each respective fee category.

(c) For manufacturers certifying other spark-ignition engines or equipment with respect to exhaust and evaporative emission standards, a separate fee from the appropriate fee category applies for each unique family. A single engine or piece of equipment may involve separate emission families and certification fees for exhaust and evaporative emissions. Also, the number of certificates issued as specified in § 1027.105(d)(3) is based on a separate count of emission families for exhaust and evaporative emissions for each respective fee category.

(d) For any certification related to evaporative emissions from engines, equipment, or components not covered by paragraph (a) through (c) of this section, the fee applies for each certified product independent of certification for exhaust emissions, as illustrated in the following examples:

(1) A fuel tank certified to meet permeation and diurnal emission standards would count as a single family for assessing the certification fee and for calculating fee amounts for future years.

(2) If an equipment manufacturer applies for certification to generate or use emission credits for fuel tanks and

fuel lines, each affected fuel-tank and fuel-line family would count as a single family for assessing the certification fee and for calculating fee amounts for future years. This fee applies whether or not the equipment manufacturer is applying for certification to demonstrate compliance with another emission standard, such as running losses.

(e) If you certify fuel system components under 40 CFR part 1060, a single fee applies for each emission family even if those components are used with different types of nonroad or stationary engines.

(f) If your application for certification relates to emission standards that apply only in California, you must pay the same fee identified for meeting EPA standards.

(g) For marine compression-ignition engines, if you apply for a federal certificate and an Annex VI certificate for the same engine family, a single fee applies for the engine family (see 40 CFR parts 94 and 1042).

(h) If you produce engines for multiple categories in a single engine family, a single fee applies for the engine family. For example, 40 CFR 60.4210 allows you to produce stationary and nonroad compression-ignition engines in a single engine family. If the certification fee for the different types of engines is different, the fee that applies for these engines is based on the emission standards to which you certify the engine family. For example, if you certify marine diesel engines to the standards that apply to land-based nonroad diesel engines under 40 CFR 94.912, the certification fee is based on the rate that applies for land-based nonroad diesel engines.

§ 1027.120 Can I qualify for reduced fees?

(a) *Eligibility requirements.* Both of the following conditions must be met before you are eligible for a reduced fee:

(1) The certificate is to be used for sale of vehicles or engines within the United States.

(2) The full fee for an application for certification for a model year exceeds 1.0% of the aggregate projected retail sales price of all vehicles or engines covered by the certificate.

(b) *Initial reduced fee calculation.* (1) If the conditions of paragraph (a) of this section are met, the initial fee paid must be $750 or 1.0% of the aggregate projected retail sales price of all the vehicles or engines to be covered by the certificate, whichever is greater.

(2) For vehicles or engines that are converted to operate on an alternative fuel using as the basis for the conversion a vehicle or engine that is covered by an existing certificate of conformity, the cost basis used in this section must be the aggregate projected retail value-added to the vehicle or engine by the conversion rather than the full cost of the vehicle or engine. For this provision to apply, the existing certificate must cover the same sales area and model year as the requested certificate for the converted vehicle or engine.

(3) For remanufacturing systems, the cost basis used in this section must be the aggregate projected retail cost of a complete remanufacture, including the cost of the replacement components, software, and assembly.

(4) For ICI certification applications, the cost basis of this section must be the aggregate projected retail cost of the entire vehicle(s) or engine(s), not just the value added by the conversion. If the vehicles/engines covered by an ICI certificate are not being offered for sale, the manufacturer shall use the fair retail market value of the vehicles/engines as the retail sale price required in this section. For an ICI application for certification, the retail sales price (or fair retail market value) must be based on the applicable National Automobile Dealer's Association (NADA) appraisal guide and/or other evidence of the actual market value.

(5) The aggregate cost used in this section must be based on the total projected sales of all vehicles and engines under a certificate, including vehicles and engines modified under the modification and test option in 40 CFR 85.1509 and 89.609. The projection of the number of vehicles or engines to be covered by the certificate and their projected retail selling price must be based on the latest information available at the time of the fee payment.

(6) You may submit a reduced fee as described in this section if it is accompanied by a calculation of the fee based on the number of vehicles covered and the projected aggregate retail sales price as specified on the fee filing form. Your reduced fee calculation shall be deemed approved unless we determine that the criteria of this section have not been met. We may make such a determination either before or after issuing a certificate of conformity. If we determine that the requirements of this section have not been met, we may deny future reduced fee applications and require submission of the full fee payment until you demonstrate to our satisfaction that your reduced fee submissions are based on accurate data and that final fee payments are made within 45 days of the end of the model year.

(7) If we deny your request for a reduced fee, you must send us the appropriate fee within 30 days after we notify you.

(c) *Revision of the number of vehicles or engines covered by the certificate.* (1) You must take both of the following steps if the number of vehicles or engines to be produced or imported under the certificate exceeds the number indicated on the certificate (including a certificate under which modification and test vehicles are imported under 40 CFR 85.1509 and 89.609):

(i) Request that we revise the certificate with a number that indicates the new projection of the vehicles or engines to be covered by the certificate. We must issue the revised certificate before the additional number of vehicles or engines may be sold or finally imported into the United States.

(ii) Submit payment of 1.0% of the aggregate projected retail sales price of all the additional vehicles or engines.

(2) You must receive a revised certificate before the sale or final importation of any vehicles or engines, including modification and test vehicles, that are not originally included in the certificate issued under paragraph (b) of this section, or as indicated in a revised certificate issued under paragraph (c)(1) of this section. Such vehicles that are sold or imported before we issue a revised certificate are deemed to be not covered by a certificate of conformity.

(d) *Final reduced fee calculation and adjustment.* (1) If the initial fee payment is less than the final reduced fee, you must pay the difference between the initial reduced fee and the final reduced fee using the provisions of § 1027.130. Calculate the final reduced fee using the procedures of paragraph (c) of this section but using actual production figures rather than projections and actual retail sales value rather than projected retail sales value.

(2) You must pay the difference between the initial reduced fee and the final reduced fee within 45 days of the end of the model year. The total fees paid for a certificate may not exceed the applicable full fee specified in § 1027.105. We may void the applicable certificate if you fail to make a complete payment within the specified period. We may also refuse to grant reduced fee requests submitted under paragraph (b)(5) of this section.

(3) If the initial fee payment exceeds the final reduced fee, you may request a refund using the procedures of § 1027.125.

(e) *Records retention.* You are subject to the applicable requirements to maintain records under this chapter. If you fail to maintain required records or provide them to us, we may void the certificate associated with such records. You must also record the basis you used to calculate the projected sales and fair retail market value and the actual sales and retail price for the vehicles and engines covered by each certificate issued under this section. You must keep this information for at least three years after we issue the certificate and provide it to us within 30 days of our request.

§ 1027.125 Can I get a refund?

(a) We will refund the total fee imposed under this part if you ask for a refund after failing to get a certificate for any reason.

(b) If your actual sales or the actual retail prices in a given year are less than you projected for calculating a reduced fee under § 1027.120, we will refund the appropriate portion of the fee. We will also refund a portion of the initial payment if it exceeds the final fee for the engines, vehicles, or equipment covered by the certificate application.

(1) You are eligible for a partial refund related only to a certificate used for the sale of engines, vehicles, or equipment under that certificate in the United States.

(2) Include all the following in your request for a partial refund of reduced fee payments:

(i) State that you sold engines, vehicles, or equipment under the applicable certificate in the United States.

(ii) Identify the number of engines, vehicles, or equipment you produced or imported under the certificate, and whether the engines, vehicles, or equipment have been sold.

(iii) Identify the reduced fee that you paid under the applicable certificate.

(iv) Identify the actual retail sales price for the engines, vehicles, or equipment produced or imported under the certificate.

(v) Calculate the final value of the reduced fee using actual production figures and retail prices.

(vi) Calculate the refund amount.

(c) We will approve your request to correct errors in the amount of the fee.

(d) All refunds must be applied for within six months after the end of the model year.

(e) Send refund and correction requests to the Fee Program Specialist, U.S. Environmental Protection Agency, Vehicle Programs and Compliance Division, 2000 Traverwood Dr., Ann Arbor, MI 48105, online at *www.Pay.gov,* or as specified in guidance by the Administrator.

(f) You may request to have refund amounts applied to the amount due on another application for certification.

§ 1027.130 How do I make a fee payment?

(a) Pay fees to the order of the Environmental Protection Agency in U.S. dollars using any of the following methods: money order, bank draft, certified check, corporate check, electronic funds transfer, any method available for payment online at *www.Pay.gov.,* or as specified in EPA guidance.

(b) Send a completed fee filing form to the address designated on the form for each fee payment or electronically at www.Pay.gov., or as provided in EPA guidance. These forms are available on the Internet at *http://www.epa.gov/otaq/guidance.htm.*

(c) You must pay the fee amount due before we will start to process an application for certification.

(d) If we deny a reduced fee, you must pay the proper fee within 30 days after we notify you of our decision.

§ 1027.135 What provisions apply to a deficient filing?

(a) Any filing under this part is deficient if it is not accompanied by a completed fee filing form and full payment of the appropriate fee.

(b) A deficient filing will be rejected unless the completed form and full payment are submitted within a time limit we specify. We will not process an application for certification if the associated filing is deficient.

§ 1027.140 What reporting and recordkeeping requirements apply under this part?

Under the Paperwork Reduction Act (44 U.S.C. 3501 *et seq.*), the Office of Management and Budget approves the reporting and recordkeeping specified in the applicable regulations. The following items illustrate the kind of reporting and recordkeeping we require for engines, vehicles, and equipment regulated under this part:

(a) Filling out fee filing forms under § 1027.130.

(b) Retaining fee records, including reduced fee documentation, under § 1027.120.

(c) Requesting refunds under § 1027.125.

§ 1027.150 What definitions apply to this subpart?

The definitions in this section apply to this part. As used in this part, all undefined terms have the meaning the Act or the standard-setting part gives to them. The definitions follow:

Annex VI means MARPOL Annex VI, which is an annex to the International Convention on the Prevention of Pollution from Ships, 1973, as modified by the protocol of 1978 relating thereto. This is an international treaty regulating disposal of waste products from marine vessels.

Application for Certification means a manufacturer's submission of an application for certification.

California-only certificate is a certificate of conformity issued by EPA showing compliance with emission standards established by California.

Federal certificate is a certificate of conformity issued by EPA showing compliance with EPA emission standards specified in one of the standard-setting parts specified in § 1027.101(a).

Light-duty means relating to light-duty vehicles and light-duty trucks.

Manufacturer has the meaning given in section 216(1) of the Act. In general, this term includes any person who manufactures an engine, vehicle, vessel, or piece of equipment for sale in the United States or otherwise introduces a new engine, vehicle, vessel, or piece of equipment into commerce in the United States. This includes importers who import such products for resale, but not dealers.

Total number of certificates issued means the number of certificates for which fees have been paid. This term is not intended to represent multiple certificates that are issued within a single family or test group.

Void has the meaning given in 40 CFR 1068.30.

We (us, our) means the Administrator of the Environmental Protection Agency and any authorized representatives.

§ 1027.155 What abbreviations apply to this subpart?

The following symbols, acronyms, and abbreviations apply to this part:

CFR	Code of Federal Regulations.
EPA	U.S. Environmental Protection Agency.
Evap	Evaporative Emissions.
EVECP	Engine, vehicle, and equipment compliance program.
ICI	Independent Commercial Importer.
U.S.	United States.

PART 1033—CONTROL OF EMISSIONS FROM LOCOMOTIVES

■ 62. The authority citation for part 1033 continues to read as follows:

Authority: 42 U.S.C. 7401–7671q.

Subpart B—[Amended]

■ 63. Section 1033.101 is amended by revising *paragraph (b) to read as follows:*

§ 1033.101 Exhaust emission standards.

* * * * *

(b) *Emission standards for switch locomotives.* Exhaust emissions from your new locomotives may not exceed the applicable emission standards in Table 2 to this section during the useful life of the locomotive. (Note: § 1033.901 defines locomotives to be ''new'' when originally manufactured and when remanufactured.) Measure emissions using the applicable test procedures described in subpart F of this part.

TABLE 2 TO § 1033.101—SWITCH LOCOMOTIVE EMISSION STANDARDS

Year of original manufacture	Tier of standards	Standards (g/bhp-hr)			
		NO_X	PM	HC	CO
1973–2001	Tier 0	11.8	0.26	2.10	8.0
2002–2004	Tier 1 [a]	11.0	0.26	1.20	2.5
2005–2010	Tier 2 [a]	8.1	[b] 0.13	0.60	2.4
2011–2014	Tier 3	5.0	0.10	0.60	2.4
2015 or later	Tier 4	[c] 1.3	0.03	[c] 0.14	2.4

[a] Switch locomotives subject to the Tier 1 through Tier 2 emission standards must also meet line-haul standards of the same tier.
[b] The PM standard for new Tier 2 switch locomotives is 0.24 g/bhp-hr until January 1, 2013.
[c] Manufacturers may elect to meet a combined NO_X+HC standard of 1.4 g/bhp-hr instead of the otherwise applicable Tier 4 NO_X and HC standards, as described in paragraph (j) of this section.

* * * * *

■ 64. Section 1033.115 is amended by adding and reserving paragraph (f)(2) and revising paragraph (g) to read as follows:

§ 1033.115 Other requirements.

* * * * *

(f) * * *

(2) [Reserved]

(g) *Idle controls.* All new locomotives must be equipped with automatic engine stop/start as described in this paragraph (g). All new locomotives must be designed to allow the engine(s) to be restarted at least six times per day without causing engine damage that would affect the expected interval between remanufacturing. Note that it is a violation of 40 CFR 1068.101(b)(1) to circumvent the provisions of this paragraph (g).

(1) Except as allowed by paragraph (g)(2) of this section, the stop/start systems must shut off the main locomotive engine(s) after 30 minutes of idling (or less).

(2) Stop/start systems may restart or continue idling for the following reasons:

(i) To prevent engine damage such as to prevent the engine coolant from freezing.

(ii) To maintain air pressure for brakes or starter system, or to recharge the locomotive battery.

(iii) To perform necessary maintenance.

(iv) To otherwise comply with federal regulations.

(3) You may ask to use alternate stop/start systems that will achieve equivalent idle control.

(4) See § 1033.201 for provisions that allow you to obtain a separate certificate for idle controls.

(5) It is not considered circumvention to allow a locomotive to idle to heat or cool the cab, provided such heating or cooling is necessary.

* * * * *

■ 65. Section 1033.120 is amended by revising paragraph (b) to read as follows:

§ 1033.120 Emission-related warranty requirements.

* * * * *

(b) *Warranty period.* Except as specified in this paragraph, the minimum warranty period is one-third of the useful life. Your emission-related warranty must be valid for at least as long as the minimum warranty periods listed in this paragraph (b) in MW-hrs of operation (or miles for Tier 0 locomotives not equipped with MW-hr meters) and years, whichever comes first. You may offer an emission-related warranty more generous than we require. The emission-related warranty for the locomotive may not be shorter than any published warranty you offer without charge for the locomotive. Similarly, the emission-related warranty for any component may not be shorter than any published warranty you offer without charge for that component. If you provide an extended warranty to individual owners for any components covered in paragraph (c) of this section for an additional charge, your emission-related warranty must cover those components for those owners to the same degree. If the locomotive does not record MW-hrs, we base the warranty periods in this paragraph (b) only on years. The warranty period begins when the locomotive is placed into service, or back into service after remanufacture.

* * * * *

■ 66. Section 1033.135 is amended by revising paragraph (b)(2)(i) to read as follows:

§ 1033.135 Labeling.

* * * * *

(b) * * *

(2) * * *

(i) The label must be permanent and legible and affixed to the locomotive in a position in which it will remain readily visible. Attach it to a locomotive chassis part necessary for normal operation and not normally requiring replacement during the service life of the locomotive. You may not attach this label to the engine or to any equipment that is easily detached from the locomotive. Attach the label so that it cannot be removed without destroying or defacing the label. For Tier 0 and Tier 1 locomotives, the label may be made up of more than one piece, as long as all pieces are permanently attached to the locomotive.

* * * * *

■ 67. Section 1033.150 is amended by revising paragraph (b) and adding paragraph (m) to read as follows:

§ 1033.150 Interim provisions.

* * * * *

(b) *Idle controls.* A locomotive equipped with an automatic engine stop/start system that was originally installed before January 1, 2009 and that conforms to the requirements of § 1033.115(g) is deemed to be covered by a certificate of conformity with respect to the requirements of § 1033.115(g). Note that the provisions of subpart C of this part also allow you to apply for a conventional certificate of conformity for such systems.

* * * * *

(m) *Assigned deterioration factors.* The provisions of this paragraph (m) apply for Tier 0 and Tier 1 locomotives to the standards of this part during model years 2008 or 2009. Remanufacturers certifying such locomotives to the standards of this part during these model years may use an assigned deterioration factor of 0.03 g/bhp-hr for PM and an assigned deterioration factor of zero for other pollutants. For purposes of determining compliance other than for certification or production-line testing, calculate the applicable in-use compliance limits for these locomotives by adjusting the applicable PM standards/FELs upward by 0.03 g/bhp-hr.

Subpart C—[Amended]

§ 1033.205 [Amended]

■ 68. Section 1033.205 is amended by removing and reserving paragraph (b).

■ 69. Section 1033.230 is amended by revising paragraph (f) to read as follows:

§ 1033.230 Grouping locomotives into engine families.

* * * * *

(f) During the first six calendar years after a new tier of standards becomes applicable, remanufactured engines/locomotives may be included in the same engine family as freshly manufactured locomotives, provided the same engines and emission controls are used for locomotive models included in the engine family.

Subpart D—[Amended]

■ 70. Section 1033.335 is amended by revising paragraph (g) introductory text to read as follows:

§ 1033.335 Remanufactured locomotives: installation audit requirements.

* * * * *

(g) Within 45 calendar days of the end of each quarter, the remanufacturer must send the Designated Compliance Officer a report which includes the following information:

* * * * *

Subpart F—[Amended]

■ 71. Section 1033.510 is amended by revising the introductory text to read as follows:

§ 1033.510 Auxiliary power units.

If your locomotive is equipped with an auxiliary power unit (APU) that operates during an idle shutdown mode, you must account for the APU's emissions rates as specified in this section, unless the APU is part of an AESS system that was certified separately from the rest of the locomotive. This section does not apply for auxiliary engines that only provide hotel power.

* * * * *

■ 72. Section 1033.515 is amended by revising paragraph (c)(5) and by redesignating paragraphs (f) and (g) as paragraphs (d) and (e), respectively, to read as follows.

§ 1033.515 Discrete-mode steady-state emission tests of locomotives and locomotive engines.

* * * * *

(c) * * *

(5) Begin proportional sampling of PM emissions at the beginning of each sampling period and terminate sampling within + 5 seconds of the specified time in each test mode. If the PM sample is sufficiently large, take one of the following actions consistent with good engineering judgment:

(i) Extend the sampling period up to a maximum of 15 minutes.

(ii) Use three different dilution ratios for the modes: one for both idle modes, one for dynamic brake through notch 5, and one for notches 6 through 8.

* * * * *

■ 73. Section 1033.530 is amended by revising paragraph (e) to read as follows:

§ 1033.530 Duty cycles and calculations.

* * * * *

(e) *Automated Start-Stop.* For locomotive equipped with features that shut the engine off after prolonged periods of idle, multiply the measured idle mass emission rate over the idle portion of the applicable test cycles by a factor equal to one minus the estimated fraction reduction in idling time that will result in use from the shutdown feature. Do not apply this factor to the weighted idle power. Application of this adjustment is subject to our approval if the fraction reduction in idling time that is estimated to result from the shutdown feature is greater than 25 percent. This paragraph (e) does not apply if the locomotive is (or will be) covered by a separate certificate for idle control.

* * * * *

Subpart G—[Amended]

■ 74. Section 1033.601 is amended by revising paragraphs (c)(1) and (c)(3) to read as follows:

§ 1033.601 General compliance provisions.

* * * * *

(c) * * *

(1) The exemption provisions of 40 CFR 1068.240 (i.e., exemptions for replacement engines) do not apply for domestic or imported locomotives. (Note: You may introduce into commerce freshly manufactured replacement engines under this part, provided the locomotives into which they are installed are covered by a certificate of conformity.)

* * * * *

(3) The exemption provisions of 40 CFR 1068.261 (i.e., exemptions for delegated assembly) do not apply for domestic or imported locomotives, except as specified in § 1033.630.

* * * * *

■ 75. Section 1033.630 is amended by revising paragraph (b) introductory text to read as follows:

§ 1033.630 Staged assembly and delegated assembly exemptions.

* * * * *

(b) *Delegated assembly.* This paragraph (b) applies where the engine manufacturer/remanufacturer does not complete assembly of the locomotives and the engine is shipped after being manufactured or remanufactured (partially or completely). The provisions of this paragraph (b) apply differently depending on who holds the certificate of conformity and the state of the engine when it is shipped. You may request an exemption under this paragraph (b) in your application for certification, or in a separate submission. If you include your request in your application, your exemption is approved when we grant your certificate. A manufacturer/remanufacturer may request an exemption under 40 CFR 1068.261 instead of under this section.

* * * * *

■ 76. Section 1033.640 is amended by revising paragraph (b) to read as follows:

§ 1033.640 Provisions for repowered and refurbished locomotives.

* * * * *

(b) A single existing locomotive cannot be divided into parts and combined with new parts to create more than one remanufactured locomotive. However, any number of locomotives can be divided into parts and combined with new parts to create more than one remanufactured locomotive, provided the number of locomotives created (remanufactured and freshly manufactured) does not exceed the number of locomotives that were disassembled.

* * * * *

■ 77. Section 1033.645 is amended by revising paragraph (a) to read as follows:

§ 1033.645 Non-OEM component certification program.

* * * * *

(a) *Applicability.* This section applies only for components that are commonly replaced during remanufacturing. It does not apply for other types of components that are replaced during a locomotive's useful life, but not typically replaced during remanufacture. Certified components may be used for remanufacturing or other maintenance.

* * * * *

Subpart I—[Amended]

■ 78. Section 1033.810 is amended by revising paragraph (c) introductory text to read as follows:

§ 1033.810 In-use testing program.

* * * * *

(c) *Test locomotive selection.* Unless we specify a different option, select test locomotives as specified in paragraph (c)(1) of this section (Option 1). In no case may you exclude locomotives because of visible smoke, a history of durability problems, or other evidence of malmaintenance. You may test more locomotives than this section requires.

* * * * *

Subpart J—[Amended]

■ 79. Section 1033.901 is amended by revising paragraph (2)(ii) of the definition for ''New'' to read as follows:

§ 1033.901 Definitions.

* * * * *

New, * * *

(2) * * *

(ii) Locomotives that are owned and operated by a small railroad and that have never been certified (i.e., manufactured or remanufactured into a certified configuration) are not considered to become new when remanufactured. The provisions of paragraph (1) of this definition apply for locomotives that have previously been remanufactured into a certified configuration.

* * * * *

PART 1039—CONTROL OF EMISSIONS FROM NEW AND IN-USE NONROAD COMPRESSION-IGNITION ENGINES

■ 80. The authority citation for part 1039 continues to read as follows:

Authority: 42 U.S.C. 7401–7671q.

Subpart A—[Amended]

■ 81. Section 1039.5 is amended by revising paragraph (d) and adding paragraph (e) to read as follows:

§ 1039.5 Which engines are excluded from this part's requirements?

* * * * *

(d) *Hobby engines.* Engines installed in reduced-scale models of vehicles that are not capable of transporting a person are not subject to the provisions of this part 1039.

(e) *Engines used in recreational vehicles.* Engines certified to meet the requirements of 40 CFR part 1051 or are otherwise subject to 40 CFR part 1051 (for example, engines used in snowmobiles and all-terrain vehicles) are not subject to the provisions of this part 1039.

Subpart B—[Amended]

■ 82. Section 1039.102 is amended by revising paragraph (g)(4) to read as follows:

§ 1039.102 What exhaust emission standards and phase-in allowances apply for my engines in model year 2014 and earlier?

* * * * *

(g) * * *

(4) *Special provisions for 37–56 kW engines.* For engines at or above 37 kW and below 56 kW from model years 2008 through 2012, you must add information to the emission-related installation instructions to clarify the equipment manufacturer's obligations under § 1039.104(f).

■ 83. Section 1039.125 is amended by revising paragraphs (a)(2)(i) and (a)(3)(i) to read as follows:

§ 1039.125 What maintenance instructions must I give to buyers?

* * * * *

(a) * * *

(2) * * *

(i) For EGR-related filters and coolers, PCV valves, crankcase vent filters, and fuel injector tips (cleaning only), the minimum interval is 1,500 hours.

* * * * *

(3) * * *

(i) For EGR-related filters and coolers, PCV valves, crankcase vent filters, and fuel injector tips (cleaning only), the minimum interval is 1,500 hours.

* * * * *

■ 84. Section 1039.135 is amended by revising paragraph (c)(4) to read as follows:

§ 1039.135 How must I label and identify the engines I produce?

* * * * *

(c) * * *

(4) State the power category or subcategory from § 1039.101 or § 1039.102 that determines the applicable emission standards for the engine family. For engines at or above 37 kW and below 56 kW from model years 2008 through 2012, and for engines less than 8 kW utilizing the provision at § 1039.101(c), you must state the applicable PM standard for the engine family.

* * * * *

Subpart G—[Amended]

■ 85. Section 1039.625 is amended as follows:

■ a. By revising paragraph (d)(1).

■ b. By revising paragraphs (e) introductory text, (e)(1), and (e)(3).

■ c. By revising paragraph (f)(4).

■ d. By revising paragraphs (g)(1) introductory text, (g)(1)(ii), and (g)(1)(iv).

■ e. By revising paragraph (g)(2).

■ f. By revising paragraph (j).

■ g. By revising paragraph (m)(2) introductory text.

§ 1039.625 What requirements apply under the program for equipment-manufacturer flexibility?

* * * * *

(d) * * *

(1) If you use the provisions of 40 CFR 1068.105(a) to use up your inventories of engines not certified to new emission standards, do not include these units in your count of equipment with exempted engines under paragraph (b) of this section. However, you may include these units in your count of total equipment you produce for the given year for the percentage calculation in paragraph (b)(1) of this section.

* * * * *

(e) *Standards.* If you produce equipment with exempted engines under this section, the engines must meet emission standards specified in this paragraph (e). Note that we consider engines to be meeting emission standards even if they are certified with a family emission limit that is higher than the emission standard that would otherwise apply.

(1) If you are using the provisions of paragraph (d)(4) of this section, engines must meet the applicable Tier 1 or Tier 2 emission standards described in § 89.112.

* * * * *

(3) In all other cases, engines at or above 56 kW and at or below 560 kW must meet the appropriate Tier 3 standards described in 40 CFR 89.112. Engines below 56 kW and engines above 560 kW must meet the appropriate Tier 2 standards described in 40 CFR 89.112.

(f) * * *

(4) An e-mail address and phone number to contact for further information, or a Web site that includes this contact information.

* * * * *

(g) * * *

(1) Before you use the provisions of this section, send the Designated Compliance Officer a written notice of your intent, including:

* * * * *

(ii) The name, phone number and e-mail address of a person to contact for more information.

* * * * *

(iv) The name and address of each company you expect to produce engines for the equipment you manufacture under this section.

* * * * *

(2) For each year that you use the provisions of this section, send the Designated Compliance Officer a written report by March 31 of the following year. Identify the following things in your report:

(i) The total count of units you sold in the preceding year for each power category, based on actual U.S.-directed production information.

(ii) The percentages of U.S.-directed production that correspond to the number of units in each power category and the cumulative numbers and percentages of units for all the units you have sold under this section for each power category. You may omit the percentage figures if you include in the report a statement that you will not be using the percent-of-production allowances in paragraph (b)(1) of this section.

(iii) The manufacturer of the engine installed in the equipment you produce under this section if this is different than you specified under paragraph (g)(1)(iv) of this section.

* * * * *

(j) *Provisions for engine manufacturers.* As an engine manufacturer, you may produce exempted engines as needed under this section. You do not have to request this exemption for your engines, but you must have written assurance from equipment manufacturers that they need a certain number of exempted engines under this section. Send us an annual report of the engines you produce under this section, as described in § 1039.250(a). For engines produced under the provisions of paragraph (a)(2) of this section, you must certify the engines under this part 1039. For all other exempt engines, the engines must meet the emission standards in paragraph (e) of this section and you must meet all the requirements of 40 CFR 1068.265. If you show under 40 CFR 1068.265(c) that the engines are identical in all material respects to engines that you have previously certified to one or more FELs above the standards specified in paragraph (e) of this section, you must supply sufficient credits for these engines. Calculate these credits under subpart H of this part using the previously certified FELs and the alternate standards. You must meet the labeling requirements in 40 CFR 89.110 or § 1039.135, as applicable, with the following exceptions:

(1) Add the following statement instead of the compliance statement in 40 CFR 89.110(b)(10) or § 1039.135(c)(12), as applicable:

THIS ENGINE MEETS U.S. EPA EMISSION STANDARDS UNDER 40 CFR 1039.625. SELLING OR INSTALLING THIS ENGINE FOR ANY PURPOSE OTHER THAN FOR THE EQUIPMENT FLEXIBILITY PROVISIONS OF 40 CFR 1039.625 MAY BE A VIOLATION OF FEDERAL LAW SUBJECT TO CIVIL PENALTY.

(2) You may omit the family emission limits if they are below the emission standards.

* * * * *

(m) * * *

(2) To apply for exemptions under this paragraph (m), send the Designated Compliance Officer a written request as soon as possible before you are in violation. In your request, include the following information:

* * * * *

■ 86. Section 1039.626 is amended as follows:

■ a. By revising paragraph (a)(2).

■ b. By revising paragraph (a)(9)(ii)(B).

■ c. By revising paragraph (a)(9)(iv).

■ d. By revising paragraph (b)(1) introductory text.

■ e. By revising paragraph (b)(2).

§ 1039.626 What special provisions apply to equipment imported under the equipment-manufacturer flexibility program?

* * * * *

(a) * * *

(2) Name an agent for service located in the United States. Service on this agent constitutes service on you or any of your officers or employees for any action by EPA or otherwise by the United States related to the requirements of this part.

* * * * *

(9) * * *

(ii) * * *

(B) Get us to approve a waiver from the bonding requirement if you can show that you meet the asset thresholds described in 40 CFR 1054.690.

* * * * *

(iv) You will forfeit the proceeds of the bond posted under this section if you need to satisfy any U.S. administrative settlement agreement, administrative final order or judicial judgment against you arising from your violation of this chapter, or violation of 18 U.S.C. 1001, 42 U.S.C. 7413(c)(2), or other applicable provisions of the Clean Air Act.

* * * * *

(b) * * *

(1) Before you use the provisions of this section, send the Designated Compliance Officer a written notice of your intent, including:

* * * * *

(2) For each year that you use the provisions of this section, send the Designated Compliance Officer a written report by March 31 of the following year. Include in your report the total number of engines you imported under this section in the preceding calendar year, broken down by engine manufacturer and by equipment manufacturer.

Subpart I—[Amended]

■ 87. Section 1039.801 is amended by revising the definition for ''Designated Compliance Officer'' to read as follows:

§ 1039.801 What definitions apply to this part?

* * * * *

Designated Compliance Officer means the Manager, Heavy-Duty and Nonroad Engine Group (6405–J), U.S. Environmental Protection Agency, 1200 Pennsylvania Ave., NW., Washington, DC 20460.

* * * * *

PART 1042—CONTROL OF EMISSIONS FROM NEW AND IN-USE MARINE COMPRESSION-IGNITION ENGINES AND VESSELS

■ 88. The authority citation for part 1042 continues to read as follows:

Authority: 42 U.S.C. 7401–7671q.

Subpart A—[Amended]

■ 89. Section 1042.5 is amended by revising paragraph (b) to read as follows:

§ 1042.5 Exclusions.

* * * * *

(b) *Hobby engines.* Engines installed in reduced-scale models of vessels that are not capable of transporting a person are not subject to the provisions of this part 1042.

Subpart B—[Amended]

■ 90. Section 1042.101 is amended by revising Table 1 in paragraph (a)(3) to read as follows:

§ 1042.101 Exhaust emission standards.

(a) * * *

(3) * * *

Table 1 to §1042.101— Tier 3 Standards for Category 1 Engines Below 3700 kW [a]

Power Density and Application	Displacement (L/cyl)	Maximum Engine Power	Model Year	PM (g/kW-hr)	NOx+HC (g/kW-hr) [b]
all	disp.< 0.9	kW <19	2009+	0.40	7.5
		19 ≤ kW < 75	2009-2013	0.30	7.5
			2014+	0.30	4.7
Commercial engines with kW/L ≤ 35[b]	disp.< 0.9	kW ≥ 75	2012+	0.14	5.4
	0.9 ≤ disp. < 1.2	all	2013+	0.12	5.4
	1.2 ≤ disp. < 2.5	kW < 600	2014-2017	0.11	5.6
			2018+	0.10	5.6
		kW ≥ 600	2014+	0.11	5.6
	2.5 ≤ disp. < 3.5	kW < 600	2013-2017	0.11	5.6
			2018+	0.10	5.6
		kW ≥ 600	2013+	0.11	5.6
	3.5 ≤ disp.< 7.0	kW < 600	2012-2017	0.11	5.8
			2018+	0.10	5.8
		kW ≥ 600	2012+	0.11	5.8
Commercial engines with kW/L > 35 and all recreational engines[b]	disp. < 0.9	kW ≥ 75	2012+	0.15	5.8
	0.9 ≤ disp. < 1.2	all	2013+	0.14	5.8
	1.2 ≤ disp. < 2.5		2014+	0.12	5.8
	2.5 ≤ disp. < 3.5		2013+	0.12	5.8
	3.5 ≤ disp. < 7.0		2012+	0.11	5.8

[a] No Tier 3 standards apply for commercial Category 1 engines at or above 3700 kW. See §1042.1(c) and paragraph (a)(6) of this section for the standards that apply for these engines.
[b] The applicable NOx+HC standards specified for Tier 2 engines in Appendix I of this part continue to apply instead of the values noted in the table for engines at or above 2000 kW. FELs for these engiens may not be higher than the Tier 1 NOx standard specified in Appendix I of this part.

* * * * *

■ 91. Section 1042.107 is revised to read as follows:

§ 1042.107 Evaporative emission standards.

(a) There are no evaporative emission standards for diesel-fueled engines, or engines using other nonvolatile or nonliquid fuels (for example, natural gas).

(b) If an engine uses a volatile liquid fuel, such as methanol, the engine's fuel system and the vessel in which the engine is installed must meet the evaporative emission requirements of 40 CFR part 1045 that apply with respect to spark-ignition engines. Manufacturers subject to evaporative emission standards must meet the requirements of 40 CFR 1045.112 as described in 40 CFR part 1060 and do all the following things in the application for certification:

(1) Describe how evaporative emissions are controlled.

(2) Present test data to show that fuel systems and vessels meet the evaporative emission standards we specify in this section if you do not use design-based certification under 40 CFR 1060.240. Show these figures before and after applying deterioration factors, where applicable.

■ 92. Section 1042.115 is amended by revising paragraph (f)(1) to read as follows:

§ 1042.115 Other requirements.

* * * * *

(f) * * *

(1) The conditions of concern were substantially included in the applicable

duty-cycle test procedures described in subpart F of this part (the portion during which emissions are measured).

* * * * *

■ 93. Section 1042.145 is amended by revising Table 2 in paragraph (f) to read as follows:

§ 1042.145 Interim provisions.

* * * * *

(f) * * *

TABLE 2 TO § 1042.145—OPTIONAL IN-USE ADJUSTMENTS FOR THE FIRST THREE MODEL YEARS OF THE TIER 4 STANDARDS

Fraction of useful life already used	In-use adjustments (g/kW-hr)	
	For model year 2017 and earlier Tier 4 NO_X standards	For model year 2017 and earlier Tier 4 PM standards
0 < hours ≤ 50% of useful life	0.3	0.05
50 < hours ≤ 75% of useful life	0.4	0.05
hours > 75% of useful life	0.5	0.05

* * * * *

Subpart G—[Amended]

§ 1042.601 [Amended]

■ 94. Section 1042.601 is amended by removing paragraph (g).

■ 95. Section 1042.615 is amended by revising paragraph (a) introductory text to read as follows:

§ 1042.615 Replacement engine exemption.

* * * * *

(a) This paragraph (a) applies instead of the provisions of 40 CFR 1068.240(b)(3). The prohibitions in 40 CFR 1068.101(a)(1) do not apply to a new replacement engine if all the following conditions are met:

* * * * *

Subpart I—[Amended]

■ 96. Section 1042.801 is amended by revising paragraph (f) to read as follows:

§ 1042.801 General provisions.

* * * * *

(f) Remanufacturing systems that require a fuel change or use of a fuel additive may be certified under this part. However, they are not considered to be ''available'' with respect to triggering the requirement for an engine to be covered by a certificate of conformity under § 1042.815. The following provisions apply:

(1) Only fuels and additives registered under 40 CFR part 79 may be used under this paragraph (f).

(2) You must demonstrate in your application that the fuel or additive will actually be used by operators, including a description of how the vessels and dispensing tanks will be labeled. We may require you to provide the labels to the operators.

(3) You must also describe analytical methods that can be used by EPA or others to verify that fuel meets your specifications.

(4) You must provide clear instructions to the operators specifying that they may only use the specified fuel/additive, label their vessels and fuel dispensing tanks, and keep records of their use of the fuel/additive in order for their engine to be covered by your certificate. Use of the incorrect fuel (or fuel without the specified additive) or any other failure to comply with the requirements of this paragraph is a violation of 40 CFR 1068.101(b)(1).

* * * * *

■ 97. Section 1042.836 is amended by revising paragraph (a) introductory text to read as follows:

§ 1042.836 Marine certification of locomotive remanufacturing systems.

* * * * *

(a) Include the following with your application for certification under 40 CFR part 92 or 1033 (or as an amendment to your application):

* * * * *

■ 98. A new part 1045 is added to subchapter U of chapter I to read as follows:

PART 1045—CONTROL OF EMISSIONS FROM SPARK-IGNITION PROPULSION MARINE ENGINES AND VESSELS

Subpart A—Overview and Applicability

Sec.

Subpart B—Emission Standards and Related Requirements

Subpart C—Certifying Engine Families

Authority: 42 U.S.C. 7401–7671q.

Subpart A—Overview and Applicability

§ 1045.1 Does this part apply for my products?

(a) Except as provided in § 1045.5, the regulations in this part 1045 apply as follows:

(1) The requirements of this part related to exhaust emissions apply to new, spark-ignition propulsion marine engines beginning with the 2010 model year.

(2) The requirements of this part related to evaporative emissions apply to fuel lines and fuel tanks used with marine engines that use a volatile liquid fuel (such as gasoline) as specified in 40 CFR part 1045.112. This includes fuel lines and fuel tanks used with auxiliary marine engines. This also includes portable marine fuel tanks and associated fuel lines.

(b) We specify optional standards for certifying sterndrive/inboard engines before the 2010 model year in § 1045.145(a). Engines certified to these standards are subject to all the requirements of this part as if these optional standards were mandatory.

(c) See 40 CFR part 91 for requirements that apply to outboard and personal watercraft engines not yet subject to the requirements of this part 1045.

(d) The provisions of §§ 1045.620 and 1045.801 apply for new engines used solely for competition beginning January 1, 2010.

§ 1045.2 Who is responsible for compliance?

The requirements and prohibitions of this part apply to manufacturers of engines and fuel-system components as described in § 1045.1. The requirements of this part are generally addressed to manufacturers subject to this part's requirements. The term ''you'' generally means the certifying manufacturer. For provisions related to exhaust emissions, this generally means the engine manufacturer, especially for issues related to certification (including production-line testing, reporting, etc.). For provisions related to certification with respect to evaporative emissions, this generally means the vessel manufacturer. Vessel manufacturers must meet applicable requirements as described in § 1045.20. Engine manufacturers must meet requirements related to evaporative emissions as described in § 1045.25.

§ 1045.5 Which engines are excluded from this part's requirements?

(a) *Auxiliary engines.* The exhaust emission standards of this part do not apply to auxiliary marine engines. See 40 CFR part 90, 1048, or 1054 for the exhaust emission standards that apply. Evaporative emission standards apply as specified in § 1045.112.

(b) *Hobby engines and vessels.* This part does not apply with respect to reduced-scale models of vessels that are not capable of transporting a person.

(c) *Large natural gas engines.* Propulsion marine engines powered by natural gas with maximum engine power at or above 250 kW are deemed to be compression-ignition engines. These engines are therefore subject to all the requirements of 40 CFR part 1042 instead of this part even if they would otherwise meet the definition of ''spark-ignition'' in § 1045.801.

§ 1045.10 How is this part organized?

This part 1045 is divided into the following subparts:

(a) Subpart A of this part defines the applicability of this part 1045 and gives an overview of regulatory requirements.

(b) Subpart B of this part describes the emission standards and other requirements that must be met to certify engines under this part 1045. Note that § 1045.145 discusses certain interim requirements and compliance provisions that apply only for a limited time.

(c) Subpart C of this part describes how to apply for a certificate of conformity.

(d) Subpart D of this part describes general provisions for testing production-line engines.

(e) Subpart E of this part describes general provisions for testing in-use engines.

(f) Subpart F of this part describes how to test your engines (including references to other parts of the Code of Federal Regulations).

(g) Subpart G of this part and 40 CFR part 1068 describe requirements, prohibitions, and other provisions that apply to engine manufacturers, vessel manufacturers, owners, operators, rebuilders, and all others.

(h) Subpart H of this part describes how you may generate and use exhaust and evaporative emission credits to certify your engines and vessels.

(i) Subpart I of this part contains definitions and other reference information.

§ 1045.15 Do any other CFR parts apply to me?

(a) Part 1060 of this chapter describes standards and procedures that apply for controlling evaporative emissions from engines fueled by gasoline or other volatile liquid fuels and the associated fuel systems. See § 1045.112 for information about how that part applies.

(b) Part 1065 of this chapter describes procedures and equipment specifications for testing engines to measure exhaust emissions. Subpart F of this part 1045 describes how to apply the provisions of part 1065 of this chapter to determine whether engines meet the exhaust emission standards in this part.

(c) The requirements and prohibitions of part 1068 of this chapter apply to everyone, including anyone who manufactures, imports, installs, owns, operates, or rebuilds any of the engines subject to this part 1045, or vessels powered by these engines. Part 1068 of this chapter describes general provisions, including these seven areas:

(1) Prohibited acts and penalties for engine manufacturers, vessel manufacturers, and others.

(2) Rebuilding and other aftermarket changes.

(3) Exclusions and exemptions for certain engines.

(4) Importing engines.

(5) Selective enforcement audits of your production.

(6) Defect reporting and recall.

(7) Procedures for hearings.

(d) Other parts of this chapter apply if referenced in this part 1045.

§ 1045.20 What requirements apply to my vessels?

(a) If you manufacture vessels with engines certified to the exhaust emission standards in this part, your vessels must meet all emission standards with the engine and fuel system installed.

(b) You may need to certify your vessels or fuel systems as described in 40 CFR 1060.1 and 1060.601. If you produce vessels subject to this part without obtaining a certificate, you must still meet the requirements of 40 CFR 1060.101(e) and (f) and keep records as described in 40 CFR 1060.210.

(c) You must identify and label vessels you produce under this section consistent with the requirements of § 1045.135 and 40 CFR part 1060.

(d) You must follow all emission-related installation instructions from the certifying manufacturers as described in § 1045.130 and 40 CFR 1068.105. If you do not follow the installation instructions, we may consider your vessel to be not covered by the certificates of conformity. Introduction of such vessels into U.S. commerce violates 40 CFR 1068.101.

§ 1045.25 How do the requirements related to evaporative emissions apply to engines and their fuel systems?

(a) Engine manufacturers must provide the installation instructions required by § 1045.130 to the ultimate purchasers of the engine. These instructions may be combined with the maintenance instructions required by § 1045.125.

(b) Engines sold with attached fuel lines or installed fuel tanks must be covered by the appropriate certificates of conformity issued under 40 CFR part 1060.

(c) Fuel lines intended to be used with new engines and new portable marine fuel tanks must be certified to the applicable requirements of 40 CFR part 1060. Similarly, fuel tanks intended to be used with new enignes must be certified to the applicable requirements of 40 CFR part 1060.

(d) All persons installing engines certified under this part 1045 must follow the certifying manufacturer's emission-related installation instructions (see § 1045.130 and 40 CFR 1068.105).

§ 1045.30 Submission of information.

(a) This part includes various requirements to record data or other information. Refer to § 1045.825 and 40 CFR 1068.25 regarding recordkeeping requirements. If recordkeeping requirements are not specified, store these records in any format and on any media and keep them readily available for one year after you send an associated application for certification, or one year after you generate the data if they do not support an application for certification. You must promptly send us organized, written records in English if we ask for them. We may review them at any time.

(b) The regulations in § 1045.255 and 40 CFR 1068.101 describe your obligation to report truthful and complete information and the consequences of failing to meet this obligation. This includes information not related to certification.

(c) Send all reports and requests for approval to the Designated Compliance Officer (see § 1045.801).

(d) Any written information we require you to send to or receive from another company is deemed to be a required record under this section. Such records are also deemed to be submissions to EPA. We may require you to send us these records whether or not you are a certificate holder.

Subpart B—Emission Standards and Related Requirements

§ 1045.101 What exhaust emission standards and requirements must my engines meet?

(a) You must show that your engines meet the following requirements:

(1) Outboard and personal watercraft engines must meet the exhaust emission standards specified in § 1045.103.

(2) Sterndrive/inboard engines must meet the exhaust emission standards specified in § 1045.105. You may optionally meet these standards earlier than we require, as specified in § 1045.145(b).

(3) Sterndrive/inboard engines must meet the engine-diagnostic requirements in § 1045.110.

(4) All engines must meet the requirements in § 1045.115.

(b) It is important that you read § 1045.145 to determine if there are other interim requirements or interim compliance provisions that apply for a limited time.

§ 1045.103 What exhaust emission standards must my outboard and personal watercraft engines meet?

(a) Duty-cycle emission standards. Starting in the 2010 model year, exhaust emissions from your outboard and personal watercraft engines may not exceed emission standards as follows:

(1) Measure emissions using the applicable steady-state test procedures described in subpart F of this part.

(2) The exhaust emission standards from the following table apply:

TABLE 1 TO § 1045.103—EMISSION STANDARDS FOR OUTBOARD AND PERSONAL WATERCRAFT ENGINES (g/kW-hr)

Pollutant	Power [1]	Emission standard
$HC + NO_X$	$P \le 4.3$ kW	30.0
	$P > 4.3$ kW	$2.1 + 0.09 \times (151 + 557/P^{0.9})$
CO	$P \le 40$ kW	$500 - 5.0 \times P$
	$P > 40$ kW	300

[1] Power (P) = maximum engine power for the engine family, in kilowatts (kW).

(3) For engines whose standard depends on maximum engine power, round the calculated $HC+NO_X$ emission standard to the nearest 0.1 g/kW-hr; round the calculated CO emission standard to the nearest g/kW-hr. Determine maximum engine power for the engine family as described in § 1045.140.

(b) *Averaging, banking, and trading.* You may generate or use emission credits under the averaging, banking, and trading (ABT) program described in subpart H of this part for demonstrating compliance with $HC+NO_X$ emission standards. For CO emissions, you may generate or use emission credits for averaging as described in subpart H of this part, but not for banking or trading. To generate or use emission credits, you must specify a family emission limit for each pollutant you include in the ABT program for each engine family. These family emission limits serve as the emission standards for the engine family with respect to all required testing instead of the standards specified in this section. An engine family meets emission standards even if its family emission limit is higher than the standard, as long as you show that the whole averaging set of applicable engine families meets the emission standards using emission credits and the engines within the family meet the family emission limit. The following FEL caps apply:

(1) For engines with maximum engine power at or below 4.3 kW, the maximum value of the family emission limit for $HC+NO_X$ is 81.0 g/kW-hr. For all other engines, the maximum value of the family emission limit for $HC+NO_X$ is defined by the following formula, with results rounded to the nearest 0.1 g/kW-hr:

$$FEL_{max,HC+NO_x} = 6.0 + 0.25 \cdot \left(151 + \frac{557}{P^{0.9}}\right)$$

(2) For engines with maximum engine power above 40 kW, the maximum value of the family emission limit for CO is 450 g/kW-hr. For all other engines, the maximum value is defined by the following formula, with results rounded to the nearest g/kW-hr:

$$FEL_{max,CO} = 650 - 5.0 \times P$$

(c) *Not-to-exceed emission standards.* Exhaust emissions may not exceed the not-to-exceed standards specified in § 1045.107.

(d) *Fuel types.* The exhaust emission standards in this section apply for engines using the fuel type on which the engines in the engine family are designed to operate. You must meet the numerical emission standards for hydrocarbons in this section based on the following types of hydrocarbon emissions for engines powered by the following fuels:

(1) Alcohol-fueled engines: THCE emissions.

(2) Natural gas-fueled engines: NMHC emissions.

(3) Other engines: THC emissions.

(e) *Useful life.* Your engines must meet the exhaust emission standards in paragraphs (a) through (c) of this section over the full useful life as follows:

(1) For outboard engines, the minimum useful life is 350 hours of engine operation or 10 years, whichever comes first.

(2) For personal watercraft engines, the minimum useful life is 350 hours of engine operation or 5 years, whichever comes first.

(3) You must specify a longer useful life in terms of hours for the engine family if the average service life of your vehicles is longer than the minimum value, as follows:

(i) Except as allowed by paragraph (e)(3)(ii) of this section, your useful life (in hours) may not be less than either of the following:

(A) Your projected operating life from advertisements or other marketing materials for any engines in the engine family.

(B) Your basic mechanical warranty for any engines in the engine family.

(ii) Your useful life may be based on the average service life of vehicles in the engine family if you show that the average service life is less than the useful life required by paragraph (e)(3)(i) of this section, but more than the minimum useful life (350 hours of engine operation). In determining the actual average service life of vehicles in an engine family, we will consider all available information and analyses. Survey data is allowed but not required to make this showing.

(f) *Applicability for testing.* The duty-cycle emission standards in this subpart apply to all testing performed according to the procedures in § 1045.505, including certification, production-line, and in-use testing. The not-to-exceed standards apply for all testing performed according to the procedures of subpart F of this part.

§ 1045.105 What exhaust emission standards must my sterndrive/inboard engines meet?

(a) *Duty-cycle emission standards.* Starting in the 2010 model year, exhaust emissions from your sterndrive/inboard engines may not exceed emission standards as follows:

(1) Measure emissions using the applicable steady-state test procedures described in subpart F of this part.

(2) For conventional sterndrive/inboard engines, the $HC+NO_X$ emission standard is 5.0 g/kW-hr and the CO emission standard is 75.0 g/kW-hr.

(3) The exhaust emission standards from the following table apply for high-performance engines:

TABLE 1 TO § 1045.105—EMISSION STANDARDS FOR HIGH-PERFORMANCE ENGINES (g/kW-hr)

Model year	Power [1]	$HC+NO_X$	CO
2010	$P \le 485$ kW	20.0	350
	$P > 485$ kW	25.0	350

TABLE 1 TO § 1045.105—EMISSION STANDARDS FOR HIGH-PERFORMANCE ENGINES (g/kW-hr)—Continued

Model year	Power [1]	$HC+NO_X$	CO
2011+ ..	P≤ 485 kW	16.0	350
	P> 485 kW	22.0	350

[1] Power (P) = maximum engine power in kilowatts (kW).

(b) *Averaging, banking, and trading.* You may not generate or use emission credits for high-performance engines. You may generate or use emission credits under the averaging, banking, and trading (ABT) program described in subpart H of this part for demonstrating compliance with $HC+NO_X$ and CO emission standards for conventional sterndrive-inboard engines. To generate or use emission credits, you must specify a family emission limit for each pollutant you include in the ABT program for each engine family. These family emission limits serve as the emission standards for the engine family with respect to all required testing instead of the standards specified in this section. An engine family meets emission standards even if its family emission limit is higher than the standard, as long as you show that the whole averaging set of applicable engine families meets the emission standards using emission credits and the engines within the family meet the family emission limit. Family emission limits for conventional sterndrive/inboard engines may not be higher than 16.0 g/kW-hr for $HC+NO_X$ and 150 g/kW-hr for CO except as specified in § 1045.145(c).

(c) *Not-to-exceed emission standards.* Exhaust emissions may not exceed the not-to-exceed standards specified in § 1045.107 for conventional sterndrive/inboard engines. These standards do not apply for high-performance engines.

(d) *Fuel types.* The exhaust emission standards in this section apply for engines using the fuel type on which the engines in the engine family are designed to operate. You must meet the numerical emission standards for hydrocarbons in this section based on the following types of hydrocarbon emissions for engines powered by the following fuels:

(1) Alcohol-fueled engines: THCE emissions.

(2) Natural gas-fueled engines: NMHC emissions.

(3) Other engines: THC emissions.

(e) *Useful life.* Your engines must meet the exhaust emission standards in paragraphs (a) through (c) of this section over their full useful life, as follows:

(1) For high-performance engines with maximum engine power above 485 kW, the useful life is 50 hours of operation or 1 year, whichever comes first. For high-performance engines with maximum engine power at or below 485 kW, the useful life is 150 hours of operation or 3 years, whichever comes first.

(2) For conventional sterndrive/inboard engines, the minimum useful life is 480 hours of operation or ten years, whichever comes first. However, you may request in your application for certification that we approve a shorter useful life for an engine family. We may approve a shorter useful life, in hours of engine operation but not in years, if we determine that these engines will rarely operate longer than the shorter useful life. If engines identical to those in the engine family have already been produced and are in use, your demonstration must include documentation from such in-use engines. In other cases, your demonstration must include an engineering analysis of information equivalent to such in-use data, such as data from research engines or similar engine models that are already in production. Your demonstration must also include any overhaul interval that you recommend, any mechanical warranty that you offer for the engine or its components, and any relevant customer design specifications. Your demonstration may include any other relevant information. The useful life value may not be shorter than any of the following:

(i) 150 hours of operation.

(ii) Your recommended overhaul interval.

(iii) Your mechanical warranty for the engine.

(3) You must specify a longer useful life for conventional sterndrive/inboard engines in terms of hours if the average service life of engines from the engine family is longer than the minimum useful life value, as follows:

(i) Except as allowed by paragraph (e)(3)(ii) of this section, your useful life (in hours) may not be less than either of the following:

(A) Your projected operating life from advertisements or other marketing materials for any engines in the engine family.

(B) Your basic mechanical warranty for any engines in the engine family.

(ii) Your useful life may be based on the average service life of engines in the engine family if you show that the average service life is less than the useful life required by paragraph (e)(3)(i) of this section, but more than the minimum useful life (480 hours of engine operation). In determining the actual average service life of engines in an engine family, we will consider all available information and analyses. Survey data is allowed but not required to make this showing.

(f) *Applicability for testing.* The duty-cycle emission standards in this section apply to all testing performed according to the procedures in § 1045.505, including certification, production-line, and in-use testing. The not-to-exceed standards apply for all testing performed according to the procedures of subpart F of this part.

§ 1045.107 What are the not-to-exceed emission standards?

Not-to-exceed emission standards apply as follows:

(a) Measure emissions using the not-to-exceed procedures in subpart F of this part:

(b) Determine the not-to-exceed standard, rounded to the same number of decimal places as the emission standard in Table 1 to this section from the following equation:

$$\text{Not-to-exceed standard} = (\text{STD}) \times (\text{M})$$

Where:

STD = The standard specified in paragraph (a) of this section if you certify without using ABT for that pollutant; or the FEL for that pollutant if you certify using ABT.

M = The NTE multiplier for that pollutant, as defined in paragraphs (c) through (e) of this section.

(c) For engines equipped with a catalyst, use NTE multipliers from the following table across the applicable zone specified in § 1045.515:

TABLE 1 TO § 1045.107—NTE MULTIPLIERS FOR CATALYST-EQUIPPED ENGINES

Pollutant	Subzone 1	Subzone 2
$HC+NO_X$	1.50	1.00
CO	N/A	1.00

(d) For two-stroke engines not equipped with a catalyst, use an NTE multiplier of 1.2 for $HC+NO_X$ and CO. Compare the weighted value specified in § 1045.515(c)(5) to the NTE standards specified in paragraph (b) of this section.

(e) For engines not covered by paragraphs (c) and (d) of this section, use the NTE multipliers from the following table across the applicable zone specified in § 1045.515:

TABLE 2 TO § 1045.107—NTE MULTIPLIERS FOR FOUR-STROKE ENGINES WITHOUT CATALYSTS

Pollutant	Subzone 1	Subzone 2
$HC+NO_X$	1.40	1.60
CO	1.50	1.50

§ 1045.110 How must my engines diagnose malfunctions?

The following engine-diagnostic requirements apply for engines equipped with three-way catalysts and closed-loop control of air-fuel ratios:

(a) *Equip your engines with a diagnostic system*. Equip each engine with a diagnostic system that will detect significant malfunctions in its emission control system using one of the following protocols:

(1) If your emission control strategy depends on maintaining air-fuel ratios at stoichiometry, an acceptable diagnostic design would identify a malfunction whenever the air-fuel ratio does not cross stoichiometry for one minute of intended closed-loop operation. You may use other diagnostic strategies if we approve them in advance.

(2) If the protocol described in paragraph (a)(1) of this section does not apply to your engine, you must use an alternative approach that we approve in advance. Your alternative approach must generally detect when the emission control system is not functioning properly.

(3) Diagnostic systems approved by the California Air Resources Board for use with sterndrive/inboard engines fully satisfy the requirements of this section.

(b) *Use a malfunction indicator*. The malfunction indicator must be designed such that the operator can readily see or hear it; visible signals may be any color except red. Visible malfunction indicators must display ''Check Engine,'' ''Service Engine Soon,'' or a similar message that we approve. The malfunction indicator must go on under each of the following circumstances:

(1) When a malfunction occurs, as described in paragraph (a) of this section.

(2) When the diagnostic system cannot send signals to meet the requirement of paragraph (b)(1) of this section.

(3) When the engine's ignition is in the ''key-on'' position before starting or cranking. The malfunction indicator should turn off after engine starting if the system detects no malfunction.

(c) *Control when the malfunction can turn off*. If the malfunction indicator goes on to show a malfunction, it must remain on during all later engine operation until servicing corrects the malfunction. If the engine is not serviced, but the malfunction does not recur for three consecutive engine starts during which the malfunctioning system is evaluated and found to be working properly, the malfunction indicator may stay off during later engine operation.

(d) *Store trouble codes in computer memory*. Record and store in computer memory any diagnostic trouble codes showing a malfunction that should activate the malfunction indicator. The stored codes must identify the malfunctioning system or component as uniquely as possible. Make these codes available through the data link connector as described in paragraph (g) of this section. You may store codes for conditions that do not activate the malfunction indicator. The system must store a separate code to show when the diagnostic system is disabled (from malfunction or tampering).

(e) *Make data, access codes, and devices accessible*. Make all required data accessible to us without any access codes or devices that only you can supply. Ensure that anyone servicing your engine can read and understand the diagnostic trouble codes stored in the onboard computer with generic tools and information.

(f) *Consider exceptions for certain conditions*. Your diagnostic systems may disregard trouble codes for the first three minutes after engine starting. You may ask us to approve diagnostic-system designs that disregard trouble codes under other conditions that would produce an unreliable reading, damage systems or components, or cause other safety risks.

(g) *Follow standard references for formats, codes, and connections*. Follow conventions defined in SAE J1939–05 (incorporated by reference in § 1045.810) or ask us to approve using updated versions of (or variations from) this standard.

§ 1045.112 What are the standards for evaporative emissions?

Fuel systems must meet the evaporative emission requirements of 40 CFR part 1060 as specified in this section. These standards apply over a useful life period of five years for personal watercraft and ten years for all other vessels and for portable marine fuel tanks.

(a) *Fuel line permeation*. Nonmetal fuel lines must meet the permeation requirements specified in 40 CFR 1060.102 for EPA NRFL fuel lines as described in this paragraph (a).

(1) Except as specified in paragraphs (a)(2) and (3) of this section, the emission standard for fuel lines starts for vessels or portable marine fuel tanks with a date of manufacture on or after January 1, 2009.

(2) The emission standard for primer bulbs applies starting January 1, 2011.

(3) The emission standard for under-cowl fuel lines used with outboard engines apply over a phase-in period as specified in this paragraph (a)(3).

(i) Except as specified in paragraph (a)(3)(ii) of this section, the phase-in period is based on total length of fuel lines as specified in Table 1 to this section. For example, at least 30 percent of the length of under-cowl fuel lines used on your full lineup of 2010 model year outboard engines must meet the specified permeation standards. See § 1045.145(k) for administrative requirements related to this phase-in.

TABLE 1 TO § 1045.112—PHASE-IN SCHEDULE FOR UNDER-COWL FUEL LINES ON OUTBOARD ENGINES

Model year	Percentage phase-in
2010	30
2011	60
2012–2014	90
2015+	100

(ii) You may instead meet the permeation standards of this paragraph (a) by complying with the specified standards with 100 percent of your under-cowl fuel lines across your full lineup of 2011 model year outboard engines. In this case, the requirements of this part would not apply to under-cowl fuel lines before the 2011 model year. To use this option, you must notify the Designated Compliance Officer before December 31, 2009 of your intent to meet permeation standards on all your under-cowl fuel lines in the 2011 model year.

(b) *Tank permeation*. Fuel tanks must meet the permeation requirements specified in 40 CFR 1060.103. Portable marine fuel tanks must meet permeation standards starting January 1, 2011. Fuel tanks for personal watercraft must meet permeation standards starting in the 2011 model year. Other installed fuel tanks must meet permeation standards starting in the 2012 model year. Vessel manufacturers may generate or use emission credits to show compliance with the requirements of this paragraph under the averaging, banking, and trading (ABT) program, as described in subpart H of this part. Starting in the 2014 model year for personal watercraft and in the 2015 model year for other installed fuel tanks, family emission limits may not exceed 5.0 g/m²/day if testing occurs at a nominal temperature of 28 °C, or 8.3 g/m²/day if testing occurs at a nominal temperature of 40 °C. These FEL caps do not apply to fuel caps that are certified separately to meet permeation standards. Portable marine fuel tank manufacturers may not generate or use emission credits under subpart H of this part.

(c) *Running loss*. The running loss requirements specified in 40 CFR part 1060 do not apply.

(d) *Diurnal emissions*. Installed fuel tanks must meet the diurnal emission requirements specified in 40 CFR 1060.105. Fuel tanks for personal watercraft must meet diurnal emission standards starting in the 2010 model year. Other installed fuel tanks must meet diurnal emission standards for vessels produced on or after July 31, 2011, except as allowed by § 1045.625. Fuel tanks meeting the definition of *portable marine fuel tank* in § 1045.801 must comply with the diurnal requirements specified in 40 CFR part 1060 starting January 1, 2010.

(e) *Other requirements*. The requirements of 40 CFR 1060.101(e) and (f) apply to vessel manufacturers even if they do not obtain a certificate.

(f) *Engine manufacturers*. To the extent that engine manufacturers produce engines with fuel lines or fuel tanks, those fuel-system components must meet the requirements specified in this section. The timing of new standards is based on the date of manufacture of the engine.

§ 1045.115 What other requirements apply?

The following requirements apply with respect to engines that are required to meet the emission standards of this part:

(a) *Crankcase emissions*. Crankcase emissions may not be discharged directly into the ambient atmosphere from any engine throughout its useful life.

(b) *Torque broadcasting*. Starting in the 2013 model year, electronically controlled engines must broadcast their speed and output shaft torque (in newton-meters). Engines may alternatively broadcast a surrogate value for determining torque. Engines must broadcast engine parameters such that they can be read with a remote device, or broadcast them directly to their controller area networks. Your broadcasting protocol must allow for valid measurements using the field-testing procedures in 40 CFR part 1065, subpart J.

(c) *EPA access to broadcast information*. If we request it, you must provide us any hardware or tools we would need to readily read, interpret, and record all information broadcast by an engine's on-board computers and electronic control modules. If you broadcast a surrogate parameter for torque values, you must provide us what we need to convert these into torque units. We will not ask for hardware or tools if they are readily available commercially.

(d) *Altitude adjustments*. Engines must meet applicable emission standards for valid tests conducted under the ambient conditions specified in 40 CFR 1065.520. Engines must meet applicable emission standards at all specified atmospheric pressures, except that for atmospheric pressures below 94.0 kPa you may rely on an altitude kit for all testing if you meet the requirements specified in § 1054.205(s). If your rely on an altitude kit for certification, you must identify in the owners manual the altitude range for which you expect proper engine performance and emission control with and without the altitude kit; you must also state in the owners manual that operating the engine with the wrong engine configuration at a given altitude may increase its emissions and decrease fuel efficiency and performance.

(e) *Adjustable parameters*. Engines that have adjustable parameters must meet all the requirements of this part for any adjustment in the physically adjustable range. An operating parameter is not considered adjustable if you permanently seal it or if it is not normally accessible using ordinary tools. We may require that you set adjustable parameters to any specification within the adjustable range during any testing, including certification testing, production-line testing, or in-use testing.

(f) *Prohibited controls*. You may not design your engines with emission-control devices, systems, or elements of design that cause or contribute to an unreasonable risk to public health, welfare, or safety while operating. For example, this would apply if the engine emits a noxious or toxic substance it would otherwise not emit that contributes to such an unreasonable risk.

(g) *Defeat devices*. You may not equip your engines with a defeat device. A defeat device is an auxiliary emission control device that reduces the effectiveness of emission controls under conditions that the engine may reasonably be expected to encounter during normal operation and use. This does not apply for altitude kits installed or removed consistent with § 1045.655. This also does not apply to auxiliary emission control devices you identify in your application for certification if any of the following is true:

(1) The conditions of concern were substantially included in the applicable duty-cycle test procedures described in subpart F of this part.

(2) You show your design is necessary to prevent engine (or vessel) damage or accidents. For example, you may design your engine to include emergency operating modes (sometimes known as limp-home operation) that would allow a vessel to return to land in the event of a malfunction even if such operating modes result in higher emissions.

(3) The reduced effectiveness applies only to starting the engine.

§ 1045.120 What emission-related warranty requirements apply to me?

(a) *General requirements*. You must warrant to the ultimate purchaser and each subsequent purchaser that the new engine, including all parts of its emission control system, meets two conditions:

(1) It is designed, built, and equipped so it conforms at the time of sale to the ultimate purchaser with the requirements of this part.

(2) It is free from defects in materials and workmanship that may keep it from meeting these requirements.

(b) *Warranty period*. Your emission-related warranty must be valid during the periods specified in this paragraph (b). You may offer an emission-related warranty more generous than we require. The emission-related warranty for an engine may not be shorter than any published warranty you offer without charge for that engine. Similarly, the emission-related warranty for any component may not be shorter than any published warranty you offer without charge for that component. If an engine has no hour meter, we base the warranty periods in this paragraph (b) only on the engine's age (in years). The warranty period begins when the engine is placed into service.

(1) The minimum warranty period for outboard engines is 175 hours of engine operation or 5 years, whichever comes first. The minimum warranty period for personal watercraft engines is 175 hours of engine operation or 30 months, whichever comes first.

(2) The minimum warranty period for sterndrive/inboard engines is shown in the following table:

TABLE 1 TO § 1045.120—WARRANTY PERIODS FOR STERNDRIVE/INBOARD ENGINES [1]

Engine type	Electronic components	Mechanical components
Conventional	3 years/480 hours	3 years/480 hours.
High-performance with maximum engine power at or below 485 kW	3 years/480 hours	3 years/150 hours.
High-performance with maximum engine power above 485 kW	3 years/480 hours	1 year/50 hours.

[1] The warranty period expires after the specified time period or number of operating hours, whichever comes first.

(c) *Components covered.* The emission-related warranty covers all components whose failure would increase an engine's emissions of any regulated pollutant, including components listed in 40 CFR part 1068, Appendix I, and components from any other system you develop to control emissions. The emission-related warranty covers these components even if another company produces the component. Your emission-related warranty does not cover components whose failure would not increase an engine's emissions of any regulated pollutant.

(d) *Limited applicability.* You may deny warranty claims under this section if the operator caused the problem through improper maintenance or use, as described in 40 CFR 1068.115.

(e) *Owners manual.* Describe in the owners manual the emission-related warranty provisions from this section that apply to the engine.

§ 1045.125 What maintenance instructions must I give to buyers?

Give the ultimate purchaser of each new engine written instructions for properly maintaining and using the engine, including the emission control system as described in this section. The maintenance instructions also apply to service accumulation on your emission-data engines as described in § 1045.245 and in 40 CFR part 1065.

(a) *Critical emission-related maintenance.* Critical emission-related maintenance includes any adjustment, cleaning, repair, or replacement of critical emission-related components. This may also include additional emission-related maintenance that you determine is critical if we approve it in advance. You may schedule critical emission-related maintenance on these components if you meet the following conditions:

(1) You demonstrate that the maintenance is reasonably likely to be done at the recommended intervals on in-use engines. We will accept scheduled maintenance as reasonably likely to occur if you satisfy any of the following conditions:

(i) You present data showing that any lack of maintenance that increases emissions also unacceptably degrades the engine's performance.

(ii) You present survey data showing that at least 80 percent of engines in the field get the maintenance you specify at the recommended intervals.

(iii) You provide the maintenance free of charge and clearly say so in your maintenance instructions.

(iv) You otherwise show us that the maintenance is reasonably likely to be done at the recommended intervals.

(2) You may not schedule critical emission-related maintenance within the useful life period for aftertreatment devices, pulse-air valves, fuel injectors, oxygen sensors, electronic control units, superchargers, or turbochargers, except as specified in paragraph (b) or (c) of this section.

(b) *Recommended additional maintenance.* You may recommend any additional amount of maintenance on the components listed in paragraph (a) of this section, as long as you state clearly that these maintenance steps are not necessary to keep the emission-related warranty valid. If operators do the maintenance specified in paragraph (a) of this section, but not the recommended additional maintenance, this does not allow you to disqualify those engines from in-use testing or deny a warranty claim. Do not take these maintenance steps during service accumulation on your emission-data engines.

(c) *Special maintenance.* You may specify more frequent maintenance to address problems related to special situations, such as atypical engine operation. You must clearly state that this additional maintenance is associated with the special situation you are addressing.

(d) *Noncritical emission-related maintenance.* Subject to the provisions of this paragraph (d), you may schedule any amount of emission-related inspection or maintenance that is not covered by paragraph (a) of this section (i.e., maintenance that is neither explicitly identified as critical emission-related maintenance, nor that we approve as critical emission-related maintenance). Noncritical emission-related maintenance generally includes changing spark plugs, re-seating valves, or any other emission-related maintenance on the components we specify in 40 CFR part 1068, Appendix I that is not covered in paragraph (a) of this section. You must state in the owners manual that these steps are not necessary to keep the emission-related warranty valid. If operators fail to do this maintenance, this does not allow you to disqualify those engines from in-use testing or deny a warranty claim. Do not take these inspection or maintenance steps during service accumulation on your emission-data engines.

(e) *Maintenance that is not emission-related.* For maintenance unrelated to emission controls, you may schedule any amount of inspection or maintenance. You may also take these inspection or maintenance steps during service accumulation on your emission-data engines, as long as they are reasonable and technologically necessary. This might include adding engine oil, changing air, fuel, or oil filters, servicing engine-cooling systems, and adjusting idle speed, governor, engine bolt torque, valve lash, or injector lash. You may perform this nonemission-related maintenance on emission-data engines at the least frequent intervals that you recommend to the ultimate purchaser (but not the intervals recommended for severe service).

(f) *Source of parts and repairs.* State clearly on the first page of your written maintenance instructions that a repair shop or person of the owner's choosing may maintain, replace, or repair emission control devices and systems. Your instructions may not require components or service identified by brand, trade, or corporate name. Also, do not directly or indirectly condition your warranty on a requirement that the engine be serviced by your franchised dealers or any other service establishments with which you have a commercial relationship. You may disregard the requirements in this paragraph (f) if you do one of two things:

(1) Provide a component or service without charge under the purchase agreement.

(2) Get us to waive this prohibition in the public's interest by convincing us the engine will work properly only with the identified component or service.

(g) *Payment for scheduled maintenance.* Owners are responsible for properly maintaining their engines. This generally includes paying for scheduled maintenance. However, manufacturers must pay for scheduled maintenance during the useful life if it meets all the following criteria:

(1) Each affected component was not in general use on similar engines before the applicable dates shown in paragraph (5) of the definition of *new propulsion marine engine* in § 1045.801.

(2) The primary function of each affected component is to reduce emissions.

(3) The cost of the scheduled maintenance is more than 2 percent of the price of the engine.

(4) Failure to perform the maintenance would not cause clear problems that would significantly degrade the engine's performance.

(h) *Owners manual.* Explain the owner's responsibility for proper maintenance in the owners manual.

§ 1045.130 What installation instructions must I give to vessel manufacturers?

(a) If you sell an engine for someone else to install in a vessel, give the engine installer instructions for installing it consistent with the requirements of this part. Include all information necessary to ensure that an engine will be installed in its certified configuration.

(b) Make sure the instructions have the following information:

(1) Include the heading: ''Emission-related installation instructions''.

(2) State: ''Failing to follow these instructions when installing a certified engine in a vessel violates federal law (40 CFR 1068.105(b)), subject to fines or other penalties as described in the Clean Air Act.''

(3) Describe the instructions needed to properly install the exhaust system and any other components. Include instructions consistent with the requirements of § 1045.205(u) related to in-use measurement and the requirements of § 1045.655 related to altitude kits.

(4) Describe the steps needed to control evaporative emissions as described in § 1045.112. This will generally require notification that the installer and/or vessel manufacturer must meet the requirements of § 1045.112 and 40 CFR part 1060.

(5) Describe any necessary steps for installing the diagnostic system described in § 1045.110.

(6) Describe any limits on the range of applications needed to ensure that the engine operates consistently with your application for certification. For example, if your engines are certified only for personal watercraft, tell vessel manufacturers not to install the engines in vessels longer than 4.0 meters.

(7) Describe any other instructions to make sure the installed engine will operate according to design specifications in your application for certification. For example, this may include specified limits for catalyst systems, such as exhaust backpressure, catalyst location, and temperature profiles during engine operation.

(8) State: ''If you install the engine in a way that makes the engine's emission control information label hard to read during normal engine maintenance, you must place a duplicate label on the vessel, as described in 40 CFR 1068.105.''

(c) You do not need installation instructions for engines you install in your own vessels.

(d) Provide instructions in writing or in an equivalent format. For example, you may post instructions on a publicly available Web site for downloading or printing. If you do not provide the instructions in writing, explain in your application for certification how you will ensure that each installer is informed of the installation requirements.

§ 1045.135 How must I label and identify the engines I produce?

The provisions of this section apply to engine manufacturers.

(a) Assign each engine a unique identification number and permanently affix, engrave, or stamp it on the engine in a legible way.

(b) At the time of manufacture, affix a permanent and legible label identifying each engine. The label must be—

(1) Attached in one piece so it is not removable without being destroyed or defaced.

(2) Secured to a part of the engine needed for normal operation and not normally requiring replacement.

(3) Durable and readable for the engine's entire life.

(4) Written in English.

(c) The label must—

(1) Include the heading ''EMISSION CONTROL INFORMATION''.

(2) Include your full corporate name and trademark. You may identify another company and use its trademark instead of yours if you comply with the provisions of § 1045.640.

(3) Include EPA's standardized designation for the engine family (and subfamily, where applicable).

(4) State the engine's displacement (in liters) and maximum engine power (in kW); however, you may omit the displacement from the label if all the engines in the engine family have the same per-cylinder displacement and total displacement.

(5) State the date of manufacture [DAY (optional), MONTH, and YEAR]; however, you may omit this from the label if you stamp, engrave, or otherwise permanently identify it elsewhere on the engine, in which case you must also describe in your application for certification where you will identify the date on the engine.

(6) State the FELs to which the engines are certified (in g/kW-hr) if certification depends on the ABT provisions of subpart H of this part.

(7) Identify the emission control system. Use terms and abbreviations as described in 40 CFR 1068.45. You may omit this information from the label if there is not enough room for it and you put it in the owners manual instead.

(8) List specifications and adjustments for engine tuneups; however, you may omit this information from the label if there is not enough room for it and you put it in the owners manual instead.

(9) Identify the fuel type and any requirements for fuel and lubricants; however, you may omit this information from the label if there is not enough room for it and you put it in the owners manual instead.

(10) State: ''THIS MARINE ENGINE COMPLIES WITH U.S. EPA EXHAUST REGULATIONS FOR [MODEL YEAR].''

(11) If your durability demonstration for sterndrive/inboard engines is limited to fresh water, state: ''THIS ENGINE IS NOT INTENDED FOR USE IN SALTWATER.''

(d) You may add information to the emission control information label as follows:

(1) You may identify other emission standards that the engine meets or does not meet (such as California standards). You may include this information by adding it to the statement we specify or by including a separate statement.

(2) You may add other information to ensure that the engine will be properly maintained and used.

(3) You may add appropriate features to prevent counterfeit labels. For example, you may include the engine's unique identification number on the label.

(e) You may ask us to approve modified labeling requirements in this part 1045 if you show that it is necessary or appropriate. We will approve your request if your alternate label is consistent with the requirements of this part.

(f) If you obscure the engine label while installing the engine in the vessel such that the label cannot be read during normal maintenance, you must place a duplicate label on the vessel. If others install your engine in their vessels in a way that obscures the engine label, we require them to add a duplicate label on the vessel (see 40 CFR 1068.105); in that case, give them the number of duplicate labels they request and keep the following records for at least five years:

(1) Written documentation of the request from the vessel manufacturer.

(2) The number of duplicate labels you send for each engine family and the date you sent them.

§ 1045.140 What is my engine's maximum engine power?

(a) An engine configuration's maximum engine power is the maximum brake power point on the nominal power curve for the engine configuration, as defined in this section. Round the power value to the nearest whole kilowatt.

(b) The nominal power curve of an engine configuration is the relationship between maximum available engine brake power and engine speed for an engine, using the mapping procedures of 40 CFR part 1065, based on the manufacturer's design and production specifications for the engine. This information may also be expressed by a torque curve that relates maximum available engine torque with engine speed.

(c) The nominal power curve must be within the range of the actual power curves of production engines considering normal production variability. If after production begins it is determined that your nominal power curve does not represent production engines, we may require you to amend your application for certification under § 1045.225.

(d) Maximum engine power for an engine family is generally the weighted average value of maximum engine power of each engine configuration within the engine family based on your total U.S.-directed production volume of engines you produce from the engine family. However, alternative approaches for defining an engine family's maximum engine power apply in the following circumstances:

(1) For outboard or personal watercraft engines for which you neither generate nor use emission credits, you may identify the greatest value for maximum engine power from all the different configurations within the engine family to determine the appropriate emission standard under § 1045.103.

(2) For high-performance engines, you must use the smallest value for maximum engine power from all the different configurations within the engine family to determine the standards and other requirements that apply under this subpart B.

§ 1045.145 Are there interim provisions that apply only for a limited time?

The provisions in this section apply instead of other provisions in this part. This section describes how and when these interim provisions apply.

(a) *Small-volume engine manufacturers.* Special provisions apply to you for sterndrive/inboard engines if you are a small-volume engine manufacturer subject to the requirements of this part. Contact us before January 1, 2010 if you intend to use the provisions of this paragraph (a). You may delay complying with emission standards and other requirements that would otherwise apply until the 2011 model year for conventional sterndrive/inboard engines and until the 2013 model year for high-performance engines. Add a permanent label to a readily visible part of each engine exempted under this paragraph (a). This label must include at least the following items:

(1) The label heading "EMISSION CONTROL INFORMATION".

(2) Your corporate name and trademark.

(3) Engine displacement (in liters), rated power, and model year of the engine or whom to contact for further information.

(4) The following statement: "THIS ENGINE IS EXEMPT UNDER 40 CFR 1045.145(a) FROM EMISSION STANDARDS AND RELATED REQUIREMENTS."

(b) *Early banking.* You may generate exhaust emission credits for conventional sterndrive/inboard engines before the 2010 model year (or before the 2011 model year for small-volume engine manufacturers) as follows:

(1) You must begin actual production of early-compliant engines by September 1, 2009 (or before September 1, 2010 for small-volume engine manufacturers).

(2) You may not generate emission credits under this paragraph (b) with engines you produce after December 31, 2009 (or December 31, 2010 for small-volume engine manufacturers).

(3) Early-compliant engines must be certified to the standards and requirements for conventional sterndrive/inboard engines under this part 1045, with all family emission limits at or below the specified emission standards.

(4) Calculate emission credits by setting STD equal to 16 g/kW-hr for $HC+NO_X$ and 150 g/kW-hr for CO (see § 1045.705).

(5) Small-volume engine manufacturers may calculate emission credits using a multiplier based on the number of model years before the 2011 model year. The multipliers are 1.25 for one year early, 1.5 for two years early, and 2.0 for three years early. For example, multiply your calculated emission credits generated from compliant 2009 model year engines by 1.5.

(6) You may not use the provisions of this paragraph (b) to generate emission credits for engines whose point of first retail sale is in California.

(7) $HC+NO_X$ or CO credits you generate under this paragraph (b) may not be used after the 2012 model year (or the 2013 model year for small-volume engine manufacturers).

(c) *Assigned emission factors.* Through the 2013 model year, small-volume engine manufacturers may establish emission levels for certification without testing for conventional four-stroke sterndrive/inboard engines by selecting a family emission limit of 22.0 g/kW-hr for $HC+NO_X$ emissions and 150 g/kW-hr for CO emissions. Note that you must use emission credits under the provisions of subpart H of this part to show that you meet applicable requirements if you use these family emission limits. Also, if you use these family emission limits, you must use them for both $HC+NO_X$ and CO emissions.

(d) *Early compliance with evaporative emission standards.* You may sell or install fuel tanks that do not meet the specified permeation standards without violating the prohibition in 40 CFR 1068.101(a)(1) if you earn evaporative emission allowances, as follows:

(1) You may earn an evaporative emission allowance from one fuel tank certified to EPA's evaporative emission standards by producing it before EPA's evaporative emission standards start to apply. You may use this evaporative emission allowance by selling one fuel tank that does not meet the specified permeation emission standards. For example, you can earn an evaporative emission allowance by selling a low-permeation fuel tank for personal watercraft before the 2011 model year, in which case you could sell a high-permeation fuel tank for a personal watercraft in 2011. You must meet all the other requirements related to evaporative emissions that apply for fuel tanks covered by an EPA certificate of conformity.

(2) You must add a label to exempted fuel tanks you produce under this paragraph (d) with the following statement: ''EXEMPT FROM EMISSION STANDARDS UNDER 40 CFR 1045.145(d)''.

(3) Evaporative emission allowances you earn under this paragraph (d) from portable marine fuel tanks may be used only for other portable marine fuel tanks. Similarly, evaporative emission allowances from personal watercraft fuel tanks may be used only for personal watercraft fuel tanks and evaporative emission allowances from other installed fuel tanks may be used only for other installed fuel tanks.

(4) You may not use the allowances you generate under this paragraph (d) for portable marine fuel tanks and personal watercraft fuel tanks in 2014 or later model years. Similarly, you may not use the allowances you generate under this paragraph (d) for other installed fuel tanks in 2015 or later model years.

(5) Send the Designated Compliance Officer the following information for each year in which you use the provisions of this paragraph (d):

(i) Send us a report within 45 days after the end of the model year describing how many pieces of equipment you produced in the preceding model year that generate allowances. You may combine this with the reports specified in § 1045.250(a) if applicable.

(ii) Describe the number of equipment using allowances under this paragraph (d) in your end-of-year reports and final reports after the end of the model year as described in § 1045.730(a). If you do not participate in averaging, banking, and trading program, send this information separately within 90 days after the end of the model year.

(e) *Useful life for evaporative emission standards.* A useful life period of two years applies for fuel tanks certified to meet the permeation emission standards in § 1045.112(b) in 2013 and earlier model years. However, for fuel tanks with a family emission limit above or below the specified emission standard, calculate emission credits under § 1045.706 based on the useful life values specified in § 1045.112.

(f) *Delayed FEL caps for stand-up personal watercraft.* The FEL caps specified in § 1045.103(b) do not apply in the 2010 and 2011 model years for personal watercraft that are designed for operation from a standing position.

(g) *Delayed compliance with not-to-exceed emission standards.* The not-to-exceed standards specified in § 1045.107 do not apply in the 2010 through 2012 model years for engine families that are certified based on carryover emission data from the 2009 model year. This includes models that were certified only in California, as long as no new testing is otherwise required to get a new certificate.

(h) *Carryover of California ARB emission data.* The provisions of 40 CFR 1065.10(c)(5) allow for the use of emission data generated for the California Air Resources Board as the basis for EPA certification. For sterndrive/inboard engines certified in California before the 2010 model year, you may use such emission data as the basis for meeting the standards of § 1045.105, as long as you meet the conditions specified in § 1045.235(d).

(i) *Hardship for obsolete engines.* We have made the determination under 40 CFR 1068.255 that secondary engine manufacturers may use the hardship exemption to sell uncertified 4.3-liter and 8.1-liter engines from General Motors in the 2010 model year. These engines are exempt without request. You must label the engines as specified in 40 CFR 1068.255(b).

(j) *Adjusted NTE subzones for noncatalyzed four-stroke engines.* For supercharged four-stroke outboard engines above 150 kW without catalysts, you may divide the NTE zone specified in § 1045.515(c)(6) based on a speed cutpoint of 70 percent of maximum test speed instead of 50 percent of maximum test speed through the 2014 model year.

(k) *Averaging for under-cowl fuel lines.* Section 1045.112 specifies phased-in standards for under-cowl fuel lines for 2010 through 2014 model years, subject to the following provisions:

(1) You must comply with these requirements based on total lengths of compliant and noncompliant fuel lines. For each model year, calculate the percentage of compliant under-cowl fuel line by adding up the length of under-cowl fuel line certified to meet the applicable permeation standards and dividing this sum by the total length of under-cowl fuel line from all your outboard engines. You may count a fuel line as compliant only if you certify that its emission levels will be at or below the specified standard throughout the useful life.

(2) In your application for certification for each outboard engine family, identify the part numbers, descriptions, and locations of all the compliant fuel lines. You must include a drawing of any fuel lines in addition to the description if that is necessary for us to find which fuel lines you intend to be certified. Your descriptions must include the lengths of compliant and noncompliant fuel lines for each engine, including aggregated lengths for the whole set of fuel lines used on an engine. If the engine family includes noncompliant fuel lines, you must also include a statement that you will have enough compliant fuel lines to meet the phase-in requirements and provide detailed calculations to support your statement.

(3) Send the Designated Compliance Officer end-of-year reports and final reports after the end of each model year that you use noncompliant fuel lines as described in § 1045.730(a). Include the production volumes with a point of retail sale in the United States, as described in §§ 1045.701(j). State your production volumes in terms of total engine sales by model and in terms of total lengths of compliant and noncompliant fuel lines. If a single engine family includes configurations with different lengths of compliant or noncompliant fuel lines, count each configuration separately. If you changed your designs during the model year in a way that affects these compliance calculations, identify the actual production volumes associated with each unique design.

(4) Keep a copy of the reports we require in this paragraph (k) until December 31, 2022 as described in § 1045.735(b). We may require you to keep additional records or to send us relevant information not required by this paragraph (k), as allowed under the Clean Air Act.

(5) Label your compliant low-permeation fuel lines as specified in § 1060.137. Any fuel line observed without a complete identification as specified in § 1060.137 will be considered noncompliant. In addition, for each model year in which you use noncompliant fuel lines, you must include one of the following statements on the engine label described in § 1045.135:

(i) ''LOW-PERM/HIGH-PERM = [x/y]'', where *x* is the percentage of low-permeation under-cowl fuel line and *y* is the percentage of high-permeation under-cowl fuel line (*x* and *y* must sum to 100).

(ii) ''LOW-PERM = [x mm]; HIGH-PERM = [y mm]'', where *x* is the length of low-permeation under-cowl fuel line and *y* is the length of high-permeation under-cowl fuel line, in mm.

(l) [Reserved]

(m) *Delayed labeling for fuel lines.* You may omit fuel-line labeling requirements specified in 40 CFR part 1060 in the 2009 model year.

(n) *Continued use of 40 CFR part 91 test procedures.* You may continue to use the test procedures in 40 CFR part

91 instead of those in subpart F of this part for 2010 through 2012 model year outboard and personal watercraft engines. This applies for certification, production-line, and in-use testing. You may continue to use test data based on the test procedures in 40 CFR part 91 for engine families in 2013 and later model years, provided that we allow you to use carryover emission data under 40 CFR 1045.235(d) for your engine family. You may also use the test procedures in 40 CFR part 91 for production-line testing with any engine family whose certification is based on testing with those procedures.

Subpart C—Certifying Engine Families

§ 1045.201 What are the general requirements for obtaining a certificate of conformity?

Engine manufacturers must certify their engines with respect to the exhaust emission standards in this part. Manufacturers of engines, equipment, or fuel-system components may need to certify their products with respect to evaporative emission standards as described in 40 CFR 1060.1 and 1060.601. The following general requirements apply for obtaining a certificate of conformity:

(a) You must send us a separate application for a certificate of conformity for each engine family. A certificate of conformity is valid starting with the indicated effective date but it is not valid for any production after December 31 of the model year for which it is issued. No certificate will be issued after December 31 of the model year.

(b) The application must contain all the information required by this part and must not include false or incomplete statements or information (see § 1045.255).

(c) We may ask you to include less information than we specify in this subpart as long as you maintain all the information required by § 1045.250.

(d) You must use good engineering judgment for all decisions related to your application (see 40 CFR 1068.5).

(e) An authorized representative of your company must approve and sign the application.

(f) See § 1045.255 for provisions describing how we will process your application.

(g) We may require you to deliver your test engines to a facility we designate for our testing (see § 1045.235(c)).

§ 1045.205 What must I include in my application?

This section specifies the information that must be in your application, unless we ask you to include less information under § 1045.201(c). We may require you to provide additional information to evaluate your application.

(a) Describe the engine family's specifications and other basic parameters of the engine's design and emission controls. List the fuel type on which your engines are designed to operate (for example, all-season gasoline). List each distinguishable engine configuration in the engine family. For each engine configuration, list the maximum engine power and the range of values for maximum engine power resulting from production tolerances, as described in § 1045.140. Describe why your engines qualify as high-performance engines, if applicable.

(b) Explain how the emission control systems operate. Describe in detail all system components for controlling exhaust emissions, including all auxiliary emission control devices (AECDs) and all fuel-system components you will install on any production or test engine. Identify the part number of each component you describe. For this paragraph (b), treat as separate AECDs any devices that modulate or activate differently from each other. Include sufficient detail to allow us to evaluate whether the AECDs are consistent with the defeat device prohibition of § 1045.115.

(c) Explain how the engine diagnostic system works, if applicable, describing especially the engine conditions (with the corresponding diagnostic trouble codes) that cause the malfunction indicator to go on. Propose the conditions under which the diagnostic system should disregard trouble codes, as described in § 1045.110(f).

(d) Describe the engines you selected for testing and the reasons for selecting them.

(e) Describe the test equipment and procedures that you used, including any special or alternate test procedures you used.

(f) Describe how you operated the emission-data engine before testing, including the duty cycle and the number of engine operating hours used to stabilize emission levels. Explain why you selected the method of service accumulation. Describe any scheduled maintenance you did.

(g) List the specifications of the test fuel to show that it falls within the required ranges we specify in 40 CFR part 1065.

(h) Identify the engine family's useful life.

(i) Include the maintenance and warranty instructions you will give to the ultimate purchaser of each new engine (see §§ 1045.120 and 1045.125).

(j) Include the emission-related installation instructions you will provide if someone else installs your engines in a vessel (see § 1045.130).

(k) Describe your emission control information label (see § 1045.135).

(l) Identify the emission standards or FELs to which you are certifying engines in the engine family.

(m) Identify the engine family's deterioration factors and describe how you developed them (see § 1045.245). Present any emission test data you used for this.

(n) State that you operated your emission-data engines as described in the application (including the test procedures, test parameters, and test fuels) to show you meet the requirements of this part.

(o) Present emission data to show that you meet emission standards, as follows:

(1) Present emission data by mode for hydrocarbons (such as THC or THCE, as applicable), NO_X, and CO on an emission-data engine to show your engines meet the duty-cycle emission standards we specify in §§ 1045.103(a) and 1045.105(a). Show weighted emission figures before and after applying deterioration factors for each engine. If we specify more than one grade of any fuel type (for example, low-temperature and all-season gasoline), you need to submit test data only for one grade, unless the regulations of this part specify otherwise for your engine.

(2) Note that §§ 1045.235 and 1045.245 allow you to submit an application in certain cases without new emission data.

(p) State that all the engines in the engine family comply with the not-to-exceed emission standards we specify in subpart B of this part for all normal operation and use when tested as specified in § 1045.515, if applicable. Describe any relevant testing, engineering analysis, or other information in sufficient detail to support your statement.

(q) Report all test results, including those from invalid tests, whether or not they were conducted according to the test procedures of subpart F of this part. If you measure CO2, report those emission levels (in g/kW-hr). We may ask you to send other information to confirm that your tests were valid under the requirements of this part and 40 CFR parts 1060 and 1065.

(r) Describe all adjustable operating parameters (see § 1045.115(e)), including production tolerances. Include the following in your description of each parameter:

(1) The nominal or recommended setting.

(2) The intended physically adjustable range.

(3) The limits or stops used to establish adjustable ranges.

(4) Information showing why the limits, stops, or other means of inhibiting adjustment are effective in preventing adjustment of parameters on in-use engines to settings outside your intended physically adjustable ranges.

(s) Describe how your engines comply with emission standards at varying atmospheric pressures. Include a description of altitude kits you design to comply with the requirements of § 1045.115(d). Identify the part number of each component you describe. Identify the altitude range for which you expect proper engine performance and emission control with and without the altitude kit. State that your engines will comply with applicable emission standards throughout the useful life with the altitude kit installed according to your instructions. Describe any relevant testing, engineering analysis, or other information in sufficient detail to support your statement. In addition, describe your plan for making information and parts available such that you would reasonably expect that altitude kits would be widely used in the high-altitude counties specified in 40 CFR part 1068, Appendix III. For example, engine owners should have ready access to information describing when an altitude kit is needed and how to obtain this service. Similarly, parts and service information should be available to qualified service facilities in addition to authorized service centers if that is needed for owners to have such altitude kits installed locally.

(t) Provide the information needed to read, record, and interpret all the information broadcast by an engine's onboard computers and electronic control units. State that, upon request, you will give us any hardware, software, or tools we would need to do this. If you broadcast a surrogate parameter for torque values, you must provide us what we need to convert these into torque units. You may reference any appropriate publicly released standards that define conventions for these messages and parameters. Format your information consistent with publicly released standards.

(u) Confirm that your emission-related installation instructions specify how to ensure that sampling of exhaust emissions will be possible after engines are installed in vessels and placed in service. Show how to sample exhaust emissions in a way that prevents diluting the exhaust sample with ambient air.

(v) Unconditionally certify that all the engines in the engine family comply with the requirements of this part, other referenced parts of the CFR, and the Clean Air Act.

(w) Include good-faith estimates of U.S.-directed production volumes. Include a justification for the estimated production volumes if they are substantially different than actual production volumes in earlier years for similar models.

(x) Include the information required by other subparts of this part. For example, include the information required by § 1045.725 if you participate in the ABT program.

(y) Include other applicable information, such as information specified in this part or 40 CFR part 1068 related to requests for exemptions.

(z) Name an agent for service located in the United States. Service on this agent constitutes service on you or any of your officers or employees for any action by EPA or otherwise by the United States related to the requirements of this part.

(aa) For imported engines, identify the following:

(1) The port(s) at which you have imported engines over the previous 12 months.

(2) The names and addresses of the agents you have authorized to import your engines.

(3) The location of a test facility in the United States where you can test your engines if we select them for testing under a selective enforcement audit, as specified in 40 CFR part 1068, subpart E.

§ 1045.210 May I get preliminary approval before I complete my application?

If you send us information before you finish the application, we will review it and make any appropriate determinations, especially for questions related to engine family definitions, auxiliary emission control devices, deterioration factors, testing for service accumulation, maintenance, and compliance with not-to-exceed standards. Decisions made under this section are considered to be preliminary approval, subject to final review and approval. We will generally not reverse a decision where we have given you preliminary approval, unless we find new information supporting a different decision. If you request preliminary approval related to the upcoming model year or the model year after that, we will make the appropriate determinations as soon as practicable. We will generally not provide preliminary approval related to a future model year more than two years ahead of time.

§ 1045.220 How do I amend the maintenance instructions in my application?

You may amend your emission-related maintenance instructions after you submit your application for certification as long as the amended instructions remain consistent with the provisions of § 1045.125. You must send the Designated Compliance Officer a written request to amend your application for certification for an engine family if you want to change the emission-related maintenance instructions in a way that could affect emissions. In your request, describe the proposed changes to the maintenance instructions. If operators follow the original maintenance instructions rather than the newly specified maintenance, this does not allow you to disqualify those engines from in-use testing or deny a warranty claim.

(a) If you are decreasing, replacing, or eliminating any specified maintenance, you may distribute the new maintenance instructions to your customers 30 days after we receive your request, unless we disapprove your request. This would generally include replacing one maintenance step with another. We may approve a shorter time or waive this requirement.

(b) If your requested change would not decrease the specified maintenance, you may distribute the new maintenance instructions anytime after you send your request.

(c) You need not request approval if you are making only minor corrections (such as correcting typographical mistakes), clarifying your maintenance instructions, or changing instructions for maintenance unrelated to emission control. We may ask you to send us copies of maintenance instructions revised under this paragraph (c).

§ 1045.225 How do I amend my application for certification to include new or modified engines or change an FEL?

Before we issue you a certificate of conformity, you may amend your application to include new or modified engine configurations, subject to the provisions of this section. After we have issued your certificate of conformity, you may send us an amended application requesting that we include new or modified engine configurations within the scope of the certificate, subject to the provisions of this section. You must amend your application if any changes occur with respect to any information included in your application.

(a) You must amend your application before you take any of the following actions:

(1) Add an engine configuration to an engine family. In this case, the engine configuration added must be consistent with other engine configurations in the engine family with respect to the criteria listed in § 1045.230.

(2) Change an engine configuration already included in an engine family in a way that may affect emissions, or change any of the components you described in your application for certification. This includes production and design changes that may affect emissions any time during the engine's lifetime.

(3) Modify an FEL for an engine family as described in paragraph (f) of this section.

(b) To amend your application for certification, send the Designated Compliance Officer the following information:

(1) Describe in detail the addition or change in the engine model or configuration you intend to make.

(2) Include engineering evaluations or data showing that the amended engine family complies with all applicable requirements. You may do this by showing that the original emission-data engine is still appropriate for showing that the amended family complies with all applicable requirements.

(3) If the original emission-data engine for the engine family is not appropriate to show compliance for the new or modified engine configuration, include new test data showing that the new or modified engine configuration meets the requirements of this part.

(c) We may ask for more test data or engineering evaluations. You must give us these within 30 days after we request them.

(d) For engine families already covered by a certificate of conformity, we will determine whether the existing certificate of conformity covers your newly added or modified engine. You may ask for a hearing if we deny your request (see § 1045.820).

(e) For engine families already covered by a certificate of conformity, you may start producing the new or modified engine configuration anytime after you send us your amended application and before we make a decision under paragraph (d) of this section. However, if we determine that the affected engines do not meet applicable requirements, we will notify you to cease production of the engines and may require you to recall the engines at no expense to the owner. Choosing to produce engines under this paragraph (e) is deemed to be consent to recall all engines that we determine do not meet applicable emission standards or other requirements and to remedy the nonconformity at no expense to the owner. If you do not provide information required under paragraph (c) of this section within 30 days after we request it, you must stop producing the new or modified engines.

(f) You may ask us to approve a change to your FEL in certain cases after the start of production. The changed FEL may not apply to engines you have already introduced into U.S. commerce, except as described in this paragraph (f). If we approve a changed FEL after the start of production, you must include the new FEL on the emission control information label for all engines produced after the change. You may ask us to approve a change to your FEL in the following cases:

(1) You may ask to raise your FEL for your engine family at any time. In your request, you must show that you will still be able to meet the emission standards as specified in subparts B and H of this part. If you amend your application by submitting new test data to include a newly added or modified engine, as described in paragraph (b)(3) of this section, use the appropriate FELs with corresponding production volumes to calculate emission credits for the model year, as described in subpart H of this part. In all other circumstances, you must use the higher FEL for the entire family to calculate emission credits under subpart H of this part.

(2) You may ask to lower the FEL for your engine family only if you have test data from production engines showing that emissions are below the proposed lower FEL. The lower FEL applies only to engines you produce after we approve the new FEL. Use the appropriate FELs with corresponding production volumes to calculate emission credits for the model year, as described in subpart H of this part.

§ 1045.230 How do I select engine families?

(a) For purposes of certification, divide your product line into families of engines that are expected to have similar emission characteristics throughout their useful life as described in this section. Your engine family is limited to a single model year.

(b) Group engines into the same engine family if they are the same in all the following aspects:

(1) The combustion cycle and fuel. See paragraph (e) of this section for special provisions that apply for dual-fuel engines.

(2) Method of air aspiration (for example, turbocharged vs. naturally aspirated).

(3) The number, location, volume, and composition of catalytic converters.

(4) The number, arrangement, and approximate bore diameter of cylinders.

(5) Method of control for engine operation, other than governing (i.e., mechanical or electronic).

(6) The numerical level of the applicable emission standards. For example, an engine family may not include engines certified to different family emission limits, though you may change family emission limits without recertifying as specified in § 1045.225.

(c) You may subdivide a group of engines that is identical under paragraph (b) of this section into different engine families if you show the expected emission characteristics are different during the useful life.

(d) You may group engines that are not identical with respect to the things listed in paragraph (b) of this section into the same engine family, as follows:

(1) In unusual circumstances, you may group such engines into the same engine family if you show that their emission characteristics during the useful life will be similar.

(2) If you are a small-volume engine manufacturer, you may group all your high-performance engines into a single engine family.

(3) The provisions of this paragraph (e) do not exempt any engines from meeting all the emission standards and requirements in subpart B of this part.

(e) You may certify dual-fuel or flexible-fuel engines in a single engine family. You may include dedicated-fuel versions of this same engine model in the same engine family, as long as they are identical to the engine configuration with respect to that fuel type for the dual-fuel or flexible-fuel version of the engine. For example, if you produce an engine that can alternately run on gasoline and natural gas, you can include the gasoline-only and natural gas-only versions of the engine in the same engine family as the dual-fuel engine if engine operation on each fuel type is identical with or without installation of components for operating on the other fuel.

§ 1045.235 What emission testing must I perform for my application for a certificate of conformity?

This section describes the emission testing you must perform to show compliance with the emission standards in §§ 1045.103 and 1045.105. See § 1045.205(p) regarding emission testing related to the not-to-exceed standards. See §§ 1045.240 and 1045.245 and 40 CFR part 1065, subpart E, regarding service accumulation before emission testing.

(a) Select an emission-data engine from each engine family for testing as described in 40 CFR 1065.401. Select the engine with a configuration that is most likely to exceed the exhaust emission standards, using good engineering judgment. Consider the emission levels of all exhaust constituents over the full useful life of the engine when operated in a vessel.

(b) Test your emission-data engines using the procedures and equipment specified in subpart F of this part. In the case of dual-fuel engines, measure emissions when operating with each type of fuel for which you intend to certify the engine. In the case of flexible-fuel engines, measure emissions when operating with the fuel mixture that is most likely to cause the engine to exceed the applicable $HC+NO_X$ emission standard, though you may ask us to exclude fuel mixtures that you can show are not likely to occur in use.

(c) We may measure emissions from any of your emission-data engines or other engines from the engine family, as follows:

(1) We may decide to do the testing at your plant or any other facility. If we do this, you must deliver the engine to a test facility we designate. The engine you provide must include appropriate manifolds, aftertreatment devices, electronic control units, and other emission-related components not normally attached directly to the engine block. If we do the testing at your plant, you must schedule it as soon as possible and make available the instruments, personnel, and equipment we need.

(2) If we measure emissions on one of your engines, the results of that testing become the official emission results for the engine. Unless we later invalidate these data, we may decide not to consider your data in determining if your engine family meets applicable requirements.

(3) We may set the adjustable parameters of your engine to any point within the physically adjustable ranges (see § 1045.115(e)).

(4) We may calibrate your engine within normal production tolerances for anything we do not consider an adjustable parameter. For example, this would apply where we determine that an engine parameter is not an adjustable parameter (as defined in § 1045.801) but that it is subject to production variability.

(d) You may ask to use carryover emission data from a previous model year instead of doing new tests, but only if all the following are true:

(1) The engine family from the previous model year differs from the current engine family only with respect to model year or other characteristics unrelated to emissions.

(2) The emission-data engine from the previous model year remains the appropriate emission-data engine under paragraph (b) of this section.

(3) The data show that the emission-data engine would meet all the requirements that apply to the engine family covered by the application for certification. For engines originally tested under the provisions of 40 CFR part 91, you may consider those test procedures to be equivalent to the procedures we specify in subpart F of this part.

(e) We may require you to test another engine of the same or different configuration in addition to the engine(s) tested under paragraph (b) of this section.

(f) If you use an alternate test procedure under 40 CFR 1065.10 and later testing shows that such testing does not produce results that are equivalent to the procedures specified in subpart F of this part, we may reject data you generated using the alternate procedure.

§ 1045.240 How do I demonstrate that my engine family complies with exhaust emission standards?

(a) For purposes of certification, your engine family is considered in compliance with the duty-cycle emission standards in § 1045.103 or § 1045.105 if all emission-data engines representing that family have test results showing deteriorated emission levels at or below these standards. This includes all test points over the course of the durability demonstration. Note that your FELs are considered to be the applicable emission standards with which you must comply if you participate in the ABT program in subpart H of this part.

(b) Your engine family is deemed not to comply if any emission-data engine representing that family has test results showing a deteriorated emission level for any pollutant that is above an applicable emission standard. Similarly, your engine family is deemed not to comply if any emission-data engine representing that family has test results showing any emission level above the applicable not-to-exceed emission standard for any pollutant. The provisions of this paragraph (b) apply for all test points over the course of the durability demonstration.

(c) Determine a deterioration factor to compare emission levels from the emission-data engine with the applicable emission standards. Section 1045.245 specifies how to test engines to develop deterioration factors that represent the expected deterioration in emissions over your engines' full useful life. Your deterioration factors must take into account any available data from in-use testing with similar engines. You may ask us to give you an assigned deterioration factor for your high-performance engines. Small-volume engine manufacturers may use assigned deterioration factors that we establish for any engine families certified under this part. Apply deterioration factors as follows:

(1) *Additive deterioration factor for exhaust emissions.* For engines that do not use aftertreatment technology, use an additive deterioration factor for exhaust emissions. An additive deterioration factor is the difference between exhaust emissions at the end of useful life and exhaust emissions at the low-hour test point. Adjust the official emission results for each tested engine at the selected test point by adding the factor to the measured emissions. If the deterioration factor is less than zero, use zero. Additive deterioration factors must be specified to one more decimal place than the emission standard.

(2) *Multiplicative deterioration factor for exhaust emissions.* For engines that use aftertreatment technology, such as catalytic converters, use a multiplicative deterioration factor for exhaust emissions. A multiplicative deterioration factor is the ratio of exhaust emissions at the end of useful life to exhaust emissions at the low-hour test point. Adjust the official emission results for each tested engine at the selected test point by multiplying the measured emissions by the deterioration factor. If the deterioration factor is less than one, use one. Multiplicative deterioration factors must be specified to one more significant figure than the emission standard.

(d) Collect emission data using measurements to one more decimal place than the applicable standard. Apply the deterioration factor to the official emission result, as described in paragraph (c) of this section, then round the adjusted figure to the same number of decimal places as the emission standard. Compare the rounded emission levels to the emission standard for each emission-data engine. In the case of $HC+NO_X$ standards, add the official emission results and apply the deterioration factor to the sum of the pollutants before rounding. However, if your deterioration factors are based on emission measurements that do not cover the vehicle's full useful life, apply the deterioration factor to each pollutant and then add the results before rounding.

§ 1045.245 How do I determine deterioration factors from exhaust durability testing?

This section describes how to determine deterioration factors, either with pre-existing test data or with new emission measurements.

(a) You may ask us to approve deterioration factors for an engine family based on emission measurements from similar engines if you have already given us these data for certifying the other engines in the same or earlier model years. Use good engineering judgment to decide whether the two engines are similar.

(b) If you are unable to determine deterioration factors for an engine family under paragraph (a) of this section, select engines, subsystems, or components for testing. Determine deterioration factors based on service accumulation and related testing. Include consideration of wear and other causes of deterioration expected under typical consumer use, including exposure to saltwater if applicable. Determine deterioration factors as follows:

(1) You must measure emissions from the emission-data engine at a low-hour test point and the end of the useful life. You may also test at evenly spaced intermediate points. Collect emission data using measurements to one more decimal place than the emission standard.

(2) Operate the engine over a representative duty cycle for a period at least as long as the useful life (in hours). You may operate the engine continuously. You may also use an engine installed in a vessel to accumulate service hours instead of running the engine only in the laboratory.

(3) In the case of dual-fuel or flexible-fuel engines, you may accumulate service hours on a single emission-data engine using the type or mixture of fuel expected to have the highest combustion and exhaust temperatures. For dual-fuel engines, you must measure emissions on each fuel type at each test point.

(4) You may perform maintenance on emission-data engines as described in § 1045.125 and 40 CFR part 1065, subpart E.

(5) If you measure emissions at only two points to calculate your deterioration factor, base your calculations on a linear relationship connecting these two data points for each pollutant. If you measure emissions at three or more points, use a linear least-squares fit of your test data for each pollutant to calculate your deterioration factor.

(6) If you test more than one engine to establish deterioration factors, calculate the deterioration factor for each engine and average the deterioration factors from all the engines before rounding.

(7) Use good engineering judgment for all aspects of the effort to establish deterioration factors under this paragraph (b).

(8) You may use other testing methods to determine deterioration factors, consistent with good engineering judgment, as long as we approve those methods in advance.

(c) Include the following information in your application for certification:

(1) If you determine your deterioration factors based on test data from a different engine family, explain why this is appropriate and include all the emission measurements on which you base the deterioration factor.

(2) If you do testing to determine deterioration factors, describe the form and extent of service accumulation, including the method you use to accumulate hours.

§ 1045.250 What records must I keep and what reports must I send to EPA?

(a) Send the Designated Compliance Officer information related to your U.S.-directed production volumes as described in § 1045.345. In addition, within 45 days after the end of the model year, you must send us a report describing information about engines you produced during the model year as follows:

(1) State the total production volume for each engine family that is not subject to reporting under § 1045.345.

(2) State the total production volume for any engine family for which you produce engines after completing the reports required in § 1045.345.

(3) For production volumes you report under this paragraph (a), identify whether or not the figures include California sales. Include a separate count of production volumes for California sales if those figures are available.

(b) Organize and maintain the following records:

(1) A copy of all applications and any summary information you send us.

(2) Any of the information we specify in § 1045.205 that you were not required to include in your application.

(3) A detailed history of each emission-data engine. For each engine, describe all of the following:

(i) The emission-data engine's construction, including its origin and buildup, steps you took to ensure that it represents production engines, any components you built specially for it, and all the components you include in your application for certification.

(ii) How you accumulated engine operating hours (service accumulation), including the dates and the number of hours accumulated.

(iii) All maintenance, including modifications, parts changes, and other service, and the dates and reasons for the maintenance.

(iv) All your emission tests, including documentation on routine and standard tests, as specified in part 40 CFR part 1065, and the date and purpose of each test.

(v) All tests to diagnose engine or emission control performance, giving the date and time of each and the reasons for the test.

(vi) Any other significant events.

(4) Production figures for each engine family divided by assembly plant.

(5) Keep a list of engine identification numbers for all the engines you produce under each certificate of conformity.

(c) Keep data from routine emission tests (such as test cell temperatures and relative humidity readings) for one year after we issue the associated certificate of conformity. Keep all other information specified in this section for eight years after we issue your certificate.

(d) Store these records in any format and on any media as long as you can promptly send us organized, written records in English if we ask for them. You must keep these records readily available. We may review them at any time.

§ 1045.255 What decisions may EPA make regarding my certificate of conformity?

(a) If we determine your application is complete and shows that the engine family meets all the requirements of this part and the Clean Air Act, we will issue a certificate of conformity for your engine family for that model year. We may make the approval subject to additional conditions.

(b) We may deny your application for certification if we determine that your engine family fails to comply with emission standards or other requirements of this part or the Clean Air Act. We will base our decision on all available information. If we deny your application, we will explain why in writing.

(c) In addition, we may deny your application or suspend or revoke your certificate if you do any of the following:

(1) Refuse to comply with any testing or reporting requirements.

(2) Submit false or incomplete information (paragraph (e) of this section applies if this is fraudulent).

(3) Render inaccurate any test data.

(4) Deny us from completing authorized activities (see 40 CFR 1068.20). This includes a failure to provide reasonable assistance.

(5) Produce engines for importation into the United States at a location where local law prohibits us from carrying out authorized activities.

(6) Fail to supply requested information or amend your application to include all engines being produced.

(7) Take any action that otherwise circumvents the intent of the Clean Air Act or this part.

(d) We may void your certificate if you do not keep the records we require or do not give us information as required under this part or the Clean Air Act.

(e) We may void your certificate if we find that you intentionally submitted false or incomplete information.

(f) If we deny your application or suspend, revoke, or void your certificate, you may ask for a hearing (see § 1045.820).

Subpart D—Testing Production-line Engines

§ 1045.301 When must I test my production-line engines?

(a) If you produce engines that are subject to the requirements of this part, you must test them as described in this subpart, except as follows:

(1) Small-volume engine manufacturers may omit testing under this subpart.

(2) We may exempt engine families with a projected U.S.-directed production volume below 150 units from routine testing under this subpart. Request this exemption in your application for certification and include your basis for projecting a production volume below 150 units. We will approve your request if we agree that you have made good-faith estimates of your production volumes. Your exemption is approved when we grant your certificate. You must promptly notify us if your actual production exceeds 150 units during the model year. If you exceed the production limit or if there is evidence of a nonconformity, we may require you to test production-line engines under this subpart, or under 40 CFR part 1068, subpart E, even if we have approved an exemption under this paragraph (a)(2).

(3) The requirements of this subpart do not apply to sterndrive/inboard engines.

(b) We may suspend or revoke your certificate of conformity for certain engine families if your production-line engines do not meet the requirements of this part or you do not fulfill your obligations under this subpart (see §§ 1045.325 and 1045.340).

(c) Other regulatory provisions authorize us to suspend, revoke, or void your certificate of conformity, or order recalls for engine families, without regard to whether they have passed these production-line testing requirements. The requirements of this subpart do not affect our ability to do selective enforcement audits, as described in 40 CFR part 1068. Individual engines in families that pass these production-line testing requirements must also conform to all applicable regulations of this part and 40 CFR part 1068.

(d) You may use alternate programs for testing production-line engines in the following circumstances:

(1) You may use analyzers and sampling systems that meet the field-testing requirements of 40 CFR part 1065, subpart J, but not the otherwise applicable requirements in 40 CFR part 1065 for laboratory testing, to demonstrate compliance with duty-cycle emission standards if you double the minimum sampling rate specified in § 1045.310(b). Use measured test results to determine whether engines comply with applicable standards without applying a measurement allowance. This alternate program does not require prior approval but we may disallow use of this option where we determine that use of field-grade equipment would prevent you from being able to demonstrate that your engines are being produced to conform to the specifications in your application for certification.

(2) You may ask to use another alternate program for testing production-line engines. In your request, you must show us that the alternate program gives equal assurance that your products meet the requirements of this part. We may waive some or all of this subpart's requirements if we approve your alternate approach. For example, in certain circumstances you may be able to give us equal assurance that your products meet the requirements of this part by using less rigorous measurement methods if you offset that by increasing the number of test engines.

(e) If you certify an engine family with carryover emission data, as described in § 1045.235(d), and these equivalent engine families consistently pass the production-line testing requirements over the preceding two-year period, you may ask for a reduced testing rate for further production-line testing for that family. The minimum testing rate is one engine per engine family. If we reduce your testing rate, we may limit our approval to any number of model years. In determining whether to approve your request, we may consider the number of engines that have failed the emission tests.

(f) We may ask you to make a reasonable number of production-line engines available for a reasonable time so we can test or inspect them for compliance with the requirements of this part.

§ 1045.305 How must I prepare and test my production-line engines?

This section describes how to prepare and test production-line engines. You must assemble the test engine in a way that represents the assembly procedures for other engines in the engine family. You must ask us to approve any deviations from your normal assembly procedures for other production engines in the engine family.

(a) *Test procedures.* Test your production-line engines using the applicable testing procedures in subpart F of this part to show you meet the duty-cycle emission standards in subpart B of this part. The not-to-exceed standards apply for this testing, but you need not do additional testing to show that production-line engines meet the not-to-exceed standards.

(b) *Modifying a test engine.* Once an engine is selected for testing (see § 1045.310), you may adjust, repair, prepare, or modify it or check its emissions only if one of the following is true:

(1) You document the need for doing so in your procedures for assembling and inspecting all your production engines and make the action routine for all the engines in the engine family.

(2) This subpart otherwise specifically allows your action.

(3) We approve your action in advance.

(c) *Engine malfunction.* If an engine malfunction prevents further emission testing, ask us to approve your decision to either repair the engine or delete it from the test sequence.

(d) *Setting adjustable parameters.* Before any test, we may require you to adjust any adjustable parameter to any setting within its physically adjustable range.

(1) We may require you to adjust idle speed outside the physically adjustable range as needed, but only until the engine has stabilized emission levels (see paragraph (e) of this section). We may ask you for information needed to establish an alternate minimum idle speed.

(2) We may specify adjustments within the physically adjustable range

by considering their effect on emission levels. We may also consider how likely it is that someone will make such an adjustment with in-use engines.

(e) *Stabilizing emission levels.* You may operate the engine to stabilize the emission levels before you test production-line engines. Using good engineering judgment, operate your engines in a way that represents the way production engines will be used. You may operate each engine for no more than the greater of two periods:

(1) 12 hours.

(2) The number of hours you operated your emission-data engine for certifying the engine family (see 40 CFR part 1065, subpart E, or the applicable regulations governing how you should prepare your test engine).

(f) *Damage during shipment.* If shipping an engine to a remote facility for production-line testing makes necessary an adjustment or repair, you must wait until after the initial emission test to do this work. We may waive this requirement if the test would be impossible or unsafe or if it would permanently damage the engine. Report to us in your written report under § 1045.345 all adjustments or repairs you make on test engines before each test.

(g) *Retesting after invalid tests.* You may retest an engine if you determine an emission test is invalid under subpart F of this part. Explain in your written report reasons for invalidating any test and the emission results from all tests. If we determine that you improperly invalidated a test, we may require you to ask for our approval for future testing before substituting results of the new tests for invalid ones.

§ 1045.310 How must I select engines for production-line testing?

(a) Test engines from each engine family as described in this section based on test periods, as follows:

(1) For engine families with projected U.S.-directed production volume of at least 1,600, the test periods are consecutive quarters (3 months). However, if your annual production period is less than 12 months long, you may take the following alternative approach to define quarterly test periods:

(i) If your annual production period is 120 days or less, the whole model year constitutes a single test period.

(ii) If your annual production period is 121 to 210 days, divide the annual production period evenly into two test periods.

(iii) If your annual production period is 211 to 300 days, divide the annual production period evenly into three test periods.

(iv) If your annual production period is 301 days or longer, divide the annual production period evenly into four test periods.

(2) For engine families with projected U.S.-directed production volume below 1,600, the whole model year constitutes a single test period.

(b) Early in each test period, randomly select and test an engine from the end of the assembly line for each engine family.

(1) In the first test period for newly certified engines, randomly select and test one more engine. Then, calculate the required sample size for the model year as described in paragraph (c) of this section.

(2) In later test periods of the same model year, combine the new test result with all previous testing in the model year. Then, calculate the required sample size for the model year as described in paragraph (c) of this section.

(3) In the first test period for engine families relying on previously submitted test data, combine the new test result with the last test result from the previous model year. Then, calculate the required sample size for the model year as described in paragraph (c) of this section. Use the last test result from the previous model year only for this first calculation. For all subsequent calculations, use only results from the current model year.

(c) Calculate the required sample size for each engine family. Separately calculate this figure for $HC+NO_X$ and CO. The required sample size is the greater of these calculated values. Use the following equation:

$$N = \left[\frac{(t_{95} \cdot \sigma)}{(x - STD)} \right]^2 + 1$$

Where:

N = Required sample size for the model year.

t_{95} = 95% confidence coefficient, which depends on the number of tests completed, n, as specified in the table in paragraph (c)(1) of this section. It defines 95% confidence intervals for a one-tail distribution.

σ = Test sample standard deviation (see paragraph (c)(2) of this section).

x = Mean of emission test results of the sample.

STD = Emission standard (or family emission limit, if applicable).

(1) Determine the 95% confidence coefficient, t_{95}, from the following table:

n	t_{95}	n	t_{95}	n	t_{95}
2	6.31	12	1.80	22	1.72
3	2.92	13	1.78	23	1.72
4	2.35	14	1.77	24	1.71
5	2.13	15	1.76	25	1.71
6	2.02	16	1.75	26	1.71
7	1.94	17	1.75	27	1.71
8	1.90	18	1.74	28	1.70
9	1.86	19	1.73	29	1.70
10	1.83	20	1.73	30+	1.70
11	1.81	21	1.72		

(2) Calculate the standard deviation, σ, for the test sample using the following formula:

$$\sigma = \left[\sum \frac{(X_i - x)^2}{(n-1)} \right]^{\frac{1}{2}}$$

Where:

X_i = Emission test result for an individual engine.

n = The number of tests completed in an engine family.

(d) Use final deteriorated test results to calculate the variables in the equations in paragraph (c) of this section (see § 1045.315(a)(2)).

(e) After each new test, recalculate the required sample size using the updated mean values, standard deviations, and the appropriate 95-percent confidence coefficient.

(f) Distribute the remaining engine tests evenly throughout the rest of the year. You may need to adjust your schedule for selecting engines if the required sample size changes. If your scheduled quarterly testing for the remainder of the model year is sufficient to meet the calculated sample size, you may wait until the next quarter to do additional testing. Continue to randomly select engines from each engine family.

(g) Continue testing until one of the following things happens:

(1) After completing the minimum number of tests required in paragraph (b) of this section, the number of tests completed in an engine family, n, is greater than the required sample size, N, and the sample mean, x, is less than or equal to the emission standard. For example, if N = 5.1 after the fifth test, the sample-size calculation does not allow you to stop testing.

(2) The engine family does not comply according to § 1045.315.

(3) You test 30 engines from the engine family.

(4) You test one percent of your projected annual U.S.-directed production volume for the engine family, rounded to the nearest whole number. Do not count an engine under this paragraph (g)(4) if it fails to meet an applicable emission standard.

(5) You choose to declare that the engine family does not comply with the requirements of this subpart.

(h) If the sample-size calculation allows you to stop testing for one pollutant but not another, you must continue measuring emission levels of all pollutants for any additional tests required under this section. However, you need not continue making the calculations specified in this subpart for the pollutant for which testing is not required. This paragraph (h) does not affect the number of tests required under this section, the required calculations in § 1045.315, or the remedial steps required under § 1045.320.

(i) You may elect to test more randomly chosen engines than we require under this section. Include these engines in the sample-size calculations.

§ 1045.315 How do I know when my engine family fails the production-line testing requirements?

This section describes the pass-fail criteria for the production-line testing requirements. We apply these criteria on an engine-family basis. See § 1045.320 for the requirements that apply to individual engines that fail a production-line test.

(a) Calculate your test results as follows:

(1) *Initial and final test results.* Calculate and round the test results for each engine. If you do several tests on an engine, calculate the initial results for each test, then add all the test results together and divide by the number of tests. Round this final calculated value for the final test results on that engine.

(2) *Final deteriorated test results.* Apply the deterioration factor for the engine family to the final test results (see § 1045.240(c)).

(3) *Round deteriorated test results.* Round the results to the number of decimal places in the emission standard expressed to one more decimal place.

(b) Construct the following CumSum Equation for each engine family for $HC+NO_X$ and CO emissions:

$$C_i = \text{Max}\ [0 \text{ or } C_{i-1} + X_{i} - (STD + 0.25 \times \sigma)]$$

Where:

C_i = The current CumSum statistic.

C_{i-1} = The previous CumSum statistic. For the first test, the CumSum statistic is 0 (i.e., $C_1 = 0$).

X_i = The current emission test result for an individual engine.

STD = Emission standard (or family emission limit, if applicable).

(c) Use final deteriorated test results to calculate the variables in the equation in paragraph (b) of this section (see § 1045.315(a)).

(d) After each new test, recalculate the CumSum statistic.

(e) If you test more than the required number of engines, include the results from these additional tests in the CumSum Equation.

(f) After each test, compare the current CumSum statistic, Ci, to the recalculated Action Limit, H, defined as $H = 5.0 \times \sigma$.

(g) If the CumSum statistic exceeds the Action Limit in two consecutive tests, the engine family fails the production-line testing requirements of this subpart. Tell us within ten working days if this happens. You may request to amend the application for certification to raise the FEL of the entire engine family as described in § 1045.225(f).

(h) If you amend the application for certification for an engine family under § 1045.225, do not change any previous calculations of sample size or CumSum statistics for the model year.

§ 1045.320 What happens if one of my production-line engines fails to meet emission standards?

(a) If you have a production-line engine with final deteriorated test results exceeding one or more emission standards (see § 1045.315(a)), the certificate of conformity is automatically suspended for that failing engine. You must take the following actions before your certificate of conformity can cover that engine:

(1) Correct the problem and retest the engine to show it complies with all emission standards.

(2) Include the test results and describe the remedy for each engine in the written report required under § 1045.345.

(b) You may request to amend the application for certification to raise the FEL of the entire engine family at this point (see § 1045.225).

§ 1045.325 What happens if an engine family fails the production-line testing requirements?

(a) We may suspend your certificate of conformity for an engine family if it fails under § 1045.315. The suspension may apply to all facilities producing engines from an engine family even if you find noncompliant engines only at one facility.

(b) We will tell you in writing if we suspend your certificate in whole or in part. We will not suspend a certificate until at least 15 days after the engine family fails. The suspension is effective when you receive our notice.

(c) Up to 15 days after we suspend the certificate for an engine family, you may ask for a hearing (see § 1045.820). If we agree before a hearing occurs that we used erroneous information in deciding to suspend the certificate, we will reinstate the certificate.

(d) Section 1045.335 specifies steps you must take to remedy the cause of the engine family's production-line failure. All the engines you have produced since the end of the last test period are presumed noncompliant and should be addressed in your proposed remedy. We may require you to apply the remedy to engines produced earlier if we determine that the cause of the failure is likely to have affected the earlier engines.

(e) You may request to amend the application for certification to raise the FEL of the engine family before or after we suspend your certificate as described in § 1045.225(f). We will approve your request if the failure is not caused by a defect and it is clear that you used good engineering judgment in establishing the original FEL.

§ 1045.330 May I sell engines from an engine family with a suspended certificate of conformity?

You may sell engines that you produce after we suspend the engine family's certificate of conformity under § 1045.315 only if one of the following occurs:

(a) You test each engine you produce and show it complies with emission standards that apply.

(b) We conditionally reinstate the certificate for the engine family. We may do so if you agree to recall all the affected engines and remedy any noncompliance at no expense to the owner if later testing shows that the engine family still does not comply.

§ 1045.335 How do I ask EPA to reinstate my suspended certificate?

(a) Send us a written report asking us to reinstate your suspended certificate. In your report, identify the reason for noncompliance, propose a remedy for the engine family, and commit to a date for carrying it out. In your proposed remedy include any quality control measures you propose to keep the problem from happening again.

(b) Give us data from production-line testing that shows the remedied engine family complies with all the emission standards that apply.

§ 1045.340 When may EPA revoke my certificate under this subpart and how may I sell these engines again?

(a) We may revoke your certificate for an engine family in the following cases:

(1) You do not meet the reporting requirements.

(2) Your engine family fails to comply with the requirements of this subpart and your proposed remedy to address a suspended certificate under § 1045.335 is inadequate to solve the problem or requires you to change the engine's design or emission control system.

(b) To sell engines from an engine family with a revoked certificate of conformity, you must modify the engine family and then show it complies with the requirements of this part.

(1) If we determine your proposed design change may not control emissions for the engine's full useful life, we will tell you within five working days after receiving your report. In this case we will decide whether production-line testing will be enough for us to evaluate the change or whether you need to do more testing.

(2) Unless we require more testing, you may show compliance by testing production-line engines as described in this subpart.

(3) We will issue a new or updated certificate of conformity when you have met these requirements.

§ 1045.345 What production-line testing records must I send to EPA?

(a) Within 45 days of the end of each test period, send us a report with the following information:

(1) Describe any facility used to test production-line engines and state its location.

(2) State the total U.S.-directed production volume and number of tests for each engine family.

(3) Describe how you randomly selected engines.

(4) Describe each test engine, including the engine family's identification and the engine's model year, build date, model number, identification number, and number of hours of operation before testing.

(5) Identify how you accumulated hours of operation on the engines and describe the procedure and schedule you used.

(6) Provide the test number; the date, time and duration of testing; test procedure; all initial test results; final test results; and final deteriorated test results for all tests. Provide the emission results for all measured pollutants. Include information for both valid and invalid tests and the reason for any invalidation.

(7) Describe completely and justify any nonroutine adjustment, modification, repair, preparation, maintenance, or test for the test engine if you did not report it separately under this subpart. Include the results of any emission measurements, regardless of the procedure or type of engine.

(8) Provide the CumSum analysis required in § 1045.315 and the sample-size calculation required in § 1045.310 for each engine family.

(9) Report on each failed engine as described in § 1045.320.

(10) State the date the test period ended for each engine family.

(b) We may ask you to add information to your written report so we can determine whether your new engines conform with the requirements of this subpart. We may also ask you to send less information.

(c) An authorized representative of your company must sign the following statement:

We submit this report under sections 208 and 213 of the Clean Air Act. Our production-line testing conformed completely with the requirements of 40 CFR part 1045. We have not changed production processes or quality-control procedures for test engines in a way that might affect emission controls. All the information in this report is true and accurate to the best of my knowledge. I know of the penalties for violating the Clean Air Act and the regulations. (Authorized Company Representative).

(d) Send electronic reports of production-line testing to the Designated Compliance Officer using an approved information format. If you want to use a different format, send us a written request with justification for a waiver.

(e) We will send copies of your reports to anyone from the public who asks for them. Section 1045.815 describes how we treat information you consider confidential.

§ 1045.350 What records must I keep?

(a) Organize and maintain your records as described in this section. We may review your records at any time.

(b) Keep paper or electronic records of your production-line testing for eight years after you complete all the testing required for an engine family in a model year.

(c) Keep a copy of the written reports described in § 1045.345.

(d) Keep the following additional records:

(1) A description of all test equipment for each test cell that you can use to test production-line engines.

(2) The names of supervisors involved in each test.

(3) The name of anyone who authorizes adjusting, repairing, preparing, or modifying a test engine and the names of all supervisors who oversee this work.

(4) If you shipped the engine for testing, the date you shipped it, the associated storage or port facility, and the date the engine arrived at the testing facility.

(5) Any records related to your production-line tests that are not in the written report.

(6) A brief description of any significant events during testing not otherwise described in the written report or in this section.

(7) Any information specified in § 1045.345 that you do not include in your written reports.

(e) If we ask, you must give us a more detailed description of projected or actual production figures for an engine family. We may ask you to divide your production figures by maximum engine power, displacement, fuel type, or assembly plant (if you produce engines at more than one plant).

(f) Keep records of the engine identification number for each engine you produce under each certificate of conformity. You may identify these numbers as a range. Give us these records within 30 days if we ask for them.

(g) We may ask you to keep or send other information necessary to implement this subpart.

Subpart E—In-Use Testing

§ 1045.401 What testing requirements apply to my engines that have gone into service?

(a) We may perform in-use testing of any engines subject to the standards of this part. If you produce outboard or personal watercraft engines that are subject to the requirements of this part, you must test them as described in this subpart. The testing requirements described in this subpart do not apply to sterndrive/inboard engines. This generally involves testing engines in the field or removing them for measurement in a laboratory.

(b) We may approve an alternate plan for showing that in-use engines comply with the requirements of this part if one of the following is true:

(1) You produce 200 or fewer engines per year in the selected engine family.

(2) You identify a unique aspect of your engine applications that keeps you from doing the required in-use testing.

(c) We may void your certificate of conformity for an engine family if you do not meet your obligations under this part.

(d) Independent of your responsibility to test in-use engines, we may choose at any time to do our own testing of your in-use engines.

(e) If in-use testing shows that engines fail to meet emission standards or other requirements of this part, we may pursue a recall or other remedy as allowed by the Clean Air Act (see § 1045.415).

§ 1045.405 How does this program work?

(a) You must test in-use engines for exhaust emissions from the families we select. We may select up to 25 percent of your engine families in any model year—or one engine family if you have three or fewer families. When we select an engine family for testing, we may specify that you preferentially test engines based on the type of vessel. In addition, we may identify specific modes of operation or sampling times. You may choose to test additional engine families that we do not select.

(b) The provisions of this paragraph (b) describe how test families are selected, depending on when we receive the application for certification.

(1) If we receive the application by December 31 of a given calendar year for the following model year (for example, by December 31, 2009 for model year 2010), we would expect to select engine families for testing by February 28 of the model year. If we have not completed the selection of engine families by February 28, you may select your own engine families for in-use testing. In this case, you must make your selections and notify us which engine families you have selected by March 31. You should consider the following factors in selecting engine families, in priority order:

(i) Select an engine family that has not recently been tested in an in-use testing regimen (and passed) under the provisions of this subpart. This should generally involve engine families that have not been selected in the previous two model years. If design changes have required new testing for certification, we would consider that this engine family has not been selected for in-use testing.

(ii) Select an engine family if we have approved an alternative approach to establishing a deterioration factor under § 1045.245(b)(8).

(iii) Select the engine family with the highest projected U.S.-directed production volume.

(2) If we receive an application for a given model year after December 31 of the previous calendar year, you must conduct in-use testing with that engine family without regard to the limitations specified in paragraph (a) of this section, unless we waive this requirement. We will generally waive testing under this paragraph (b)(2) only for small-volume engine manufacturers or in the case where similar testing was recently completed for a related engine family.

(c) Send us an in-use testing plan for engine families selected for testing. Complete the testing within 24 calendar months after we approve your plan. Send us the in-use testing plan according to the following deadlines:

(1) Within 12 calendar months after we direct you to test a particular engine family.

(2) By February 28 of the following year if you select engine families for testing under paragraph (b)(1) of this section.

(3) Within 12 calendar months after we approve certification for engine families subject to the requirements of paragraph (b)(2) of this section.

(d) You may need to test engines from more than one model year at a given time.

(e) In appropriate extreme and unusual circumstances that are clearly outside your control and could not have been avoided by the exercise of prudence, diligence, and due care, we may waive the in-use testing requirement for an engine family. For example, if your test fleet is destroyed by severe weather during service accumulation and we agree that completion of testing is not possible, we would generally waive testing requirements for that engine family.

§ 1045.410 How must I select, prepare, and test my in-use engines?

(a) You may make arrangements to select representative test engines from your own fleet or from other independent sources.

(b) For the selected engine families, select engines that you or your customers have—

(1) Operated for at least 50 percent of the engine family's useful life (see § 1045.103(e));

(2) Not maintained or used in an abnormal way; and

(3) Documented in terms of total hours of operation, maintenance, operating conditions, and storage.

(c) Use the following methods to determine the number of engines you must test in each engine family:

(1) Test at least two engines if you produce 2,000 or fewer engines in the model year from all engine families, or if you produce 500 or fewer engines from the selected engine family. Otherwise, test at least four engines.

(2) If you successfully complete an in-use test program on an engine family and later certify an equivalent engine family with carryover emission data, as described in § 1045.235(d)(1), then test at least one engine instead of the testing rates in paragraph (c)(1) of this section.

(3) If you test the minimum required number of engines and all comply fully with emission standards, you may stop testing.

(4) For each engine that fails any applicable emission standard, test two more. Regardless of measured emission levels, you do not have to test more than ten engines in an engine family. You may do more tests than we require.

(5) You may concede that the engine family does not comply before testing a total of ten engines.

(6) In appropriate extreme and unusual circumstances that could not have been avoided by the exercise of prudence, diligence, and due care, we may waive the in-use testing requirement for an engine family.

(d) You may do minimal maintenance to set components of a test engine to specifications for anything we do not consider an adjustable parameter (see § 1045.205(r)). Limit maintenance to what is in the owner's instructions for engines with that amount of service and age. Document all maintenance and adjustments.

(e) You may do repeat measurements with a test engine; however, you must conduct the same number of tests on each engine.

(f) For a test program on an engine family, choose one of the following methods to test your engines:

(1) Remove the selected engines for testing in a laboratory. Use the applicable procedures in subpart F of this part to show compliance with the duty-cycle standards in § 1045.103(a) or § 1045.105(a). We may direct you to measure emissions on the dynamometer using the test procedures in § 1045.515 to show compliance with the not-to-exceed standards in § 1045.107.

(2) Test the selected engines while they remain installed in the vessel. Use the procedures in § 1045.515. Measure emissions during normal operation of the vessel to show compliance with the not-to-exceed standards in § 1045.107. We may direct you to include specific areas of normal operation.

(g) You may ask us to waive parts of the prescribed test procedures if they are not necessary to determine in-use compliance.

(h) Calculate the average emission levels for an engine family from the results for the set of tested engines. Round them to the number of decimal places in the emission standards expressed to one more decimal place.

§ 1045.415 What happens if in-use engines do not meet requirements?

(a) Determine the reason each in-use engine exceeds the emission standards.

(b) If the average emission levels calculated in § 1045.410(h) exceed any of the emission standards that apply, notify us within fifteen days of completing testing on this family. Otherwise follow the reporting instructions in § 1045.420.

(c) We will consider failure rates, average emission levels, and any defects—among other things—to decide on taking remedial action under this subpart (see 40 CFR 1068.505). We may consider the results from any voluntary additional testing you perform. We may also consider information related to testing from other engine families showing that you designed them to exceed the minimum requirements for controlling emissions. We may order a recall before or after you complete testing of an engine family if we determine a substantial number of engines do not conform to section 213 of the Clean Air Act or to this part. The scope of the recall may include other engine families in the same or different model years if the cause of the problem identified in paragraph (a) of this section applies more broadly than the tested engine family, as allowed by the Clean Air Act.

(d) If in-use testing reveals a design or manufacturing defect that prevents engines from meeting the requirements of this part, you must correct the defect as soon as possible for any future production for engines in every family affected by the defect. See 40 CFR 1068.501 for additional requirements related to defect reporting.

(e) You may voluntarily recall an engine family for emission failures, as described in 40 CFR 1068.535, unless we have ordered a recall for that family under 40 CFR 1068.505.

(f) You have the right to a hearing before we order you to recall your engines or implement an alternative remedy (see § 1045.820).

§ 1045.420 What in-use testing information must I report to EPA?

(a) In a report to us within three months after you finish testing an engine family, do all the following:

(1) Identify the engine family, model, serial number, and date of manufacture.

(2) [Reserved]

(3) Describe the specific reasons for disqualifying any engines for not being properly maintained or used.

(4) For each engine selected for testing, include the following information:

(i) Estimate the hours each engine was used before testing.

(ii) Describe all maintenance, adjustments, modifications, and repairs to each test engine.

(5) State the date and time of each test attempt.

(6) Include the results of all emission testing, including incomplete or invalidated tests, if any.

(b) Send electronic reports of in-use testing to the Designated Compliance Officer using an approved information format. If you want to use a different format, send us a written request with justification for a waiver.

(c) We will send copies of your reports to anyone from the public who asks for them. See § 1045.815 for information on how we treat information you consider confidential.

(d) We may ask for more information.

§ 1045.425 What records must I keep?

(a) Organize and maintain your records as described in this section. We may review your records at any time, so it is important to keep required information readily available.

(b) Keep paper records of your in-use testing for one full year after you complete all the testing required for an engine family in a model year. You may use any additional storage formats or media if you like.

(c) Keep a copy of the written reports described in § 1045.420.

(d) Keep any additional records related to the procurement process.

Subpart F—Test Procedures

§ 1045.501 How do I run a valid emission test?

(a) *Applicability.* This subpart is addressed to you as a manufacturer but it applies equally to anyone who does testing for you, and to us when we perform testing to determine if your engines meet emission standards.

(b) *General requirements.* Use the equipment and procedures for spark-ignition engines in 40 CFR part 1065 to determine whether engines meet the duty-cycle emission standards in §§ 1045.103 and 1045.105. Measure the emissions of all regulated pollutants as specified in 40 CFR part 1065. Use the applicable duty cycles specified in § 1045.505. Section 1045.515 describes the supplemental procedures for evaluating whether engines meet the not-to-exceed emission standards in § 1045.107.

(c) *Fuels.* Use the fuels and lubricants specified in 40 CFR part 1065, subpart H, for all the testing we require in this part, except as specified in § 1045.515. Use gasoline meeting the specifications described in 40 CFR 1065.710 for general testing. For service accumulation, use the test fuel or any commercially available fuel that is representative of the fuel that in-use engines will use. You may alternatively use gasoline blended with ethanol as follows:

(1) You may use the ethanol-blended fuel for certifying engines under this part without our advance approval. If you use the blended fuel for certifying a given engine family, you may also use it for production-line testing or any other testing you perform for that engine family under this part. If you use the blended fuel for certifying a given engine family, we may use the blended fuel or the specified gasoline test fuel with that engine family.

(2) The blended fuel must consist of a mix of gasoline meeting the specifications described in 40 CFR 1065.710 for general testing and fuel-grade ethanol meeting the specifications described in 40 CFR 1060.501(c) such that the blended fuel has 10.0+1.0 percent ethanol by volume. You may also use ethanol with a higher or lower purity if you show us that it will not affect your ability to demonstrate compliance with the applicable emission standards. You do not need to measure the ethanol concentration of such blended fuels and may instead calculate the blended composition by assuming that the ethanol is pure and mixes perfectly with the base fuel.

(d) *Laboratory conditions.* Ambient conditions for duty-cycle testing must be within ranges specified in 40 CFR 1065.520, subject to the provisions of § 1045.115(d). Emissions may not be corrected for the effects of test temperature or pressure. Humidity levels must represent actual in-use humidity levels; however, you may correct emissions for humidity as specified in 40 CFR 1065.670.

(e) *Engine stabilization.* Instead of the provisions of 40 CFR 1065.405, you may consider emission levels stable without measurement after 12 hours of engine operation.

(f) *Maximum test speed.* Instead of the provisions of 40 CFR 1065.510(f), you may declare a value of maximum test speed for laboratory testing that is within 500 rpm of the corresponding measured value for maximum test speed.

(g) *Special and alternate procedures.* If you are unable to run the duty cycle specified in this part for your engine (such as with constant-speed engines), use an alternate test cycle that will result in a cycle-weighted emission measurement equivalent to the expected average in-use emissions. This cycle must be approved under 40 CFR 1065.10. You may use other special or alternate procedures to the extent we allow them under 40 CFR 1065.10.

(h) *Laboratory testing with portable analyzers.* You may use field-grade equipment for any laboratory testing with high-performance engines, as specified in 40 CFR 1065.901(b), without requesting approval.

§ 1045.505 How do I test engines using discrete-mode or ramped-modal duty cycles?

(a) This section describes how to test engines under steady-state conditions. We allow you to perform tests with either discrete-mode or ramped-modal sampling. You must use the modal testing method for certification and all other testing you perform for an engine family. If we test your engines to confirm that they meet emission standards, we will use the modal testing method you select for your own testing. If you submit certification test data collected with both discrete-mode and ramped-modal testing (either in your original application or in an amendment to your application), either method may be used for subsequent testing. We may also perform other testing as allowed by the Clean Air Act. Conduct duty-cycle testing as follows:

(1) For discrete-mode testing, sample emissions separately for each mode, then calculate an average emission level for the whole cycle using the weighting factors specified for each mode. In each mode, operate the engine for at least 5 minutes, then sample emissions for at least 1 minute. Calculate cycle statistics and compare with the established criteria as specified in 40 CFR 1065.514 to confirm that the test is valid.

(2) For ramped-modal testing, start sampling at the beginning of the first mode and continue sampling until the end of the last mode. Calculate emissions and cycle statistics the same as for transient testing as specified in 40 CFR part 1065.

(b) Measure emissions by testing the engine on a dynamometer to determine whether it meets the emission standards in §§ 1045.103(a) and 1045.105(a). Use the 5-mode duty cycle or the corresponding ramped-modal cycle described in Appendix I of this part.

(c) During idle mode, operate the engine at its warm idle speed as described in 40 CFR 1065.510; this may involve a nonzero torque setting if that represents in-use operation.

(d) For full-load operating modes, operate the engine at wide-open throttle.

(e) See 40 CFR part 1065 for detailed specifications of tolerances and calculations.

§ 1045.515 What are the test procedures related to not-to-exceed standards?

(a) This section describes the procedures to determine whether your engines meet the not-to-exceed emission standards in § 1045.107. These procedures may include any normal engine operation and ambient conditions that the engines may experience in use. Paragraphs (b) and (c) of this section define the limits of what we will consider normal engine operation and ambient conditions. Use the test procedures we specify in § 1045.501, except for the provisions we specify in this section. Measure emissions with one of the following procedures:

(1) Remove the selected engines for testing in a laboratory. You may use an engine dynamometer to simulate normal operation, as described in this section.

(2) Test the selected engines while they remain installed on a vessel. In 40 CFR part 1065, subpart J, we describe the equipment and sampling methods for testing engines in the field. Use fuel meeting the specifications of 40 CFR part 1065, subpart H, or a fuel typical of what you would expect the engine to use in service.

(b) Engine testing may occur under a range of ambient conditions as follows:

(1) Engine testing may occur under the following ranges of ambient conditions without correcting measured emission levels:

(i) Barometric pressure must be between 94.0 and 103.325 kPa.

(ii) Ambient air temperature must be between 13 and 35 °C.

(iii) Ambient water temperature must be between 5 and 27 °C.

(iv) Any ambient humidity level.

(2) Engine testing may occur outside the conditions described in paragraph (b)(1) of this section, as long as measured values are corrected to be equivalent to the nearest end of the specified range using good engineering practice.

(c) An engine's emissions may not exceed the NTE standards in § 1045.107 under the following ranges of engine operation:

(1) The sampling period may not begin until the engine has reached stable operating temperatures. For example, this would exclude engine operation after starting until the thermostat starts modulating coolant temperature. The sampling period may also not include engine starting. For testing under paragraphs (c)(4) and (6) of this section, the NTE standards apply for any continuous sampling period of at least 30 seconds.

(2) Engine operation during the emission sampling period may include any nominally steady-state combination of speeds and loads within the applicable zone defined by segments on an engine's power vs. speed map specified in paragraphs (c)(3) through (6) of this section, except as follows:

(i) You may request that we specify a narrower zone, as long as the modified zone includes all points where your engines are expected to normally operate in use, but not including any points at which engine speed is below 40 percent of maximum test speed or engine load is below 25.3 percent of maximum torque at maximum test speed. However, we may perform valid tests at any speeds and loads within the zones specified in paragraphs (c)(3) through (6) of this section that we observe with in-use engines. The engine must comply with emission standards at all such speeds and loads unless we determine that one of following criteria are true:

(A) Such speeds and loads occur very infrequently. This determination may consider whether the operation would be expected to result in damage to the engine or vessel or be inherently unsafe.

(B) Such speeds and loads result from the engine being installed in a manner that is not consistent with your emission-related installation instructions.

(ii) You must notify us if you design your engines for normal in-use operation outside the specified zone. If we learn that normal in-use operation for your engines includes other speeds and loads, we may specify a broader zone, as long as the modified zone is limited to normal in-use operation for speeds greater than 40 percent of maximum test speed and loads greater than 25.3 percent of maximum torque at maximum test speed.

(3) The NTE zone for testing engines under this section is defined by the following segments on an engine's torque vs. speed map, as illustrated in Figures 1 through 3 of this section:

(i) Speed at or above 40 percent of maximum test speed.

(ii) Speeds and torques below the line defined by the following equation:

Normalized torque = 1.5 × normalized speed − 0.16

(iii) Speeds and torques at or below the engine's mapped torque values.

(iv) Speeds at or below 100 percent of maximum test speed, except as specified in paragraph (c)(5) of this section.

(v) Speeds and torques above the line defined by the following equation:

Normalized torque = (normalized speed)$^{1.5}$ − 0.08

(vi) Torques at or above 25.3 percent of maximum torque at maximum test speed, except as specified in paragraph (c)(5) of this section.

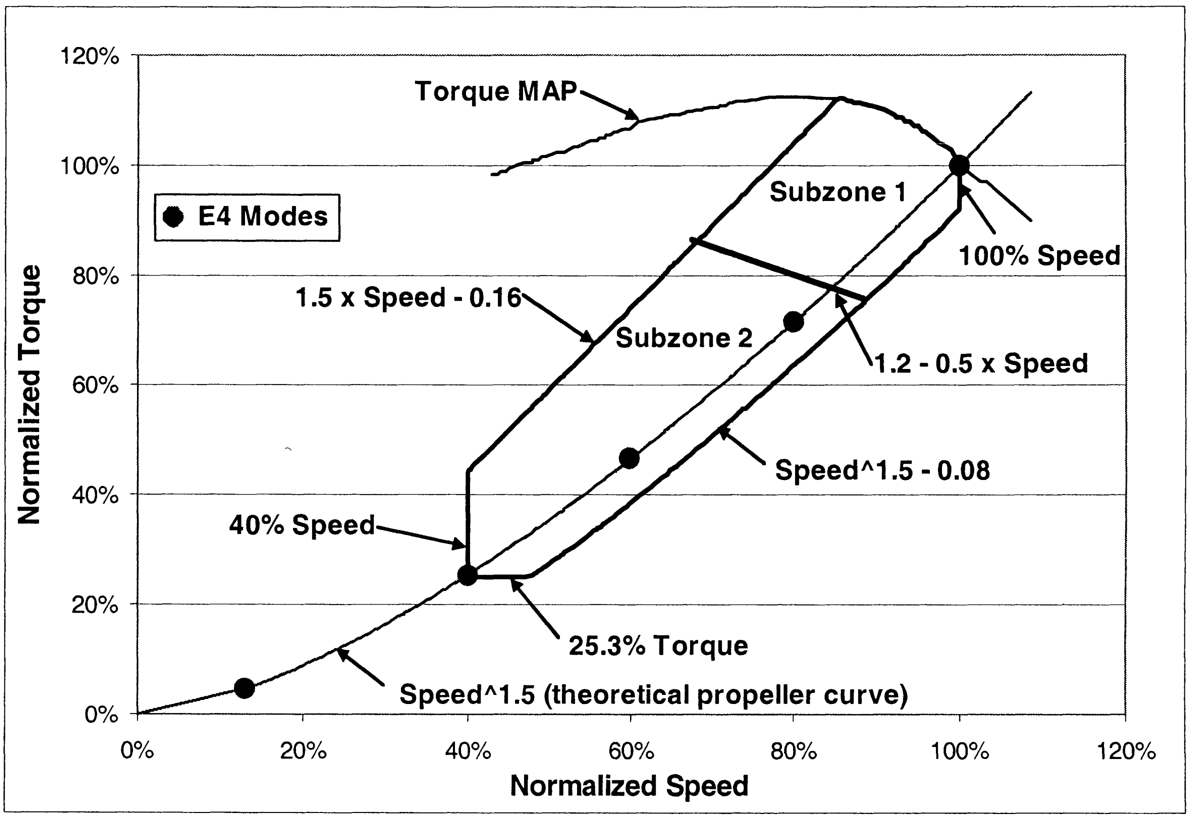
(4) For engines equipped with a catalyst, the NTE zone described in paragraph (c)(3) of this section is divided into the following subzones for determining the applicable NTE standards, as illustrated in Figure 1 of this section:

(i) Subzone 1 includes all operation in the NTE zone characterized by speeds and torques above the line represented by the following equation:

(percent torque) = 1.2 − 0.5 × (percent speed)

(ii) Subzone 2 includes all operation in the NTE zone not included in Subzone 1.

Figure 1 of §1045.515 –
NTE Zone and Subzones for Catalyst-Equipped Engines



(5) For two-stroke engines not equipped with a catalyst, the NTE zone described in paragraph (c)(3) of this section is divided into subzones for testing to determine compliance with the applicable NTE standards. Measure emissions to get an NTE result by collecting emissions at five points as described in this paragraph (c)(5). Calculate a weighted test result for these emission measurements using the weighting factors from Appendix I of this part for the corresponding modal result (similar to discrete-mode testing for certification). Test engines over the following modes corresponding to the certification duty cycle:

(i) Mode 1: Operate the engine at wide open throttle. For laboratory testing, this may involve any torque value between the boundaries specified in paragraph (c)(3) of this section.

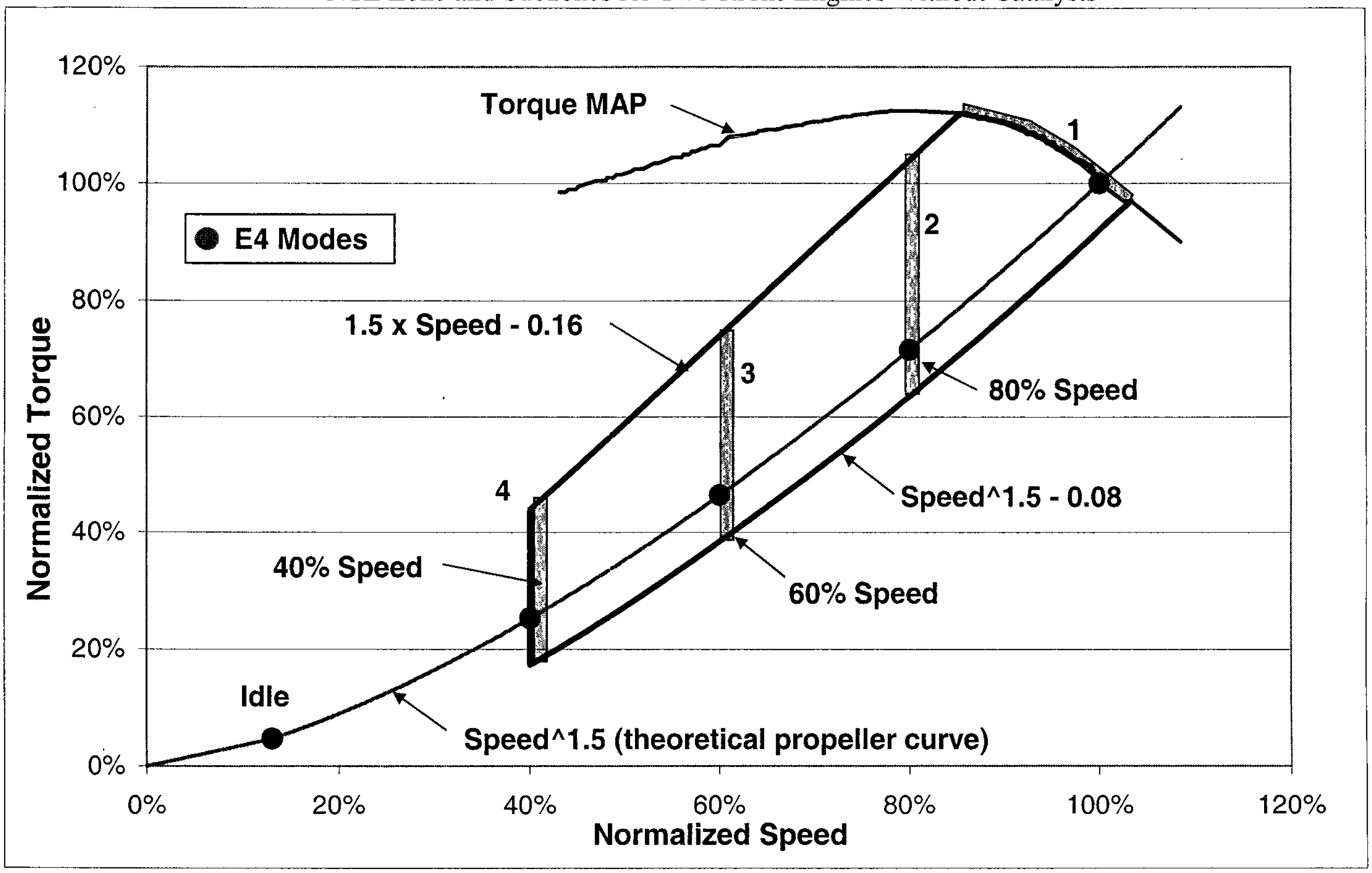
(ii) Mode 2: Operate the engine at a nominal speed that is 80 percent of maximum test speed at any torque value between the boundaries specified in paragraph (c)(3) of this section.

(iii) Mode 3: Operate the engine at a nominal speed that is 60 percent of maximum test speed at any torque value between the boundaries specified in paragraph (c)(3) of this section.

(iv) Mode 4: Operate the engine at a nominal speed that is 40 percent of maximum test speed at any torque value between the boundaries specified in paragraphs (c)(3)(ii) and (v) of this section.

(v) Mode 5: Operate the engine at idle.

Figure 2 of §1045.515 --
NTE Zone and Subzones for Two-stroke Engines Without Catalysts

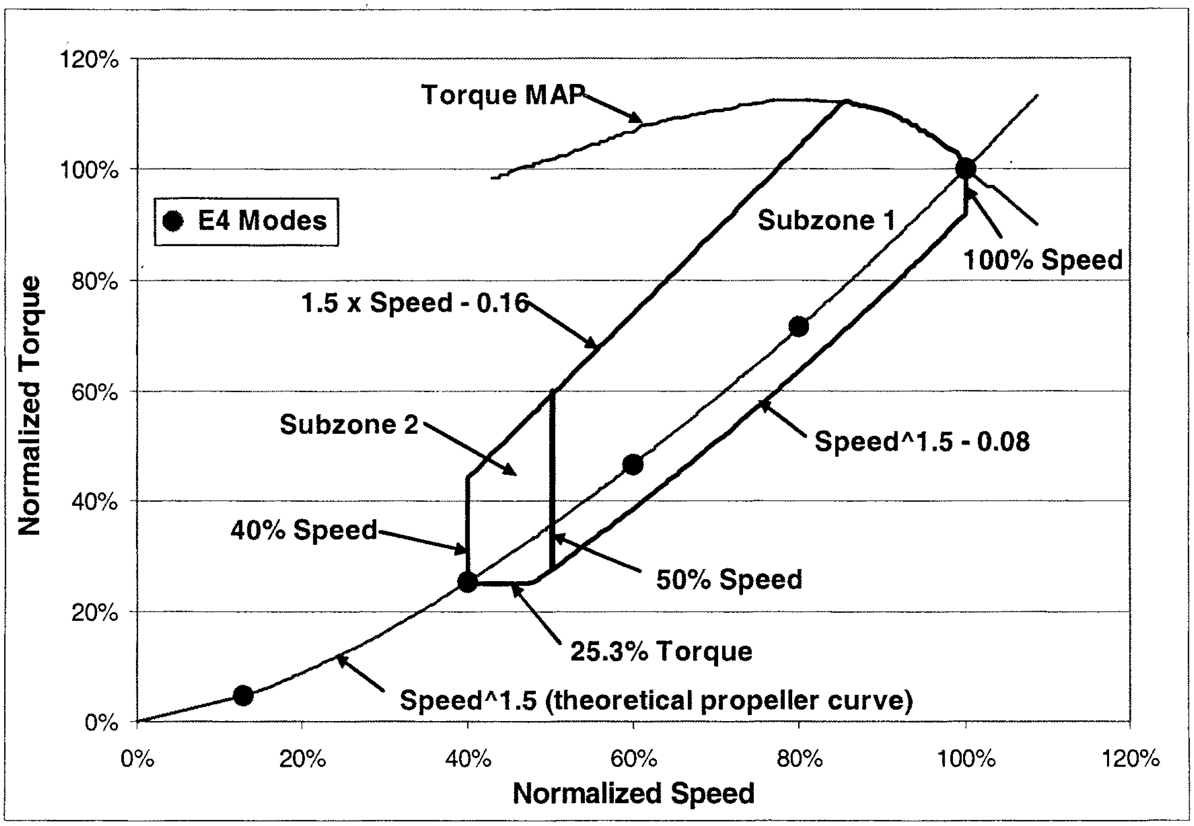


(6) For any engines not covered by paragraphs (c)(4) and (5) of this section, the NTE zone described in paragraph (c)(3) of this section is divided into the following subzones for determining the applicable NTE standards, as illustrated in Figure 2 of this section:

(i) Subzone 1 includes all operation in the NTE zone at speeds above 50 percent of maximum test speed.

(ii) Subzone 2 includes all operation in the NTE zone not included in Subzone 1.

Figure 3 of §1045.515 –
NTE Zone and Subzones for Four-Stroke Engines Without Catalysts



§ 1045.520 What testing must I perform to establish deterioration factors?

Sections 1045.240 and 1045.245 describe the required methods for testing to establish deterioration factors for an engine family.

Subpart G—Special Compliance Provisions

§ 1045.601 What compliance provisions apply to these engines?

Engine and vessel manufacturers, as well as owners, operators, and rebuilders of engines subject to the requirements of this part, and all other persons, must observe the provisions of this part, the requirements and prohibitions in 40 CFR part 1068, and the provisions of the Clean Air Act.

§ 1045.605 What provisions apply to engines already certified under the motor vehicle or Large SI programs?

(a) *General provisions.* If you are an engine manufacturer, this section allows you to introduce new propulsion marine engines into U.S. commerce if they are already certified to the requirements that apply to spark-ignition engines under 40 CFR parts 85 and 86 or part 1048 for the appropriate model year. If you comply with all the provisions of this section, we consider the certificate issued under 40 CFR part 86 or 1048 for each engine to also be a valid certificate of conformity under this part 1045 for its model year, without a separate application for certification under the requirements of this part 1045.

(b) *Vessel-manufacturer provisions.* If you are not an engine manufacturer, you may produce vessels using motor vehicle engines or nonroad spark-ignition engines under this section as long as you meet all the requirements and conditions specified in paragraph (d) of this section. If you modify the engine in any of the ways described in paragraph (d)(2) of this section, we will consider you a manufacturer of a new propulsion marine engine. Such engine modifications prevent you from using the provisions of this section.

(c) *Liability.* Engines for which you meet the requirements of this section are exempt from all the requirements and prohibitions of this part, except for those specified in this section. Engines exempted under this section must meet all the applicable requirements from 40 CFR parts 85 and 86, or part 1048. This applies to engine manufacturers, vessel manufacturers who use these engines, and all other persons as if these engines were used in applications other than for installation as propulsion marine engines. The prohibited acts of 40 CFR 1068.101(a)(1) apply to these new engines and vessels; however, we consider the certificate issued under 40 CFR part 86 or 1048 for each engine to also be a valid certificate of conformity under this part 1045 for its model year. If we make a determination that these engines do not conform to the regulations during their useful life, we may require you to recall them under 40 CFR part 86 or 1068.

(d) *Specific requirements.* If you are an engine or vessel manufacturer and meet all the following criteria and requirements regarding your new propulsion marine engine, the engine is eligible for an exemption under this section:

(1) Your engine must be covered by a valid certificate of conformity issued under 40 CFR part 86 or 1048.

(2) You must not make any changes to the certified engine that could reasonably be expected to increase its exhaust emissions for any pollutant, or its evaporative emissions. For example, if you make any of the following

changes to one of these engines, you do not qualify for this exemption:

(i) Change any fuel-system or evaporative-system parameters from the certified configuration (this does not apply to refueling controls).

(ii) Change, remove, or fail to properly install any other component, element of design, or calibration specified in the engine manufacturer's application for certification. This includes aftertreatment devices and all related components.

(iii) Modify or design the marine engine cooling system so that temperatures or heat rejection rates are outside the original engine manufacturer's specified ranges.

(3) You must show that fewer than 10 percent of the engine family's total sales in the United States are used in marine applications. This includes engines used in any application without regard to which company manufactures the vessel or equipment. Show this as follows:

(i) If you are the original manufacturer of the engine, base this showing on your sales information.

(ii) In all other cases, you must get the original manufacturer of the engine to confirm this based on its sales information.

(4) You must ensure that the engine has the label we require under 40 CFR part 86 or 1048.

(5) You must add a permanent supplemental label to the engine in a position where it will remain clearly visible after installation in the vessel. In the supplemental label, do the following:

(i) Include the heading: ''MARINE ENGINE EMISSION CONTROL INFORMATION''.

(ii) Include your full corporate name and trademark. You may instead include the full corporate name and trademark of another company you choose to designate.

(iii) State: ''THIS ENGINE WAS ADAPTED FOR MARINE USE WITHOUT AFFECTING ITS EMISSION CONTROLS.''

(iv) If the modified engine is certified as a motor vehicle engine, also state: ''THE EMISSION CONTROL SYSTEM DEPENDS ON THE USE OF FUEL MEETING SPECIFICATIONS THAT APPLY FOR MOTOR VEHICLE APPLICATIONS. OPERATING THE ENGINE ON OTHER FUELS MAY BE A VIOLATION OF FEDERAL LAW.''

(v) State the date you finished modifying the engine (month and year), if applicable.

(6) The original and supplemental labels must be readily visible after the engine is installed in the vessel or, if the vessel obscures the engine's emission control information label, the vessel manufacturer must attach duplicate labels, as described in 40 CFR 1068.105.

(7) Send the Designated Compliance Officer a signed letter by the end of each calendar year (or less often if we tell you) with all the following information:

(i) Identify your full corporate name, address, and telephone number.

(ii) List the engine or vessel models you expect to produce under this exemption in the coming year and describe your basis for meeting the sales restrictions of paragraph (d)(3) of this section.

(iii) State: ''We produce each listed [engine or vessel] model without making any changes that could increase its certified emission levels, as described in 40 CFR 1045.605.''

(e) *Failure to comply.* If your engines do not meet the criteria listed in paragraph (d) of this section, they will be subject to the standards, requirements, and prohibitions of this part 1045 and the certificate issued under 40 CFR part 86 or 1048 will not be deemed to also be a certificate issued under this part 1045. Introducing these engines into U.S. commerce without a valid exemption or certificate of conformity under this part violates the prohibitions in 40 CFR 1068.101(a)(1).

(f) *Data submission.* We may require you to send us emission test data on one of the duty cycles specified in subpart F of this part.

(g) *Participation in averaging, banking and trading.* Engines adapted for marine use under this section may not generate or use emission credits under this part 1045. These engines may generate credits under the ABT provisions in 40 CFR part 86. These engines must use emission credits under 40 CFR part 86 if they are certified to an FEL above a standard that applies under 40 CFR part 86.

§ 1045.610 What provisions apply to using engines already certified to Small SI emission standards?

This section applies to marine engines that are identical to land-based engines certified under 40 CFR part 90 or 1054. See § 1045.605 for provisions that apply to marine engines that are certified under other programs.

(a) If an engine meets all the following criteria, it is exempt from the requirements of this part:

(1) The engine must be in an engine family that has a valid certificate of conformity showing that it meets emission standards for nonhandheld engines under 40 CFR part 90 or 1054 for the appropriate model year.

(2) You must show that fewer than 5 percent of the engine family's total sales in the United States are used in marine applications. This includes engines used in any application without regard to which company manufactures the vessel or equipment.

Show this as follows:

(i) If you are the original manufacturer of the engine, base this showing on your sales information.

(ii) In all other cases, you must get the original manufacturer of the engine to confirm this based on its sales information.

(b) The only requirements or prohibitions from this part that apply to an engine that meets the criteria in paragraph (a) of this section are in this section.

(c) Engines exempted under this section are subject to all the requirements affecting engines under 40 CFR part 90 or 1054. The requirements and restrictions of 40 CFR part 90 or 1054 apply to anyone manufacturing these engines, anyone manufacturing equipment that uses these engines, and all other persons in the same manner as if these engines were not used as propulsion marine engines.

(d) You may use the provisions of § 1045.605 in addition to the provisions of this section for engines certified under 40 CFR part 1054. Where § 1045.605 references 40 CFR parts 85, 86, and/or 1048, apply the applicable provisions of 40 CFR part 1054 instead. Include the engines you sell under this section in your demonstration that you meet the sales limit in § 1045.605(d)(3).

§ 1045.620 What are the provisions for exempting engines used solely for competition?

The provisions of this section apply for new engines and vessels built on or after January 1, 2010.

(a) We may grant you an exemption from the standards and requirements of this part for a new engine on the grounds that it is to be used solely for competition. The requirements of this part, other than those in this section, do not apply to engines that we exempt for use solely for competition.

(b) We will exempt engines that we determine will be used solely for competition. The basis of our determination is described in paragraphs (c) and (d) of this section. Exemptions granted under this section are good for only one model year and you must request renewal for each subsequent model year. We will not approve your renewal request if we determine the engine will not be used solely for competition.

(c) Engines meeting all the following criteria are considered to be used solely for competition:

(1) Neither the engine nor any vessels containing the engine may be displayed for sale in any public dealership or otherwise offered for sale to the general public. Note that this does not preclude display of these engines as long as they are not available for sale to the general public.

(2) Sale of the vessel in which the engine is installed must be limited to professional racing teams, professional racers, or other qualified racers. For replacement engines, the sale of the engine itself must be limited to professional racing teams, professional racers, other qualified racers, or to the original vessel manufacturer.

(3) The engine and the vessel in which it is installed must have performance characteristics that are substantially superior to noncompetitive models.

(4) The engines are intended for use only as specified in paragraph (e) of this section.

(d) You may ask us to approve an exemption for engines not meeting the criteria listed in paragraph (c) of this section as long as you have clear and convincing evidence that the engines will be used solely for competition.

(e) Engines are considered to be used solely for competition only if their use is limited to competition events sanctioned by the U.S. Coast Guard or another public organization with authorizing permits for participating competitors. Operation of such engines may include only racing events, trials to qualify for racing events, and practice associated with racing events. Authorized attempts to set speed records are also considered racing events. Engines will not be considered to be used solely for competition if they are ever used for any recreational or other noncompetitive purpose. Use of exempt engines in any recreational events, such as poker runs and lobsterboat races, is a violation of 40 CFR 1068.101(b)(4).

(f) You must permanently label engines exempted under this section to clearly indicate that they are to be used only for competition. Failure to properly label an engine will void the exemption for that engine.

(g) If we request it, you must provide us any information we need to determine whether the engines are used solely for competition. This would include documentation regarding the number of engines and the ultimate purchaser of each engine as well as any documentation showing a vessel manufacturer's request for an exempted engine. Keep these records for five years.

§ 1045.625 What requirements apply under the Diurnal Transition Program?

The provisions of this section allow vessel manufacturers to produce a certain number of vessels with installed fuel tanks that do not meet the diurnal emission standards specified in § 1045.112(d) and 40 CFR 1060.105. The provisions of this section do not apply for portable marine fuel tanks, personal watercraft, or outboard engines with under-cowl fuel tanks. Vessels you produce under this section are exempt from the prohibitions in 40 CFR 1068.101(a)(1) with respect to diurnal emissions, subject to the provisions of this section.

(a) *General.* If you are a vessel manufacturer, you may introduce into U.S. commerce limited numbers of exempted vessels under this section. You may use the exemptions in this section only if you have primary responsibility for designing and manufacturing vessels and your manufacturing procedures include installing some engines in these vessels. Consider all U.S.-directed vessel sales in showing that you meet the requirements of this section, including those from any parent or subsidiary companies and those from any other companies you license to produce vessels for you. These provisions are available for vessels you produce during the periods specified in paragraph (b) of this section.

(b) *Allowances.* You may choose one of the following options to produce exempted vessels under this section:

(1) *Percent-of-production allowances.* You may produce up to 50 percent of your vessels from July 31, 2011 through July 31, 2012 that are exempt from the diurnal emission standards. Calculate this percentage based on your total U.S.-directed production volume.

(2) *Small-volume allowances.* Small-volume vessel manufacturers may produce up to 1200 vessels from July 31, 2011 through July 31, 2013 that are exempt from the diurnal emission standards.

(c) *Vessel labeling.* You must add a permanent label, written legibly in English, to a readily visible part of each exempted vessel you produce under this section. You may combine this with the label required under 40 CFR 1060.135. This label must include at least the following items:

(1) The label heading ''EMISSION CONTROL INFORMATION''.

(2) Your corporate name and trademark.

(3) The vessel's date of manufacture.

(4) The following statement: ''THIS VESSEL IS EXEMPT FROM DIURNAL STANDARDS UNDER 40 CFR 1045.625.''

(d) *Notification and reporting.* You must notify us of your intent to use the provisions of this section and send us an annual report to verify that you are not exceeding the allowances, as follows:

(1) Before you produce vessels that are exempt under this section, send the Designated Compliance Officer a written notice of your intent with the following information:

(i) Identify your company's name and address, and your parent company's name and address, if applicable.

(ii) Identify the name, e-mail address, and phone number of a person to contact for further information.

(iii) Identify the name and address of the company you expect to produce the fuel tanks you will be using for the vessels exempted under this section.

(iv) If you qualify as a small-volume vessel manufacturer, state whether you will comply under paragraph (b)(1) or (b)(2) of this section.

(v) Include your production figures for the period from July 31, 2009 through July 31, 2010, including figures broken down by model.

(2) Send the Designated Compliance Officer a written report by December 31, 2012. If you are a small-volume manufacturer using the provisions of paragraph (b)(2) of this section to produce exempted vessels after July 31, 2012, send us a second report by December 31, 2013. These reports must include the total number of vessels and the number of exempted vessels you sold in the preceding year for each model, based on actual U.S.-directed production information. You may omit the count of compliant vessels if you include in the report a statement that you are not using the percent-of-production allowances in paragraph (b)(1) of this section. If you initially comply using the percent-of-production allowances in paragraph (b)(1) of this section, you may not use the small-volume allowances in paragraph (b)(2) of this section for later production.

(3) If you send your initial notification under paragraph (d)(1) of this section after the specified deadline, we may approve your use of allowances under this section. In your request, describe why you were unable to meet the deadline. We will not approve your request if the delay could have been avoided with reasonable care and discretion.

(e) *Recordkeeping.* Keep the following records of all exempted vessels you produce under this section:

(1) The model number, serial number, and the date of manufacture for each vessel.

(2) The total number or percentage of exempted vessels as described in paragraph (b) of this section and all documentation supporting your calculation.

(3) The notifications and reports we require under paragraph (d) of this section.

(f) *Provisions for fuel tank manufacturers.* As a fuel tank manufacturer, you may produce fuel tanks as needed for vessel manufacturers under this section without our prior approval. These fuel tanks are exempt from the diurnal emission standards. Note that this diurnal exemption does not affect the requirements related to permeation emissions specified in § 1045.112. You must have written assurance from vessel manufacturers that they need a certain number of exempted fuel tanks under this section. You must keep records of the number of exempted fuel tanks you sell to each vessel manufacturer.

(g) *Enforcement.* Producing more exempted vessels than we allow under this section violates the prohibitions in 40 CFR 1068.101(a)(1). Vessel manufacturers and fuel tank manufacturers must keep the records we require under this section until at least December 31, 2017 and give them to us if we ask for them (see 40 CFR 1068.101(a)(2)).

§ 1045.630 What is the personal-use exemption.

This section applies to individuals who manufacture recreational vessels for personal use with used engines. If you and your vessel meet all the conditions of this section, the vessel and its engine are considered to be exempt from the standards and requirements of this part that apply to new engines, including standards and requirements related to evaporative emissions. For example, you are not required to use certified fuel system components or otherwise obtain certificates of conformity showing that the vessel meets evaporative emission standards, and you do not need to install a certified engine.

(a) The vessel may not be manufactured from a previously certified vessel, nor may it be manufactured from a partially complete vessel that is equivalent to a certified vessel. The vessel must be manufactured primarily from unassembled components, but may incorporate some preassembled components. For example, fully preassembled steering assemblies may be used. You may also power the vessel with an engine that was previously used in a highway or land-based nonroad application.

(b) The vessel may not be sold within five years after the date of final assembly.

(c) No individual may manufacture more than one vessel in any five-year period under this exemption.

(d) You may not use the vessel in any revenue-generating service or for any other commercial purpose. For example, this exemption does not apply for vessels used in commercial fishing or charter service.

(e) This exemption may not be used to circumvent the requirements of this part or the requirements of the Clean Air Act. For example, this exemption would not cover a case in which a person sells an almost completely assembled vessel to another person, who would then complete the assembly. This would be considered equivalent to the sale of the complete new vessel. This section also does not allow engine manufacturers to produce new engines that are exempt from emission standards and it does not provide an exemption from the prohibition against tampering with certified engines.

§ 1045.635 What special provisions apply for small-volume engine manufacturers?

This section describes how we apply the special provisions in this part for small-volume engine manufacturers.

(a) Special provisions apply for certain small-volume engine manufacturers, as illustrated by the following examples:

(1) Additional lead time and other provisions related to the transition to new emission standards. See § 1045.145.

(2) More flexible arrangements for creating engine families for high-performance engines. See § 1045.230.

(3) Assigned deterioration factors. See § 1045.240.

(4) Waived requirements for production-line testing. See § 1045.301.

(5) Additional special provisions apply for small-volume engine and vessel manufacturers. For example, see § 1045.625 and 40 CFR 1068.250.

(b) If you use any of the provisions of this part that apply specifically to small-volume engine manufacturers and we find that you do not qualify to use these provisions, we may consider you to be in violation of the requirements that apply for companies that are not small-volume engine manufacturers. If your number of employees grows to the point that you no longer qualify as a small-volume engine manufacturer, we will work with you to determine a reasonable schedule for complying with additional requirements that apply. For example, if you no longer qualify as a small-volume engine manufacturer shortly before you certify your engines for the next model year, we might allow you to use assigned deterioration factors for one more model year.

§ 1045.640 What special provisions apply to branded engines?

The following provisions apply if you identify the name and trademark of another company instead of your own on your emission control information label, as provided by § 1045.135(c)(2):

(a) You must have a contractual agreement with the other company that obligates that company to take the following steps:

(1) Meet the emission warranty requirements that apply under § 1045.120. This may involve a separate agreement involving reimbursement of warranty-related expenses.

(2) Report all warranty-related information to the certificate holder.

(b) In your application for certification, identify the company whose trademark you will use.

(c) You remain responsible for meeting all the requirements of this chapter, including warranty and defect-reporting provisions.

§ 1045.645 What special provisions apply for converting an engine to use an alternate fuel?

A certificate of conformity is no longer valid for an engine if the engine is modified such that it is not in a configuration covered by the certificate. This section applies if such modifications are done to convert the engine to run on a different fuel type. Such engines may need to be recertified as specified in this section if the certificate is no longer valid for that engine.

(a) Converting a certified new engine to run on a different fuel type violates 40 CFR 1068.101(a)(1) if the modified engine is not covered by a certificate of conformity.

(b) Converting a certified engine that is not new to run on a different fuel type violates 40 CFR 1068.101(b)(1) if the modified engine is not covered by a certificate of conformity. We may specify alternate certification provisions consistent with the requirements of this part. For example, you may certify the modified engine for a partial useful life. For example, if the engine is modified halfway through its original useful life period, you may generally certify the engine based on completing the original useful life period; or if the engine is modified after the original useful life period is past, you may generally certify the engine based on testing that does not involve further durability demonstration.

(c) Engines may be certified using the certification procedures for new engines as specified in this part or using the certification procedures for aftermarket parts as specified in 40 CFR part 85, subpart V. Unless the original engine manufacturer continues to be responsible for the engine as specified in paragraph (d) of this section, you must remove the original engine manufacturer's emission control information label if you recertify the engine.

(d) The original manufacturer is not responsible for operation of modified engines in configurations resulting from modifications performed by others. In cases where the modification allows an engine to be operated in either its original configuration or a modified configuration, the original manufacturer remains responsible for operation of the modified engine in its original configuration.

(e) Entities producing conversion kits may obtain certificates of conformity for the converted engines. Such entities are engine manufacturers for purposes of this part.

§ 1045.650 Do delegated-assembly provisions apply for marine engines?

The provisions of 40 CFR 1068.261 related to delegated final assembly do not apply for marine spark-ignition engines certified under this part 1045. This means that for engines requiring exhaust aftertreatment (such as catalysts), the engine manufacturers must either install the aftertreatment on the engine before introducing it into U.S. commerce or ship the aftertreatment along with the engine.

§ 1045.655 What special provisions apply for installing and removing altitude kits?

An action for the purpose of installing or modifying altitude kits and performing other changes to compensate for changing altitude is not considered a prohibited act under 40 CFR 1068.101(b) as long as it is done consistent with the manufacturer's instructions.

§ 1045.660 How do I certify outboard or personal watercraft engines for use in jet boats?

(a) This section describes how to certify outboard or personal watercraft engines for use in jet boats. To be certified under this section, the jet boat engines must be identical in all physical respects to the corresponding outboard or personal watercraft engines, but may differ slightly with respect to engine calibrations.

(b) The outboard or personal watercraft engines must meet all the applicable requirements for outboard or personal watercraft engines. Jet boat engines certified under this section must meet all the applicable requirements for sterndrive/inboard engines.

(c) The jet boat engines must be in an engine family separate from the corresponding outboard or personal watercraft engines.

(d) Jet boat engine families may use emission credits from outboard or personal watercraft engine families, as described in § 1045.701(d).

(e) Jet-boat engines certified under the provisions of this section must meet emission standards over the same useful-life period that applies to the corresponding outboard or personal watercraft engine family, as described in § 1045.103(e).

Subpart H—Averaging, Banking, and Trading for Certification

§ 1045.701 General provisions.

(a) You may average, bank, and trade (ABT) emission credits for purposes of certification as described in this subpart to show compliance with the standards of this part. This applies for engines with respect to exhaust emissions and for vessels with respect to evaporative emissions. Participation in this program is voluntary.

(b) The definitions of subpart I of this part apply to this subpart. The following definitions also apply:

(1) *Actual emission credits* means emission credits you have generated that we have verified by reviewing your final report.

(2) *Averaging set* means a set of engines (or vessels) in which emission credits may be exchanged only with other engines (or vessels) in the same averaging set.

(3) *Broker* means any entity that facilitates a trade of emission credits between a buyer and seller.

(4) *Buyer* means the entity that receives emission credits as a result of a trade.

(5) *Family* means engine family for exhaust credits or emission family for evaporative credits.

(6) *Reserved emission credits* means emission credits you have generated that we have not yet verified by reviewing your final report.

(7) *Seller* means the entity that provides emission credits during a trade.

(8) *Standard* means the emission standard that applies under subpart B of this part for engines or fuel-system components not participating in the ABT program of this subpart.

(9) *Trade* means to exchange emission credits, either as a buyer or seller.

(c) You may not average or exchange banked or traded exhaust credits with evaporative credits, or vice versa. Evaporative credits generated by any vessels under this part may be used by any vessels under this part. Exhaust credits may be exchanged only within an averaging set. Except as specified in paragraph (d) of this section, the following criteria define the applicable exhaust averaging sets:

(1) Sterndrive/inboard engines.

(2) Outboard and personal watercraft engines.

(d) Sterndrive/inboard engines certified under § 1045.660 for jet boats may use $HC+NO_X$ and CO exhaust credits generated from outboard and personal watercraft engines, as long as the credit-using engine is the same model as an engine model from an outboard or personal watercraft family. These emission credits may be used for averaging, but not for banking or trading. The FEL caps for such jet boat families are the $HC+NO_X$ and CO standard for outboard and personal watercraft engines. U.S.-directed sales from jet boat engines using the provisions of this paragraph (d) may not be greater than the U.S.-directed sales of the same engine model for outboard or personal watercraft engines.

(e) You may not generate evaporative credits based on permeation measurements from metal fuel tanks or portable marine fuel tanks.

(f) You may not use emission credits generated under this subpart to offset any emissions that exceed an FEL or standard. This applies for all testing, including certification testing, in-use testing, selective enforcement audits, and other production-line testing. However, if exhaust emissions from an engine exceed an exhaust FEL or standard (for example, during a selective enforcement audit), you may use emission credits to recertify the family with a higher FEL that applies only to future production.

(g) Emission credits may be used in the model year they are generated (averaging) and in future model years (banking), except that CO emission credits for outboard and personal watercraft engines may not be banked or traded.

(h) You may increase or decrease an exhaust FEL during the model year by amending your application for certification under § 1045.225.

(i) Engine and vessel manufacturers certifying with respect to evaporative emissions may use emission credits to demonstrate compliance under this subpart. Component manufacturers may establish FELs for their certified products, but they may not generate or use emission credits under this subpart.

(j) In your application for certification, base your showing of compliance on projected production volumes for engines or vessels intended for sale in the United States. As described in § 1045.730, compliance with the requirements of this subpart is determined at the end of the model year based on actual production volumes for engines or vessels intended for sale in the United States. Do not include any of the following engines or vessels to calculate emission credits:

(1) Engines or vessels exempted under subpart G of this part or under 40 CFR part 1068.

(2) Engines or vessels intended for export.

(3) Engines or vessels that are subject to state emission standards for that model year. However, this restriction does not apply if we determine that the state standards and requirements are equivalent to those of this part and that products sold in such a state will not generate credits under the state program. For example, you may not include engines or vessels certified for California if California has more stringent emission standards for these products or if your products generate or use emission credits under the California program.

(4) Engines or vessels not subject to the requirements of this part, such as those excluded under § 1054.5.

(5) Any other engines or vessels where we indicate elsewhere in this part 1054 that they are not to be included in the calculations of this subpart.

§ 1045.705 How do I generate and calculate exhaust emission credits?

The provisions of this section apply for calculating exhaust emission credits for $HC+NO_X$ or CO. You may generate exhaust emission credits only if you are a certifying engine manufacturer.

(a) For each participating family, calculate positive or negative emission credits relative to the otherwise applicable emission standard. Calculate positive emission credits for a family that has an FEL below the standard. Calculate negative emission credits for a family that has an FEL above the standard. Sum your positive and negative credits for the model year before rounding. Round the sum of emission credits to the nearest kilogram (kg) using consistent units throughout the following equation:

$$\text{Emission credits (kg)} = (\text{STD} - \text{FEL}) \times (\text{Volume}) \times (\text{Power}) \times (\text{UL}) \times (\text{LF}) \times (10^{-3})$$

Where:

STD = the emission standard, in g/kW-hr.

FEL = the family emission limit for the family, in g/kW-hr.

Volume = the number of engines eligible to participate in the averaging, banking, and trading program within the given family during the model year, as described in § 1045.701(j).

Power = maximum engine power for the family, in kilowatts (see § 1045.140).

UL = The useful life for the given family.

LF = load factor. Use 0.207. We may specify a different load factor if we approve the use of special test procedures for an family under 40 CFR 1065.10(c)(2), consistent with good engineering judgment.

(b) [Reserved]

§ 1045.706 How do I generate and calculate evaporative emission credits?

The provisions of this section apply for calculating evaporative emission credits. This applies only for fuel tank permeation. You may generate credits only if you are a certifying vessel manufacturer. This may include outboard engine manufacturers if they install under-cowl fuel tanks.

(a) For each participating vessel, calculate positive or negative emission credits relative to the otherwise applicable emission standard. Calculate positive emission credits for a family that has an FEL below the standard. Calculate negative emission credits for a family that has an FEL above the standard. Sum your positive and negative credits for the model year before rounding. Round the sum of emission credits to the nearest kilogram (kg) using consistent units throughout the following equation:

$$\text{Emission credits (kg)} = (\text{STD} - \text{FEL}) \times (\text{Total Area}) \times (\text{UL}) \times (\text{AF}) \times (365) \times (10^{-3})$$

Where:

STD = the emission standard, in g/m²/day.

FEL = the family emission limit for the family, in g/m²/day, as described in paragraph (b) of this section.

Total Area = The combined internal surface area of all fuel tanks in the family, in m².

UL = 5 years, which represents the useful life for the given family.

AF = adjustment factor. Use 1.0 for fuel tank testing performed at 28 °C and 0.60 for testing performed at 40 °C.

(b) For calculating credits under paragraph (a) of this section, the emission standard and FEL must both be based on test measurements at the same temperature (28 ° or 40 °C). Determine the FEL for calculating emission credits (relative to testing at 28 °C) as follows:

(1) To use an FEL below 5.0 g/m²/day, it must be based on emission measurements.

(2) The provisions of this paragraph (b)(2) apply for all emission families with FELs at or above 5.0 g/m²/day. To calculate emission credits for such emission families, you must choose from one of the following options and apply it to all your emission families with FELs at or above 5.0 g/m²/day:

(i) Option 1: Establish all your FELs based on emission measurements. This may include measurements from a certifying fuel tank manufacturer.

(ii) Option 2: Use an assigned FEL of 10.4 g/m²/day. This would apply without regard to whether any of these emission families have measured emission levels below 10.4 g/m²/day. If any of your fuel tanks were otherwise certified (by you or the fuel tank manufacturer) with an FEL between 5.0 and 10.4 g/m²/day, the assigned FEL of 10.4 g/m²/day applies only for emission credit calculations.

§ 1045.710 How do I average emission credits?

(a) Averaging is the exchange of emission credits among your families. You may average emission credits only within the same averaging set.

(b) You may certify one or more families to an FEL above the emission standard, subject to the FEL caps and other provisions in subpart B of this part, if you show in your application for certification that your projected balance of all emission-credit transactions in that model year is greater than or equal to zero.

(c) If you certify a family to an FEL that exceeds the otherwise applicable standard, you must obtain enough emission credits to offset the family's deficit by the due date for the final report required in § 1045.730. The emission credits used to address the deficit may come from your other families that generate emission credits in the same model year, from emission credits you have banked, or from emission credits you obtain through trading.

§ 1045.715 How do I bank emission credits?

(a) Banking is the retention of emission credits by the manufacturer generating the emission credits for use in future model years for averaging or trading. You may use banked emission credits only within the averaging set in which they were generated, except as described in this subpart.

(b) You may designate any emission credits you plan to bank in the reports you submit under § 1045.730. During the model year and before the due date for the final report, you may designate your reserved emission credits for averaging or trading.

(c) Reserved credits become actual emission credits when you submit your final report. However, we may revoke these emission credits if we are unable to verify them after reviewing your reports or auditing your records.

§ 1045.720 How do I trade emission credits?

(a) Trading is the exchange of emission credits between manufacturers. You may use traded emission credits for averaging, banking, or further trading transactions. Traded emission credits may be used only within the averaging set in which they were generated, except as described in this subpart.

(b) You may trade actual emission credits as described in this subpart. You may also trade reserved emission credits, but we may revoke these emission credits based on our review of your records or reports or those of the company with which you traded emission credits. You may trade banked credits within an averaging set to any certifying engine or vessel manufacturer.

(c) If a negative emission credit balance results from a transaction, both the buyer and seller are liable, except in cases we deem to involve fraud. See § 1045.255(e) for cases involving fraud. We may void the certificates of all families participating in a trade that results in a manufacturer having a negative balance of emission credits. See § 1045.745.

§ 1045.725 What must I include in my application for certification?

(a) You must declare in your application for certification your intent to use the provisions of this subpart for each family that will be certified using the ABT program. You must also declare the FELs you select for the family for each pollutant for which you are using the ABT program. Your FELs must comply with the specifications of subpart B of this part, including the FEL caps. FELs must be expressed to the same number of decimal places as the emission standard.

(b) Include the following in your application for certification:

(1) A statement that, to the best of your belief, you will not have a negative balance of emission credits for any averaging set when all emission credits are calculated at the end of the year.

(2) Detailed calculations of projected emission credits (positive or negative) based on projected production volumes. We may require you to include similar calculations from your other engine families to demonstrate that you will be able to avoid a negative credit balance for the model year. If you project negative emission credits for a family, state the source of positive emission credits you expect to use to offset the negative emission credits.

§ 1045.730 What ABT reports must I send to EPA?

(a) If any of your families are certified using the ABT provisions of this subpart, you must send an end-of-year report within 90 days after the end of the model year and a final report within 270 days after the end of the model year. We may waive the requirement to send the end-of year report as long as you send the final report on time.

(b) Your end-of-year and final reports must include the following information for each family participating in the ABT program:

(1) Family designation.

(2) The emission standards that would otherwise apply to the family.

(3) The FEL for each pollutant. If you change the FEL after the start of production, identify the date that you started using the new FEL and/or give the engine identification number for the first engine covered by the new FEL. In this case, identify each applicable FEL and calculate the positive or negative emission credits under each FEL.

(4) The projected and actual production volumes for the model year with a point of retail sale in the United States, as described in § 1045.701(j). For fuel tanks, state the production volume in terms of total surface area and production volume for each tank configuration and state the total surface area for the emission family. If you changed an FEL during the model year, identify the actual production volume associated with each FEL.

(5) Maximum engine power for each engine configuration, and your declared value of maximum engine power for the engine family (see § 1045.140).

(6) Useful life.

(7) Calculated positive or negative emission credits for the whole family. Identify any emission credits that you traded, as described in paragraph (d)(1) of this section.

(c) Your end-of-year and final reports must include the following additional information:

(1) Show that your net balance of emission credits from all your participating families in each averaging set in the applicable model year is not negative.

(2) State whether you will retain any emission credits for banking.

(3) State that the report's contents are accurate.

(d) If you trade emission credits, you must send us a report within 90 days after the transaction, as follows:

(1) As the seller, you must include the following information in your report:

(i) The corporate names of the buyer and any brokers.

(ii) A copy of any contracts related to the trade.

(iii) The families that generated emission credits for the trade, including the number of emission credits from each family.

(2) As the buyer, you must include the following information in your report:

(i) The corporate names of the seller and any brokers.

(ii) A copy of any contracts related to the trade.

(iii) How you intend to use the emission credits, including the number of emission credits you intend to apply to each family (if known).

(e) Send your reports electronically to the Designated Compliance Officer using an approved information format. If you want to use a different format, send us a written request with justification for a waiver.

(f) Correct errors in your end-of-year report or final report as follows:

(1) You may correct any errors in your end-of-year report when you prepare the final report as long as you send us the final report by the time it is due.

(2) If you or we determine within 270 days after the end of the model year that errors mistakenly decreased your balance of emission credits, you may correct the errors and recalculate the balance of emission credits. You may not make these corrections for errors that are determined more than 270 days after the end of the model year. If you report a negative balance of emission credits, we may disallow corrections under this paragraph (f)(2).

(3) If you or we determine anytime that errors mistakenly increased your balance of emission credits, you must correct the errors and recalculate the balance of emission credits.

§ 1045.735 What records must I keep?

(a) You must organize and maintain your records as described in this section. We may review your records at any time.

(b) Keep the records required by this section for at least eight years after the due date for the end-of-year report. You may not use emission credits for any engines or vessel if you do not keep all the records required under this section. You must therefore keep these records to continue to bank valid credits. Store these records in any format and on any media as long as you can promptly send us organized, written records in English if we ask for them. You must keep these records readily available. We may review them at any time.

(c) Keep a copy of the reports we require in §§ 1045.725 and 1045.730.

(d) Keep records of the engine identification number for each engine or vessel you produce that generates or uses emission credits under the ABT program. You may identify these numbers as a range.

(e) We may require you to keep additional records or to send us relevant information not required by this section in accordance with the Clean Air Act.

§ 1045.745 What can happen if I do not comply with the provisions of this subpart?

(a) For each family participating in the ABT program, the certificate of conformity is conditional upon full compliance with the provisions of this subpart during and after the model year. You are responsible to establish to our satisfaction that you fully comply with applicable requirements. We may void the certificate of conformity for a family if you fail to comply with any provisions of this subpart.

(b) You may certify your family to an FEL above an emission standard based on a projection that you will have enough emission credits to offset the deficit for the family. However, we may void the certificate of conformity if you cannot show in your final report that you have enough actual emission credits to offset a deficit for any pollutant in a family.

(c) We may void the certificate of conformity for a family if you fail to keep records, send reports, or give us information we request.

(d) You may ask for a hearing if we void your certificate under this section (see § 1045.820).

Subpart I—Definitions and Other Reference Information

§ 1045.801 What definitions apply to this part?

The following definitions apply to this part. The definitions apply to all subparts unless we note otherwise. All undefined terms have the meaning the Clean Air Act gives to them. The definitions follow:

Adjustable parameter means any device, system, or element of design that someone can adjust (including those which are difficult to access) and that, if adjusted, may affect emissions or engine performance during emission testing or normal in-use operation. This includes, but is not limited to, parameters related to injection timing and fueling rate. You may ask us to exclude a parameter that is difficult to access if it cannot be adjusted to affect emissions without significantly degrading engine performance, or if you otherwise show us that it will not be adjusted in a way that affects emissions during in-use operation.

Aftertreatment means relating to a catalytic converter, particulate filter, or any other system, component, or technology mounted downstream of the exhaust valve (or exhaust port) whose design function is to decrease emissions in the engine exhaust before it is exhausted to the environment. Exhaust-gas recirculation (EGR), turbochargers, and oxygen sensors are not aftertreatment.

Alcohol-fueled engine means an engine that is designed to run using an alcohol fuel. For purposes of this definition, alcohol fuels do not include fuels with a nominal alcohol content below 25 percent by volume.

Amphibious vehicle means a vehicle with wheels or tracks that is designed primarily for operation on land and secondarily for operation in water.

Applicable emission standard or *applicable standard* means an emission standard to which an engine (or vessel) is subject. Additionally, if an engine (or vessel) has been or is being certified to another standard or FEL, *applicable emission standard* means the FEL or other standard to which the engine (or vessel) has been or is being certified. This definition does not apply to subpart H of this part.

Auxiliary emission control device means any element of design that senses temperature, motive speed, engine RPM, transmission gear, or any other parameter for the purpose of activating, modulating, delaying, or deactivating the operation of any part of the emission control system.

Brake power means the usable power output of the engine, not including power required to fuel, lubricate, or heat the engine, circulate coolant to the engine, or to operate aftertreatment devices.

Calibration means the set of specifications and tolerances specific to a particular design, version, or application of a component or assembly capable of functionally describing its operation over its working range.

Carryover means relating to certification based on emission data generated from an earlier model year, as described in § 1045.235(d).

Certification means relating to the process of obtaining a certificate of conformity for an engine family that complies with the emission standards and requirements in this part.

Certified emission level means the highest deteriorated emission level in an engine family for a given pollutant from either transient or steady-state testing.

Clean Air Act means the Clean Air Act, as amended, 42 U.S.C. 7401–7671q.

Conventional sterndrive/inboard engine means a sterndrive/inboard engine that is not a high-performance engine.

Crankcase emissions means airborne substances emitted to the atmosphere from any part of the engine crankcase's ventilation or lubrication systems. The crankcase is the housing for the crankshaft and other related internal parts.

Critical emission-related component means any of the following components:

(1) Electronic control units, aftertreatment devices, fuel-metering components, EGR-system components, crankcase-ventilation valves, all components related to charge-air compression and cooling, and all sensors and actuators associated with any of these components.

(2) Any other component whose primary purpose is to reduce emissions.

Date of manufacture has the meaning given in 40 CFR 1068.30.

Days means calendar days unless otherwise specified. For example, when we specify working days we mean calendar days, excluding weekends and U.S. national holidays.

Designated Compliance Officer means the Manager, Heavy-Duty and Nonroad Engine Group (6405–J), U.S. Environmental Protection Agency, 1200 Pennsylvania Ave., NW., Washington, DC 20460.

Designated Enforcement Officer means the Director, Air Enforcement Division (2242A), U.S. Environmental Protection Agency, 1200 Pennsylvania Ave., NW.,Washington, DC 20460.

Deteriorated emission level means the emission level that results from applying the appropriate deterioration factor to the official emission result of the emission-data engine.

Deterioration factor means the relationship between emissions at the end of useful life and emissions at the low-hour test point (see §§ 1045.240 and 1045.245), expressed in one of the following ways:

(1) For multiplicative deterioration factors, the ratio of emissions at the end of useful life to emissions at the low-hour test point.

(2) For additive deterioration factors, the difference between emissions at the end of useful life and emissions at the low-hour test point.

Discrete-mode means relating to the discrete-mode type of steady-state test described in § 1045.505.

Dual fuel means relating to an engine designed for operation on two different fuels but not on a continuous mixture of those fuels.

Emission control system means any device, system, or element of design that controls or reduces the emissions of regulated pollutants from an engine.

Emission-data engine means an engine that is tested for certification. This includes engines tested to establish deterioration factors.

Emission-related maintenance means maintenance that substantially affects emissions or is likely to substantially affect emission deterioration.

Engine has the meaning given in 40 CFR 1068.30. This includes complete and partially complete engines.

Engine configuration means a unique combination of engine hardware and calibration within an engine family. Engines within a single engine configuration differ only with respect to normal production variability.

Engine family has the meaning given in § 1045.230.

Engine manufacturer means the manufacturer of the engine. See the definition of ''manufacturer'' in this section.

Evaporative means relating to fuel emissions controlled by 40 CFR part 1060. This generally includes emissions that result from permeation of fuel through the fuel-system materials or from ventilation of the fuel system.

Excluded means relating to an engine that either:

(1) Has been determined not to be a nonroad engine, as specified in 40 CFR 1068.30; or

(2) Is a nonroad engine that, according to § 1045.5, is not subject to this part 1045.

Exempted has the meaning given in 40 CFR 1068.30.

Exhaust-gas recirculation (EGR) means a technology that reduces emissions by routing exhaust gases that had been exhausted from the combustion chamber(s) back into the engine to be mixed with incoming air before or during combustion. The use of valve timing to increase the amount of residual exhaust gas in the combustion chamber(s) that is mixed with incoming air before or during combustion is not considered exhaust-gas recirculation for the purposes of this part.

Family emission limit (FEL) means an emission level declared by the manufacturer to serve in place of the emission standards specified in subpart B of this part under the ABT program in subpart H of this part. The family emission limit must be expressed to the same number of decimal places as the emission standard it replaces. The family emission limit serves as the emission standard for the engine family (exhaust) or emission family (evaporative) with respect to all required testing.

Flexible-fuel means relating to an engine designed for operation on any mixture of two or more different fuels.

Fuel line means hose, tubing, and primer bulbs containing or exposed to liquid fuel, including hose or tubing that delivers fuel to or from the engine, as follows:

(1) This includes flexible molded sections for transporting liquid fuel to or from the engine, but does not include inflexible components for connecting hose or tubing.

(2) This includes hose or tubing for the vent line or filler neck if fuel systems are designed such that any portion of the vent-line or filler-neck material continues to be exposed to liquid fuel after completion of a refueling event in which an operator fills the fuel tank using typical methods. For example, we would not consider a filler neck to be a fuel line if an operator stops refueling after an initial automatic shutoff that signals the fuel tank is full, where any liquid fuel in the filler neck during the refueling procedure drains into the fuel tank.

(3) This does not include primer bulbs that contain liquid fuel only for priming the engine before starting.

Fuel system means all components involved in transporting, metering, and mixing the fuel from the fuel tank to the combustion chamber(s), including the fuel tank, fuel tank cap, fuel pump, fuel filters, fuel lines, carburetor or fuel-injection components, and all fuel-system vents.

Fuel type means a general category of fuels such as gasoline or natural gas. There can be multiple grades within a single fuel type, such as low-temperature or all-season gasoline.

Good engineering judgment has the meaning given in 40 CFR 1068.30. See 40 CFR 1068.5 for the administrative process we use to evaluate good engineering judgment.

High-performance means relating to a sterndrive/inboard engine with maximum engine power above 373 kW that has design features to enhance power output such that the expected operating time until rebuild is substantially shorter than 480 hours.

Hydrocarbon (HC) means the hydrocarbon group on which the emission standards are based for each fuel type, as described in subpart B of this part.

Identification number means a unique specification (for example, a model number/serial number combination) that allows someone to distinguish a particular engine from other similar engines.

Jet boat means a vessel that uses an installed internal combustion engine powering a water jet pump as its primary source of propulsion and is designed with open area for carrying passengers. Jet boat engines qualify as sterndrive/inboard engines.

Low-hour means relating to an engine that has stabilized emissions and represents the undeteriorated emission level. This would generally involve less than 30 hours of operation.

Manufacture means the physical and engineering process of designing, constructing, and assembling an engine or vessel.

Manufacturer has the meaning given in section 216(1) of the Clean Air Act (42 U.S.C. 7550(1)). In general, this term includes any person who manufactures an engine, or vessel for sale in the United States or otherwise introduces a new marine engine into U.S. commerce. This includes importers who import engines or vessels for resale, but not dealers. All manufacturing entities under the control of the same person are considered to be a single manufacturer.

Marine engine means a nonroad engine that is installed or intended to be installed on a vessel. This includes a portable auxiliary marine engine only if its fueling, cooling, or exhaust system is an integral part of the vessel. There are two kinds of marine engines:

(1) *Propulsion marine engine* means a marine engine that moves a vessel through the water or directs the vessel's movement.

(2) *Auxiliary marine engine* means a marine engine not used for propulsion.

Marine vessel has the meaning given in 1 U.S.C. 3, except that it does not include amphibious vehicles. The definition in 1 U.S.C. 3 very broadly includes every craft capable of being used as a means of transportation on water.

Maximum engine power has the meaning given in § 1045.140.

Maximum test speed has one of the following meanings:

(1) For all testing with two-stroke engines and for testing four-stroke engines on an engine dynamometer, *maximum test speed* has the meaning given in 40 CFR 1065.1001 and § 1045.501.

(2) For testing a four-stroke engine that remains installed in a vessel, *maximum test speed* means the engine speed during sustained operation with maximum operator demand.

Model year means one of the following things:

(1) For freshly manufactured vessels and engines (see definition of ''new propulsion marine engine,'' paragraph (1)), model year means one of the following:

(i) Calendar year.

(ii) Your annual new model production period if it is different than the calendar year. This must include

January 1 of the calendar year for which the model year is named. It may not begin before January 2 of the previous calendar year and it must end by December 31 of the named calendar year. For seasonal production periods not including January 1, model year means the calendar year in which the production occurs, unless you choose to certify the applicable engine family with the following model year. For example, if your production period is June 1, 2010 through November 30, 2010, your model year would be 2010 unless you choose to certify the engine family for model year 2011.

(2) For an engine that is converted to a propulsion marine engine after being certified and placed into service as a motor vehicle engine, a nonroad engine that is not a propulsion marine engine, or a stationary engine, model year means the model year in which the engine was originally produced. For an engine that is converted to a nonroad engine after being placed into service as a motor vehicle engine, a nonroad engine that is not a propulsion marine engine, or a stationary engine without having been certified, model year means the calendar year in which the engine becomes a new nonroad engine. (See definition of ''new propulsion marine engine,'' paragraph (2).)

(3) [Reserved]

(4) For engines that are not freshly manufactured but are installed in new vessels, model year means the calendar year in which the engine is installed in the new vessel (see definition of ''new propulsion marine engine,'' paragraph (4)).

(5) For imported engines:

(i) For imported engines described in paragraph (5)(i) of the definition of ''new propulsion marine engine,'' *model year* has the meaning given in paragraphs (1) through (4) of this definition.

(ii) For imported engines described in paragraph (5)(ii) of the definition of ''new propulsion marine engine,'' *model year* means the calendar year in which the engine is modified.

(iii) For imported engines described in paragraph (5)(iii) of the definition of ''new nonroad engine,'' *model year* means the calendar year in which the engine is assembled in its imported configuration, unless specified otherwise in this part or in 40 CFR part 1068.

New portable marine fuel tanks and fuel lines means portable marine fuel tanks and fuel lines that have not yet been placed into service, or which are otherwise offered for sales as new products.

New propulsion marine engine or *new engine* means any of the following things:

(1) A freshly manufactured propulsion marine engine for which the ultimate purchaser has never received the equitable or legal title. This kind of engine might commonly be thought of as ''brand new.'' In the case of this paragraph (1), the engine is new from the time it is produced until the ultimate purchaser receives the title or the product is placed into service, whichever comes first.

(2) An engine originally manufactured as a motor vehicle engine, a nonroad engine that is not a propulsion marine engine, or a stationary engine that is later used or intended to be used as a propulsion marine engine. In this case, the engine is no longer a motor vehicle, nonpropulsion, or stationary engine and becomes a ''new propulsion marine engine.'' The engine is no longer new when it is placed into service as a marine propulsion engine. This paragraph (2) applies for engines we exclude under § 1045.5, where that engine is later installed as a propulsion engine in a vessel that is covered by this part 1045.

(3) [Reserved]

(4) An engine not covered by paragraphs (1) through (3) of this definition that is intended to be installed in a new vessel. This generally includes installation of used engines in new vessels. The engine is no longer new when the ultimate purchaser receives a title for the vessel or the product is placed into service, whichever comes first.

(5) An imported marine engine, subject to the following provisions:

(i) An imported marine engine covered by a certificate of conformity issued under this part that meets the criteria of one or more of paragraphs (1) through (4) of this definition, where the original engine manufacturer holds the certificate, is new as defined by those applicable paragraphs.

(ii) An imported engine that will be covered by a certificate of conformity issued under this part, where someone other than the original engine manufacturer holds the certificate (such as when the engine is modified after its initial assembly), is a new propulsion marine engine when it is imported. It is no longer new when the ultimate purchaser receives a title for the engine or it is placed into service, whichever comes first.

(iii) An imported propulsion marine engine that is not covered by a certificate of conformity issued under this part at the time of importation is new. This addresses uncertified engines and vessels initially placed into service that someone seeks to import into the United States. Importation of this kind of engine (or vessel containing such an engine) is generally prohibited by 40 CFR part 1068. However, the importation of such an engine is not prohibited if the engine has an earlier model year than that identified in the following table, since it is not subject to standards:

APPLICABILITY OF EMISSION STANDARDS FOR PROPULSION MARINE ENGINES

Engine type	Initial model year of emission standards
Outboard	1998
Personal watercraft	1999
Sterndrive/inboard	2010

New vessel means either of the following things:

(1) A vessel for which the ultimate purchaser has never received the equitable or legal title. The product is no longer new when the ultimate purchaser receives this title or it is placed into service, whichever comes first.

(2) An imported vessel that has already been placed into service, where it has an engine not covered by a certificate of conformity issued under this part at the time of importation that was manufactured after the requirements of this part start to apply (see § 1045.1).

Noncompliant engine means an engine that was originally covered by a certificate of conformity but is not in the certified configuration or otherwise does not comply with the conditions of the certificate.

Nonconforming engine means an engine not covered by a certificate of conformity that would otherwise be subject to emission standards.

Nonmethane hydrocarbon has the meaning given in 40 CFR 1065.1001. This generally means the difference between the emitted mass of total hydrocarbons and the emitted mass of methane.

Nonroad means relating to nonroad engines, or vessels, or equipment that include nonroad engines.

Nonroad engine has the meaning given in 40 CFR 1068.30. In general, this means all internal-combustion engines except motor vehicle engines, stationary engines, engines used solely for competition, or engines used in aircraft.

Official emission result means the measured emission rate for an emission-data engine on a given duty cycle before the application of any deterioration factor.

Outboard engine means an assembly of a spark-ignition engine and drive unit used to propel a vessel from a properly mounted position external to the hull of the vessel. An outboard drive unit is partially submerged during operation and can be tilted out of the water when not in use.

Owners manual means a document or collection of documents prepared by the engine manufacturer for the owner or operator to describe appropriate engine maintenance, applicable warranties, and any other information related to operating or keeping the engine. The owners manual is typically provided to the ultimate purchaser at the time of sale. The owners manual may be in paper or electronic format.

Oxides of nitrogen has the meaning given in 40 CFR part 1065.1001.

Personal watercraft means a vessel less than 4.0 meters (13 feet) in length that uses an installed spark-ignition engine powering a water jet pump as its primary source of propulsion and is designed with no open load carrying area that would retain water. The vessel is designed to be operated by a person or persons positioned on, rather than within the confines of the hull. A vessel using an outboard engine as its primary source of propulsion is not a personal watercraft.

Personal watercraft engine means a spark-ignition engine used to propel a personal watercraft.

Placed into service means put into initial use for its intended purpose.

Point of first retail sale means the location at which the initial retail sale occurs. This generally means an equipment dealership, but may also include an engine seller or distributor in cases where loose engines are sold to the general public for uses such as replacement engines.

Portable marine fuel tank has the meaning given in 40 CFR 1060.801.

Ramped-modal means relating to the ramped-modal type of steady-state test described in § 1045.505.

Revoke has the meaning given in 40 CFR 1068.30. In general this means to terminate the certificate or an exemption for an engine family.

Round has the meaning given in 40 CFR 1065.1001.

Scheduled maintenance means adjusting, repairing, removing, disassembling, cleaning, or replacing components or systems periodically to keep a part or system from failing, malfunctioning, or wearing prematurely. It also may mean actions you expect are necessary to correct an overt indication of failure or malfunction for which periodic maintenance is not appropriate.

Small-volume engine manufacturer means an engine manufacturer with 250 or fewer employees. This includes any employees working for a parent company and all its subsidiaries.

Small-volume vessel manufacturer means a vessel manufacturer with 500 or fewer employees. This includes any employees working for a parent company and all its subsidiaries.

Spark-ignition means relating to a gasoline-fueled engine or any other type of engine with a spark plug (or other sparking device) and with operating characteristics significantly similar to the theoretical Otto combustion cycle. Spark-ignition engines usually use a throttle to regulate intake air flow to control power during normal operation.

Steady-state means relating to emission tests in which engine speed and load are held at a finite set of essentially constant values. Steady-state tests are either discrete-mode tests or ramped-modal tests.

Sterndrive/inboard engine means a spark-ignition engine that is used to propel a vessel, but is not an outboard engine or a personal watercraft engine. A sterndrive/inboard engine may be either a conventional sterndrive/inboard engine or a high-performance engine. Engines on propeller-driven vessels, jet boats, air boats, and hovercraft are all sterndrive/inboard engines.

Stoichiometric means relating to the particular ratio of air and fuel such that if the fuel were fully oxidized, there would be no remaining fuel or oxygen. For example, stoichiometric combustion in a gasoline-fueled engine typically occurs at an air-to-fuel mass ratio of about 14.7:1.

Suspend has the meaning given in 40 CFR 1068.30. In general this means to temporarily discontinue the certificate or an exemption for an engine family.

Test engine means an engine in a test sample.

Test sample means the collection of engines selected from the population of an engine family for emission testing. This may include testing for certification, production-line testing, or in-use testing.

Total hydrocarbon has the meaning given in 40 CFR 1065.1001. This generally means the combined mass of organic compounds measured by the specified procedure for measuring total hydrocarbon, expressed as a hydrocarbon with a hydrogen-to-carbon mass ratio of 1.85:1.

Total hydrocarbon equivalent has the meaning given in 40 CFR 1065.1001. This generally means the sum of the carbon mass contributions of non-oxygenated hydrocarbons, alcohols and aldehydes, or other organic compounds that are measured separately as contained in a gas sample, expressed as exhaust hydrocarbon from petroleum-fueled engines. The hydrogen-to-carbon ratio of the equivalent hydrocarbon is 1.85:1.

Ultimate purchaser means, with respect to any new vessel or new marine propulsion engine, the first person who in good faith purchases such new vessel or new engine for purposes other than resale.

Under-cowl fuel line means a fuel line that is entirely contained within the cowl of an outboard engine. This does not include a fuel line that crosses through the cowl housing.

United States has the meaning given in 40 CFR 1068.30.

Upcoming model year for an engine family means the model year after the one currently in production.

U.S.-directed production volume means the number of engine units, subject to the requirements of this part, produced by a manufacturer for which the manufacturer has a reasonable assurance that sale was or will be made to ultimate purchasers in the United States.

Useful life means the period during which a vehicle is required to comply with all applicable emission standards, specified as a given number of hours of operation or calendar years, whichever comes first. It is the period during which an engine is required to comply with all applicable emission standards. See §§ 1045.103(e), 1045.105(e), and 1045.112. If an engine has no hour meter, the specified number of hours does not limit the period during which an in-use engine is required to comply with emission standards unless the degree of service accumulation can be verified separately.

Variable-speed engine means an engine that is not a constant-speed engine.

Vessel means marine vessel.

Void has the meaning given in 40 CFR 1068.30. In general this means to invalidate a certificate or an exemption both retroactively and prospectively.

Volatile liquid fuel means any fuel other than diesel or biodiesel that is a liquid at atmospheric pressure and has a Reid Vapor Pressure higher than 2.0 pounds per square inch.

We (us, our) means the Administrator of the Environmental Protection Agency and any authorized representatives.

Wide-open throttle means maximum throttle opening. Unless this is specified at a given speed, it refers to maximum throttle opening at maximum speed. For electronically controlled or other engines with multiple possible fueling rates, wide-open throttle also means the maximum fueling rate at maximum throttle opening under test conditions.

§ 1045.805 What symbols, acronyms, and abbreviations does this part use?

The following symbols, acronyms, and abbreviations apply to this part:

ABT Averaging, banking, and trading.
AECD Auxiliary emission control device.
CFR Code of Federal Regulations.
CH_4 methane.
CO carbon monoxide.
CO_2 carbon dioxide.
EPA Environmental Protection Agency.
FEL Family Emission Limit.
g gram.
HC hydrocarbon.
hr hour.
kPa kilopascals.
kW kilowatt.
m meter.
N_2O nitrous oxide.
NARA National Archives and Records Administration.
NMHC nonmethane hydrocarbons.
NO_X oxides of nitrogen (NO and NO_2).
NTE not-to-exceed
psig pounds per square inch of gauge pressure.
RPM revolutions per minute.
SAE Society of Automotive Engineers.
THC total hydrocarbon.
THCE total hydrocarbon equivalent.
U.S.C. United States Code.

§ 1045.810 What materials does this part reference?

Documents listed in this section have been incorporated by reference into this part. The Director of the Federal Register approved the incorporation by reference as prescribed in 5 U.S.C. 552(a) and 1 CFR part 51. Anyone may inspect copies at the U.S. EPA, Air and Radiation Docket and Information Center, 1301 Constitution Ave., NW., Room B102, EPA West Building, Washington, DC 20460 or at the National Archives and Records Administration (NARA). For information on the availability of this material at NARA, call 202–741–6030, or go to: *http://www.archives.gov/federal_register/code_of_federal_regulations/ibr_locations.html*.

(a) *SAE material.* Table 1 to this section lists material from the Society of Automotive Engineers that we have incorporated by reference. The first column lists the number and name of the material. The second column lists the sections of this part where we reference it. Anyone may purchase copies of these materials from the Society of Automotive Engineers, 400 Commonwealth Drive, Warrendale, PA 15096 or *http://www.sae.org.* Table 1 follows:

TABLE 1 TO § 1045.810—SAE MATERIALS

Document number and name	Part 1045 reference
SAE J1939–05, Marine Stern Drive and Inboard Spark-Ignition Engine On-Board Diagnostics Implementation Guide, February 2008	1045.110

(b) [Reserved]

§ 1045.815 What provisions apply to confidential information?

(a) Clearly show what you consider confidential by marking, circling, bracketing, stamping, or some other method.

(b) We will store your confidential information as described in 40 CFR part 2. Also, we will disclose it only as specified in 40 CFR part 2. This applies both to any information you send us and to any information we collect from inspections, audits, or other site visits.

(c) If you send us a second copy without the confidential information, we will assume it contains nothing confidential whenever we need to release information from it.

(d) If you send us information without claiming it is confidential, we may make it available to the public without further notice to you, as described in 40 CFR 2.204.

§ 1045.820 How do I request a hearing?

(a) You may request a hearing under certain circumstances as described elsewhere in this part. To do this, you must file a written request, including a description of your objection and any supporting data, within 30 days after we make a decision.

(b) For a hearing you request under the provisions of this part, we will approve your request if we find that your request raises a substantial factual issue.

(c) If we agree to hold a hearing, we will use the procedures specified in 40 CFR part 1068, subpart G.

§ 1045.825 What reporting and recordkeeping requirements apply under this part?

Under the Paperwork Reduction Act (44 U.S.C. 3501 *et seq.*), the Office of Management and Budget approves the reporting and recordkeeping specified in the applicable regulations. The following items illustrate the kind of reporting and recordkeeping we require for engines and vessels regulated under this part:

(a) We specify the following requirements related to engine and vessel certification in this part 1045:

(1) In § 1045.20 we require vessel manufacturers to label their vessels if they are relying on component certification.

(2) In § 1045.135 we require engine manufacturers to keep certain records related to duplicate labels sent to vessel manufacturers.

(3) In § 1045.145 we include various reporting and recordkeeping requirements related to interim provisions.

(4) In subpart C of this part we identify a wide range of information required to certify engines.

(5) In §§ 1045.345 and 1045.350 we specify certain records related to production-line testing.

(6) In §§ 1045.420 and 1045.425 we specify certain records related to in-use testing.

(7) In subpart G of this part we identify several reporting and recordkeeping items for making demonstrations and getting approval related to various special compliance provisions.

(8) In §§ 1045.725, 1045.730, and 1045.735 we specify certain records related to averaging, banking, and trading.

(b) We specify the following requirements related to vessel or component certification in 40 CFR part 1060:

(1) In 40 CFR 1060.20 we give an overview of principles for reporting information.

(2) In 40 CFR part 1060, subpart C, we identify a wide range of information required to certify products.

(3) In 40 CFR 1060.301 we require manufacturers to make engines or vessels available for our testing if we make such a request.

(4) In 40 CFR 1060.505 we specify information needs for establishing various changes to published test procedures.

(c) We specify the following requirements related to testing in 40 CFR part 1065:

(1) In 40 CFR 1065.2 we give an overview of principles for reporting information.

(2) In 40 CFR 1065.10 and 1065.12 we specify information needs for establishing various changes to published test procedures.

(3) In 40 CFR 1065.25 we establish basic guidelines for storing test information.

(4) In 40 CFR 1065.695 we identify data that may be appropriate for collecting during testing of in-use engines using portable analyzers.

(d) We specify the following requirements related to the general compliance provisions in 40 CFR part 1068:

(1) In 40 CFR 1068.5 we establish a process for evaluating good engineering judgment related to testing and certification.

(2) In 40 CFR 1068.25 we describe general provisions related to sending and keeping information.

(3) In 40 CFR 1068.27 we require manufacturers to make engines available for our testing or inspection if we make such a request.

(4) In 40 CFR 1068.105 we require vessel manufacturers to keep certain records related to duplicate labels from engine manufacturers.

(5) In 40 CFR 1068.120 we specify recordkeeping related to rebuilding engines.

(6) In 40 CFR part 1068, subpart C, we identify several reporting and recordkeeping items for making demonstrations and getting approval related to various exemptions.

(7) In 40 CFR part 1068, subpart D, we identify several reporting and recordkeeping items for making demonstrations and getting approval related to importing engines.

(8) In 40 CFR 1068.450 and 1068.455 we specify certain records related to testing production-line engines in a selective enforcement audit.

(9) In 40 CFR 1068.501 we specify certain records related to investigating and reporting emission-related defects.

(10) In 40 CFR 1068.525 and 1068.530 we specify certain records related to recalling nonconforming engines.

Appendix I to Part 1045—Summary of Previous Emission Standards

(a) The following standards apply to outboard and personal watercraft engines produced before the model years specified in § 1045.1 (since the end of the phase-in period specified in 40 CFR 91.104):

(1) For engines at or below 4.3 kW, the $HC+NO_X$ standard is 81.00 g/kW-hr.

(2) For engines above 4.3 kW, the following $HC+NO_X$ standard applies:

$$STD = 6.00 + 0.250 \cdot (151 + 557/P^{0.9})$$

Where:

STD = The $HC+NO_X$ emission standard, in g/kW-hr.

P = The average power of an engine family, in kW.

(b) See 40 CFR 91.104 for standards that applied to outboard and personal watercraft engines during the phase-in period.

Appendix II to Part 1045—Duty Cycles for Propulsion Marine Engines

(a) The following duty cycle applies for discrete-mode testing:

E4 Mode No.	Engine speed[1]	Torque (percent)[2]	Weighting factors
1	Maximum test speed	100	0.06
2	80%	71.6	0.14
3	60%	46.5	0.15
4	40%	25.3	0.25
5	Warm idle	0	0.40

[1] Speed terms are defined in 40 CFR part 1065. Percent speed values are relative to maximum test speed.
[2] Except as noted in § 1045.505, the percent torque is relative to maximum torque at maximum test speed.

(b) The following duty cycle applies for ramped-modal testing:

RMC Mode	Time in mode (seconds)	Engine speed[1,2]	Torque (percent)[2,3]
1a Steady-state	225	Idle	0
1b Transition	20	Linear transition	Linear transition
2a Steady-state	63	Maximum test speed	100
2b Transition	20	Linear transition	Linear transition
*3a Steady-state	271	40%	25.3%
3b Transition	20	Linear transition	Linear transition
4a Steady-state	151	80%	71.6%
4b Transition	20	Linear transition	Linear transition
5a Steady-state	161	60%	46.5%
5b Transition	20	Linear transition	Linear transition
6 Steady-state	229	Warm idle	0

[1] Speed terms are defined in 40 CFR part 1065. Percent speed values are relative to maximum test speed.
[2] Advance from one mode to the next within a 20-second transition phase. During the transition phase, command linear progressions of speed and torque from the speed setting and torque setting of the current mode to the speed setting and torque setting of the next mode.
[3] Except as noted in § 1045.505, the percent torque is relative to maximum torque at maximum test speed.

PART 1048—CONTROL OF EMISSIONS FROM NEW, LARGE NONROAD SPARK-IGNITION ENGINES

■ 99. The authority citation for part 1048 continues to read as follows:

Authority: 42 U.S.C. 7401–7671q.

Subpart A—[Amended]

■ 100. Section 1048.1 is amended by revising paragraph (d) to read as follows:

§ 1048.1 Does this part apply to me?

* * * * *

(d) In certain cases, the regulations in this part 1048 apply to engines with maximum engine power at or below 19 kW that would otherwise be covered by 40 CFR part 90 or 1054. See 40 CFR 90.913 or 1054.615 for provisions related to this allowance.

■ 101. A new § 1048.2 is added to read as follows:

§ 1048.2 Who is responsible for compliance?

The regulations in this part 1048 contain provisions that affect both engine manufacturers and others. However, the requirements of this part are generally addressed to the engine manufacturer. The term ''you'' generally means the engine manufacturer, as defined in § 1048.801, especially for issues related to certification (including production-line testing, reporting, etc.).

■ 102. Section 1048.5 is amended by revising paragraph (b) and adding paragraph (c) to read as follows:

§ 1048.5 Which engines are excluded from this part's requirements?

* * * * *

(b) Propulsion marine engines. See 40 CFR parts 91 and 1045. This part applies with respect to auxiliary marine engines.

(c) Engines that are certified to meet the requirements of 40 CFR parts 92 or 1033 (locomotive engines), or are otherwise subject to 40 CFR parts 92 or 1033.

■ 103. Section 1048.10 is amended by revising the introductory text to read as follows:

§ 1048.10 How is this part organized?

This part 1048 is divided into the following subparts:

* * * * *

■ 104. Section 1048.15 is amended as follows:

■ a. By revising the section heading.

■ b. By redesignating paragraphs (a) through (c) as paragraphs (b) through (d), respectively.

■ c. By adding a new paragraph (a).

§ 1048.15 Do any other regulation parts apply to me?

(a) Part 1060 of this chapter describes standards and procedures for controlling evaporative emissions from engines fueled by gasoline or other volatile liquid fuels and the associated fuel systems. These requirements apply to engine manufacturers as specified in this part 1048. Part 1060 applies optionally for equipment manufacturers and fuel-tank manufacturers for certifying their products.

* * * * *

Subpart B—[Amended]

■ 105. Section 1048.101 is amended to read as follows:

■ a. By adding paragraph (a)(2)(iv).

■ b. By removing paragraph (a)(4).

■ c. By revising paragraphs (e)(1), (e)(2), and (e)(3).

■ d. By revising paragraphs (f) and (h) to read as follows:

§ 1048.101 What exhaust emission standards must my engines meet?

* * * * *

(a) * * *

(2) * * *

(iv) Constant-speed engines and severe-duty engines.

* * * * *

(e) * * *

(1) Natural gas-fueled engines: NMHC emissions.

(2) Alcohol-fueled engines: THCE emissions.

(3) Other engines: THC emissions.

(f) *Small engines.* Certain engines with total displacement at or below 1000 cc may comply with the requirements of 40 CFR part 90 or 1054 instead of complying with the requirements of this part, as described in § 1048.615.

* * * * *

(h) *Applicability for testing.* The duty-cycle emission standards in this subpart apply to all testing performed according to the procedures in §§ 1048.505 and 1048.510, including certification, production-line, and in-use testing. The field-testing standards apply for all testing performed according to the procedures of subpart F of this part.

■ 106. Section 1048.105 is revised to read as follows:

§ 1048.105 What evaporative emission standards and requirements apply?

Starting in the 2007 model year, new engines that run on a volatile liquid fuel (such as gasoline) must meet the emission standards of this section over a useful life of five years, except as specified in paragraph (f) of this section. Note that § 1048.245 allows you to use design-based certification instead of generating new emission data.

(a) *Fuel line permeation.* For nonmetallic fuel lines, you must specify and use products that meet the Category 1 specifications for permeation in SAE J2260 (incorporated by reference in § 1048.810).

(b) [Reserved]

(c) *Diurnal emissions.* Evaporative hydrocarbon emissions may not exceed 0.2 grams per gallon of fuel tank capacity when measured using the test procedures specified in § 1048.501. Diurnal emission controls must continue to function during engine operation.

(d) *Running loss.* Liquid fuel in the fuel tank may not reach boiling during continuous engine operation in the final installation at an ambient temperature of 30 °C. Note that gasoline with a Reid vapor pressure of 62 kPa (9 psi) begins to boil at about 53 °C at atmospheric pressure, and at about 60 °C for fuel tanks that hold pressure as described in § 1048.245(e)(1)(i).

(e) *Installation.* If other companies install your engines in their equipment, you may introduce your engines into U.S. commerce without meeting all the requirements in this section. However, you must give equipment manufacturers any appropriate instructions so that fully assembled equipment will meet all the requirements in this section, as described in § 1048.130. Your instructions may specify that equipment manufacturers may alternatively use other fuel-system components that have been certified under 40 CFR part 1060. Introducing equipment into U.S. commerce without meeting all the requirements of this section violates 40 CFR 1068.101(a)(1).

(f) *Motor vehicles and marine vessels.* Motor vehicles and marine vessels may contain engines subject to the exhaust emission standards in this part 1048. Evaporative emission standards apply to these products as follows:

(1) Marine vessels using spark-ignition engines are subject to the requirements of 40 CFR part 1045. The vessels are not required to comply with the evaporative emission standards and related requirements of this part 1048.

(2) Motor vehicles are subject to the requirements of 40 CFR part 86. They are not required to comply with the evaporative emission standards and related requirements of this part 1048.

■ 107. Section 1048.110 is amended by adding introductory text and revising paragraphs (b) introductory text, (c), (d), and (g) introductory text to read as follows:

§ 1048.110 How must my engines diagnose malfunctions?

The following engine-diagnostic requirements apply for engines equipped with three-way catalysts and closed-loop control of air-fuel ratios:

* * * * *

(b) *Use a malfunction-indicator light (MIL).* The MIL must be readily visible to the operator; it may be any color except red. When the MIL goes on, it must display ''Check Engine,'' ''Service Engine Soon,'' or a similar message that we approve. You may use sound in addition to the light signal. The MIL must go on under each of the following circumstances:

* * * * *

(c) *Control when the MIL can go out.* If the MIL goes on to show a malfunction or system error, it must remain on during all later engine operation until servicing corrects the malfunction. If the engine is not serviced, but the malfunction or system error does not recur for three consecutive engine starts during which the malfunctioning system is evaluated and found to be working properly, the MIL may stay off during later engine operation.

(d) *Store trouble codes in computer memory.* Record and store in computer memory any diagnostic trouble codes showing a malfunction that should illuminate the MIL. The stored codes must identify the malfunctioning system or component as uniquely as possible. Make these codes available through the data link connector as described in paragraph (g) of this section. You may store codes for conditions that do not turn on the MIL. The system must store a separate code to show when the diagnostic system is disabled.

* * * * *

(g) *Follow standard references for formats, codes, and connections.* Follow conventions defined in 40 CFR 1045.110 or in the following documents (incorporated by reference in § 1048.810) or ask us to approve using updated versions of (or variations from) these documents:

* * * * *

■ 108. Section 1048.115 is amended by revising the section heading, introductory text, and paragraph (e) to read as follows:

§ 1048.115 What other requirements apply?

Engines that are required to meet the emission standards of this part must meet the following requirements:

* * * * *

(e) *Adjustable parameters.* Engines that have adjustable parameters must meet all the requirements of this part for any adjustment in the physically adjustable range. An operating parameter is not considered adjustable if you permanently seal it or if it is not normally accessible using ordinary tools. We may require that you set adjustable parameters to any specification within the adjustable range during any testing, including certification testing, production-line testing, or in-use testing.

* * * * *

■ 109. Section 1048.120 is amended by revising paragraph (c) to read as follows:

§ 1048.120 What emission-related warranty requirements apply to me?

* * * * *

(c) *Components covered.* The emission-related warranty covers all your components whose failure would increase an engine's emissions of any regulated pollutant, including components listed in 40 CFR part 1068, Appendix I, and components from any other system you develop to control emissions. The emission-related warranty covers these components even if another company produces the component for you. Your emission-related warranty does not cover components whose failure would not increase an engine's emissions of any regulated pollutant.

* * * * *

■ 110. Section 1048.125 is amended by revising paragraphs (a)(1)(iii) and (d) to read as follows:

§ 1048.125 What maintenance instructions must I give to buyers?

* * * * *

(a) * * *

(1) * * *

(iii) You provide the maintenance free of charge and clearly say so in your maintenance instructions.

* * * * *

(d) *Noncritical emission-related maintenance.* Subject to the provisions of this paragraph (d), you may schedule any amount of emission-related inspection or maintenance that is not covered by paragraph (a) of this section (i.e., maintenance that is neither explicitly identified as critical emission-related maintenance, nor that we approve as critical emission-related maintenance). Noncritical emission-related maintenance generally includes changing spark plugs, re-seating valves, or any other emission-related maintenance on the components we specify in 40 CFR part 1068, Appendix I that is not covered in paragraph (a) of this section. You must state in the owners manual that these steps are not necessary to keep the emission-related warranty valid. If operators fail to do this maintenance, this does not allow you to disqualify those engines from in-use testing or deny a warranty claim. Do not take these inspection or maintenance steps during service accumulation on your emission-data engines.

* * * * *

■ 111. Section 1048.135 is amended by revising paragraphs (c) and (f) to read as follows:

§ 1048.135 How must I label and identify the engines I produce?

* * * * *

(c) The label must—

(1) Include the heading ''EMISSION CONTROL INFORMATION''.

(2) Include your full corporate name and trademark. You may identify another company and use its trademark instead of yours if you comply with the provisions of § 1048.635.

(3) Include EPA's standardized designation for the engine family (and subfamily, where applicable).

(4) State the engine's displacement (in liters); however, you may omit this from the label if all the engines in the engine family have the same per-cylinder displacement and total displacement.

(5) State the date of manufacture [DAY (optional), MONTH, and YEAR]; however, you may omit this from the label if you stamp, engrave, or otherwise permanently identify it elsewhere on the engine, in which case you must also describe in your application for certification where you will identify the date on the engine.

(6) Identify the emission control system. Use terms and abbreviations as described in 40 CFR 1068.45. You may omit this information from the label if there is not enough room for it and you put it in the owners manual instead.

(7) State: ''THIS ENGINE IS CERTIFIED TO OPERATE ON [specify operating fuel or fuels].''

(8) Identify any requirements for fuel and lubricants. You may omit this information from the label if there is not enough room for it and you put it in the owners manual instead.

(9) List specifications and adjustments for engine tuneups; show the proper position for the transmission during tuneup and state which accessories should be operating. You may omit this information from the label if there is not enough room for it and you put it in the owners manual instead.

(10) State the useful life for your engine family if it has a longer useful life under § 1048.101(g)(1) or a shortened useful life under § 1048.101(g)(2).

(11) Identify the emission standards to which you have certified the engine (in g/kW-hr).

(12) Include one of the following compliance statements:

(i) For engines that may be used in nonroad or stationary equipment, state: ''THIS ENGINE COMPLIES WITH U.S. EPA REGULATIONS FOR [MODEL YEAR] NONROAD AND STATIONARY ENGINES.''

(ii) For engines that will be used only in nonroad equipment, state: ''THIS ENGINE COMPLIES WITH U.S. EPA REGULATIONS FOR [MODEL YEAR] NONROAD ENGINES.''

(iii) For engines that will be used only in stationary equipment, state: ''THIS ENGINE COMPLIES WITH U.S. EPA REGULATIONS FOR [MODEL YEAR] STATIONARY ENGINES.''

(13) Include any of the following additional statements for special situations if they apply to your engines:

(i) If your engines are certified only for constant-speed operation, state: ''USE IN CONSTANT-SPEED APPLICATIONS ONLY.''

(ii) If your engines are certified only for variable-speed operation, state: ''USE

IN VARIABLE-SPEED APPLICATIONS ONLY.''

(iii) If your engines are certified only for high-load engines, state: ''THIS ENGINE IS NOT INTENDED FOR OPERATION AT LESS THAN 75 PERCENT OF FULL LOAD.''

(iv) If you certify your engines under § 1048.101(d), and show in your application for certification that in-use engines will experience infrequent high-load operation, state: ''THIS ENGINE IS NOT INTENDED FOR OPERATION AT MORE THAN PERCENT OF FULL LOAD.'' Specify the appropriate percentage of full load based on the nature of the engine protection. You may add other statements to discourage operation in engine-protection modes.

(v) If your engines are certified to the voluntary standards in § 1048.140, state: ''BLUE SKY SERIES'' and identify the standard to which you certify the engines.

* * * * *

(f) If you obscure the engine label while installing the engine in the equipment such that the label cannot be read during normal maintenance, you must place a duplicate label on the equipment. If others install your engine in their equipment in a way that obscures the engine label, we require them to add a duplicate label on the equipment (see 40 CFR 1068.105); in that case, give them the number of duplicate labels they request and keep the following records for at least five years:

(1) Written documentation of the request from the equipment manufacturer.

(2) The number of duplicate labels you send for each engine family and the date you sent them.

■ 112. Section 1048.140 is revised to read as follows:

§ 1048.140 What are the provisions for certifying Blue Sky Series engines?

This section defines voluntary standards for a recognized level of superior emission control for engines designated as ''Blue Sky Series'' engines. If you certify an engine family under this section, it is subject to all the requirements of this part as if these voluntary standards were mandatory. To receive a certificate of conformity as ''Blue Sky Series,'' you must certify to one of the sets of exhaust emission standards in the following table:

TABLE 1 OF § 1048.140—STANDARDS FOR BLUE SKY SERIES ENGINES (g/kW–hr)

Standards for steady-state and transient test procedures		Standards for field-testing procedures	
$HC+NO_X$	CO	$HC+NO_X$	CO
0.80	4.4	1.10	6.6
0.60	4.4	0.84	6.6
0.40	4.4	0.56	6.6
0.20	4.4	0.28	6.6
0.10	4.4	0.14	6.6

■ 113. Section 1048.145 is amended by adding paragraphs (j) and (k) to read as follows:

§ 1048.145 What provisions apply only for a limited time?

* * * * *

(j) Delayed compliance with labeling requirements. Before the 2010 model year, you may omit the dates of manufacture from the emission control information label as specified in § 1048.135(c)(5) if you keep those records and provide them to us upon request.

(k) Delayed compliance with fuel tank permeation requirements. Before the 2010 model year, you may omit the permeation-related requirements related to plastic fuel tanks in § 1048.245(e)(1)(i) and § 1048.501(e).

Subpart C—[Amended]

■ 114. Section 1048.201 is amended by revising paragraph (a) to read as follows:

§ 1048.201 What are the general requirements for obtaining a certificate of conformity?

(a) You must send us a separate application for a certificate of conformity for each engine family. A certificate of conformity is valid starting with the indicated effective date, but it is not valid for any production after December 31 of the model year for which it is issued. No certificate will be issued after December 31 of the model year.

* * * * *

■ 115. Section 1048.205 is amended as follows:

■ a. By revising paragraph (p)(1).

■ b. By revising paragraph (q).

■ c. By revising paragraph (r) introductory text.

■ d. By revising paragraph (s).

■ e. By revising paragraph (y).

■ f. By revising paragraph (aa).

§ 1048.205 What must I include in my application?

* * * * *

(p) * * *

(1) Present exhaust emission data for HC, NO_X, and CO on an emission-data engine to show your engines meet the applicable duty-cycle emission standards we specify in § 1048.101. Show emission figures before and after applying deterioration factors for each engine. Include emission results for each mode if you do discrete-mode testing under § 1048.505. Include test data for each type of fuel from 40 CFR part 1065, subpart H, on which you intend for engines in the engine family to operate (for example, gasoline, liquefied petroleum gas, methanol, or natural gas). If we specify more than one grade of any fuel type (for example, a summer grade and winter grade of gasoline), you need to submit test data only for one grade unless the regulations of this part specify otherwise for your engine. Note that § 1048.235 allows you to submit an application in certain cases without new emission data.

* * * * *

(q) State that all the engines in the engine family comply with the field-testing emission standards we specify in § 1048.101(c) for all normal operation and use when tested as specified in § 1048.515. Describe any relevant testing, engineering analysis, or other information in sufficient detail to support your statement.

(r) For engines not subject to transient testing requirements in § 148.101(a), include information showing how your emission controls will function during normal in-use transient operation. For example, this might include the following:

* * * * *

(s) Report all test results, including those from invalid tests or from any other tests, whether or not they were conducted according to the test procedures of subpart F of this part. If you measure CO_2, report those emission levels (in g/kW-hr). We may ask you to send other information to confirm that your tests were valid under the requirements of this part and 40 CFR part 1065.

* * * * *

(y) Include good-faith estimates of U.S.-directed production volumes. Include a justification for the estimated production volumes if they are substantially different than actual production volumes in earlier years for similar models.

* * * * *

(aa) Name an agent for service located in the United States. Service on this agent constitutes service on you or any of your officers or employees for any action by EPA or otherwise by the

United States related to the requirements of this part.

■ 116. Section 1048.220 is amended by revising the introductory text and paragraph (a) to read as follows:

§ 1048.220 How do I amend the maintenance instructions in my application?

You may amend your emission-related maintenance instructions after you submit your application for certification as long as the amended instructions remain consistent with the provisions of § 1048.125. You must send the Designated Compliance Officer a written request to amend your application for certification for an engine family if you want to change the emission-related maintenance instructions in a way that could affect emissions. In your request, describe the proposed changes to the maintenance instructions. If operators follow the original maintenance instructions rather than the newly specified maintenance, this does not allow you to disqualify those engines from in-use testing or deny a warranty claim.

(a) If you are decreasing, replacing, or eliminating any specified maintenance, you may distribute the new maintenance instructions to your customers 30 days after we receive your request, unless we disapprove your request. This would generally include replacing one maintenance step with another. We may approve a shorter time or waive this requirement.

* * * * *

■ 117. Section 1048.225 is revised to read as follows:

§ 1048.225 How do I amend my application for certification to include new or modified engine configurations?

Before we issue you a certificate of conformity, you may amend your application to include new or modified engine configurations, subject to the provisions of this section. After we have issued your certificate of conformity, you may send us an amended application requesting that we include new or modified engine configurations within the scope of the certificate, subject to the provisions of this section. You must amend your application if any changes occur with respect to any information included in your application.

(a) You must amend your application before you take any of the following actions:

(1) Add an engine configuration to an engine family. In this case, the engine configuration added must be consistent with other engine configurations in the engine family with respect to the criteria listed in § 1048.230.

(2) Change an engine configuration already included in an engine family in a way that may affect emissions, or change any of the components you described in your application for certification. This includes production and design changes that may affect emissions any time during the engine's lifetime.

(b) To amend your application for certification, send the Designated Compliance Officer the following information:

(1) Describe in detail the addition or change in the engine model or configuration you intend to make.

(2) Include engineering evaluations or data showing that the amended engine family complies with all applicable requirements. You may do this by showing that the original emission-data engine is still appropriate for showing that the amended family complies with all applicable requirements.

(3) If the original emission-data engine for the engine family is not appropriate to show compliance for the new or modified engine configuration, include new test data showing that the new or modified engine configuration meets the requirements of this part.

(c) We may ask for more test data or engineering evaluations. You must give us these within 30 days after we request them.

(d) For engine families already covered by a certificate of conformity, we will determine whether the existing certificate of conformity covers your newly added or modified engine. You may ask for a hearing if we deny your request (see § 1048.820).

(e) For engine families already covered by a certificate of conformity, you may start producing the new or modified engine configuration anytime after you send us your amended application and before we make a decision under paragraph (d) of this section. However, if we determine that the affected engines do not meet applicable requirements, we will notify you to cease production of the engines and may require you to recall the engines at no expense to the owner. Choosing to produce engines under this paragraph (e) is deemed to be consent to recall all engines that we determine do not meet applicable emission standards or other requirements and to remedy the nonconformity at no expense to the owner. If you do not provide information required under paragraph (c) of this section within 30 days after we request it, you must stop producing the new or modified engines.

■ 118. Section 1048.230 is amended by revising paragraphs (a), (b)(3), and (d) and removing paragraph (b)(7) to read as follows:

§ 1048.230 How do I select engine families?

(a) For purposes of certification, divide your product line into families of engines that are expected to have similar emission characteristics throughout the useful life as described in this section. Your engine family is limited to a single model year.

(b) * * *

(3) Configuration of the fuel system (for example, fuel-injected vs. carbureted gasoline engines).

* * * * *

(d) In unusual circumstances, you may group engines that are not identical with respect to the things listed in paragraph (b) of this section in the same engine family if you show that their emission characteristics during the useful life will be similar.

* * * * *

■ 119. Section 1048.235 is amended by revising paragraphs (a), (c)(4), (d) introductory text, (d)(1), and (e) to read as follows:

§ 1048.235 What emission testing must I perform for my application for a certificate of conformity?

* * * * *

(a) Test your emission-data engines using the procedures and equipment specified in subpart F of this part.

* * * * *

(c) * * *

(4) Before we test one of your engines, we may calibrate it within normal production tolerances for anything we do not consider an adjustable parameter. For example, this would apply where we determine that an engine parameter is not an adjustable parameter (as defined in § 1048.801) but that it is subject to production variability.

(d) You may ask to use carryover emission data from a previous model year instead of doing new tests, but only if all the following are true:

(1) The engine family from the previous model year differs from the current engine family only with respect to model year or other characteristics unrelated to emissions. You may also ask to add a configuration subject to § 1048.225.

* * * * *

(e) We may require you to test another engine of the same or different configuration in addition to the engine tested under paragraph (b) of this section.

* * * * *

■ 120. Section 1048.240 is amended by revising paragraphs (a), (b), and (c) to read as follows:

§ 1048.240 How do I demonstrate that my engine family complies with exhaust emission standards?

(a) For purposes of certification, your engine family is considered in compliance with the applicable numerical emission standards in § 1048.101(a) and (b) if all emission-data engines representing that family have test results showing deteriorated emission levels at or below these standards. This includes all test points over the course of the durability demonstration.

(b) Your engine family is deemed not to comply if any emission-data engine representing that family has test results showing a deteriorated emission level for any pollutant that is above an applicable emission standard from § 1048.101. This includes all test points over the course of the durability demonstration.

(c) To compare emission levels from the emission-data engine with the applicable emission standards, apply deterioration factors to the measured emission levels for each pollutant. Specify the deterioration factors based on emission measurements using four significant figures, consistent with good engineering judgment. For example, your deterioration factors must take into account any available data from in-use testing with similar engines (see subpart E of this part). Small-volume engine manufacturers may use assigned deterioration factors that we establish. In addition, anyone may use assigned deterioration factors for engine families with a projected U.S.-directed production volume at or below 300 engines. Apply deterioration factors as follows:

(1) *Multiplicative deterioration factor.* Except as specified in paragraph (c)(2) of this section, use a multiplicative deterioration factor for exhaust emissions. A multiplicative deterioration factor is the ratio of exhaust emissions at the end of useful life to exhaust emissions at the low-hour test point. Adjust the official emission results for each tested engine at the selected test point by multiplying the measured emissions by the deterioration factor. If the factor is less than one, use one.

(2) *Additive deterioration factor.* Use an additive deterioration factor for exhaust emissions if engines do not use aftertreatment technology. Also, you may use an additive deterioration factor for exhaust emissions for a particular pollutant if all the emission-data engines in the engine family have low-hour emission levels at or below 0.3 g/kW-hr for $HC+NO_X$ or 0.5 g/kW-hr for CO, unless a multiplicative deterioration factor is more appropriate. For example, you should use a multiplicative deterioration factor if emission increases are best represented by the ratio of exhaust emissions at the end of the useful life to exhaust emissions at the low-hour test point. An additive deterioration factor is the difference between exhaust emissions at the end of useful life and exhaust emissions at the low-hour test point. Adjust the official emission results for each tested engine at the selected test point by adding the factor to the measured emissions. If the factor is less than zero, use zero.

* * * * *

■ 121. Section 1048.245 is amended by revising paragraphs (c) and (e) to read as follows:

§ 1048.245 How do I demonstrate that my engine family complies with evaporative emission standards?

* * * * *

(c) Use good engineering judgment to develop a test plan to establish deterioration factors to show how much emissions increase at the end of the useful life.

* * * * *

(e) You may demonstrate that your engine family complies with the evaporative emission standards by demonstrating that you use the following control technologies:

(1) For certification to the standards specified in § 1048.105(a)(1), with the following technologies:

(i) Use a tethered or self-closing gas cap on a fuel tank that stays sealed up to a positive pressure of 24.5 kPa (3.5 psig); however, they may contain air inlets that open when there is a vacuum pressure inside the tank. Nonmetal fuel tanks must also use one of the qualifying designs for controlling permeation emissions specified in 40 CFR 1060.240.

(ii) [Reserved]

(2) For certification to the standards specified in § 1048.105(a)(3), demonstrating that you use design features to prevent fuel boiling under all normal operation. If you install engines in equipment, you may do this using fuel temperature data measured during normal operation. Otherwise, you may do this by including appropriate information in your emission-related installation instructions.

(3) We may establish additional options for design-based certification where we find that new test data demonstrate that a technology will ensure compliance with the emission standards in this section

■ 122. Section 1048.250 is amended as follows:

■ a. By removing paragraph (d).

■ b. By redesignating paragraphs (a) through (c) as paragraphs (b) through (d), respectively.

■ c. By adding a new paragraph (a).

■ d. By revising the newly redesignated paragraph (c).

§ 1048.250 What records must I keep and make available to EPA?

(a) Send the Designated Compliance Officer information related to your U.S.-directed production volumes as described in § 1048.345. In addition, within 45 days after the end of the model year, you must send us a report describing information about engines you produced during the model year as follows:

(1) State the total production volume for each engine family that is not subject to reporting under § 1048.345.

(2) State the total production volume for any engine family for which you produce engines after completing the reports required in § 1048.345.

(3) For production volumes you report under this paragraph (a), identify whether or not the figures include California sales. Include a separate count of production volumes for California sales if those figures are available.

* * * * *

(c) Keep data from routine emission tests (such as test cell temperatures and relative humidity readings) for one year after we issue the associated certificate of conformity. Keep all other information specified in this section for eight years after we issue your certificate.

* * * * *

■ 123. Section 1048.255 is amended by revising the section heading and paragraph (d) to read as follows:

§ 1048.255 What decisions may EPA make regarding my certificate of conformity?

* * * * *

(d) We may void your certificate if you do not keep the records we require or do not give us information as required under this part or the Act.

* * * * *

Subpart D—[Amended]

■ 124. Section 1048.301 is revised to read as follows:

§ 1048.301 When must I test my production-line engines?

(a) If you produce engines that are subject to the requirements of this part, you must test them as described in this subpart, except as follows:

(1) [Reserved]

(2) We may exempt engine families with a projected U.S.-directed production volume below 150 units from routine testing under this subpart. Request this exemption in your application for certification and include your basis for projecting a production volume below 150 units. We will approve your request if we agree that you have made good-faith estimates of your production volumes. Your exemption is approved when we grant your certificate. You must promptly notify us if your actual production exceeds 150 units during the model year. If you exceed the production limit or if there is evidence of a nonconformity, we may require you to test production-line engines under this subpart, or under 40 CFR part 1068, subpart E, even if we have approved an exemption under this paragraph (a)(2).

(b) We may suspend or revoke your certificate of conformity for certain engine families if your production-line engines do not meet the requirements of this part or you do not fulfill your obligations under this subpart (see §§ 1048.325 and 1048.340).

(c) Other regulatory provisions authorize us to suspend, revoke, or void your certificate of conformity, or order recalls for engine families, without regard to whether they have passed these production-line testing requirements. The requirements of this subpart do not affect our ability to do selective enforcement audits, as described in part 1068 of this chapter. Individual engines in families that pass these production-line testing requirements must also conform to all applicable regulations of this part and part 1068 of this chapter.

(d) You may use alternate programs for testing production-line engines in the following circumstances:

(1) You may use analyzers and sampling systems that meet the field-testing requirements of 40 CFR part 1065, subpart J, but not the otherwise applicable requirements in 40 CFR part 1065 for laboratory testing, to demonstrate compliance with duty-cycle emission standards if you double the minimum sampling rate specified in § 1048.310(b). Use measured test results to determine whether engines comply with applicable standards without applying a measurement allowance. This alternate program does not require prior approval but we may disallow use of this option where we determine that use of field-grade equipment would prevent you from being able to demonstrate that your engines are being produced to conform to the specifications in your application for certification.

(2) You may ask to use another alternate program for testing production-line engines. In your request, you must show us that the alternate program gives equal assurance that your products meet the requirements of this part. We may waive some or all of this subpart's requirements if we approve your alternate approach. For example, in certain circumstances you may be able to give us equal assurance that your products meet the requirements of this part by using less rigorous measurement methods if you offset that by increasing the number of test engines.

(e) If you certify an engine family with carryover emission data, as described in § 1048.235(d), and these equivalent engine families consistently pass the production-line testing requirements over the preceding two-year period, you may ask for a reduced testing rate for further production-line testing for that family. The minimum testing rate is one engine per engine family. If we reduce your testing rate, we may limit our approval to any number of model years. In determining whether to approve your request, we may consider the number of engines that have failed the emission tests.

(f) We may ask you to make a reasonable number of production-line engines available for a reasonable time so we can test or inspect them for compliance with the requirements of this part.

■ 125. Section 1048.305 is amended by adding introductory text and revising paragraphs (a), (d), and (g) to read as follows:

§ 1048.305 How must I prepare and test my production-line engines?

This section describes how to prepare and test production-line engines. You must assemble the test engine in a way that represents the assembly procedures for other engines in the engine family. You must ask us to approve any deviations from your normal assembly procedures for other production engines in the engine family.

(a) *Test procedures.* Test your production-line engines using either the steady-state or transient testing procedures specified in subpart F of this part to show you meet the duty-cycle emission standards in subpart B of this part. The field-testing standards apply for this testing, but you need not do additional testing to show that production-line engines meet the field-testing standards.

* * * * *

(d) *Setting adjustable parameters.* Before any test, we may require you to adjust any adjustable parameter to any setting within its physically adjustable range.

(1) We may require you to adjust idle speed outside the physically adjustable range as needed, but only until the engine has stabilized emission levels (see paragraph (e) of this section). We may ask you for information needed to establish an alternate minimum idle speed.

(2) We may specify adjustments within the physically adjustable range by considering their effect on emission levels. We may also consider how likely it is that someone will make such an adjustment with in-use equipment.

* * * * *

(g) *Retesting after invalid tests.* You may retest an engine if you determine an emission test is invalid under subpart F of this part. Explain in your written report reasons for invalidating any test and the emission results from all tests. If we determine that you improperly invalidated a test, we may require you to ask for our approval for future testing before substituting results of the new tests for invalid ones.

■ 126. Section 1048.310 is amended as follows:

■ a. By revising paragraph (a).

■ b. By revising paragraph (c) introductory text.

■ c. By revising paragraph (c)(2).

■ d. By revising paragraph (f).

■ e. By revising paragraph (g).

■ f. By revising paragraph (h).

§ 1048.310 How must I select engines for production-line testing?

(a) Use test results from two engines each quarter to calculate the required sample size for the model year for each engine family.

* * * * *

(c) Calculate the required sample size for each engine family. Separately calculate this figure for $HC+NO_X$ and CO. The required sample size is the greater of these calculated values. Use the following equation:

$$N = \left[\frac{(t_{95} \cdot \sigma)}{(x - STD)} \right]^2 + 1$$

Where:

N = Required sample size for the model year.

t_{95} = 95% confidence coefficient, which depends on the number of tests completed, n, as specified in the table in paragraph (c)(1) of this section. It defines 95% confidence intervals for a one-tail distribution.

σ = Test sample standard deviation (see paragraph (c)(2) of this section).

x = Mean of emission test results of the sample.
STD = Emission standard.

* * * * *

(2) Calculate the standard deviation, σ, for the test sample using the following formula:

Where:

$$\sigma = \left[\sum \frac{(X_i - x)^2}{(n-1)} \right]^{\frac{1}{2}}$$

X_i = Emission test result for an individual engine.
n = The number of tests completed in an engine family.

* * * * *

(f) Distribute the remaining tests evenly throughout the rest of the year. You may need to adjust your schedule for selecting engines if the required sample size changes. If your scheduled quarterly testing for the remainder of the model year is sufficient to meet the calculated sample size, you may wait until the next quarter to do additional testing. Continue to randomly select engines from each engine family.

(g) Continue testing until one of the following things happens:

(1) After completing the minimum number of tests required in paragraph (b) of this section, the number of tests completed in an engine family, n, is greater than the required sample size, N, and the sample mean, x, is less than or equal to the emission standard. For example, if N = 5.1 after the fifth test, the sample-size calculation does not allow you to stop testing.

(2) The engine family does not comply according to § 1048.315.

(3) You test 30 engines from the engine family.

(4) You test one percent of your projected annual U.S.-directed production volume for the engine family, rounded to the nearest whole number. Do not count an engine under this paragraph (g)(4) if it fails to meet an applicable emission standard. You may stop testing after you test one percent of your production volume even if you have not tested the number of engines specified in paragraph (b) of this section. For example, if projected volume is 475 engines, test two engines in each of the first two quarters and one engine in the third quarter to fulfill your testing requirements under this section for that engine family.

(5) You choose to declare that the engine family does not comply with the requirements of this subpart.

(h) If the sample-size calculation allows you to stop testing for one pollutant but not another, you must continue measuring emission levels of all pollutants for any additional tests required under this section. However, you need not continue making the calculations specified in this subpart for the pollutant for which testing is not required. This paragraph (h) does not affect the number of tests required under this section, the required calculations in § 1048.315, or the remedial steps required under § 1048.320.

* * * * *

■ 127. Section 1048.315 is amended by revising paragraphs (a) and (b) to read as follows:

§ 1048.315 How do I know when my engine family fails the production-line testing requirements?

* * * * *

(a) Calculate your test results as follows:

(1) *Initial and final test results.* Calculate and round the test results for each engine. If you do several tests on an engine, calculate the initial results for each test, then add all the test results together and divide by the number of tests. Round this final calculated value for the final test results on that engine.

(2) *Final deteriorated test results.* Apply the deterioration factor for the engine family to the final test results (see § 1048.240(c)).

(3) *Round deteriorated test results.* Round the results to the number of decimal places in the emission standard expressed to one more decimal place.

(b) Construct the following CumSum Equation for each engine family for $HC+NO_X$ and CO emissions:

$C_i = \text{Max}\,[0 \text{ or } C_{i-1} + X_i - (\text{STD} + 0.25 \times \sigma)]$

Where:

C_i = The current CumSum statistic.
C_i-1 = The previous CumSum statistic. For the first test, the CumSum statistic is 0 (*i.e.*, $C_1 = 0$).
X_i = The current emission test result for an individual engine.
STD = Emission standard.

* * * * *

■ 128. Section 1048.320 is amended by revising paragraph (b) to read as follows:

§ 1048.320 What happens if one of my production-line engines fails to meet emission standards?

* * * * *

(b) Include the test results and describe the remedy for each engine in the written report required under § 1048.345.

■ 129. Section 1048.325 is amended by revising the section heading and paragraph (c) to read as follows:

§ 1048.325 What happens if an engine family fails the production-line testing requirements?

* * * * *

(c) Up to 15 days after we suspend the certificate for an engine family, you may ask for a hearing (see § 1048.820). If we agree before a hearing occurs that we used erroneous information in deciding to suspend the certificate, we will reinstate the certificate.

* * * * *

■ 130. Section 1048.345 is amended as follows:

■ a. By removing the introductory text.

■ b. By revising paragraphs (a)(4), (a)(5), (a)(6), and (a)(8).

■ c. By revising paragraphs (b) and (c).

§ 1048.345 What production-line testing records must I send to EPA?

(a) * * *

(4) Describe each test engine, including the engine family's identification and the engine's model year, build date, model number, identification number, and number of hours of operation before testing.

(5) Identify how you accumulated hours of operation on the engines and describe the procedure and schedule you used.

(6) Provide the test number; the date, time and duration of testing; test procedure; all initial test results; final test results; and final deteriorated test results for all tests. Provide the emission results for all measured pollutants. Include information for both valid and invalid tests and the reason for any invalidation.

* * * * *

(8) Provide the CumSum analysis required in § 1048.315 and the sample-size calculation required in § 1048.310 for each engine family.

* * * * *

(b) We may ask you to add information to your written report, so we can determine whether your new engines conform with the requirements of this subpart. We may also ask you to send less information.

(c) An authorized representative of your company must sign the following statement:

We submit this report under Sections 208 and 213 of the Clean Air Act. Our production-line testing conformed completely with the requirements of 40 CFR part 1048. We have not changed production processes or quality-control procedures for test engines in a way that might affect emission controls. All the information in this report is true and accurate, to the best of my knowledge. I know of the penalties for violating the

Clean Air Act and the regulations. (Authorized Company Representative)

* * * * *

■ 131. Section 1048.350 is amended by revising paragraphs (b), (e), and (f) to read as follows:

§ 1048.350 What records must I keep?

* * * * *

(b) Keep paper or electronic records of your production-line testing for eight years after you complete all the testing required for an engine family in a model year.

* * * * *

(e) If we ask, you must give us projected or actual production figures for an engine family. We may ask you to divide your production figures by maximum engine power, displacement, fuel type, or assembly plant (if you produce engines at more than one plant).

(f) Keep records of the engine identification number for each engine you produce under each certificate of conformity. You may identify these numbers as a range. Give us these records within 30 days if we ask for them.

* * * * *

Subpart E—[Amended]

■ 132. Section 1048.405 is amended by adding paragraph (d) to read as follows:

§ 1048.405 How does this program work?

* * * * *

(d) In appropriate extreme and unusual circumstances that are clearly outside your control and could not have been avoided by the exercise of prudence, diligence, and due care, we may waive the in-use testing requirement for an engine family. For example, if your test fleet is destroyed by severe weather during service accumulation and we agree that completion of testing is not possible, we would generally waive testing requirements for that engine family.

■ 133. Section 1048.410 is amended by revising paragraph (e) to read as follows:

§ 1048.410 How must I select, prepare, and test my in-use engines?

* * * * *

(e) You may do repeat measurements with a test engine; however, you must conduct the same number of tests on each engine.

* * * * *

■ 134. Section 1048.415 is amended by revising paragraphs (c) and (d) to read as follows:

§ 1048.415 What happens if in-use engines do not meet requirements?

* * * * *

(c) We will consider failure rates, average emission levels, and any defects—among other things—to decide on taking remedial action under this subpart (see 40 CFR 1068.505). We may consider the results from any voluntary additional testing you perform. We may also consider information related to testing from other engine families showing that you designed them to exceed the minimum requirements for controlling emissions. We may order a recall before or after you complete testing of an engine family if we determine a substantial number of engines do not conform to section 213 of the Act or to this part. The scope of the recall may include other engine families in the same or different model years if the cause of the problem identified in paragraph (a) of this section applies more broadly than the tested engine family, as allowed by the Act.

(d) If in-use testing reveals a design or manufacturing defect that prevents engines from meeting the requirements of this part, you must correct the defect as soon as possible for any future production for engines in every family affected by the defect. See 40 CFR 1068.501 for additional requirements related to defect reporting.

* * * * *

Subpart F—[Amended]

■ 135. Section 1048.501 is amended by revising paragraphs (c) and (e) and removing paragraph (h) to read as follows:

§ 1048.501 How do I run a valid emission test?

* * * * *

(c) Use the fuels and lubricants specified in 40 CFR part 1065, subpart H, to perform valid tests for all the testing we require in this part, except as noted in § 1048.515. For service accumulation, use the test fuel or any commercially available fuel that is representative of the fuel that in-use engines will use.

* * * * *

(e) To test engines for evaporative emissions, use the equipment and procedures specified for testing diurnal emissions as described in 40 CFR 1060.525, subject to the following provisions:

(1) Precondition nonmetal fuel tanks as specified in 40 CFR 1060.520(a) and (b).

(2) For engines equipped with carbon canisters that store fuel vapors that will be purged for combustion in the engine, precondition the canister as specified in 40 CFR 86.132–96(h) and then operate the engine for 60 minutes over repeat runs of the duty cycle specified in Appendix I of this part.

(3) Start the diurnal emission test after the engine is stabilized at room temperatures, but within 36 hours after the engine operation specified in paragraph (e)(2) of this section.

(4) You may not separately measure permeation emissions from nonmetal fuel tanks for subtracting from the diurnal emission measurement.

(5) Note that you may omit testing for evaporative emissions during certification if you certify by design, as specified in § 1048.245.

* * * * *

■ 136. Section 1048.505 is revised to read as follows:

§ 1048.505 What transient duty cycles apply for laboratory testing?

This section describes how to test engines under steady-state conditions. In some cases, we allow you to choose the appropriate steady-state duty cycle for an engine. In these cases, you must use the duty cycle you select in your application for certification for all testing you perform for that engine family. If we test your engines to confirm that they meet emission standards, we will use the duty cycles you select for your own testing. We may also perform other testing as allowed by the Clean Air Act.

(a) You may perform steady-state testing with either discrete-mode or ramped-modal cycles, as follows:

(1) For discrete-mode testing, sample emissions separately for each mode, then calculate an average emission level for the whole cycle using the weighting factors specified for each mode. Calculate cycle statistics and compare with the established criteria as specified in 40 CFR 1065.514 to confirm that the test is valid. Operate the engine and sampling system as follows:

(i) *Engines with lean NO_X aftertreatment.* For lean-burn engines that depend on aftertreatment to meet the NO_X emission standard, operate the engine for 5–6 minutes, then sample emissions for 1–3 minutes in each mode.

(ii) *Engines without lean NO_X aftertreatment.* For other engines, operate the engine for at least 5 minutes, then sample emissions for at least 1 minute in each mode.

(2) For ramped-modal testing, start sampling at the beginning of the first mode and continue sampling until the end of the last mode. Calculate emissions and cycle statistics the same

as for transient testing as specified in 40 CFR part 1065, subpart G.

(b) Measure emissions by testing the engine on a dynamometer with one or more of the following sets of duty cycles to determine whether it meets the steady-state emission standards in § 1048.101(b):

(1) For engines from an engine family that will be used only in variable-speed applications, use one of the following duty cycles:

(i) The following duty cycle applies for discrete-mode testing:

TABLE 1 OF § 1048.505

C2 mode No.	Engine speed [1]	Torque (percent) [2]	Weighting factors
1	Maximum test speed	25	0.06
2	Intermediate test	100	0.02
3	Intermediate test	75	0.05
4	Intermediate test	50	0.32
5	Intermediate test	25	0.30
6	Intermediate test	10	0.10
7	Warm idle	0	0.15

[1] Speed terms are defined in 40 CFR part 1065.
[2] The percent torque is relative to the maximum torque at the given engine speed.

(ii) The following duty cycle applies for ramped-modal testing:

TABLE 2 OF § 1048.505

RMC mode	Time in mode (seconds)	Engine speed [1,2]	Torque (percent) [2,3]
1a Steady-state	119	Warm idle	0
1b Transition	20	Linear transition	Linear transition.
2a Steady-state	29	Intermediate speed	100
2b Transition	20	Intermediate speed	Linear transition.
3a Steady-state	150	Intermediate speed	10
3b Transition	20	Intermediate speed	Linear transition.
4a Steady-state	80	Intermediate speed	75
4b Transition	20	Intermediate speed	Linear transition.
5a Steady-state	513	Intermediate speed	25
5b Transition	20	Intermediate speed	Linear transition.
6a Steady-state	549	Intermediate speed	50
6b Transition	20	Linear transition	Linear transition.
7a Steady-state	96	Maximum test speed	25
7b Transition	20	Linear transition	Linear transition.
8 Steady-state	124	Warm idle	0

[1] Speed terms are defined in 40 CFR part 1065.
[2] Advance from one mode to the next within a 20-second transition phase. During the transition phase, command a linear progression from the torque setting of the current mode to the torque setting of the next mode.
[3] The percent torque is relative to maximum torque at the commanded engine speed.

(2) For engines from an engine family that will be used only at a single, rated speed, use the 5-mode duty cycle or the corresponding ramped-modal cycle described in 40 CFR part 1039, Appendix II, paragraph (a).

(3) Use a duty cycle from both paragraphs (b)(1) and (b)(2) of this section if you will not restrict an engine family to constant-speed or variable-speed applications.

(4) Use a duty cycle specified in paragraph (b)(2) of this section for all severe-duty engines.

(5) For high-load engines, use one of the following duty cycles:

(i) The following duty cycle applies for discrete-mode testing:

TABLE 3 OF § 1048.505

D1 mode No.	Engine speed	Torque (percent) [1]	Minimum time in mode (minutes)	Weighting factors
1	Maximum test	100	3.0	0.50
2	Maximum test	75	3.0	0.50

[1] The percent torque is relative to the maximum torque at maximum test speed.

(ii) The following duty cycle applies for discrete-mode testing:

TABLE 4 OF § 1048.505

RMC modes	Time in mode (seconds)	Engine speed (percent)	Torque (percent) [1, 2]
1a Steady-state	290	Engine governed	100
1b Transition	20	Engine governed	Linear transition.
2 Steady-state	290	Engine governed	75

[1] The percent torque is relative to maximum test torque.

[2] Advance from one mode to the next within a 20-second transition phase. During the transition phase, command a linear progression from the torque setting of the current mode to the torque setting of the next mode.

(c) If we test an engine to confirm that it meets the duty-cycle emission standards, we will use the steady-state duty cycles that apply for that engine family.

(d) During idle mode, operate the engine at its warm idle speed as described in 40 CFR 1065.510.

(e) For full-load operating modes, operate the engine at wide-open throttle.

(f) See 40 CFR part 1065 for detailed specifications of tolerances and calculations.

(g) For those cases where steady-state testing does not directly follow a transient test, perform the steady-state test according to this section after an appropriate warm-up period, consistent with 40 CFR part 1065, subpart F.

■ 137. Section 1048.510 is amended to read as follows:

■ a. By revising the section heading.

■ b. By revising paragraph (a).

■ c. By removing and reserving paragraph (b).

■ d. By revising paragraph (c) introductory text and (c)(1).

§ 1048.510 What transient duty cycles apply for laboratory testing?

(a) Starting with the 2007 model year, measure emissions by testing the engine on a dynamometer with the duty cycle described in Appendix II to determine whether it meets the transient emission standards in § 1048.101(a).

(b) [Reserved]

(c) Warm up the test engine as follows before running a transient test:

(1) Operate the engine for the first 180 seconds of the appropriate duty cycle, then allow it to idle without load for 30 seconds. At the end of the 30-second idling period, start measuring emissions as the engine operates over the prescribed duty cycle. For severe-duty engines, this engine warm-up procedure may include up to 15 minutes of operation over the appropriate duty cycle.

* * * * *

■ 138. Section 1048.515 is amended by revising paragraph (b)(1)(i) to read as follows:

§ 1048.515 What are the field-testing procedures?

* * * * *

(b) * * *

(1) * * *

(i) Average power must be at least 5 percent of maximum brake power.

* * * * *

Subpart G—[Amended]

■ 139. Section 1048.601 is revised to read as follows:

§ 1048.601 What compliance provisions apply to these engines?

(a) Engine and equipment manufacturers, as well as owners, operators, and rebuilders of engines subject to the requirements of this part, and all other persons, must observe the provisions of this part, the requirements and prohibitions in 40 CFR part 1068, and the provisions of the Act.

(b) This paragraph (b) describes how the replacement-engine provisions of 40 CFR 1068.240 apply for engines subject to the requirements of this part in conjunction with the secondary engine manufacturer provisions in 40 CFR 1068.262. For cases in which the secondary engine manufacturer completes assembly of the engine, these provisions apply as written. If the secondary engine manufacturer arranges for a third party to complete engine assembly, the following additional provisions apply:

(1) The ultimate purchaser must purchase (or otherwise order) the replacement engine from the secondary engine manufacturer. The secondary engine manufacturer must provide assembly instructions to the engine assembler (unless the engine being replaced was not subject to emission standards). The secondary engine manufacturer may arrange for the original engine manufacturer to ship the engine directly to the engine assembler. However, if the secondary engine manufacturer does not take possession of the engine, it must supply the engine label specified in 40 CFR 1068.240 to the engine assembler and the engine assembler must apply the label before shipping the engine.

(2) The secondary engine manufacturer and engine assembler are both responsible if the engine is installed in new equipment or otherwise violates the circumvention provisions of 40 CFR 1068.240.

(3) Consider the following example. A secondary engine manufacturer receiving a valid request for a replacement engine for which it does not already have an engine available in inventory may order a partially complete engine from an original engine manufacturer and have it shipped directly to an independent engine assembler. In this case, the secondary engine manufacturer must state in its order that the partially complete engine should be labeled as being exempt under 40 CFR 1068.240 and identify the engine assembler's address; the secondary engine manufacture must also provide instructions to the engine assembler. The original engine manufacturer would label the engine as described in 40 CFR 1068.262, identifying the replacement-engine exemption as the basis for shipping an uncertified engine, and ship the engine directly to the assembler. The engine assembler would complete the assembly by applying the label and otherwise following the instructions provided by the secondary engine manufacturer.

■ 140. Section 1048.605 is amended by revising the section heading and paragraph (d)(7)(ii) to read as follows:

§ 1048.605 What provisions apply to engines certified under the motor vehicle program?

* * * * *

(d) * * *

(7) * * *

(ii) List the engine or equipment models you expect to produce under this exemption in the coming year and describe your basis for meeting the sales restrictions of paragraph (d)(3) of this section.

* * * * *

■ 141. Section 1048.610 is amended by revising the section heading and paragraphs (d)(7)(ii) and (g) to read as follows:

§ 1048.610 What provisions apply to vehicles certified under the motor vehicle program?

* * * * *

(d) * * *

(7) * * *

(ii) List the equipment models you expect to produce under this exemption in the coming year and describe your basis for meeting the sales restrictions of paragraph (d)(3) of this section.

* * * * *

(g) *Participation in averaging, banking and trading.* Vehicles adapted for nonroad use under this section may generate credits under the ABT provisions in 40 CFR part 86. These vehicles must be included in the calculation of the applicable fleet average in 40 CFR part 86.

■ 142. A new § 1048.612 is added to subpart G to read as follows:

§ 1048.612 What is the exemption for delegated final assembly?

The provisions of 40 CFR 1068.261 related to delegated final assembly apply for engines certified under this part 1048, with the following exceptions and clarifications:

(a) The provisions related to reduced auditing rates in 40 CFR 1068.261(d)(3)(iii) apply starting with the 2014 model year.

(b) [Reserved]

■ 143. Section 1048.615 is revised to read as follows:

§ 1048.615 What are the provisions for exempting engines designed for lawn and garden applications?

This section is intended for engines designed for lawn and garden applications, but it applies to any engines meeting the criteria in paragraph (a) of this section.

(a) If an engine meets all the following criteria, it is exempt from the requirements of this part:

(1) The engine must have a nominal displacement of 1000 cc or less.

(2) The engine must have a maximum engine power at or below 30 kW.

(3) The engine must be in an engine family that has a valid certificate of conformity showing that it meets emission standards for Class II engines under 40 CFR part 90 or 1054 for the appropriate model year.

(b) The only requirements or prohibitions from this part that apply to an engine that meets the criteria in paragraph (a) of this section are in this section.

(c) If your engines do not meet the criteria listed in paragraph (a) of this section, they will be subject to the provisions of this part. Introducing these engines into commerce without a valid exemption or certificate of conformity violates the prohibitions in 40 CFR 1068.101.

(d) Engines exempted under this section are subject to all the requirements affecting engines under 40 CFR part 90 or 1054. The requirements and restrictions of 40 CFR part 90 or 1054 apply to anyone manufacturing these engines, anyone manufacturing equipment that uses these engines, and all other persons in the same manner as if these engines had a total maximum engine power at or below 19 kW.

■ 144. Section 1048.620 is amended by revising the section heading to read as follows:

§ 1048.620 What are the provisions for exempting large engines fueled by natural gas or liquefied petroleum gas?

* * * * *

■ 145. Section 1048.630 is revised to read as follows:

§ 1048.630 What are the provisions for exempting engines used solely for competition?

We may grant you an exemption from the standards and requirements of this part for a new engine on the grounds that it is to be used solely for competition under the provisions of 40 CFR 1054.620. The requirements of this part do not apply to engines that we exempt for use solely for competition.

■ 146. Section 1048.635 is amended by revising paragraph (b) to read as follows:

§ 1048.635 What special provisions apply to branded engines?

* * * * *

(b) In your application for certification, identify the company whose trademark you will use.

* * * * *

■ 147. A new § 1048.640 is added to subpart G to read as follows:

§ 1048.640 What special provisions apply for small-volume engine manufacturers?

This section describes how we apply the special provisions in this part for small-volume engine manufacturers.

(a) Special provisions apply for small-volume engine manufacturers, as illustrated by the following examples:

(1) Waived requirements related to torque broadcasting. See § 1048.115.

(2) Assigned deterioration factors to reduce testing burden. See § 1048.240.

(3) Additional special provisions apply for small-volume engine and equipment manufacturers under 40 CFR part 1068. For example, see 40 CFR 1068.250.

(b) If you use any of the provisions of this part that apply specifically to small-volume engine manufacturers and we find that you do not qualify to use these provisions, we may consider you to be in violation of the requirements that apply for companies that are not small-volume engine manufacturers. If you no longer qualify as a small-volume engine manufacturer (based on increased production volumes or other factors), we will work with you to determine a reasonable schedule for complying with additional requirements that apply. For example, if you no longer qualify as a small-volume engine manufacturer shortly before you certify your engines for the next model year, we might allow you to use assigned deterioration factors for one more model year.

Subpart I—[Amended]

■ 148. Section 1048.801 is amended as follows:

■ a. By revising the definitions for ''Aftertreatment'', ''Constant-speed operation'', ''Designated Compliance Officer'', ''Emission-control system'', ''Engine configuration'', ''Low-hour'' ''Maximum engine power'', ''Model year'', ''New nonroad engine'', ''Noncommercial fuel'', ''Nonmethane hydrocarbon'', ''Official emission result'', ''Owners manual'', ''Oxides of nitrogen'',''Small-volume engine manufacturer'', ''Steady-state'', ''Total hydrocarbon'', ''Total hydrocarbon equivalent'', and ''Useful life''.

■ b. By adding definitions for ''Alcohol-fueled engine'', ''Days'', ''Engine'', and ''Sealed'' in alphabetical order.

§ 1048.801 What definitions apply to this part?

* * * * *

Aftertreatment means relating to a catalytic converter, particulate filter, or any other system, component, or technology mounted downstream of the exhaust valve (or exhaust port) whose design function is to decrease emissions in the engine exhaust before it is exhausted to the environment. Exhaust-gas recirculation (EGR), turbochargers, and oxygen sensors are not aftertreatment.

* * * * *

Alcohol-fueled engine means an engine that is designed to run using an alcohol fuel. For purposes of this definition, alcohol fuels do not include fuels with a nominal alcohol content below 25 percent by volume.

* * * * *

Constant-speed operation has the meaning given in 40 CFR 1065.1001.

* * * * *

Days means calendar days unless otherwise specified. For example, where we specify working days, we mean calendar days excluding weekends and U.S. national holidays.

Designated Compliance Officer means the Manager, Heavy-Duty and Nonroad Engine Group (6405–J), U.S. Environmental Protection Agency, 1200 Pennsylvania Ave., NW., Washington, DC 20460.

* * * * *

Emission-control system means any device, system, or element of design that controls or reduces the emissions of regulated pollutants from an engine.

* * * * *

Engine has the meaning given in 40 CFR 1068.30. This includes complete and partially complete engines.

Engine configuration means a unique combination of engine hardware and calibration within an engine family. Engines within a single engine configuration differ only with respect to normal production variability or factors unrelated to emissions.

* * * * *

Low-hour means relating to an engine with stabilized emissions and represents the undeteriorated emission level. This would generally involve less than 125 hours of operation.

* * * * *

Maximum engine power has one of the following meanings:

(1) For engines at or below 100 kW, maximum engine power has the meaning given in 40 CFR 90.3 for 2010 and earlier model years and in 40 CFR 1054.140 for 2011 and later model years.

(2) For engines above 100 kW, maximum engine power has the meaning given in 40 CFR 1039.140.

* * * * *

Model year means one of the following things:

(1) For freshly manufactured equipment and engines (see definition of ''new nonroad engine,'' paragraph (1)), model year means one of the following:

(i) Calendar year.

(ii) Your annual new model production period if it is different than the calendar year.

This must include January 1 of the calendar year for which the model year is named. It may not begin before January 2 of the previous calendar year and it must end by December 31 of the named calendar year.

(2) For an engine that is converted to a nonroad engine after being placed into service as a stationary engine, or being certified and placed into service as a motor vehicle engine, model year means the calendar year in which the engine was originally produced. For a motor vehicle engine that is converted to be a nonroad engine without having been certified, model year means the calendar year in which the engine becomes a new nonroad engine. (See definition of ''new nonroad engine,'' paragraph (2)).

(3) For a nonroad engine excluded under § 1048.5 that is later converted to operate in an application that is not excluded, model year means the calendar year in which the engine was originally produced (see definition of ''new nonroad engine,'' paragraph (3)).

(4) For engines that are not freshly manufactured but are installed in new nonroad equipment, model year means the calendar year in which the engine is installed in the new nonroad equipment (see definition of ''new nonroad engine,'' paragraph (4)).

(5) For imported engines:

(i) For imported engines described in paragraph (5)(i) of the definition of ''new nonroad engine,'' *model year* has the meaning given in paragraphs (1) through (4) of this definition.

(ii) For imported engines described in paragraph (5)(ii) of the definition of ''new nonroad engine,'' *model year* means the calendar year in which the engine is modified.

(iii) For imported engines described in paragraph (5)(iii) of the definition of ''new nonroad engine,'' *model year* means the calendar year in which the engine is assembled in its imported configuration, unless specified otherwise in this part or in 40 CFR part 1068.

* * * * *

New nonroad engine means any of the following things:

(1) A freshly manufactured nonroad engine for which the ultimate purchaser has never received the equitable or legal title. This kind of engine might commonly be thought of as ''brand new.'' In the case of this paragraph (1), the engine is new from the time it is produced until the ultimate purchaser receives the title or the product is placed into service, whichever comes first.

(2) An engine originally manufactured as a motor vehicle engine or a stationary engine that is later used or intended to be used in a piece of nonroad equipment. In this case, the engine is no longer a motor vehicle or stationary engine and becomes a ''new nonroad engine.'' The engine is no longer new when it is placed into nonroad service. This paragraph (2) applies if a motor vehicle engine or a stationary engine is installed in nonroad equipment, or if a motor vehicle or a piece of stationary equipment is modified (or moved) to become nonroad equipment.

(3) A nonroad engine that has been previously placed into service in an application we exclude under § 1048.5, when that engine is installed in a piece of equipment that is covered by this part 1048. The engine is no longer new when it is placed into nonroad service covered by this part 1048. For example, this would apply to a marine-propulsion engine that is no longer used in a marine vessel but is instead installed in a piece of nonroad equipment subject to the provisions of this part.

(4) An engine not covered by paragraphs (1) through (3) of this definition that is intended to be installed in new nonroad equipment. This generally includes installation of used engines in new equipment. The engine is no longer new when the ultimate purchaser receives a title for the equipment or the product is placed into service, whichever comes first.

(5) An imported nonroad engine, subject to the following provisions:

(i) An imported nonroad engine covered by a certificate of conformity issued under this part that meets the criteria of one or more of paragraphs (1) through (4) of this definition, where the original engine manufacturer holds the certificate, is new as defined by those applicable paragraphs.

(ii) An imported engine covered by a certificate of conformity issued under this part, where someone other than the original engine manufacturer holds the certificate (such as when the engine is modified after its initial assembly), is a new nonroad engine when it is imported. It is no longer new when the ultimate purchaser receives a title for the engine or it is placed into service, whichever comes first.

(iii) An imported nonroad engine that is not covered by a certificate of conformity issued under this part at the time of importation is new. This addresses uncertified engines and equipment initially placed into service that someone seeks to import into the United States. Importation of this kind of engine (or equipment containing such an engine) is generally prohibited by 40 CFR part 1068. However, the importation of such an engine is not prohibited if the engine has a model year before 2004, since it is not subject to standards.

* * * * *

Noncommercial fuel means a combustible product that is not marketed as a commercial fuel, but is used as a fuel for nonroad engines. For example, this includes methane that is produced and released from landfills or oil wells, or similar unprocessed fuels that are not intended to meet any otherwise applicable fuel specifications. See § 1048.625 for provisions related to engines designed to burn noncommercial fuels.

* * * * *

Nonmethane hydrocarbon has the meaning given in 40 CFR 1065.1001.

* * * * *

Official emission result means the measured emission rate for an emission-data engine on a given duty cycle before the application of any deterioration factor.

Owners manual means a document or collection of documents prepared by the engine manufacturer for the owner or operator to describe appropriate engine maintenance, applicable warranties, and any other information related to operating or keeping the engine. The owners manual is typically provided to the ultimate purchaser at the time of sale. The owners manual may be in paper or electronic format.

Oxides of nitrogen has the meaning given in 40 CFR 1065.1001.

* * * * *

Sealed has the meaning given in 40 CFR 1060.801.

* * * * *

Small-volume engine manufacturer means a company meeting either of the following characteristics:

(1) An engine manufacturer with U.S.-directed production volumes of engines subject to the requirements of this part totaling no more than 2,000 units in any year. This includes engines produced by parent or subsidiary companies.

(2) An engine manufacturer with fewer than 200 employees. This includes any employees working for parent or subsidiary companies.

* * * * *

Steady-state has the meaning given in 40 CFR 1065.1001.

* * * * *

Total hydrocarbon has the meaning given in 40 CFR 1065.1001. This generally means the combined mass of organic compounds measured by the specified procedure for measuring total hydrocarbon, expressed as a hydrocarbon with a hydrogen-to-carbon mass ratio of 1.85:1.

Total hydrocarbon equivalent has the meaning given in 40 CFR 1065.1001.

* * * * *

Useful life means the period during which the engine is designed to properly function in terms of reliability and fuel consumption, without being remanufactured, specified as a number of hours of operation or calendar years, whichever comes first. It is the period during which a nonroad engine is required to comply with all applicable emission standards. See § 1048.101(g). If an engine has no hour meter, the specified number of hours does not limit the period during which an in-use engine is required to comply with emission standards unless the degree of service accumulation can be verified separately.

* * * * *

■ 149. Section 1048.810 is revised to read as follows:

§ 1048.810 What materials does this part reference?

Documents listed in this section have been incorporated by reference into this part. The Director of the Federal Register approved the incorporation by reference as prescribed in 5 U.S.C. 552(a) and 1 CFR part 51. Anyone may inspect copies at the U.S. EPA, Air and Radiation Docket and Information Center, 1301 Constitution Ave., NW., Room B102, EPA West Building, Washington, DC 20460 or at the National Archives and Records Administration (NARA). For information on the availability of this material at NARA, call 202–741–6030, or go to: *http://www.archives.gov/federal_register/code_of_federal_regulations/ibr_locations.html.*

(a) *SAE material.* Table 1 of this section lists material from the Society of Automotive Engineers that we have incorporated by reference. The first column lists the number and name of the material. The second column lists the sections of this part where we reference it. Anyone may purchase copies of these materials from the Society of Automotive Engineers, 400 Commonwealth Drive, Warrendale, PA 15096 or *http://www.sae.org*. Table 1 follows:

TABLE 1 OF § 1048.810—SAE MATERIALS

Document number and name	Part 1048 reference
SAE J2260, Nonmetallic Fuel System Tubing with One or More Layers, November 2004	1048.105

(b) *ISO material.* Table 2 of this section lists material from the International Organization for Standardization that we have incorporated by reference. The first column lists the number and name of the material. The second column lists the section of this part where we reference it. Anyone may purchase copies of these materials from the International Organization for Standardization, Case Postale 56, CH–1211 Geneva 20, Switzerland or *http://www.iso.org*. Table 2 follows:

TABLE 2 OF § 1048.810—ISO MATERIALS

Document number and name	Part 1048 reference
ISO 9141–2 Road vehicles—Diagnostic systems—Part 2: CARB requirements for interchange of digital information, February 1994	1048.110
ISO 14230–4 Road vehicles—Diagnostic systems—Keyword Protocol 2000—Part 4: Requirements for emission-related systems, June 2000	1048.110

■ 150. A new § 1048.825 is added to read as follows:

§ 1048.825 What reporting and recordkeeping requirements apply under this part?

Under the Paperwork Reduction Act (44 U.S.C. 3501 *et seq.*), the Office of Management and Budget approves the reporting and recordkeeping specified in the applicable regulations. The following items illustrate the kind of reporting and recordkeeping we require for engines and equipment regulated under this part:

(a) We specify the following requirements related to engine certification in this part 1048:

(1) In § 1048.20 we require manufacturers of stationary engines to label their engines in certain cases.

(2) In § 1048.135 we require engine manufacturers to keep certain records related to duplicate labels sent to equipment manufacturers.

(3) In § 1048.145 we include various reporting and recordkeeping requirements related to interim provisions.

(4) In subpart C of this part we identify a wide range of information required to certify engines.

(5) In §§ 1048.345 and 1048.350 we specify certain records related to production-line testing.

(6) In §§ 1048.420 and 1048.425 we specify certain records related to in-use testing.

(7) In subpart G of this part we identify several reporting and recordkeeping items for making demonstrations and getting approval related to various special compliance provisions.

(b) [Reserved]

(c) We specify the following requirements related to testing in 40 CFR part 1065:

(1) In 40 CFR 1065.2 we give an overview of principles for reporting information.

(2) In 40 CFR 1065.10 and 1065.12 we specify information needs for establishing various changes to published test procedures.

(3) In 40 CFR 1065.25 we establish basic guidelines for storing test information.

(4) In 40 CFR 1065.695 we identify data that may be appropriate for collecting during testing of in-use engines using portable analyzers.

(d) We specify the following requirements related to the general compliance provisions in 40 CFR part 1068:

(1) In 40 CFR 1068.5 we establish a process for evaluating good engineering judgment related to testing and certification.

(2) In 40 CFR 1068.25 we describe general provisions related to sending and keeping information.

(3) In 40 CFR 1068.27 we require manufacturers to make engines available for our testing or inspection if we make such a request.

(4) In 40 CFR 1068.105 we require equipment manufacturers to keep certain records related to duplicate labels from engine manufacturers.

(5) In 40 CFR 1068.120 we specify recordkeeping related to rebuilding engines.

(6) In 40 CFR part 1068, subpart C, we identify several reporting and recordkeeping items for making demonstrations and getting approval related to various exemptions.

(7) In 40 CFR part 1068, subpart D, we identify several reporting and recordkeeping items for making demonstrations and getting approval related to importing engines.

(8) In 40 CFR 1068.450 and 1068.455 we specify certain records related to testing production-line engines in a selective enforcement audit.

(9) In 40 CFR 1068.501 we specify certain records related to investigating and reporting emission-related defects.

(10) In 40 CFR 1068.525 and 1068.530 we specify certain records related to recalling nonconforming engines.

Appendix I—[Reserved]

■ 151. Appendix I to part 1048 is removed and reserved.

PART 1051—CONTROL OF EMISSIONS FROM RECREATIONAL ENGINES AND VEHICLES

■ 152. The authority citation for part 1051 continues to read as follows:

Authority: 42 U.S.C. 7401–7671q.

Subpart A—[Amended]

■ 153. Section 1051.1 is amended by revising paragraph (a)(4) to read as follows:

§ 1051.1 Does this part apply for my vehicles or engines?

(a) * * *

(4) Offroad utility vehicles with engines with displacement less than or equal to 1000 cc, maximum engine power less than or equal to 30 kW, and maximum vehicle speed higher than 25 miles per hour. Offroad utility vehicles that are subject to this part are subject to the same requirements as ATVs. This means that any requirement that applies to ATVs also applies to these offroad utility vehicles, without regard to whether the regulatory language mentions offroad utility vehicles.

* * * * *

■ 154. A new § 1051.2 is added to read as follows:

§ 1051.2 Who is responsible for compliance?

The regulations in this part 1051 contain provisions that affect both vehicle manufacturers and others. However, the requirements of this part are generally addressed to the vehicle manufacturer. The term ''you'' generally means the vehicle manufacturer, as defined in § 1051.801, especially for issues related to certification (including production-line testing, reporting, etc.).

■ 155. Section 1051.5 is amended by revising paragraph (a) to read as follows:

§ 1051.5 Which engines are excluded from this part's requirements?

(a)(1) You may exclude vehicles with compression-ignition engines. See 40 CFR parts 89 and 1039 for regulations that cover these engines.

(2) Vehicles with a combined total vehicle dry weight under 20.0 kilograms are excluded from this part. Spark-ignition engines in these vehicles must instead meet emission standards specified in 40 CFR parts 90 and 1054. See 40 CFR 90.103(a) and the definition of *handheld* in 40 CFR 1054.801.

* * * * *

■ 156. Section 1051.10 is amended by revising the introductory text to read as follows:

§ 1051.10 How is this part organized?

This part 1051 is divided into the following subparts:

* * * * *

■ 157. Section 1051.15 is amended by redesignating paragraphs (b) and (c) as paragraphs (c) and (d) and adding a new paragraph (b) to read as follows:

§ 1051.15 Do any other regulation parts apply to me?

* * * * *

(b) Part 1060 of this chapter describes standards and procedures that optionally apply for controlling evaporative emissions from engines fueled by gasoline or other volatile liquid fuels and the associated fuel systems.

* * * * *

■ 158. Section 1051.25 is amended by revising paragraphs (a) and (c) to read as follows:

§ 1051.25 What requirements apply when installing certified engines in recreational vehicles?

(a) If you manufacture recreational vehicles with engines certified under § 1051.20, you must certify your vehicle with respect to the evaporative emission standards in § 1051.110, but you need not certify the vehicle with respect to exhaust emissions under this part. The vehicle must nevertheless meet all emission standards with the engine installed. You must also label fuel tanks and fuel lines as specified in § 1051.135(d).

* * * * *

(c) If you obscure the engine label while installing the engine in the vehicle such that the label cannot be read during normal maintenance, you must place a duplicate label on the vehicle as described in 40 CFR 1068.105.

Subpart B—[Amended]

■ 159. Section 1051.103 is amended by revising paragraphs (b)(1), (b)(2), and (b)(3) to read as follows:

§ 1051.103 What are the exhaust emission standards for snowmobiles?

* * * * *

(b) * * *

(1) Natural gas-fueled snowmobiles: NMHC emissions.

(2) Alcohol-fueled snowmobiles: THCE emissions.

(3) Other snowmobiles: THC emissions.

* * * * *

■ 160. Section 1051.105 is amended by revising paragraphs (b)(1), (b)(2), and (b)(3) to read as follows:

§ 1051.105 What are the exhaust emission standards for off-highway motorcycles?

* * * * *

(b) * * *

(1) Natural gas-fueled off-highway motorcycles: NMHC emissions.

(2) Alcohol-fueled off-highway motorcycles: THCE emissions.

(3) Other off-highway motorcycles: THC emissions.

* * * * *

■ 161. Section 1051.107 is amended by revising paragraphs (b)(1), (b)(2), and (b)(3) to read as follows:

§ 1051.107 What are the exhaust emission standards for all-terrain vehicles (ATVs) and offroad utility vehicles?

* * * * *

(b) * * *

(1) Natural gas-fueled ATVs: NMHC emissions.

(2) Alcohol-fueled ATVs: THCE emissions.

(3) Other ATVs: THC emissions.

* * * * *

■ 162. Section 1051.110 is amended by revising the introductory text and adding paragraph (c) to read as follows:

§ 1051.110 What evaporative emission standards must my vehicles meet?

Your new vehicles that run on a volatile liquid fuel (such as gasoline) must meet the emission standards of this section over their full useful life. Note that § 1051.245 allows you to use design-based certification instead of generating new emission data.

* * * * *

(c) You may certify your fuel tanks and fuel lines under the provisions of 40 CFR part 1060. You may also specify in your application for certification that you are using components that have been certified by the component manufacturer.

■ 163. Section 1051.115 is amended by revising the section heading and introductory text to read as follows:

§ 1051.115 What other requirements apply?

Vehicles that are required to meet the emission standards of this part must meet the following requirements:

* * * * *

■ 164. Section 1051.120 is amended by revising paragraph (c) to read as follows:

§ 1051.120 What emission-related warranty requirements apply to me?

* * * * *

(c) *Components covered.* The emission-related warranty covers all components whose failure would increase an engine's emissions of any regulated pollutant, including components listed in 40 CFR part 1068, Appendix I, and components from any other system you develop to control emissions. The emission-related warranty covers these components even if another company produces the component. Your emission-related warranty does not cover components whose failure would not increase an engine's emissions of any regulated pollutant.

* * * * *

■ 165. Section 1051.125 is amended by revising paragraphs (a)(1)(iii) and (d) to read as follows:

§ 1051.125 What maintenance instructions must I give to buyers?

* * * * *

(a) * * *

(1) * * *

(iii) You provide the maintenance free of charge and clearly say so in your maintenance instructions.

* * * * *

(d) *Noncritical emission-related maintenance.* Subject to the provisions of this paragraph (d), you may schedule any amount of emission-related inspection or maintenance that is not covered by paragraph (a) of this section (i.e., maintenance that is neither explicitly identified as critical emission-related maintenance, nor that we approve as critical emission-related maintenance). Noncritical emission-related maintenance generally includes changing spark plugs, re-seating valves, or any other emission-related maintenance on the components we specify in 40 CFR part 1068, Appendix I that is not covered in paragraph (a) of this section. You must state in the owner's manual that these steps are not necessary to keep the emission-related warranty valid. If operators fail to do this maintenance, this does not allow you to disqualify those vehicles from in-use testing or deny a warranty claim. Do not take these inspection or maintenance steps during service accumulation on your emission-data vehicles.

* * * * *

■ 166. Section 1051.135 is amended to read as follows:

■ a. By revising paragraphs (c)(6), (c)(7), and (c)(8).

■ b. By adding a new paragraph (c)(13).

■ d. By removing and reserving paragraph (f).

§ 1051.135 How must I label and identify the vehicles I produce?

* * * * *

(c) * * *

(6) State the date of manufacture [DAY (optional), MONTH, and YEAR]; however, you may omit this from the label if you stamp, engrave, or otherwise permanently identify it elsewhere on the vehicle or engine, in which case you must also describe in your application for certification where you will identify the date on the vehicle or engine.

(7) State the exhaust emission standards or FELs to which the vehicles are certified (in g/km or g/kW-hr). Also, state the FEL that applies for the fuel tank if it is different than the otherwise applicable standard.

(8) Identify the emission-control system. Use terms and abbreviations as described in 40 CFR 1068.45. You may omit this information from the label if there is not enough room for it and you put it in the owner's manual instead.

* * * * *

(13) Identify evaporative emission controls as specified in 40 CFR 1060.135.

* * * * *

■ 167. Section 1051.137 is amended by revising the introductory text to read as follows:

§ 1051.137 What are the consumer labeling requirements?

Label every vehicle certified under this part with a removable hang-tag showing its emission characteristics relative to other models. The label should be attached securely to the vehicle before it is offered for sale in such a manner that it would not be accidentally removed prior to sale. Use the applicable equations of this section to determine the normalized emission rate (NER) from the FEL for your vehicle. If the vehicle is certified without a family emission limit that is different than the otherwise applicable standard, use the final deteriorated emission level. Round the resulting normalized emission rate for your vehicle to one decimal place. If the calculated NER value is less than zero, consider NER to be zero for that vehicle. We may specify a standardized format for labels. At a minimum, the tag should include: the manufacturer's name, vehicle model name, engine description (500 cc two-stroke with DFI), the NER, and a brief explanation of the scale (for example, note that 0 is the cleanest and 10 is the least clean).

* * * * *

■ 168. A new § 1051.140 is added to read as follows:

§ 1051.140 What is my vehicle's maximum engine power and displacement?

This section describes how to quantify your vehicle's maximum engine power and displacement for the purposes of this part.

(a) An engine configuration's maximum engine power is the maximum brake power point on the nominal power curve for the engine configuration, as defined in this section. Round the power value to the nearest 0.5 kilowatts. The nominal power curve of an engine configuration is the relationship between maximum available engine brake power and engine speed for an engine, using the mapping procedures of 40 CFR part 1065, based on the manufacturer's design and production specifications for the engine. This information may also be expressed by a torque curve that relates maximum available engine torque with engine speed.

(b) An engine configuration's displacement is the intended swept volume of the engine rounded to the nearest cubic centimeter. The swept volume of the engine is the product of the internal cross-section area of the cylinders, the stroke length, and the number of cylinders. For example, for a one-cylinder engine with a circular cylinder having an internal diameter of 6.00 cm and a 6.25 cm stroke length, the rounded displacement would be: $(1)\times(6.00/2)^2\times(\pi)\times(6.25) = 177$ cc. Calculate the engine's intended swept volume from the design specifications for the cylinders using enough significant figures to allow determination of the displacement to the nearest 0.1 cc.

(c) The nominal power curve and intended swept volume must be within the range of the actual power curves and swept volumes of production engines considering normal production variability. If after production begins it is determined that either your nominal power curve or your intended swept volume does not represent production engines, we may require you to amend your application for certification under § 1051.225.

■ 169. Section 1051.145 is amended by revising paragraphs (b) and (e)(1) and adding paragraph (i) to read as follows:

§ 1051.145 What provisions apply only for a limited time?

* * * * *

(b) *Optional emission standards for ATVs.* To meet ATV standards for model years before 2014, you may apply the exhaust emission standards by model year in paragraph (b)(1) of this section while measuring emissions using the engine-based test procedures in 40 CFR part 1065 instead of the chassis-based test procedures in 40 CFR part 86. In model year 2014 you may apply this provision for exhaust emission engine families representing up to 50 percent of your U.S.-directed production volume. This provision is not available in the 2015 or later-model years. If you certify only one ATV exhaust emission engine family in the 2014 model year this provision is available for that family in the 2014 model year.

(1) Follow Table 1 of this section for exhaust emission standards, while meeting all the other requirements of § 1051.107. You may use emission credits to show compliance with these standards (see subpart H of this part). You may not exchange emission credits with engine families meeting the standards in § 1051.107(a). You may also not exchange credits between engine families certified to the standards for engines above 225 cc and engine families certified to the standards for engines below 225 cc. The phase-in percentages in the table specify the percentage of your total U.S.-directed production that must comply with the emission standards for those model years (i.e., the percentage requirement does not apply separately for engine families above and below 225 cc). Table 1 follows:

TABLE 1 OF § 1051.145—OPTIONAL EXHAUST EMISSION STANDARDS FOR ATVS (g/kW-hr)

Engine displacement	Model year	Phase-in	Emission standards		Maximum allowable family emission limits
			$HC+NO_X$	CO	$HC+NO_X$
<225 cc	2006	50%	16.1	400	32.2
	2007 and later	100	16.1	400	32.2
≥225 cc	2006	50	13.4	400	26.8
	2007 and later	100	13.4	400	26.8

(2) Measure emissions by testing the engine on a dynamometer with the steady-state duty cycle described in Table 2 of this section.

(i) During idle mode, hold the speed within your specifications, keep the throttle fully closed, and keep engine torque under 5 percent of the peak torque value at maximum test speed.

(ii) For the full-load operating mode, operate the engine at its maximum fueling rate.

(iii) See part 1065 of this chapter for detailed specifications of tolerances and calculations.

(iv) Table 2 follows:

TABLE 2 OF § 1051.145—6–MODE DUTY CYCLE FOR RECREATIONAL ENGINES

Mode No.	Engine speed (percent of maximum test speed)	Torque (percent of maximum torque at test speed)	Minimum time in mode (minutes)	Weighting factors
1	85	100	5.0	0.09
2	85	75	5.0	0.20
3	85	50	5.0	0.29
4	85	25	5.0	0.30
5	85	10	5.0	0.07
6	Idle	0	5.0	0.05

(3) For ATVs certified to the standards in this paragraph (b), use the following equations to determine the normalized emission rate required by § 1051.137:

(i) For engines at or above 225 cc, use the following equation:

$$NER = 9.898 \times \log (HC+NO_X) - 4.898$$

Where:

$HC + NO_X$ is the sum of the cycle-weighted emission rates for hydrocarbons and oxides of nitrogen in g/kW-hr.

(ii) For engines below 225 cc, use the following equation:

$$NER = 9.898 \times \log [(HC+NO_X) \times 0.83] - 4.898$$

Where:

$HC + NO_X$ is the sum of the cycle-weighted emission rates for hydrocarbons and oxides of nitrogen in g/kW-hr.

* * * * *

(e) * * *

(1) *Snowmobile.* You may use the raw sampling procedures described in 40 CFR part 90 or 91 for snowmobiles subject to Phase 1 or Phase 2 standards.

* * * * *

(i) *Delayed compliance with labeling requirements.* Before the 2010 model year, you may omit the date of manufacture from the emission control information label if you keep those records and provide them to us upon request. Before the 2010 model year, you may also omit the label information specified for evaporative emission controls.

Subpart C—[Amended]

■ 170. Section 1051.201 is amended by revising paragraph (a) to read as follows:

§ 1051.201 What are the general requirements for obtaining a certificate of conformity?

(a) You must send us a separate application for a certificate of conformity for each engine family. A certificate of conformity is valid starting with the indicated effective date, but it is not valid for any production after December 31 of the model year for which it is issued. No certificate will be issued after December 31 of the model year.

* * * * *

■ 171. Section 1051.205 is amended by revising paragraphs (b), (o)(1), (p), (t), and (w) to read as follows:

§ 1051.205 What must I include in my application?

* * * * *

(b) Explain how the emission control systems operate. Describe the evaporative emission controls. Also describe in detail all system components for controlling exhaust emissions, including all auxiliary emission control devices (AECDs) and all fuel-system components you will install on any production or test vehicle or engine. Identify the part number of each component you describe. For this paragraph (b), treat as separate AECDs any devices that modulate or activate differently from each other. Include sufficient detail to allow us to evaluate whether the AECDs are consistent with the defeat device prohibition of § 1051.115.

* * * * *

(o) * * *

(1) Present exhaust emission data for hydrocarbons (such as NMHC or THCE, as applicable), NO_X, and CO on an emission-data vehicle to show your vehicles meet the exhaust emission standards as specified in subpart B of this part. Show emission figures before and after applying deterioration factors for each vehicle or engine. If we specify more than one grade of any fuel type (for example, a summer grade and winter grade of gasoline), you need to submit test data only for one grade unless the regulations of this part specify otherwise for your engine.

* * * * *

(p) Report all test results, including those from invalid tests or from any other tests, whether or not they were conducted according to the test procedures of subpart F of this part. If you measure CO_2, report those emission levels (in g/kW-hr or g/km, as appropriate). We may ask you to send other information to confirm that your tests were valid under the requirements of this part and 40 CFR part 1065.

* * * * *

(t) Include good-faith estimates of U.S.-directed production volumes. Include a justification for the estimated production volumes if they are substantially different than actual production volumes in earlier years for similar models.

* * * * *

(w) Name an agent for service located in the United States. Service on this agent constitutes service on you or any of your officers or employees for any action by EPA or otherwise by the United States related to the requirements of this part.

■ 172. Section 1051.220 is amended by revising the introductory text and paragraph (a) to read as follows:

§ 1051.220 How do I amend the maintenance instructions in my application?

You may amend your emission-related maintenance instructions after you submit your application for certification as long as the amended instructions remain consistent with the provisions of § 1051.125. You must send the Designated Compliance Officer a request to amend your application for certification for an engine family if you want to change the emission-related maintenance instructions in a way that could affect emissions. In your request, describe the proposed changes to the maintenance instructions. If operators follow the original maintenance instructions rather than the newly specified maintenance, this does not allow you to disqualify those engines from in-use testing or deny a warranty claim.

(a) If you are decreasing, replacing, or eliminating any specified maintenance, you may distribute the new maintenance instructions to your customers 30 days after we receive your request, unless we disapprove your request. This would generally include replacing one maintenance step with another. We may approve a shorter time or waive this requirement.

* * * * *

■ 173. Section 1051.225 is revised to read as follows:

§ 1051.225 How do I amend my application for certification to include new or modified vehicle configurations or to change an FEL?

Before we issue you a certificate of conformity, you may amend your application to include new or modified vehicle configurations, subject to the provisions of this section. After we have issued your certificate of conformity, you may send us an amended application requesting that we include new or modified vehicle configurations within the scope of the certificate, subject to the provisions of this section. You must amend your application if any changes occur with respect to any information included in your application.

(a) You must amend your application before you take any of the following actions:

(1) Add a vehicle configuration to an engine family. In this case, the vehicle configuration added must be consistent with other vehicle configurations in the engine family with respect to the criteria listed in § 1051.230.

(2) Change a vehicle configuration already included in an engine family in a way that may affect emissions, or change any of the components you described in your application for certification. This includes production and design changes that may affect emissions any time during the engine's lifetime.

(3) Modify an FEL for an engine family, as described in paragraph (f) of this section.

(b) To amend your application for certification, send the Designated Compliance Officer the following information:

(1) Describe in detail the addition or change in the vehicle model or configuration you intend to make.

(2) Include engineering evaluations or data showing that the amended engine family complies with all applicable requirements. You may do this by showing that the original emission-data vehicle is still appropriate for showing that the amended family complies with all applicable requirements.

(3) If the original emission-data vehicle for the engine family is not appropriate to show compliance for the new or modified vehicle configuration, include new test data showing that the new or modified vehicle configuration meets the requirements of this part.

(c) We may ask for more test data or engineering evaluations. You must give us these within 30 days after we request them.

(d) For engine families already covered by a certificate of conformity, we will determine whether the existing certificate of conformity covers your new or modified vehicle configuration. You may ask for a hearing if we deny your request (see § 1051.820).

(e) For engine families already covered by a certificate of conformity, you may start producing the new or modified vehicle configuration anytime after you send us your amended application, before we make a decision under paragraph (d) of this section. However, if we determine that the affected vehicles do not meet applicable requirements, we will notify you to cease production of the vehicles and may require you to recall the vehicles at no expense to the owner. Choosing to produce vehicles under this paragraph (e) is deemed to be consent to recall all vehicles that we determine do not meet applicable emission standards or other requirements and to remedy the nonconformity at no expense to the owner. If you do not provide information required under paragraph (c) of this section within 30 days after we request it, you must stop producing the new or modified vehicle configuration.

(f) You may ask us to approve a change to your FEL in certain cases after the start of production. The changed FEL may not apply to vehicles you have already introduced into commerce, except as described in this paragraph (f). If we approve a changed FEL after the start of production, you must include the new FEL on the emission control information label for all vehicles produced after the change. You may ask us to approve a change to your FEL in the following cases:

(1) You may ask to raise your FEL for your engine family at any time. In your request, you must show that you will still be able to meet the emission standards as specified in subparts B and H of this part. If you amend your application by submitting new test data to include a newly added or modified vehicle, as described in paragraph (b)(3) of this section, use the appropriate FELs with corresponding production volumes to calculate your average emission level for the model year, as described in subpart H of this part. In all other circumstances, you must use the higher FEL for the entire family to calculate your average emission level under subpart H of this part.

(2) You may ask to lower the FEL for your engine family only if you have test data from production engines showing that the engines have emissions below the proposed lower FEL. The lower FEL applies only to engines you produce after we approve the new FEL. Use the appropriate FELs with corresponding production volumes to calculate your average emission level for the model year, as described in subpart H of this part.

■ 174. Section 1051.230 is amended by revising the paragraphs (a), (b)(8), and (e)(1) to read as follows:

§ 1051.230 How do I select engine families?

(a) For purposes of certification, divide your product line into families of vehicles as described in this section. Except as specified in paragraph (f) of this section, you must have separate engine families for meeting exhaust and evaporative emissions. Your engine family is limited to a single model year.

(b) * * *

(8) Numerical level of the emission standards that apply to the vehicle. For example, an engine family may not include vehicles certified to different family emission limits, though you may change family emission limits without recertifying as specified in § 1051.225.

* * * * *

(e) * * *

(1) In unusual circumstances, you may group such vehicles in the same engine family if you show that their emission characteristics during the useful life will be similar.

* * * * *

■ 175. Section 1051.235 is amended by revising paragraphs (c)(4), (d)(1) introductory text, and (d)(1)(i) to read as follows:

§ 1051.235 What emission testing must I perform for my application for a certificate of conformity?

* * * * *

(c) * * *

(4) Before we test one of your vehicles or engines, we may calibrate it within normal production tolerances for anything we do not consider an adjustable parameter. For example, this would apply where we determine that an engine parameter is not an adjustable parameter (as defined in § 1051.801) but that it is subject to production variability.

(d) * * *

(1) You may ask to use carryover emission data from a previous model year instead of doing new tests, but only if all the following are true:

(i) The engine family from the previous model year differs from the current engine family only with respect to model year or other characteristics unrelated to emissions. You may also ask to add a configuration subject to § 1051.225.

* * * * *

■ 176. Section 1051.240 is amended by revising paragraphs (a), (b), and (c)(1) to read as follows:

§ 1051.240 How do I demonstrate that my engine family complies with exhaust emission standards?

(a) For purposes of certification, your engine family is considered in compliance with the applicable numerical exhaust emission standards in subpart B of this part if all emission-data vehicles representing that family have test results showing deteriorated emission levels at or below these standards. This includes all test points over the course of the durability demonstration. (Note: if you participate in the ABT program in subpart H of this part, your FELs are considered to be the applicable emission standards with which you must comply.)

(b) Your engine family is deemed not to comply if any emission-data vehicle representing that family has test results showing a deteriorated emission level for any pollutant that is above an applicable FEL or emission standard. This includes all test points over the course of the durability demonstration.

(c) * * *

(1) For vehicles that use aftertreatment technology, such as catalytic converters, use a multiplicative deterioration factor for exhaust emissions. A multiplicative deterioration factor is the ratio of exhaust emissions at the end of the useful life and exhaust emissions at the low-hour test point. In these cases, adjust the official emission results for each tested vehicle or engine at the selected test point by multiplying the measured emissions by the deterioration factor. If the factor is less than one, use one. Multiplicative deterioration factors must be specified to three significant figures.

* * * * *

■ 177. Section 1051.243 is amended by revising the introductory text and paragraphs (b)(6) and (c)(1) to read as follows:

§ 1051.243 How do I determine deterioration factors from exhaust durability testing?

This section describes how to determine deterioration factors, either with pre-existing test data or with new emission measurements.

* * * * *

(b) * * *

(6) You may use other testing methods to determine deterioration factors, consistent with good engineering judgment, as long as we approve those methods in advance.

(c) * * *

(1) If you determine your deterioration factors based on test data from a different engine family, explain why this is appropriate and include all the emission measurements on which you base the deterioration factor.

* * * * *

■ 178. Section 1051.245 is amended by revising paragraph (e) to read as follows:

§ 1051.245 How do I demonstrate that my engine family complies with evaporative emission standards?

* * * * *

(e) You may demonstrate for certification that your engine family complies with the evaporative emission standards by demonstrating that you use the following control technologies:

(1) For certification to the standards specified in § 1051.110(a) with the control technologies shown in the following table:

TABLE 1 OF § 1051.245—DESIGN-CERTIFICATION TECHNOLOGIES FOR CONTROLLING TANK PERMEATION

If the tank permeability control technology is . . .	Then you may design-certify with a tank emission level of . . .
(i) A metal fuel tank with no non-metal gaskets or with gaskets made from a low-permeability material.	1.5 g/m^2/day.
(ii) A metal fuel tank with non-metal gaskets with an exposed surface area of 1000 mm^2 or less.	1.5 g/m^2/day.

(2) For certification to the standards specified in § 1051.110(b) with the control technologies shown in the following table:

TABLE 2 OF § 1051.245—DESIGN-CERTIFICATION TECHNOLOGIES FOR CONTROLLING FUEL-LINE PERMEATION

If the fuel-line permeability control technology is . . .	Then you may design-certify with a fuel line permeation emission level of . . .
(i) Hose meeting the specifications for Low Emission Fuel Lines as described in 40 CFR 1048.105.	15 g/m^2/day.
(ii) Hose meeting the R11–A or R12 permeation specifications in SAE J30 as described in 40 CFR 1060.810.	15 g/m^2/day.

■ 179. Section 1051.250 is amended as follows:

■ a. By removing paragraph (d).

■ b. By redesignating paragraphs (a) through (c) as paragraphs (b) through (d), respectively.

■ c. By adding a new paragraph (a).

■ d. By revising the newly redesignated paragraph (c).

§ 1051.250 What records must I keep and make available to EPA?

(a) Send the Designated Compliance Officer information related to your U.S.-directed production volumes as described in § 1051.345. In addition, within 45 days after the end of the model year, you must send us a report describing information about vehicles you produced during the model year as follows:

(1) State the total production volume for each engine family that is not subject to reporting under § 1051.345.

(2) State the total production volume for any engine family for which you produce vehicles after completing the reports required in § 1051.345.

(3) For production volumes you report under this paragraph (a), identify whether or not the figures include California sales. Include a separate count of production volumes for California sales if those figures are available.

* * * * *

(c) Keep data from routine emission tests (such as test cell temperatures and relative humidity readings) for one year after we issue the associated certificate of conformity. Keep all other information specified in this section for eight years after we issue your certificate.

* * * * *

Subpart D—[Amended]

■ 180. Section 1051.301 is amended by revising paragraphs (a), (c), (d), (e), and (h) introductory text to read as follows:

§ 1051.301 When must I test my production-line vehicles or engines?

(a) If you produce vehicles that are subject to the requirements of this part, you must test them as described in this subpart, except as follows:

(1) Small-volume manufacturers may omit testing under this subpart.

(2) We may exempt engine families with a projected U.S.-directed production volume below 150 units from routine testing under this subpart. Request this exemption in your application for certification and include your basis for projecting a production volume below 150 units. We will approve your request if we agree that you have made good-faith estimates of your production volumes. Your exemption is approved when we grant your certificate. You must promptly notify us if your actual production exceeds 150 units during the model year. If you exceed the production limit or if there is evidence of a nonconformity, we may require you to test production-line engines under this subpart, or under 40 CFR part 1068, subpart E, even if we have approved an exemption under this paragraph (a)(2).

* * * * *

(c) Other regulatory provisions authorize us to suspend, revoke, or void your certificate of conformity, or order recalls for engine families, without regard to whether they have passed these production-line testing requirements. The requirements of this subpart do not affect our ability to do selective enforcement audits, as described in part 1068 of this chapter. Individual vehicles and engines in families that pass these production-line testing requirements must also conform to all applicable regulations of this part and part 1068 of this chapter.

(d) You may use alternate programs for testing production-line vehicles or engines in the following circumstances:

(1) You may use analyzers and sampling systems that meet the field-testing requirements of 40 CFR part 1065, subpart J, but not the otherwise applicable requirements in 40 CFR part 1065 for laboratory testing, to demonstrate compliance with emission standards if you double the minimum sampling rate specified in § 1054.310(b). Use measured test results to determine whether vehicles or engines comply with applicable standards without applying a measurement allowance. This alternate program does not require prior approval but we may disallow use of this option where we determine that use of field-grade equipment would prevent you from being able to demonstrate that your vehicles or engines are being produced to conform to the specifications in your application for certification.

(2) You may ask to use another alternate program for testing production-line vehicles or engines. In your request, you must show us that the alternate program gives equal assurance that your products meet the requirements of this part. We may waive some or all of this subpart's requirements if we approve your alternate approach. For example, in certain circumstances you may be able to give us equal assurance that your products meet the requirements of this part by using less rigorous measurement methods if you offset that by increasing the number of test vehicles or engines.

(e) If you certify an engine family with carryover emission data, as described in § 1051.235(d), and these equivalent engine families consistently pass the production-line testing requirements over the preceding two-year period, you may ask for a reduced testing rate for further production-line testing for that family. The minimum testing rate is one vehicle or engine per engine family. If we reduce your testing rate, we may limit our approval to any number of model years. In determining whether to approve your request, we may consider the number of vehicles or engines that have failed the emission tests.

* * * * *

(h) Vehicles certified to the following standards are exempt from the production-line testing requirements of this subpart if no engine families in the averaging set have family emission limits that are different than the otherwise applicable standard:

* * * * *

■ 181. Section 1051.305 is amended by adding introductory text and revising paragraphs (d) and (g) to read as follows:

§ 1051.305 How must I prepare and test my production-line vehicles or engines?

This section describes how to prepare and test production-line vehicles or engines. Test the engine if your vehicle is certified to g/kW-hr standards; otherwise test the vehicle. You must assemble the test vehicle or engine in a way that represents the assembly procedures for other vehicles or engines in the engine family. You must ask us to approve any deviations from your normal assembly procedures for other production vehicles or engines in the engine family.

* * * * *

(d) *Setting adjustable parameters.* Before any test, we may require you to adjust any adjustable parameter to any setting within its physically adjustable range.

(1) We may require you to adjust idle speed outside the physically adjustable range as needed, but only until the vehicle or engine has stabilized emission levels (see paragraph (e) of this section). We may ask you for information needed to establish an alternate minimum idle speed.

(2) We may specify adjustments within the physically adjustable range by considering their effect on emission levels. We may also consider how likely it is that someone will make such an adjustment with in-use vehicles.

(3) We may specify an air-fuel ratio within the adjustable range specified in § 1051.115(d).

* * * * *

(g) *Retesting after invalid tests.* You may retest a vehicle or engine if you determine an emission test is invalid under subpart F of this part. Explain in your written report reasons for invalidating any test and the emission results from all tests. If we determine that you improperly invalidated a test, we may require you to ask for our approval for future testing before substituting results of the new tests for invalid ones.

■ 182. Section 1051.310 is amended by revising paragraphs (a), (b), (c) introductory text, (c)(2), (f), (g), and (h) to read as follows:

§ 1051.310 How must I select vehicles or engines for production-line testing?

(a) Test engines from each engine family as described in this section based on test periods, as follows:

(1) For engine families with projected U.S.-directed production volume of at least 1,600, the test periods are consecutive quarters (3 months). However, if your annual production period is less than 12 months long, you may take the following alternative approach to define quarterly test periods:

(i) If your annual production period is 120 days or less, the whole model year constitutes a single test period.

(ii) If your annual production period is 121 to 210 days, divide the annual production period evenly into two test periods.

(iii) If your annual production period is 211 to 300 days, divide the annual production period evenly into three test periods.

(iv) If your annual production period is 301 days or longer, divide the annual production period evenly into four test periods.

(2) For engine families with projected U.S.-directed production volume below

1,600, the whole model year constitutes a single test period.

(b) Early in each test period, randomly select and test an engine from the end of the assembly line for each engine family.

(1) In the first test period for newly certified engines, randomly select and test one more engine. Then, calculate the required sample size for the model year as described in paragraph (c) of this section.

(2) In later test periods of the same model year, combine the new test result with all previous testing in the model year. Then, calculate the required sample size for the model year as described in paragraph (c) of this section.

(3) In the first test period for engine families relying on previously submitted test data, combine the new test result with the last test result from the previous model year. Then, calculate the required sample size for the model year as described in paragraph (c) of this section. Use the last test result from the previous model year only for this first calculation. For all subsequent calculations, use only results from the current model year.

(c) Calculate the required sample size for each engine family. Separately calculate this figure for HC, NO_X (or HC + NO_X), and CO. The required sample size is the greater of these calculated values. Use the following equation:

$$N = \left[\frac{(t_{95} \cdot \sigma)}{(x - STD)}\right]^2 + 1$$

Where:

N = Required sample size for the model year.

t_{95} = 95% confidence coefficient, which depends on the number of tests completed, n, as specified in the table in paragraph (c)(1) of this section. It defines 95% confidence intervals for a one-tail distribution.

σ = Test sample standard deviation (see paragraph (c)(2) of this section).

x = Mean of emission test results of the sample.

STD = Emission standard (or family emission limit, if applicable).

* * * * *

(2) Calculate the standard deviation, σ, for the test sample using the following formula:

$$\sigma = \left[\sum \frac{(X_i - x)^2}{(n-1)}\right]^{\frac{1}{2}}$$

Where:

X_i = Emission test result for an individual vehicle or engine.

n = The number of tests completed in an engine family.

* * * * *

(f) Distribute the remaining tests evenly throughout the rest of the year. You may need to adjust your schedule for selecting vehicles or engines if the required sample size changes. If your scheduled quarterly testing for the remainder of the model year is sufficient to meet the calculated sample size, you may wait until the next quarter to do additional testing. Continue to randomly select vehicles or engines from each engine family.

(g) Continue testing until one of the following things happens:

(1) After completing the minimum number of tests required in paragraph (b) of this section, the number of tests completed in an engine family, n, is greater than the required sample size, N, and the sample mean, x, is less than or equal to the emission standard. For example, if N = 5.1 after the fifth test, the sample-size calculation does not allow you to stop testing.

(2) The engine family does not comply according to § 1051.315.

(3) You test 30 vehicles or engines from the engine family.

(4) You test one percent of your projected annual U.S.-directed production volume for the engine family, rounded to the nearest whole number. Do not count a vehicle or engine under this paragraph (g)(4) if it fails to meet an applicable emission standard.

(5) You choose to declare that the engine family does not comply with the requirements of this subpart.

(h) If the sample-size calculation allows you to stop testing for one pollutant but not another, you must continue measuring emission levels of all pollutants for any additional tests required under this section. However, you need not continue making the calculations specified in this subpart for the pollutant for which testing is not required. This paragraph (h) does not affect the number of tests required under this section, the required calculations in § 1051.315, or the remedial steps required under § 1051.320.

* * * * *

■ 183. Section 1051.315 is amended by revising paragraphs (a), (b), and (g) to read as follows:

§ 1051.315 How do I know when my engine family fails the production-line testing requirements?

* * * * *

(a) Calculate your test results as follows:

(1) *Initial and final test results.* Calculate and round the test results for each vehicle or engine. If you do several tests on a vehicle or engine, calculate the initial results for each test, then add all the test results together and divide by the number of tests. Round this final calculated value for the final test results on that vehicle or engine.

(2) *Final deteriorated test results.* Apply the deterioration factor for the engine family to the final test results (see § 1051.240(c)).

(3) *Round deteriorated test results.* Round the results to the number of decimal places in the emission standard expressed to one more decimal place.

(b) Construct the following CumSum Equation for each engine family for HC, NO_X (HC + NO_X), and CO emissions:

$$C_i = \text{Max}\,[0 \text{ or } C_{i-1} + X_i - (STD + 0.25 \times \sigma)]$$

Where:

C_i = The current CumSum statistic.

C_{i-1} = The previous CumSum statistic. For the first test, the CumSum statistic is 0 (i.e., $C_1 = 0$).

X_i = The current emission test result for an individual vehicle or engine.

STD = Emission standard (or family emission limit, if applicable).

* * * * *

(g) If the CumSum statistic exceeds the Action Limit in two consecutive tests, the engine family fails the production-line testing requirements of this subpart. Tell us within ten working days if this happens. You may request to amend the application for certification to raise the FEL of the engine family as described in § 1051.225(f).

* * * * *

■ 184. Section 1051.320 is amended by revising paragraph (a)(2) to read as follows:

§ 1051.320 What happens if one of my production-line vehicles or engines fails to meet emission standards?

(a) * * *

(2) Include the test results and describe the remedy for each engine in the written report required under § 1051.345.

* * * * *

■ 185. Section 1051.325 is amended by revising the section heading and paragraphs (c) and (e) to read as follows:

§ 1051.325 What happens if an engine family fails the production-line testing requirements?

* * * * *

(c) Up to 15 days after we suspend the certificate for an engine family, you may ask for a hearing (see § 1051.820). If we agree before a hearing occurs that we used erroneous information in deciding to suspend the certificate, we will reinstate the certificate.

* * * * *

(e) You may request to amend the application for certification to raise the FEL of the engine family before or after we suspend your certificate as described in § 1051.225(f). We will approve your request if it is clear that you used good engineering judgment in establishing the original FEL.

■ 186. Section 1051.345 is amended as follows:

■ a. By removing the introductory text.

■ b. By revising paragraphs (a)(4), (a)(6), and (a)(8).

■ c. By revising paragraphs (b) and (c).

§ 1051.345 What production-line testing records must I send to EPA?

(a) * * *

(4) Describe each test vehicle or engine, including the engine family's identification and the vehicle's model year, build date, model number, identification number, and number of hours of operation before testing.

* * * * *

(6) Provide the test number; the date, time and duration of testing; test procedure; all initial test results; final test results; and final deteriorated test results for all tests. Provide the emission results for all measured pollutants. Include information for both valid and invalid tests and the reason for any invalidation.

* * * * *

(8) Provide the CumSum analysis required in § 1051.315 and the sample-size calculation required in § 1051.310 for each engine family.

* * * * *

(b) We may ask you to add information to your written report, so we can determine whether your new vehicles conform with the requirements of this subpart. We may also ask you to send less information.

(c) An authorized representative of your company must sign the following statement: We submit this report under Sections 208 and 213 of the Clean Air Act. Our production-line testing conformed completely with the requirements of 40 CFR part 1051. We have not changed production processes or quality-control procedures for test engines (or vehicles) in a way that might affect emission controls. All the information in this report is true and accurate, to the best of my knowledge. I know of the penalties for violating the Clean Air Act and the regulations. (Authorized Company Representative)

* * * * *

■ 187. Section 1051.350 is amended by revising paragraphs (b), (e), and (f) to read as follows:

§ 1051.350 What records must I keep?

* * * * *

(b) Keep paper or electronic records of your production-line testing for eight years after you complete all the testing required for an engine family in a model year.

* * * * *

(e) If we ask, you must give us projected or actual production figures for an engine family. We may ask you to divide your production figures by maximum engine power, displacement, fuel type, or assembly plant (if you produce vehicles or engines at more than one plant).

(f) Keep records of the vehicle or engine identification number for each vehicle or engine you produce under each certificate of conformity. You may identify these numbers as a range. Give us these records within 30 days if we ask for them.

* * * * *

Subpart F—[Amended]

■ 188. Section 1051.501 is amended as follows:

■ a. By revising paragraphs (c)(2) and (d).

■ b. By redesignating paragraphs (e) and (f) as paragraphs (g) and (h).

■ c. By adding a new paragraph (e).

■ d. By reserving paragraph (f).

§ 1051.501 What procedures must I use to test my vehicles or engines?

* * * * *

(c) * * *

(2) Prior to permeation testing of fuel hose, the hose must be preconditioned by filling the hose with the fuel specified in paragraph (d)(3) of this section, sealing the openings, and soaking the hose for 4 weeks at 23 ± 5 °C. To measure fuel-line permeation emissions, use the equipment and procedures specified in SAE J30 as described in 40 CFR 1060.810. The measurements must be performed at 23 ± 2 °C using the fuel specified in paragraph (d)(3) of this section.

(d) *Fuels.* Use the fuels meeting the following specifications:

(1) *Exhaust.* Use the fuels and lubricants specified in 40 CFR part 1065, subpart H, for all the exhaust testing we require in this part. For service accumulation, use the test fuel or any commercially available fuel that is representative of the fuel that in-use engines will use. The following provisions apply for using specific fuel types:

(i) For gasoline-fueled engines, use the grade of gasoline specified for general testing.

(ii) For diesel-fueled engines, use either low-sulfur diesel fuel or ultra low-sulfur diesel fuel meeting the specifications in 40 CFR 1065.703. If you use sulfur-sensitive technology as defined in 40 CFR 1039.801 and you measure emissions using ultra low-sulfur diesel fuel, you must add a permanent label near the fuel inlet with the following statement: ''ULTRA LOW SULFUR FUEL ONLY''.

(2) *Fuel Tank Permeation.* (i) For the preconditioning soak described in § 1051.515(a)(1) and fuel slosh durability test described in § 1051.515(d)(3), use the fuel specified in Table 1 of 40 CFR 1065.710 blended with 10 percent ethanol by volume. As an alternative, you may use Fuel CE10, which is Fuel C as specified in ASTM D 471–98 (see 40 CFR 1060.810) blended with 10 percent ethanol by volume.

(ii) For the permeation measurement test in § 1051.515(b), use the fuel specified in Table 1 of 40 CFR 1065.710. As an alternative, you may use the fuel specified in paragraph (d)(2)(i) of this section.

(3) *Fuel Hose Permeation.* Use the fuel specified in Table 1 of 40 CFR 1065.710 blended with 10 percent ethanol by volume for permeation testing of fuel lines. As an alternative, you may use Fuel CE10, which is Fuel C as specified in ASTM D 471–98 (see 40 CFR 1060.810) blended with 10 percent ethanol by volume.

(e) *Engine stabilization.* Instead of the provisions of 40 CFR 1065.405, you may consider emission levels stable without measurement after 12 hours of engine operation.

(f) [Reserved]

* * * * *

■ 189. Section 1051.505 is amended by revising paragraphs (a) and (b) to read as follows:

§ 1051.505 What special provisions apply for testing snowmobiles?

* * * * *

(a) You may perform steady-state testing with either discrete-mode or ramped-modal cycles. You must use the type of testing you select in your application for certification for all testing you perform for that engine family. If we test your engines to confirm that they meet emission standards, we will do testing the same way. If you submit certification test data collected with both discrete-mode and ramped-modal testing (either in your original application or in an amendment to your application), either method may be used for subsequent testing. We may also perform other testing as allowed by the Clean Air Act. Measure steady-state emissions as follows:

(1) For discrete-mode testing, sample emissions separately for each mode, then calculate an average emission level for the whole cycle using the weighting factors specified for each mode. In each mode, operate the engine for at least 5 minutes, then sample emissions for at least 1 minute. Calculate cycle statistics and compare with the established criteria as specified in 40 CFR 1065.514 to confirm that the test is valid.

(2) For ramped-modal testing, start sampling at the beginning of the first mode and continue sampling until the end of the last mode. Calculate emissions and cycle statistics the same as for transient testing as specified in 40 CFR part 1065, subpart G.

(3) Measure emissions by testing the engine on a dynamometer with one or more of the following sets of duty cycles to determine whether it meets the steady-state emission standards in § 1051.103:

(i) The following duty cycle applies for discrete-mode testing:

TABLE 1 OF § 1051.505—5-MODE DUTY CYCLE FOR SNOWMOBILES

Mode No.	Speed (percent) [1]	Torque (percent) [2]	Minimum time in mode (minutes)	Weighting factors
1	100	100	3.0	0.12
2	85	51	3.0	0.27
3	75	33	3.0	0.25
4	65	19	3.0	0.31
5	Idle	0	3.0	0.05

[1] Percent speed is percent of maximum test speed.
[2] Percent torque is percent of maximum torque at maximum test speed.

(ii) The following duty cycle applies for ramped-modal testing:

TABLE 2 OF § 1051.505—RAMPED-MODAL CYCLE FOR TESTING SNOWMOBILES

RMC mode	Time in mode	Speed (percent) [1]	Torque (percent) [2, 3]
1a Steady-state	27	Warm Idle	0
1b Transition	20	Linear Transition	Linear Transition
2a Steady-state	121	100	100
2b Transition	20	Linear Transition	Linear Transition
3a Steady-state	347	65	19
3b Transition	20	Linear Transition	Linear Transition
4a Steady-state	305	85	51
4b Transition	20	Linear Transition	Linear Transition
5a Steady-state	272	75	33
5b Transition	20	Linear Transition	Linear Transition
6 Steady-state	28	Warm Idle	0

[1] Percent speed is percent of maximum test speed.
[2] Advance from one mode to the next within a 20-second transition phase. During the transition phase, command a linear progression from the torque setting of the current mode to the torque setting of the next mode.
[3] Percent torque is percent of maximum torque at maximum test speed.

(b) During idle mode, operate the engine at its warm idle speed as described in 40 CFR 1065.510.

* * * * *

Subpart G—[Amended]

■ 190. Section 1051.605 is amended by revising the section heading and paragraph (d)(7)(ii) to read as follows:

§ 1051.605 What provisions apply to engines already certified under the motor vehicle program or the Large Spark-ignition program?

* * * * *

(d) * * *

(7) * * *

(ii) List the engine or vehicle models you expect to produce under this exemption in the coming year and describe your basis for meeting the sales restrictions of paragraph (d)(3) of this section.

* * * * *

■ 191. Section 1051.610 is amended by revising the section heading and paragraphs (d)(7)(ii) and (g) to read as follows:

§ 1051.610 What provisions apply to vehicles already certified under the motor vehicle program?

* * * * *

(d) * * *

(7) * * *

(ii) List the vehicle models you expect to produce under this exemption in the coming year and describe your basis for meeting the sales restrictions of paragraph (d)(3) of this section.

* * * * *

(g) *Participation in averaging, banking and trading.* Vehicles adapted for recreational use under this section may not generate or use emission credits under this part 1051. These vehicles may generate credits under the ABT provisions in 40 CFR part 86. These vehicles must use emission credits under 40 CFR part 86 if they are certified to an FEL that exceeds an emission standard that applies.

■ 192. Section 1051.615 is amended by revising paragraphs (d) introductory text, (d)(3), and (d)(4) to read as follows:

§ 1051.615 What are the special provisions for certifying small recreational engines?

* * * * *

(d) Measure steady-state emissions by testing the engine on an engine dynamometer using the equipment and procedures of 40 CFR part 1065 with either discrete-mode or ramped-modal cycles. You must use the type of testing you select in your application for certification for all testing you perform for that engine family. If we test your engines to confirm that they meet emission standards, we will do testing the same way. If you submit certification test data collected with both discrete-mode and ramped-modal testing (either in your original application or in an amendment to your application), either method may be used for subsequent testing. We may also perform other testing as allowed by the Clean Air Act. Measure steady-state emissions as follows:

* * * * *

(3) Measure emissions by testing the engine on a dynamometer with one or more of the following sets of duty cycles to determine whether it meets applicable emission standards:

(i) The following duty cycle applies for discrete-mode testing:

TABLE 1 OF § 1051.615—6-MODE DUTY CYCLE FOR RECREATIONAL ENGINES

Mode No.	Engine speed (percent) [1]	Torque (percent) [2]	Minimum time in mode (minutes)	Weighting factors
1	85	100	5.0	0.09
2	85	75	5.0	0.20
3	85	50	5.0	0.29
4	85	25	5.0	0.30
5	85	10	5.0	0.07
6	Idle	0	5.0	0.05

[1] Percent speed is percent of maximum test speed.
[2] Percent torque is percent of maximum torque at the commanded test speed.

(ii) The following duty cycle applies for ramped-modal testing:

TABLE 2 OF § 1051.615—RAMPED-MODAL CYCLE FOR TESTING RECREATIONAL ENGINES

RMC mode	Time	Speed (percent) [1,2]	Torque (percent) [2,3]
1a Steady-state	41	Warm Idle	0.
1b Transition	20	Linear Transition	Linear Transition.
2a Steady-state	135	85	100.
2b Transition	20	85	Linear Transition.
3a Steady-state	112	85	10.
3b Transition	20	85	Linear Transition.
4a Steady-state	337	85	75.
4b Transition	20	85	Linear Transition.
5a Steady-state	518	85	25.
5b Transition	20	85	Linear Transition.
6a Steady-state	494	85	50.
6b Transition	20	Linear Transition	Linear Transition.
7 Steady-state	43	Warm Idle	0.

[1] Percent speed is percent of maximum test speed.
[2] Advance from one mode to the next within a 20-second transition phase. During the transition phase, command a linear progression from the torque setting of the current mode to the torque setting of the next mode.
[3] Percent torque is percent of maximum torque at the commanded test speed.

(4) During idle mode, operate the engine at its warm idle speed as described in 40 CFR 1065.510.

* * * * *

■ 193. Section 1051.635 is amended by revising paragraph (a) to read as follows:

§ 1051.635 What provisions apply to new manufacturers that are small businesses?

(a) If you are a small business (as defined by the Small Business Administration at 13 CFR 121.201) that manufactures recreational vehicles, but does not otherwise qualify for the small-volume manufacturer provisions of this part, you may ask us to designate you to be a small-volume manufacturer. You may do this whether you began manufacturing recreational vehicles before, during, or after 2002.

* * * * *

■ 194. Section 1051.645 is amended by revising paragraph (b) to read as follows:

§ 1051.645 What special provisions apply to branded engines?

* * * * *

(b) In your application for certification, identify the company whose trademark you will use.

* * * * *

■ 195. A new § 1051.650 is added to subpart G to read as follows:

§ 1051.650 What special provisions apply for converting a vehicle to use an alternate fuel?

A certificate of conformity is no longer valid for a vehicle if the vehicle is modified such that it is not in a configuration covered by the certificate. This section applies if such modifications are done to convert the vehicle to run on a different fuel type. Such vehicles may be recertified as specified in this section if the original certificate is no longer valid for that vehicle.

(a) Converting a certified new vehicle to run on a different fuel type violates 40 CFR 1068.101(a)(1) if the modified vehicle is not covered by a certificate of conformity.

(b) Converting a certified vehicle that is not new to run on a different fuel type violates 40 CFR 1068.101(b)(1) if the modified vehicle is not covered by a certificate of conformity. We may specify alternate certification provisions consistent with the requirements of this part. For example, you may certify the modified vehicle for a partial useful life. For example, if the vehicle is modified halfway through its original useful life period, you may generally certify the vehicle based on completing the original useful life period; or if the vehicle is modified after the original useful life period is past, you may generally certify the vehicle based on testing that does not involve further durability demonstration.

(c) Vehicles (or engines) may be certified using the certification procedures for new vehicles (or engines) as specified in this part or using the certification procedures for aftermarket parts as specified in 40 CFR part 85, subpart V. Unless the original vehicle manufacturer continues to be responsible for the vehicle as specified in paragraph (d) of this section, you must remove the original manufacturer's emission control information label if you recertify the vehicle.

(d) The original vehicle manufacturer is not responsible for operation of modified vehicles in configurations resulting from modifications performed by others. In cases where the modification allows a vehicle to be operated in either its original configuration or a modified configuration, the original vehicle manufacturer remains responsible for operation of the modified vehicle in its original configuration.

(e) Entities producing conversion kits may obtain certificates of conformity for the converted vehicles. Such entities are vehicle manufacturers for purposes of this part.

Subpart H—[Amended]

■ 196. Section 1051.701 is amended by revising paragraph (a) to read as follows:

§ 1051.701 General provisions.

(a) You may average, bank, and trade emission credits for purposes of certification as described in this subpart to show compliance with the standards of this part. To do this you must certify your engines to Family Emission Limits (FELs) and show that your average emission levels for all your engine families together are below the emission standards in subpart B of this part, or that you have sufficient credits to offset a credit deficit for the model year (as calculated in § 1051.720).

* * * * *

■ 197. Section 1051.710 is amended by revising paragraphs (d) and (e) and removing paragraph (f) to read as follows:

§ 1051.710 How do I generate and bank emission credits?

* * * * *

(d) You may designate any emission credits you plan to bank in the reports you submit under § 1051.730. During the model year and before the due date for the final report, you may designate your reserved emission credits for averaging or trading.

(e) Reserved credits become actual emission credits when you submit your final report. However, we may revoke these emission credits if we are unable to verify them after reviewing your reports or auditing your records.

■ 198. Section 1051.715 is amended by revising paragraph (b) and removing and reserving paragraph (c) to read as follows:

§ 1051.715 How do I trade emission credits?

* * * * *

(b) You may trade actual emission credits as described in this subpart. You may also trade reserved emission credits, but we may revoke these emission credits based on our review of your records or reports or those of the company with which you traded emission credits. You may trade banked credits within an averaging set to any certifying manufacturer.

(c) [Reserved]

* * * * *

■ 199. Section 1051.720 is amended by revising paragraph (a)(2) to read as follows:

§ 1051.720 How do I calculate my average emission level or emission credits?

(a) * * *

(2) For vehicles that have standards expressed as g/kW-hr and a useful life in kilometers, convert the useful life to kW-hr based on the maximum engine power and an assumed vehicle speed of 30 km/hr as follows: UL (kW-hr) = UL (km) × Maximum Engine Power (kW) ÷ 30 km/hr. (Note: It is not necessary to include a load factor, since credit exchange is not allowed between vehicles certified to g/kW-hr standards and vehicles certified to g/km standards.)

* * * * *

■ 200. Section 1051.725 is amended by revising paragraph (b)(2) to read as follows:

§ 1051.725 What must I include in my applications for certification?

* * * * *

(b) * * *

(2) Detailed calculations of projected emission credits (positive or negative) based on projected production volumes. We may require you to include similar calculations from your other engine families to demonstrate that you will be able to avoid a negative credit balance for the model year. If you project negative emission credits for an engine family, state the source of positive emission credits you expect to use to offset the negative emission credits.

■ 201. Section 1051.730 is amended by revising paragraphs (b)(3), (b)(4), (b)(5), (c)(2), and (f) to read as follows:

§ 1051.730 What ABT reports must I send to EPA?

* * * * *

(b) * * *

(3) The FEL for each pollutant. If you change the FEL after the start of production, identify the date that you started using the new FEL and/or give the vehicle identification number for the first vehicle covered by the new FEL. In this case, identify each applicable FEL and calculate the positive or negative emission credits under each FEL.

(4) The projected and actual production volumes for the model year with a point of retail sale in the United States, as described in § 1051.701(d). For fuel tanks, state the production volume in terms of surface area and production volume for each tank configuration and state the total surface area for the emission family. If you changed an FEL during the model year, identify the actual production volume associated with each FEL.

(5) For vehicles that have standards expressed as g/kW-hr, maximum engine power for each vehicle configuration, and the average engine power weighted by U.S.-directed production volumes for the engine family.

* * * * *

(c) * * *

(2) State whether you will retain any emission credits for banking.

* * * * *

(f) Correct errors in your end-of-year report or final report as follows:

(1) You may correct any errors in your end-of-year report when you prepare the final report as long as you send us the final report by the time it is due.

(2) If you or we determine within 270 days after the end of the model year that errors mistakenly decreased your balance of emission credits, you may correct the errors and recalculate the balance of emission credits. You may not make these corrections for errors that are determined more than 270 days after the end of the model year. If you report a negative balance of emission credits, we may disallow corrections under this paragraph (f)(2).

(3) If you or we determine anytime that errors mistakenly increased your balance of emission credits, you must correct the errors and recalculate the balance of emission credits.

■ 202. Section 1051.735 is amended by revising paragraphs (b), (d), and (e) to read as follows:

§ 1051.735 What records must I keep?

* * * * *

(b) Keep the records required by this section for at least eight years after the due date for the end-of-year report. You may not use emission credits on any engines if you do not keep all the records required under this section. You must therefore keep these records to continue to bank valid credits. Store these records in any format and on any media as long as you can promptly send us organized, written records in English if we ask for them. You must keep these records readily available. We may review them at any time.

* * * * *

(d) Keep records of the identification number for each vehicle or engine or piece of equipment you produce that generates or uses emission credits under the ABT program. You may identify these numbers as a range.

(e) We may require you to keep additional records or to send us relevant information not required by this section in accordance with the Clean Air Act.

■ 203. Section 1051.740 is amended by revising paragraph (b)(4)(ii) to read as follows:

§ 1051.740 Are there special averaging provisions for snowmobiles?

* * * * *

(b) * * *

(4) * * *

(ii) HC and CO credits for Phase 3 are calculated relative to 75 g/kW-hr and 200 g/kW-hr values, respectively.

* * * * *

Subpart I—[Amended]

■ 204. Section 1051.801 is amended as follows:

■ a. By removing the definitions for ''Maximum test power'' and ''Maximum test torque''.

■ b. By revising the definitions for ''Aftertreatment'', ''Designated Compliance Officer'', ''Emission-control system'', ''Engine configuration'', ''Maximum engine power'', ''Model year'', ''New'', ''Nonmethane hydrocarbon'', ''Official emission result'', ''Owners manual'', ''Recreational'', ''Total hydrocarbon'', and ''Total hydrocarbon equivalent''.

■ c. By adding definitions for ''Alcohol-fueled'', ''Days'', ''Low-permeability material'', and ''Volatile liquid fuel'' in alphabetical order.

§ 1051.801 What definitions apply to this part?

* * * * *

Aftertreatment means relating to a catalytic converter, particulate filter, or any other system, component, or technology mounted downstream of the exhaust valve (or exhaust port) whose design function is to decrease emissions in the engine exhaust before it is exhausted to the environment. Exhaust-gas recirculation (EGR), turbochargers, and oxygen sensors are not aftertreatment.

Alcohol-fueled means relating to a vehicle with an engine that is designed to run using an alcohol fuel. For purposes of this definition, alcohol fuels do not include fuels with a nominal alcohol content below 25 percent by volume.

* * * * *

Days means calendar days unless otherwise specified. For example, where we specify working days, we mean calendar days excluding weekends and U.S. national holidays.

Designated Compliance Officer means the Manager, Light-Duty Engine Group, U.S. Environmental Protection Agency, 2000 Traverwood Drive, Ann Arbor, MI 48105.

* * * * *

Emission-control system means any device, system, or element of design that controls or reduces the emissions of regulated pollutants from an engine.

* * * * *

Engine configuration means a unique combination of engine hardware and calibration within an engine family. Engines within a single engine configuration differ only with respect to normal production variability or factors unrelated to emissions.

* * * * *

Low-permeability material has the meaning given in 40 CFR 1060.801.

* * * * *

Maximum engine power has the meaning given in 40 CFR 90.3 for 2010 and earlier model years and in § 1051.140 for 2011 and later model years. Note that maximum engine power is based on the engine alone, without regard to any governing or other restrictions from the vehicle installation.

* * * * *

Model year means one of the following things:

(1) For freshly manufactured vehicles (see definition of ''new,'' paragraph (1)), model year means one of the following:

(i) Calendar year.

(ii) Your annual new model production period if it is different than the calendar year. This must include January 1 of the calendar year for which the model year is named. It may not begin before January 2 of the previous calendar year and it must end by December 31 of the named calendar year. For seasonal production periods not including January 1, *model year* means the calendar year in which the production occurs, unless you choose to certify the applicable emission family with the following model year. For example, if your production period is June 1, 2010, through November 30, 2010, your model year would be 2010 unless you choose to certify the emission family for model year 2011.

(2) For an engine originally certified and manufactured as a motor vehicle engine or a stationary engine that is later used or intended to be used in a vehicle subject to the standards and requirements of this part 1051, *model year* means the calendar year in which the engine was originally produced. For an engine originally manufactured as a motor vehicle engine or a stationary engine without having been certified that is later used or intended to be used in a vehicle subject to the standards and requirements of this part 1051, *model year* means the calendar year in which the engine becomes subject to this part 1051. (See definition of ''new,'' paragraph (2)).

(3) For a nonroad engine that has been previously placed into service in an application covered by 40 CFR part 90, 91, 1048, or 1054, where that engine is installed in a piece of equipment that is covered by this part 1051, *model year* means the calendar year in which the engine was originally produced (see definition of ''new,'' paragraph (3)).

(4) For engines that are not freshly manufactured but are installed in new recreational vehicles, model year means the calendar year in which the engine is installed in the recreational vehicle (see definition of ''new,'' paragraph (4)).

(5) For imported engines:

(i) For imported engines described in paragraph (5)(i) of the definition of ''new,'' *model year* has the meaning given in paragraphs (1) through (4) of this definition.

(ii) For imported engines described in paragraph (5)(ii) of the definition of ''new,'' *model year* means the calendar year in which the vehicle is modified.

(iii) For imported engines described in paragraph (5)(iii) of the definition of ''new'' *model year* means the calendar year in which the engine is assembled in its imported configuration, unless specified otherwise in this part or in 40 CFR part 1068.

* * * * *

New means relating to any of the following things:

(1) A freshly manufactured vehicle for which the ultimate purchaser has never received the equitable or legal title. This kind of vehicle might commonly be thought of as ''brand new.''

In the case of this paragraph (1), the vehicle is new from the time it is produced until the ultimate purchaser receives the title or the product is placed into service, whichever comes first.

(2) An engine originally manufactured as a motor vehicle engine or a stationary engine that is later used or intended to be used in a vehicle subject to the standards and requirements of this part 1051. In this case, the engine is no longer a motor vehicle or stationary engine and becomes new. The engine is no longer new when it is placed into service as a recreational vehicle covered by this part 1051.

(3) A nonroad engine that has been previously placed into service in an application covered by 40 CFR part 90, 91, 1048, or 1054, when that engine is installed in a piece of equipment that is covered by this part 1051. The engine is no longer new when it is placed into service in a recreational vehicle covered by this part 1051. For example, this would apply to a marine propulsion engine that is no longer used in a marine vessel.

(4) An engine not covered by paragraphs (1) through (3) of this definition that is intended to be installed in a new vehicle covered by this part 1051. This generally includes installation of used engines in new recreational vehicles. The engine is no longer new when the ultimate purchaser receives a title for the vehicle or it is placed into service, whichever comes first.

(5) An imported vehicle or engine, subject to the following provisions:

(i) An imported recreational vehicle or recreational-vehicle engine covered by a certificate of conformity issued under this part that meets the criteria of one or more of paragraphs (1) through (4) of this definition, where the original manufacturer holds the certificate, is new as defined by those applicable paragraphs.

(ii) An imported vehicle or engine covered by a certificate of conformity issued under this part, where someone other than the original manufacturer holds the certificate (such as when the engine is modified after its initial assembly), is new when it is imported. It is no longer new when the ultimate purchaser receives a title for the vehicle or engine or it is placed into service, whichever comes first.

(iii) An imported recreational vehicle or recreational-vehicle engine that is not covered by a certificate of conformity issued under this part at the time of importation is new. This addresses uncertified vehicles and engines initially placed into service that someone seeks to import into the United States. Importation of this kind of vehicle or engine is generally prohibited by 40 CFR part 1068. However, the importation of such a vehicle or engine is not prohibited if it has a model year before 2006, since it is not subject to standards.

* * * * *

Nonmethane hydrocarbon has the meaning given in 40 CFR 1065.1001.

* * * * *

Official emission result means the measured emission rate for an emission-data vehicle on a given duty cycle before the application of any deterioration factor.

* * * * *

Owners manual means a document or collection of documents prepared by the engine manufacturer for the owner or operator to describe appropriate engine maintenance, applicable warranties, and any other information related to operating or keeping the engine. The owners manual is typically provided to the ultimate purchaser at the time of sale. The owners manual may be in paper or electronic format.

* * * * *

Recreational means, for purposes of this part, relating to snowmobiles, all-terrain vehicles, off-highway motorcycles, and other vehicles that we regulate under this part. Note that 40 CFR parts 90 and 1054 apply to engines used in other recreational vehicles.

* * * * *

Total hydrocarbon has the meaning given in 40 CFR 1065.1001. This generally means the combined mass of organic compounds measured by the specified procedure for measuring total hydrocarbon, expressed as a hydrocarbon with a hydrogen-to-carbon mass ratio of 1.85:1.

Total hydrocarbon equivalent has the meaning given in 40 CFR 1065.1001.

* * * * *

Volatile liquid fuel means any fuel other than diesel or biodiesel that is a liquid at atmospheric pressure and has a Reid Vapor Pressure higher than 2.0 pounds per square inch.

* * * * *

§ 1051.810 [Removed]

■ 205. Section 1051.810 is removed.

■ 206. A new § 1051.825 is added to subpart I to read as follows:

§ 1051.825 What reporting and recordkeeping requirements apply under this part?

Under the Paperwork Reduction Act (44 U.S.C. 3501 *et seq.*), the Office of Management and Budget approves the reporting and recordkeeping specified in the applicable regulations. The following items illustrate the kind of reporting and recordkeeping we require for vehicles regulated under this part:

(a) We specify the following requirements related to certification in this part 1051:

(1) In §§ 1051.20 and 1051.25 we describe special provisions for manufacturers to certify recreational engines instead of vehicles.

(2) [Reserved]

(3) In § 1051.145 we include various reporting and recordkeeping requirements related to interim provisions.

(4) In subpart C of this part we identify a wide range of information required to certify vehicles.

(5) In §§ 1051.345 and 1051.350 we specify certain records related to production-line testing.

(6) [Reserved]

(7) In § 1051.501 we specify information needs for establishing various changes to published vehicle-based test procedures.

(8) In subpart G of this part we identify several reporting and recordkeeping items for making demonstrations and getting approval related to various special compliance provisions.

(9) In §§ 1051.725, 1051.730, and 1051.735 we specify certain records related to averaging, banking, and trading.

(b) [Reserved]

(c) We specify the following requirements related to testing in 40 CFR part 1065:

(1) In 40 CFR 1065.2 we give an overview of principles for reporting information.

(2) In 40 CFR 1065.10 and 1065.12 we specify information needs for

establishing various changes to published engine-based test procedures.

(3) In 40 CFR 1065.25 we establish basic guidelines for storing test information.

(4) In 40 CFR 1065.695 we identify data that may be appropriate for collecting during testing of in-use engines or vehicles using portable analyzers.

(d) We specify the following requirements related to the general compliance provisions in 40 CFR part 1068:

(1) In 40 CFR 1068.5 we establish a process for evaluating good engineering judgment related to testing and certification.

(2) In 40 CFR 1068.25 we describe general provisions related to sending and keeping information

(3) In 40 CFR 1068.27 we require manufacturers to make engines or vehicles available for our testing or inspection if we make such a request.

(4) In 40 CFR 1068.105 we require manufacturers to keep certain records related to duplicate labels from engine manufacturers.

(5) In 40 CFR 1068.120 we specify recordkeeping related to rebuilding engines.

(6) In 40 CFR part 1068, subpart C, we identify several reporting and recordkeeping items for making demonstrations and getting approval related to various exemptions.

(7) In 40 CFR part 1068, subpart D, we identify several reporting and recordkeeping items for making demonstrations and getting approval related to importing engines or vehicles.

(8) In 40 CFR 1068.450 and 1068.455 we specify certain records related to testing production-line engines in a selective enforcement audit.

(9) In 40 CFR 1068.501 we specify certain records related to investigating and reporting emission-related defects.

(10) In 40 CFR 1068.525 and 1068.530 we specify certain records related to recalling nonconforming vehicles.

■ 207 A new part 1054 is added to subchapter U of chapter I to read as follows:

PART 1054—CONTROL OF EMISSIONS FROM NEW, SMALL NONROAD SPARK-IGNITION ENGINES AND EQUIPMENT

Subpart A—Overview and Applicability

Sec.

Subpart B—Emission Standards and Related Requirements

Subpart C—Certifying Emission Families

Subpart D—Production-line Testing

Subpart E—In-use Testing

Subpart F—Test Procedures

Subpart G—Special Compliance Provisions

Subpart H—Averaging, Banking, and Trading for Certification

Authority: 42 U.S.C. 7401–7671q.

Subpart A—Overview and Applicability

§ 1054.1 Does this part apply for my engines and equipment?

(a) Except as provided in § 1054.5, the regulations in this part 1054 apply as follows:

(1) The requirements of this part related to exhaust emissions apply to new, spark-ignition engines with maximum engine power at or below 19 kW. This includes auxiliary marine spark-ignition engines.

(2) The requirements of this part related to evaporative emissions apply as specified in §§ 1054.110 and 1054.112 to fuel systems used with engines subject to exhaust emission standards in this part if the engines use a volatile liquid fuel (such as gasoline).

(3) This part 1054 applies starting with the model years noted in the following table:

TABLE 1 TO § 1054.1—PART 1054 APPLICABILITY BY MODEL YEAR

Engine type	Engine displacement	Model year
Handheld	all	2010
Nonhandheld	displacement < 225 cc.	2012
Nonhandheld	displacement ≥ 225 cc.	2011

(4) This part 1054 applies for other spark-ignition engines as follows:

(i) The provisions of §§ 1054.620 and 1054.801 apply for engines used solely for competition beginning January 1, 2010.

(ii) The provisions of §§ 1054.660 and 1054.801 apply for engines used in emergency rescue equipment beginning January 1, 2010.

(5) We specify provisions in § 1054.145(e) and (f) and in § 1054.740 that allow for meeting the requirements of this part before the dates shown in Table 1 to this section. Engines, fuel-system components, or equipment certified to these standards are subject to all the requirements of this part as if these optional standards were mandatory.

(b) Although the definition of nonroad engine in 40 CFR 1068.30 excludes certain engines used in stationary applications, stationary engines are required under 40 CFR part 60, subpart JJJJ, to comply with this part starting with the model years shown in Table 1 to this section.

(c) See 40 CFR part 90 for requirements that apply to engines not yet subject to the requirements of this part 1054.

(d) In certain cases, the regulations in this part 1054 apply to engines with maximum engine power above 19 kW that would otherwise be covered by 40 CFR part 1048 or 1051. See 40 CFR 1048.615 and 1051.145(a)(3) for provisions related to these allowances.

(e) In certain cases, the regulations in this part 1054 apply to propulsion marine engines that would otherwise be covered by 40 CFR part 1045. See 40 CFR 1045.610 for provisions related to these allowances.

§ 1054.2 Who is responsible for compliance?

The requirements and prohibitions of this part apply to manufacturers of engines and equipment, as described in § 1054.1. The requirements of this part are generally addressed to manufacturers subject to this part's requirements. The term ''you'' generally means the certifying manufacturer. For provisions related to exhaust emissions, this generally means the engine manufacturer, especially for issues related to certification (including production-line testing, reporting, etc.). For provisions related to certification with respect to evaporative emissions, this generally means the equipment manufacturer. Equipment manufacturers must meet applicable requirements as described in § 1054.20. Engine manufacturers that assemble an engine's complete fuel system are considered to be the equipment manufacturer with respect to evaporative emissions (see 40 CFR 1060.5). Note that certification requirements for component manufacturers are described in 40 CFR part 1060.

§ 1054.5 Which nonroad engines are excluded from this part's requirements?

This part does not apply to the following nonroad engines:

(a) Engines that are certified to meet the requirements of 40 CFR part 1051 (for example, engines used in snowmobiles and all-terrain vehicles). Engines that are otherwise subject to 40 CFR part 1051 but not required to be certified (such as engines exempted under 40 CFR part 1051) are also excluded from this part 1054, unless the regulations in 40 CFR part 1051 specifically require them to comply with the requirements of this part 1054.

(b) Engines that are certified to meet the requirements of 40 CFR part 1048, subject to the provisions of § 1054.615.

(c) Propulsion marine engines. See 40 CFR parts 91 and 1045. Note that the evaporative emission standards of this part also do not apply with respect to auxiliary marine engines as described in § 1054.20.

(d) Engines used in reduced-scale models of vehicles that are not capable of transporting a person.

§ 1054.10 How is this part organized?

This part 1054 is divided into the following subparts:

(a) Subpart A of this part defines the applicability of this part 1054 and gives an overview of regulatory requirements.

(b) Subpart B of this part describes the emission standards and other requirements that must be met to certify engines under this part. Note that § 1054.145 discusses certain interim requirements and compliance provisions that apply only for a limited time.

(c) Subpart C of this part describes how to apply for a certificate of conformity.

(d) Subpart D of this part describes general provisions for testing production-line engines.

(e) Subpart E of this part describes general provisions for testing in-use engines.

(f) Subpart F of this part describes how to test your engines (including references to other parts of the Code of Federal Regulations).

(g) Subpart G of this part and 40 CFR part 1068 describe requirements, prohibitions, and other provisions that apply to engine manufacturers, equipment manufacturers, owners, operators, rebuilders, and all others.

(h) Subpart H of this part describes how you may generate and use exhaust and evaporative emission credits to certify your engines and equipment.

(i) Subpart I of this part contains definitions and other reference information.

§ 1054.15 Do any other CFR parts apply to me?

(a) Part 1060 of this chapter describes standards and procedures that apply for controlling evaporative emissions from engines fueled by gasoline or other volatile liquid fuels and the associated fuel systems. See §§ 1054.110 and 1054.112 for information about how that part applies.

(b) Part 1065 of this chapter describes procedures and equipment specifications for testing engines to measure exhaust emissions. Subpart F of this part 1054 describes how to apply the provisions of part 1065 of this chapter to determine whether engines meet the exhaust emission standards in this part.

(c) The requirements and prohibitions of part 1068 of this chapter apply to everyone, including anyone who manufactures, imports, installs, owns, operates, or rebuilds any of the engines subject to this part 1054, or equipment containing these engines. Part 1068 of this chapter describes general provisions, including these seven areas:

(1) Prohibited acts and penalties for engine manufacturers, equipment manufacturers, and others.

(2) Rebuilding and other aftermarket changes.

(3) Exclusions and exemptions for certain engines.

(4) Importing engines.

(5) Selective enforcement audits of your production.

(6) Defect reporting and recall.

(7) Procedures for hearings.

(d) Other parts of this chapter apply if referenced in this part.

§ 1054.20 What requirements apply to my equipment?

(a) If you manufacture equipment using engines certified under this part, your equipment must meet all applicable emission standards with the engine and fuel system installed.

(b) Except as specified in paragraph (f) of this section, all equipment subject to the exhaust standards of this part must meet the evaporative emission standards of 40 CFR part 1060, as described in §§ 1054.110 and 1054.112.

(c) Except as specified in paragraph (f) of this section, you must identify and label equipment you produce under this section consistent with the requirements of 40 CFR 1060.135.

(d) You may need to certify your equipment or fuel systems as described in 40 CFR 1060.1 and 1060.601.

(e) You must follow all emission-related installation instructions from the certifying manufacturers as described in § 1054.130, 40 CFR 1060.130, and 40 CFR 1068.105. Failure to follow these instructions subjects you to civil penalties as described in 40 CFR part 1068, subpart B.

(f) Motor vehicles and marine vessels may contain engines subject to the exhaust emission standards in this part 1054. Evaporative emission standards apply to these products as follows:

(1) Marine vessels using spark-ignition engines are subject to the requirements of 40 CFR part 1045. The vessels are not required to comply with the evaporative emission standards and related requirements of this part 1054.

(2) Motor vehicles are subject to the requirements of 40 CFR part 86. They are not required to comply with the evaporative emission standards and related requirements of this part 1054.

§ 1054.30 Submission of information.

(a) This part includes various requirements to record data or other information. Refer to § 1054.825 and 40 CFR 1068.25 regarding recordkeeping requirements. If recordkeeping requirements are not specified, store these records in any format and on any media and keep them readily available for one year after you send an associated application for certification, or one year after you generate the data if they do not support an application for certification. You must promptly send us organized, written records in English if we ask for them. We may review them at any time.

(b) The regulations in § 1054.255 and 40 CFR 1068.101 describe your obligation to report truthful and complete information and the consequences of failing to meet this obligation. This includes information not related to certification.

(c) Send all reports and requests for approval to the Designated Compliance Officer (see § 1054.801).

(d) Any written information we require you to send to or receive from another company is deemed to be a required record under this section. Such records are also deemed to be submissions to EPA. We may require you to send us these records whether or not you are a certificate holder.

Subpart B—Emission Standards and Related Requirements

§ 1054.101 What emission standards and requirements must my engines meet?

(a) *Exhaust emissions.* You must show that your engines meet the following exhaust emission standards, except as specified in paragraphs (b) through (d) of this section:

(1) Handheld engines must meet the exhaust emission standards in § 1054.103.

(2) Nonhandheld engines must meet the exhaust emission standards in § 1054.105.

(3) All engines must meet the requirements in § 1054.115.

(b) *Evaporative emissions.* Except as specified in § 1054.20, new equipment using engines that run on a volatile liquid fuel (such as gasoline) must meet the evaporative emission requirements of 40 CFR part 1060. The requirements of 40 CFR part 1060 that apply are considered also to be requirements of this part 1054. Marine vessels using auxiliary marine engines subject to this part must meet the evaporative emission requirements in 40 CFR 1045.112 instead of the evaporative emission requirements in this part. We specify evaporative emission requirements for handheld and nonhandheld equipment separately in §§ 1054.110 and 1054.112.

(c) *Wintertime engines.* Emission standards regulating HC and NO_X exhaust emissions are optional for wintertime engines. However, if you certify an emission family to such standards, those engines are subject to all the requirements of this part as if these optional standards were mandatory.

(d) *Two-stroke snowthrower engines.* Two-stroke snowthrower engines may meet exhaust emission standards that apply to handheld engines with the same engine displacement instead of the nonhandheld standards that would otherwise apply.

(e) *Relationship between handheld and nonhandheld engines.* Any engines certified to the nonhandheld emission standards in § 1054.105 may be used in either handheld or nonhandheld equipment. Engines above 80 cc certified to the handheld emission standards in § 1054.103 may not be used in nonhandheld equipment. For purposes of the requirements of this part, engines at or below 80 cc are considered handheld engines, but may be installed in either handheld or nonhandheld equipment. These engines are subject to handheld exhaust emission standards; the equipment in which they are installed are subject to handheld evaporative emission standards starting with the model years specified in this part 1054. See § 1054.701(c) for special provisions related to emission credits for engine families with displacement at or below 80 cc where those engines are installed in nonhandheld equipment.

(f) *Interim provisions.* It is important that you read § 1054.145 to determine if there are other interim requirements or interim compliance provisions that apply for a limited time.

§ 1054.103 What exhaust emission standards must my handheld engines meet?

(a) *Emission standards.* Exhaust emissions from your handheld engines may not exceed the emission standards in Table 1 to this section. Measure emissions using the applicable steady-state test procedures described in subpart F of this part.

TABLE 1 TO § 1054.103—PHASE 3 EMISSION STANDARDS FOR HANDHELD ENGINES (g/kW-hr)

Engine displacement class	$HC+NO_X$	CO
Class III	50	805
Class IV	50	805
Class V	72	603

(b) *Averaging, banking, and trading.* You may generate or use emission credits under the averaging, banking, and trading (ABT) program for $HC+NO_X$ emissions as described in subpart H of this part. You may not generate or use emission credits for CO emissions. To generate or use emission credits, you must specify a family emission limit for each engine family you include in the ABT program. These family emission limits serve as the emission standards for the engine family with respect to all required testing instead of the standards specified in this section. An engine family meets emission standards even if its family emission limit is higher than the standard, as long as you show that the whole averaging set of applicable engine families meets the emission standards using emission credits and the engines within the family meet the family emission limit. The following FEL caps are the maximum values you may specify for family emission limits:

(1) 336 g/kW-hr for Class III engines.

(2) 275 g/kW-hr for Class IV engines.

(3) 186 g/kW-hr for Class V engines.

(c) *Fuel types.* The exhaust emission standards in this section apply for engines using the fuel type on which the engines in the emission family are designed to operate. You must meet the numerical emission standards for hydrocarbons in this section based on the following types of hydrocarbon emissions for engines powered by the following fuels:

(1) Alcohol-fueled engines: THCE emissions.

(2) Natural gas-fueled engines: NMHC emissions.

(3) Other engines: THC emissions.

(d) *Useful life.* Your engines must meet the exhaust emission standards in paragraph (a) of this section over their full useful life as described in § 1054.107.

(e) *Applicability for testing.* The emission standards in this subpart apply to all testing, including certification, production-line, and in-use testing.

§ 1054.105 What exhaust emission standards must my nonhandheld engines meet?

(a) *Emission standards.* Exhaust emissions from your engines may not exceed the emission standards in Table 1 to this section. Measure emissions using the applicable steady-state test procedures described in subpart F of this part.

TABLE 1 TO § 1054.105—PHASE 3 EMISSION STANDARDS FOR NONHANDHELD ENGINES (g/kW-hr)

Engine displacement class	$HC+NO_X$	Primary CO standard	CO standard for marine generator engines
Class I	10.0	610	5.0
Class II	8.0	610	5.0

(b) *Averaging, banking, and trading.* You may generate or use emission credits under the averaging, banking, and trading (ABT) program for $HC+NO_X$ emissions as described in subpart H of this part. You may not generate or use emission credits for CO emissions. To generate or use emission credits, you must specify a family emission limit for each engine family you include in the ABT program. These family emission limits serve as the emission standards for the engine family with respect to all required testing instead of the standards specified in this section. An engine family meets emission standards even if its family emission limit is higher than the standard, as long as you show that the whole averaging set of applicable engine families meets the emission standards using emission credits, and the engines within the family meet the family emission limit. The following FEL caps are the maximum values you may specify for family emission limits:

(1) 40.0 g/kW-hr for Class I engines with displacement below 100 cc.

(2) 16.1 g/kW-hr for Class I engines with displacement at or above 100 cc.

(3) 12.1 for Class II engines.

(c) *Fuel types.* The exhaust emission standards in this section apply for engines using the fuel type on which the engines in the emission family are designed to operate. You must meet the numerical emission standards for hydrocarbons in this section based on the following types of hydrocarbon emissions for engines powered by the following fuels:

(1) Alcohol-fueled engines: THCE emissions.

(2) Natural gas-fueled engines: NMHC emissions.

(3) Other engines: THC emissions.

(d) *Useful life.* Your engines must meet the exhaust emission standards in paragraph (a) of this section over their full useful life as described in § 1054.107.

(e) *Applicability for testing.* The emission standards in this subpart apply to all testing, including certification, production-line, and in-use testing.

§ 1054.107 What is the useful life period for meeting exhaust emission standards?

This section describes an engine family's useful life, which is the period during which engines are required to comply with all emission standards that apply. The useful life period is five years or a number of hours of operation, whichever comes first, as described in this section.

(a) Determine the useful life period for exhaust requirements as follows:

(1) Except as specified in paragraphs (a)(2) and (3) of this section, the useful life period for exhaust requirements is the number of engine operating hours from Table 1 to this section that most closely matches the expected median in-use life of your engines. The median in-use life of your engine is the shorter of the following values:

(i) The median in-use life of equipment into which the engine is expected to be installed.

(ii) The median in-use life of the engine without being scrapped or rebuilt.

TABLE 1 TO § 1054.107—NOMINAL USEFUL LIFE PERIODS

Nonhandheld			
	Residential	Extended life residential [1]	Commercial
Class I	125	250	500
Class II	250	500	1,000
Handheld			
	Light use	Medium use	Heavy use
Class III—V	50	125	300

[1] Or "General Purpose."

(2) You may select a longer useful life for nonhandheld engines than that specified in paragraph (a)(1) of this section in 100-hour increments not to exceed 3,000 hours for Class I engines or 5,000 hours for Class II engines. For engine families generating emission credits, you may do this only with our approval. These are considered ''Heavy Commercial'' engines.

(3) The minimum useful life period for engines with maximum engine power above 19 kW is 1,000 hours (see § 1054.1(d)).

(b) Keep any available information to support your selection and make it available to us if we ask for it. We may require you to certify to a different useful life value from the table if we determine that the selected useful life value is not justified by the data. We may consider any relevant information, including your product warranty statements and marketing materials regarding engine life, in making this determination. We may void your certificate if we determine that you intentionally selected an incorrect value. Support your selection based on any of the following information:

(1) Surveys of the life spans of the equipment in which the subject engines are installed.

(2) Engineering evaluations of field aged engines to ascertain when engine performance deteriorates to the point where usefulness and/or reliability is impacted to a degree sufficient to necessitate overhaul or replacement.

(3) Failure reports from engine customers.

(4) Engineering evaluations of the durability, in hours, of specific engine technologies, engine materials, or engine designs.

§ 1054.110 What evaporative emission standards must my handheld equipment meet?

The following evaporative emission requirements apply for handheld equipment over a useful life of five years:

(a) *Fuel line permeation.* Nonmetal fuel lines must meet the permeation requirements for EPA Nonroad Fuel Lines or EPA Cold-Weather Fuel Lines as specified in 40 CFR 1060.102. These requirements apply starting in the 2012 model year, except that they apply starting in the 2013 model year for emission families involving small-volume emission families that are not used in cold-weather equipment. For fuel lines used in cold-weather equipment, you may generate or use emission credits to show compliance with these permeation standards through 2015 as described in § 1054.145(h).

(b) *Tank permeation.* Fuel tanks must meet the permeation requirements specified in 40 CFR 1060.103. These requirements apply for handheld equipment starting in the 2010 model year, except that they apply starting in the 2011 model year for structurally integrated nylon fuel tanks, in the 2012 model year for handheld equipment using nonhandheld engines, and in the 2013 model year for all small-volume emission families. For nonhandheld equipment using engines at or below 80 cc, the requirements of this paragraph (b) apply starting in the 2012 model year. (Note: 40 CFR 90.129 specifies emission standards for certain 2009 model year engines and equipment.) You may generate or use emission credits to show compliance with the requirements of this paragraph (b) under the averaging, banking, and trading program as described in subpart H of this part. FEL caps apply as specified in § 1054.112(b)(1) through (3) starting in the 2015 model year.

(c) *Running loss.* The running loss requirements specified in 40 CFR part 1060 do not apply for handheld equipment.

(d) *Other requirements.* The provisions of 40 CFR 1060.101(e) and (f) include general requirements that apply to all nonroad equipment subject to evaporative emission standards.

(e) *Engine manufacturers.* To the extent that engine manufacturers produce engines with fuel lines or fuel tanks, those fuel-system components must meet the requirements specified in this section. The timing of new standards is based on the date of manufacture of the engine.

§ 1054.112 What evaporative emission standards must my nonhandheld equipment meet?

The evaporative emission requirements of this section apply starting in the 2011 model year for equipment using Class II engines and in the 2012 model year for equipment using Class I engines over a useful life of five years. See § 1054.110 for requirements that apply for nonhandheld equipment using engines at or below 80 cc.

(a) *Fuel line permeation.* Nonmetal fuel lines must meet the permeation requirements for EPA Nonroad Fuel Lines as specified in 40 CFR 1060.102.

(b) *Tank permeation.* Fuel tanks must meet the permeation requirements specified in 40 CFR 1060.103. Equipment manufacturers may generate or use emission credits to show compliance with the requirements of this paragraph (b) under the averaging, banking, and trading program as described in subpart H of this part. Starting in the 2014 model year for Class II equipment and in the 2015 model year for Class I equipment, the following FEL caps represent the maximum values for family emission limits that you may use for your fuel tanks:

(1) Except as specified in paragraphs (b)(2) of this section, you may not use fuel tanks with a family emission limit that exceeds 5.0 $g/m^2/day$ for testing at a nominal temperature of 28 °C, or 8.3 $g/m^2/day$ for testing at a nominal temperature of 40 °C.

(2) For small-volume emission families, you may not use fuel tanks with a family emission limit that exceeds 8.0 $g/m^2/day$ for testing at a nominal temperature of 28 °C, or 13.3 g/

m2/day for testing at a nominal temperature of 40 °C.

(3) FEL caps do not apply to fuel caps that are certified separately to meet permeation standards.

(c) *Running loss.* Running loss requirements apply as specified in 40 CFR 1060.104.

(d) *Diurnal emissions.* Nonhandheld equipment may optionally be certified to the diurnal emission standards specified in 40 CFR 1060.105, in which case the permeation standards specified in paragraphs (a) and (b) of this section do not apply.

(e) *Other requirements.* The provisions of 40 CFR 1060.101(e) and (f) include general requirements that apply to all nonroad equipment subject to evaporative emission standards.

(f) *Engine manufacturers.* To the extent that engine manufacturers produce engines with fuel lines or fuel tanks, those fuel-system components must meet the requirements specified in this section. The timing of new standards is based on the date of manufacture of the engine.

§ 1054.115 What other requirements apply?

The following requirements apply with respect to engines that are required to meet the emission standards of this part:

(a) *Crankcase emissions.* Crankcase emissions may not be discharged directly into the ambient atmosphere from any engine throughout its useful life, except as follows:

(1) Snowthrower engines may discharge crankcase emissions to the ambient atmosphere if the emissions are added to the exhaust emissions (either physically or mathematically) during all emission testing. If you take advantage of this exception, you must do the following things:

(i) Manufacture the engines so that all crankcase emissions can be routed into the applicable sampling systems specified in 40 CFR part 1065.

(ii) Account for deterioration in crankcase emissions when determining exhaust deterioration factors.

(2) For purposes of this paragraph (a), crankcase emissions that are routed to the exhaust upstream of exhaust aftertreatment during all operation are not considered to be discharged directly into the ambient atmosphere.

(b) *Adjustable parameters.* Engines that have adjustable parameters must meet all the requirements of this part for any adjustment in the physically adjustable range. An operating parameter is not considered adjustable if you permanently seal it or if it is not normally accessible using ordinary tools. We may require that you set adjustable parameters to any specification within the adjustable range during any testing, including certification testing, production-line testing, or in-use testing. You may ask us to limit idle-speed or carburetor adjustments to a smaller range than the physically adjustable range if you show us that the engine will not be adjusted outside of this smaller range during in-use operation without significantly degrading engine performance.

(c) *Altitude adjustments.* Engines must meet applicable emission standards for valid tests conducted under the ambient conditions specified in 40 CFR 1065.520. Except as specified in § 1054.145(c), engines must meet applicable emission standards at all specified atmospheric pressures, except that for atmospheric pressures below 94.0 kPa you may rely on an altitude kit for all testing if you meet the requirements specified in § 1054.205(r). If you rely on an altitude kit for certification, you must identify in the owners manual the altitude range for which you expect proper engine performance and emission control with and without the altitude kit; you must also state in the owners manual that operating the engine with the wrong engine configuration at a given altitude may increase its emissions and decrease fuel efficiency and performance. See § 1054.145(c) for special provisions that apply for handheld engines.

(d) *Prohibited controls.* You may not design your engines with emission-control devices, systems, or elements of design that cause or contribute to an unreasonable risk to public health, welfare, or safety while operating. For example, this would apply if the engine emits a noxious or toxic substance it would otherwise not emit that contributes to such an unreasonable risk.

(e) *Defeat devices.* You may not equip your engines with a defeat device. A defeat device is an auxiliary emission control device that reduces the effectiveness of emission controls under conditions that the engine may reasonably be expected to encounter during normal operation and use. This does not apply for altitude kits installed or removed consistent with § 1054.655. This also does not apply to auxiliary emission control devices you identify in your application for certification if any of the following is true:

(1) The conditions of concern were substantially included in the applicable duty-cycle test procedures described in subpart F of this part.

(2) You show your design is necessary to prevent engine (or equipment) damage or accidents.

(3) The reduced effectiveness applies only to starting the engine.

§ 1054.120 What emission-related warranty requirements apply to me?

The requirements of this section apply to the manufacturer certifying with respect to exhaust emissions. See 40 CFR part 1060 for the warranty requirements related to evaporative emissions.

(a) *General requirements.* You must warrant to the ultimate purchaser and each subsequent purchaser that the new engine, including all parts of its emission control system, meets two conditions:

(1) It is designed, built, and equipped so it conforms at the time of sale to the ultimate purchaser with the requirements of this part.

(2) It is free from defects in materials and workmanship that may keep it from meeting these requirements.

(b) *Warranty period.* Your emission-related warranty must be valid during the periods specified in this paragraph (b). You may offer an emission-related warranty more generous than we require. The emission-related warranty for the engine may not be shorter than any published warranty you offer without charge for the engine. Similarly, the emission-related warranty for any component may not be shorter than any published warranty you offer without charge for that component. If an engine has no hour meter, we base the warranty periods in this paragraph (b) only on the engine's age (in years). The warranty period begins on the date of sale to the ultimate purchaser. The minimum warranty periods are as follows:

(1) The minimum warranty period is two years except as allowed under paragraph (b)(2) or (3) of this section.

(2) We may establish a shorter warranty period for handheld engines subject to severe service in seasonal equipment if we determine that these engines are likely to operate for a number of hours greater than the applicable useful life within 24 months. You must request this shorter warranty period in your application for certification or in an earlier submission.

(3) For engines equipped with hour meters, you may deny warranty claims for engines that have accumulated a number of hours greater than 50 percent of the applicable useful life.

(c) *Components covered.* The emission-related warranty covers all components whose failure would increase an engine's emissions of any regulated pollutant, including components listed in 40 CFR part 1068, Appendix I, and components from any other system you develop to control emissions. The emission-related warranty covers these components even if another company produces the component. Your emission-related warranty does not cover components whose failure would not increase an engine's emissions of any regulated pollutant.

(d) *Limited applicability.* You may deny warranty claims under this section if the operator caused the problem through improper maintenance or use, as described in 40 CFR 1068.115.

(e) *Owners manual.* Describe in the owners manual the emission-related warranty provisions from this section that apply to the engine. Include instructions for obtaining warranty service consistent with the requirements of paragraph (f) of this section.

(f) *Requirements related to warranty claims.* You are required at a minimum to meet the following conditions to ensure that owners will be able to promptly obtain warranty repairs:

(1) You must provide and monitor a toll-free telephone number and an e-mail address for owners to receive information about how to make a warranty claim, and how to make arrangements for authorized repairs.

(2) You must provide a source of replacement parts within the United States. For parts that you import, this requires you to have at least one distributor within the United States.

(3) You must use one of the following methods to show that you will generally be able to honor warranty claims:

(i) If you have authorized service centers in all U.S. population centers with a population of 100,000 or more based on the 2000 census, you may limit warranty repairs to these service providers.

(ii) You may limit warranty repairs to authorized service centers for owners located within 100 miles of an authorized service center. For owners located more than 100 miles from an authorized service center, you must state in your warranty that you will either pay for shipping costs to and from an authorized service center, provide for a service technician to come to the owner to make the warranty repair, or pay for the repair to be made at a local nonauthorized service center. The provisions of this paragraph (f)(3)(ii) apply only for the contiguous states, excluding the states with high-altitude areas identified in 40 CFR part 1068, Appendix III.

(iii) You may use the approach described in paragraphs (f)(3)(i) of this section for some states and the approach described in paragraph (f)(3)(ii) of this section for other states. However, you must have at least one authorized service center in each state unless the whole state is within 100 miles of authorized service centers in other states.

(4) If your plan for meeting the requirements of this paragraph (f) does not include at least 100 authorized repair facilities in the United States or at least one such facility for each 5,000 engines you sell in the United States, you must also post a bond as described in § 1054.690 to ensure that you will fulfill your warranty-repair responsibilities even if you are not obligated to post a bond under that section. Note that you may post a single bond to meet the requirements of this section and § 1054.690.

§ 1054.125 What maintenance instructions must I give to buyers?

Give the ultimate purchaser of each new engine written instructions for properly maintaining and using the engine, including the emission control system as described in this section. The maintenance instructions also apply to service accumulation on your emission-data engines as described in § 1054.245 and in 40 CFR part 1065. Note that for handheld engines subject to Phase 3 standards you may perform maintenance on emission-data engines during service accumulation as described in 40 CFR part 90.

(a) *Critical emission-related maintenance.* Critical emission-related maintenance includes any adjustment, cleaning, repair, or replacement of critical emission-related components. This may also include additional emission-related maintenance that you determine is critical if we approve it in advance. You may schedule critical emission-related maintenance on these components if you meet the following conditions:

(1) You demonstrate that the maintenance is reasonably likely to be done at the recommended intervals on in-use engines. We will accept scheduled maintenance as reasonably likely to occur if you satisfy any of the following conditions:

(i) You present data showing that any lack of maintenance that increases emissions also unacceptably degrades the engine's performance.

(ii) You present survey data showing that at least 80 percent of engines in the field get the maintenance you specify at the recommended intervals. If the survey data show that 60 to 80 percent of engines in the field get the maintenance you specify at the recommended intervals, you may ask us to consider additional factors such as the effect on performance and emissions. For example, we may allow you to schedule fuel-injector replacement as critical emission-related maintenance if you have survey data showing this is done at the recommended interval for 65 percent of engines and you demonstrate that performance degradation is roughly proportional to the degradation in emission control for engines that do not have their fuel injectors replaced.

(iii) You provide the maintenance free of charge and clearly say so in your maintenance instructions.

(iv) You otherwise show us that the maintenance is reasonably likely to be done at the recommended intervals.

(2) You may schedule cleaning or changing air filters or changing spark plugs at the least frequent interval described in the owners manual. See § 1054.245 for testing requirements related to these maintenance steps.

(3) You may not schedule critical emission-related maintenance within the useful life period for aftertreatment devices, pulse-air valves, fuel injectors, oxygen sensors, electronic control units, superchargers, or turbochargers, except as specified in paragraph (b) or (c) of this section.

(b) *Recommended additional maintenance.* You may recommend any additional amount of maintenance on the components listed in paragraph (a) of this section, as long as you state clearly that these maintenance steps are not necessary to keep the emission-related warranty valid. If operators do the maintenance specified in paragraph (a) of this section, but not the recommended additional maintenance, this does not allow you to disqualify those engines from in-use testing or deny a warranty claim. Do not take these maintenance steps during service accumulation on your emission-data engines.

(c) *Special maintenance.* You may specify more frequent maintenance to address problems related to special situations, such as atypical engine operation. You must clearly state that this additional maintenance is associated with the special situation you are addressing.

(d) *Noncritical emission-related maintenance.* Subject to the provisions of this paragraph (d), you may schedule any amount of emission-related inspection or maintenance that is not covered by paragraph (a) of this section (i.e., maintenance that is neither explicitly identified as critical emission-related maintenance, nor that we approve as critical emission-related maintenance). Noncritical emission-related maintenance generally includes re-seating valves, removing combustion chamber deposits, or any other emission-related maintenance on the components we specify in 40 CFR part 1068, Appendix I that is not covered in paragraph (a) of this section. You must state in the owners manual that these steps are not necessary to keep the emission-related warranty valid. If operators fail to do this maintenance, this does not allow you to disqualify those engines from in-use testing or deny a warranty claim. Do not take these inspection or maintenance steps during service accumulation on your emission-data engines.

(e) *Maintenance that is not emission-related.* For maintenance unrelated to emission controls, you may schedule any amount of inspection or maintenance. You may also take these inspection or maintenance steps during service accumulation on your emission-data engines, as long as they are reasonable and technologically necessary. This might include adding engine oil, changing fuel or oil filters, servicing engine-cooling systems, and adjusting idle speed, governor, engine bolt torque, valve lash, or injector lash. You may perform this nonemission-related maintenance on emission-data engines at the least frequent intervals that you recommend to the ultimate purchaser (but not the intervals recommended for severe service).

(f) *Source of parts and repairs.* State clearly on the first page of your written maintenance instructions that a repair shop or person of the owner's choosing may maintain, replace, or repair emission control devices and systems. Your instructions may not require components or service identified by brand, trade, or corporate name. Also, do not directly or indirectly condition your warranty on a requirement that the engine be serviced by your franchised dealers or any other service establishments with which you have a commercial relationship. You may disregard the requirements in this paragraph (f) if you do one of two things:

(1) Provide a component or service without charge under the purchase agreement.

(2) Get us to waive this prohibition in the public's interest by convincing us the engine will work properly only with the identified component or service.

(g) *Payment for scheduled maintenance.* Owners are responsible for properly maintaining their engines. This generally includes paying for scheduled maintenance. However, manufacturers must pay for scheduled maintenance during the useful life if it meets all the following criteria:

(1) Each affected component was not in general use on similar engines before 1997.

(2) The primary function of each affected component is to reduce emissions.

(3) Failure to perform the maintenance would not cause clear problems that would significantly degrade the engine's performance.

(h) *Owners manual.* Explain the owner's responsibility for proper maintenance in the owners manual.

§ 1054.130 What installation instructions must I give to equipment manufacturers?

(a) If you sell an engine for someone else to install in a piece of equipment, give the engine installer instructions for installing it consistent with the requirements of this part. Include all information necessary to ensure that an engine will be installed in its certified configuration.

(b) Make sure the instructions have the following information:

(1) Include the heading: ''Emission-related installation instructions''.

(2) State: ''Failing to follow these instructions when installing a certified engine in nonroad equipment violates federal law (40 CFR 1068.105(b)), subject to fines or other penalties as described in the Clean Air Act.''

(3) Describe the instructions needed to properly install the exhaust system and any other components. Include instructions consistent with the requirements of § 1054.655 related to altitude kits.

(4) Describe the steps needed to control evaporative emissions in accordance with certificates of conformity that you hold. Include instructions for connecting fuel lines as needed to prevent running loss emissions, if applicable. Such instructions must include sufficient detail to ensure that running loss control will not cause the engine to exceed exhaust emission standards. For example, you may specify a maximum vapor flow rate under normal operating conditions. Also include notification that the installer must meet the requirements of § 1054.112 and 40 CFR part 1060.

(5) Describe any limits on the range of applications needed to ensure that the engine remains in its certified configuration after installation. For example, if you certify engines only for rated-speed applications tell equipment manufacturers that the engine must not be installed in equipment involving intermediate-speed operation. Also, if your wintertime engines are not certified to the otherwise applicable $HC+NO_X$ standards, tell equipment manufacturers that the engines must be installed in equipment that is used only in wintertime.

(6) Describe any other instructions to make sure the installed engine will operate according to design specifications in your application for certification. For example, this may include specified limits for catalyst systems, such as exhaust backpressure, catalyst location, and temperature profiles during engine operation.

(7) State: ''If you install the engine in a way that makes the engine's emission control information label hard to read during normal engine maintenance, you must place a duplicate label on the equipment, as described in 40 CFR 1068.105.''

(c) You do not need installation instructions for engines you install in your own equipment.

(d) Provide instructions in writing or in an equivalent format. For example, you may post instructions on a publicly available Web site for downloading or printing. If you do not provide the instructions in writing, explain in your application for certification how you will ensure that each installer is informed of the installation requirements.

§ 1054.135 How must I label and identify the engines I produce?

The provisions of this section apply to engine manufacturers.

(a) Assign each engine a unique identification number and permanently affix, engrave, or stamp it on the engine in a legible way.

(b) At the time of manufacture, affix a permanent and legible label identifying each engine. The label must be—

(1) Attached in one piece so it is not removable without being destroyed or defaced.

(2) Secured to a part of the engine needed for normal operation and not normally requiring replacement.

(3) Durable and readable for the engine's entire life.

(4) Written in English.

(c) The label must conform to the following specifications without exception:

(1) Include the heading ''EMISSION CONTROL INFORMATION''.

(2) Include your full corporate name and trademark. You may identify another company and use its trademark instead of yours if you comply with the provisions of § 1054.640.

(3) Include EPA's standardized designation for the emission family (and subfamily, where applicable).

(4) State the following based on the useful life requirements in § 1054.107: ''EMISSION COMPLIANCE PERIOD = [identify applicable useful life period] HOURS''. In addition to specifying the hours, you may optionally add the descriptive terms specified in § 1054.107(a) to characterize the useful life. You may use the term Heavy Commercial for nonhandheld engines if you establish a longer useful life under § 1054.107(a)(2).

(5) State the engine's displacement (in cubic centimeters); however, you may omit this from the label if all the engines in the emission family have the same per-cylinder displacement and total displacement.

(6) State the date of manufacture [DAY (optional), MONTH, and YEAR]; however, you may omit this from the label if you stamp, engrave, or otherwise permanently identify it elsewhere on the engine, in which case you must also describe in your application for certification where you will identify the date on the engine.

(7) Identify the emission control system. Use terms and abbreviations as described in 40 CFR 1068.45. You may omit this information from the label if there is not enough room for it and you put it in the owners manual instead.

(8) Include one of the following statements:

(i) If you certify the engine only with respect to exhaust emissions, state—

''THIS ENGINE MEETS U.S. EPA EXH REGS FOR [MODEL YEAR].''

(ii) If you certify the engine with respect to exhaust emissions and the equipment with respect to evaporative emissions, state—

''THIS ENGINE MEETS U.S. EPA EXH/EVP REGS FOR [MODEL YEAR].''

(d) The following information may be included on the label or in the owners manual:

(1) List specifications and adjustments for engine tuneups.

(2) Identify the altitude at which an altitude kit should be installed if you specify an altitude kit under § 1054.115(c).

(3) Identify the fuel type and any requirements for fuel and lubricants.

(4) If your nonhandheld engines are certified for use only at rated speed or only at intermediate speed, add the statement: ''CERTIFIED FOR [rated-speed or intermediate-speed] APPLICATIONS ONLY'' or ''CERTIFIED FOR [identify nominal engine speed or range of speeds for testing] OPERATION ONLY''.

(e) You may add information to the emission control information label as follows:

(1) You may identify other emission standards that the engine meets or does not meet (such as California standards). You may include this information by adding it to the statement we specify or by including a separate statement.

(2) You may add other information to ensure that the engine will be properly maintained and used.

(3) You may add appropriate features to prevent counterfeit labels. For example, you may include the engine's unique identification number on the label.

(f) Except for the labeling requirements specified in paragraph (c) of this section, you may ask us to approve modified labeling requirements in this part 1054 if you show that it is necessary or appropriate. We will approve your request if your alternate label is consistent with the requirements of this part.

(g) If others install your engine in their equipment in a way that obscures the engine label such that the label cannot be read during normal maintenance, we require them to add a duplicate label on the equipment (see 40 CFR 1068.105). If equipment manufacturers request it, send them labels that include all the information from the original label and that are clearly identified as duplicate labels. You may omit the date of manufacture from the duplicate label. Keep a written record of each request for five years after it is no longer needed for ongoing production.

(h) Integrated equipment manufacturers certifying their engines and equipment with respect to both exhaust and evaporative emission standards may meet labeling requirements with a single label that has all the required information specified in this section and in 40 CFR 1060.135.

§ 1054.140 What is my engine's maximum engine power and displacement?

This section describes how to quantify your engine's maximum engine power and displacement for the purposes of this part.

(a) An engine configuration's maximum engine power is the maximum brake power point on the nominal power curve for the engine configuration, as defined in this section. Round the power value to the nearest 0.1 kilowatts for nonhandheld engines and to the nearest 0.01 kilowatts for handheld engines. The nominal power curve of an engine configuration is the relationship between maximum available engine brake power and engine speed for an engine, using the mapping procedures of 40 CFR part 1065, based on the manufacturer's design and production specifications for the engine. For handheld engines, we may allow manufacturers to base the nominal power curve on other mapping procedures, consistent with good engineering judgment. This information may also be expressed by a torque curve that relates maximum available engine torque with engine speed. Note that maximum engine power is based on engines and installed engine governors; equipment designs that further limit engine operation do not change maximum engine power.

(b) An engine configuration's displacement is the intended swept volume of all the engine's cylinders. The swept volume of the engine is the product of the internal cross-section area of the cylinders, the stroke length, and the number of cylinders. Calculate the engine's intended swept volume from the design specifications for the cylinders using enough significant figures to allow determination of the displacement to the nearest 0.1 cc. Determine the final value by rounding to the nearest cubic centimeter. For example, for a one-cylinder engine with circular cylinders having an internal diameter of 6.00 cm and a 6.25 cm stroke length, the rounded displacement would be: $(1) \times (6.00/2)^2 \times (\pi) \times (6.25) = 177$ cc.

(c) The nominal power curve and intended swept volume must be within the range of the actual power curves and swept volumes of production engines considering normal production variability. If after production begins it is determined that either your nominal power curve or your intended swept volume does not represent production engines, we may require you to amend your application for certification under § 1054.225.

§ 1054.145 Are there interim provisions that apply only for a limited time?

The provisions in this section apply instead of other provisions in this part. This section describes how and when these interim provisions apply.

(a) *Delayed Phase 3 implementation for engine manufacturers.* Small-volume engine manufacturers may delay complying with the Phase 3 exhaust emission standards and requirements that would otherwise apply, subject to the following conditions:

(1) You may delay meeting the Phase 3 exhaust emission standards until 2013 for Class II engines and until 2014 for Class I engines. The running loss standards in § 1054.112 also do not apply to engines exempted under this paragraph (a), or to equipment using these engines.

(2) You must certify your engines exempted under this section to the Phase 2 standards and requirements specified in 40 CFR 90.103 and summarized in Appendix I of this part. You must meet the labeling requirements in 40 CFR 90.114, but use the following compliance statement instead of the compliance statement in 40 CFR 90.114(c)(7): ''THIS ENGINE COMPLIES WITH U.S. EPA REGULATIONS FOR [CURRENT MODEL YEAR] NONROAD ENGINES UNDER 40 CFR 1054.145(a).''

(3) After the delays indicated in paragraph (a)(1) of this section, you must comply with the same standards and requirements as all other manufacturers except as noted elsewhere in this section.

(4) The provisions of this paragraph (a) may not be used to circumvent the requirements of this part.

(5) You may continue to generate early credits during this two-year period as described under § 1054.740 as if the Phase 3 emission standards applied starting in the 2013 model year for Class II engines and in the 2014 model year for Class I engines.

(b) *Delayed Phase 3 implementation for equipment manufacturers.* The provisions of § 1054.625 describe how manufacturers may produce certain numbers of equipment using Class II engines that meet Phase 2 standards during the first four years that the Phase 3 standards apply.

(c) *Special provisions for handheld engines.* The following provisions apply for handheld engines:

(1) You may use the provisions in 40 CFR 90.104(g) to rely on assigned deterioration factors for small-volume engine manufacturers and for small-volume engine families.

(2) You may perform maintenance on emission-data engines during service accumulation as described in 40 CFR part 90. If your scheduled emission-related maintenance falls within 10 hours of a test point, delay the maintenance until the engine reaches the test point. Measure emissions before and after peforming the maintenance. Use the average values from these two measurements to calculate deterioration factors. The emission-data engine must meet applicable emission standards before and after maintenance to be considered in compliance, as described in § 1054.240(a) and (b).

(3) Engines subject to Phase 3 emission standards must meet the standards at or above barometric pressures of 96.0 kPa in the standard configuration and are not required to meet emission standards at lower barometric pressures. This is intended to allow testing under most weather conditions at all altitudes up to 1,100 feet above sea level. In your application for certification, identify the altitude above which you rely on an altitude kit to meet emission standards and describe your plan for making information and parts available such that you would reasonably expect that altitude kits would be widely used at all such altitudes.

(d) *Alignment of model years for exhaust and evaporative standards.* Evaporative emission standards generally apply based on the model year of the equipment, which is determined by the equipment's date of final assembly. However, in the first year of new emission standards, equipment manufacturers may apply evaporative emission standards based on the model year of the engine as shown on the engine's emission control information label. For example, for the fuel line permeation standards starting in 2012, equipment manufacturers may order a batch of 2011 model year engines for installation in 2012 model year equipment, subject to the anti-stockpiling provisions of 40 CFR 1068.105(a). The equipment with the 2011 model year engines would not need to meet fuel line permeation standards, as long as the equipment is fully assembled by December 31, 2012.

(e) *Early compliance with evaporative emission standards—nonhandheld equipment manufacturers.* You may produce nonhandheld equipment that does not meet the otherwise applicable evaporative emission standards without violating the prohibition in 40 CFR 1068.101(a)(1) if you earn evaporative emission allowances, as follows:

(1) You may earn an evaporative emission allowance from each piece of equipment certified to California's evaporative emission standards by producing it before the requirements of this part start to apply and selling it outside of California. You may use an evaporative emission allowance by selling one piece of equipment that does not meet any EPA evaporative emission standards even though it is subject to the EPA standards. The early-compliant equipment must be covered by an EPA certificate of conformity (see 40 CFR 1060.105(e)).

(2) You may earn an evaporative emission allowance with respect to fuel tank permeation from each piece of equipment certified to EPA's evaporative emission standards by selling it outside of California or in an application that is preempted from California's standards before EPA's fuel tank permeation standards start to apply. The early-compliant fuel tanks must be covered by an EPA certificate of conformity, though you may demonstrate compliance based on the specifications and procedures adopted by the California Air Resources Board. You may use an evaporative emission allowance by selling one piece of equipment with a fuel tank that does not meet the EPA emission standards that would otherwise apply. For example, you can earn an evaporative emission allowance by selling a low-permeation fuel tank for Class II equipment before the 2011 model year, in which case you could sell a piece of Class II equipment in 2011 with a high-permeation fuel tank. You may not generate allowances under this paragraph (e)(2) based on your sales of metal fuel tanks.

(3) Evaporative emission allowances you earn under this paragraph (e) from equipment with Class I engines may be used only for other equipment with Class I engines. Similarly, evaporative emission allowances you earn under this paragraph (e) from equipment with Class II engines may be used only for other equipment with Class II engines.

(4) You must label any equipment using allowances under this paragraph (e) with the following statement: ''EXEMPT FROM EVAPORATIVE STANDARDS UNDER 40 CFR 1054.145(e)''.

(5) You may not use the allowances you generate under this paragraph (e) for 2014 and later model year equipment with Class II engines or for 2015 and later model year equipment with Class I engines.

(6) Send the Designated Compliance Officer the following information for each year in which you use the provisions of this paragraph (e):

(i) Send us a report within 45 days after the end of the model year describing how many pieces of equipment you produced in the preceding model year that generate allowances. You may combine this with the reports specified in § 1054.250(a) if applicable.

(ii) Describe the number of equipment using allowances under this paragraph (e) in your end-of-year reports and final reports after the end of the model year as described in § 1054.730(a). If you do not participate in the averaging, banking, and trading program, send this information separately within 90 days after the end of the model year.

(f) *Early banking for evaporative emission standards—handheld equipment manufacturers.* You may earn emission credits for handheld equipment you produce before the evaporative emission standards of § 1054.110 apply. To do this, your equipment must use fuel tanks with a family emission limit below 1.5 $g/m^2/day$ (or 2.5 $g/m^2/day$ for testing at 40 °C). Calculate your credits as described in § 1054.706 based on the difference between the family emission limit and 1.5 $g/m^2/day$ (or 2.5 $g/m^2/day$ for testing at 40 °C).

(g) *Useful life for evaporative emission standards.* (1) A useful life period of two years applies for fuel tanks or fuel caps certified to meet permeation emission standards in 2013 and earlier model years. However, for fuel tanks with a family emission limit above or below the specified emission standard, calculate emission credits under § 1054.706 based on a useful life of five years.

(2) A useful life period of two years applies for cold-weather fuel lines certified to meet permeation emission standards in 2012 and 2013. However, for fuel lines with a family emission limit above or below the specified emission standard, calculate emission credits under § 1054.706 based on a useful life of five years.

(h) *Emission credit program for cold-weather fuel lines.* In the 2012 through 2015 model years, certifying equipment manufacturers may generate or use emission credits for averaging to show compliance with the permeation standards for cold-weather fuel lines, but not for banking or trading, as follows:

(1) To generate or use emission credits, apply the provisions of subpart H of this part as they apply for fuel tanks except as specified in this paragraph (h). For example, calculate emission credits based on the internal surface area of the fuel lines and a five-year useful life, even if the standards apply temporarily over a shorter useful life.

(2) Establish an FEL for each emission family based on emission measurements as specified in 40 CFR 1060.515. The FEL may not exceed 400 $g/m^2/day$ for any emission family.

(3) Use an adjustment factor (AF) of 1.0 for calculating credits.

(4) Cold-weather fuel lines are in a separate averaging set, which means you may not exchange emission credits between fuel tanks and fuel lines.

(i) *Use of California data for handheld fuel tank permeation.* If you certified handheld fuel tanks to the permeation standards in 40 CFR 90.129 based on emission measurements for demonstrating compliance with emission standards for California, you may continue to comply with the provisions of 40 CFR 90.129 instead of the provisions of § 1054.110(b) for the 2010 and 2011 model years, provided that we allow you to use carryover emission data under 40 CFR 1060.235(e) for your emission family.

(j) *Continued use of 40 CFR part 90 test procedures.* You may use the test procedures for measuring exhaust emissions in 40 CFR part 90 instead of those in subpart F of this part for 2010 through 2012 model years. This applies for certification, production-line, and in-use testing. You may continue to use data based on the test procedures in 40 CFR part 90 for engine families in 2013 and later model years, provided that we allow you to use carryover emission data under 40 CFR 1054.235(d) for your emission family. You may also use the test procedures for measuring exhaust emissions in 40 CFR part 90 for production-line testing with any engine family whose certification is based on testing with those procedures.

(k) *Carryover of exhaust emission data from Californa ARB procedures.* You may certify your engines through the 2012 model year based on exhaust emission data you previously submitted to California ARB. This applies for certification and production-line testing. This paragraph (k) no longer applies starting with the 2013 model year. Note that other regulatory provisions may allow you to use data from California ARB for EPA certification in certain circumstances.

(l) [Reserved]

(m) *Delayed compliance for rotation-molded fuel tanks.* (1) You may produce limited numbers of 2011 and 2012 model year equipment with rotation-molded fuel tanks that do not meet permeation emission standards specified in § 1054.112(b) and 40 CFR 1060.103, subject to the following provisions:

(i) You may use allowances under this paragraph (m) only for Class II equipment models using identical fuel tanks such that the production volumes of the fuel tank design used in such equipment is no more than 5,000 units in the 2011 and 2012 model years, with a total corporate allowance of 10,000 units in 2012. If production volumes are greater than 5,000 for a given fuel tank design (or greater than 10,000 corporate-wide in the 2012 model year), all those tanks must comply with emission standards. Tanks are generally considered identical if they are produced under a single part number to conform to a single design or blueprint. Tanks should be considered identical if they differ only with respect to production variability, post-production changes (such as different fittings or grommets), supplier, color, or other extraneous design variables. The limit of 5,000 units for a given fuel tank design applies together for the total production from any parent or subsidiary companies.

(ii) Include the following statement on the emission label specified in 40 CFR 1060.135: ''EXEMPT FROM TANK PERMEATION STANDARDS UNDER 40 CFR 1054.145''.

(iii) You must keep records to demonstrate that you do not exceed the specified production volumes. Identify the number of exempted equipment you produced from each model and from each production facility.

(iv) You may not apply the provisions of this paragraph (m) for fuel tanks that are not rotation-molded or for equipment that is not powered by a Class II engine.

(2) Fuel tank manufacturers may produce exempted fuel tanks as needed for equipment manufacturers under this paragraph (m) without our prior approval. Fuel tank manufacturers must keep records of the number of exempted fuel tanks sold to each equipment manufacturer.

(3) Equipment you produce under this paragraph (m) are exempt from the prohibitions in 40 CFR 1068.101(a)(1) with respect to fuel tank permeation emissions, subject to the provisions of this paragraph (m). However, producing more exempted equipment than we allow under this paragraph (m) violates the prohibitions in 40 CFR 1068.101(a)(1). Equipment manufacturers and fuel tank manufacturers must keep the records we require under this paragraph (m) until at least December 31, 2016 and give them to us if we ask for them (see 40 CFR 1068.101(a)(2)).

(n) *Ethanol-blended test fuel for nonhandheld engines.* During the first two years of the Phase 3 standards, if you use an ethanol-blended test fuel for certifying a given engine family as described in § 1054.501(b)(2), we will also use the blended fuel for testing engines from that engine family, whether or not you use the blended fuel for certifying all your Class I (or Class II) engine families in that model year.

Subpart C—Certifying Emission Families

§ 1054.201 What are the general requirements for obtaining a certificate of conformity?

Engine manufacturers must certify their engines with respect to the exhaust emission standards in this part. Manufacturers of engines, equipment, or fuel-system components may need to certify their products with respect to evaporative emission standards as described in 40 CFR 1060.1 and 1060.601. The following general requirements apply for obtaining a certificate of conformity:

(a) You must send us a separate application for a certificate of conformity for each engine family. A certificate of conformity is valid starting with the indicated effective date but it is not valid for any production after December 31 of the model year for which it is issued. No certificate will be issued after December 31 of the model year. If you certify with respect to both exhaust and evaporative emissions, you must submit separate applications.

(b) The application must contain all the information required by this part and must not include false or incomplete statements or information (see § 1054.255).

(c) We may ask you to include less information than we specify in this subpart as long as you maintain all the information required by § 1054.250.

(d) You must use good engineering judgment for all decisions related to your application (see 40 CFR 1068.5).

(e) An authorized representative of your company must approve and sign the application.

(f) See § 1054.255 for provisions describing how we will process your application.

(g) We may require you to deliver your test engines to a facility we designate for our testing (see § 1054.235(c)).

§ 1054.205 What must I include in my application?

This section specifies the information that must be in your application, unless we ask you to include less information under § 1054.201(c). We may require you to provide additional information to evaluate your application. The provisions of this section apply to integrated equipment manufacturers and engine manufacturers selling loose engines. Nonintegrated equipment manufacturers must follow the requirements of 40 CFR part 1060.

(a) Describe the emission family's specifications and other basic parameters of the engine's design and emission controls. List the fuel type on which your engines are designed to operate (for example, all-season gasoline). List each distinguishable engine configuration in the emission family. For each engine configuration in which the maximum modal power of the emission-data engine is at or above 25 kW (or power at or above 15 kW if displacement is above 1000 cc), list the maximum engine power and the range of values for maximum engine power resulting from production tolerances, as described in § 1054.140.

(b) Explain how the emission control systems operate. Describe the evaporative emission controls and show how your design will prevent running loss emissions, if applicable. Also describe in detail all system components for controlling exhaust emissions, including all auxiliary emission control devices (AECDs) and all fuel-system components you will install on any production or test engine. Identify the part number of each component you describe (or the alphanumeric designation for catalysts described in § 1054.610, if applicable). For this paragraph (b), treat as separate AECDs any devices that modulate or activate differently from each other. Include sufficient detail to allow us to evaluate whether the AECDs are consistent with the defeat device prohibition of § 1054.115. For example, if your engines will routinely experience in-use operation that differs from the specified duty cycle for certification, describe how the fuel-metering system responds to varying speeds and loads not represented by the duty cycle. If you test an emission-data engine by disabling the governor for full-load operation such that the engine operates at an air-fuel ratio significantly different than under full-load operation with an installed governor, explain why these differences are necessary or appropriate. For conventional carbureted engines without electronic fuel controls, it is sufficient to state that there is no significant difference in air-fuel ratios.

(c) [Reserved]

(d) Describe the engines, equipment, and fuel system components you selected for testing and the reasons for selecting them.

(e) Describe the test equipment and procedures that you used, including any special or alternate test procedures you used. For handheld engines, describe how you selected the value for rated speed.

(f) Describe how you operated the emission-data engine before testing, including the duty cycle and the number of engine operating hours used to stabilize emission levels. Explain why you selected the method of service accumulation. Describe any scheduled maintenance you did.

(g) List the specifications of the test fuel to show that it falls within the required ranges we specify in 40 CFR part 1065.

(h) Identify the emission family's useful life. Describe the basis for selecting useful life values with respect to exhaust emissions (see § 1054.107).

(i) Include the maintenance and warranty instructions you will give to the ultimate purchaser of each new engine (see §§ 1054.120 and 1054.125). Describe your basis for meeting the warranty-assurance provisions in § 1054.120(f). Describe your recall repair network if it is different than your warranty repair network. State that you will post a bond as specified in § 1054.120(f) and 1054.690 or describe why those requirements do not apply.

(j) Include the emission-related installation instructions you will provide if someone else installs your engines in nonroad equipment (see § 1054.130).

(k) Describe your emission control information label (see § 1054.135).

(l) Identify the emission standards or FELs for the emission family.

(m) Identify the emission family's deterioration factors and describe how you developed them (see § 1054.245). Present any emission test data you used for this.

(n) State that you operated your emission-data engines as described in the application (including the test procedures, test parameters, and test fuels) to show you meet the requirements of this part.

(o) Present emission data to show that you meet exhaust emission standards, as follows:

(1) Present emission data for hydrocarbons (such as THC, THCE, or NMHC, as applicable), NO_X, and CO on an emission-data engine to show your engines meet the applicable exhaust emission standards as specified in § 1054.101. Show emission figures before and after applying deterioration factors for each engine. Include test data from each applicable duty cycle specified in § 1054.505(b). If we specify more than one grade of any fuel type (for example, low-temperature and all-season gasoline), you need to submit test data only for one grade, unless the regulations of this part specify otherwise for your engine.

(2) Note that §§ 1054.235 and 1054.245 allow you to submit an application in certain cases without new emission data.

(p) Report all test results, including those from invalid tests, whether or not they were conducted according to the test procedures of subpart F of this part. If you measure CO_2, report those emission levels (in g/kW-hr). We may ask you to send other information to confirm that your tests were valid under the requirements of this part and 40 CFR parts 1060 and 1065.

(q) Describe all adjustable operating parameters (see § 1054.115(b)), including production tolerances. Include the following in your description of each parameter:

(1) The nominal or recommended setting.

(2) The intended physically adjustable range.

(3) The limits or stops used to establish adjustable ranges.

(4) Information showing why the limits, stops, or other means of inhibiting adjustment are effective in preventing adjustment of parameters on in-use engines to settings outside your intended physically adjustable ranges.

(r) Describe how your nonhandheld engines comply with emission standards at varying atmospheric pressures. Include a description of altitude kits you design to comply with the requirements of § 1054.115(c). Identify the part number of each component you describe. Identify the altitude range for which you expect proper engine performance and emission control with and without the altitude kit. State that your engines will comply with applicable emission standards throughout the useful life with the altitude kit installed according to your instructions. Describe any relevant testing, engineering analysis, or other information in sufficient detail to support your statement. In addition, describe your plan for making information and parts available such that you would reasonably expect that altitude kits would be widely used in the high-altitude counties specified in 40 CFR part 1068, Appendix III. For example, engine owners should have ready access to information describing when an altitude kit is needed and how to obtain this service. Similarly, parts and service information should be available to qualified service facilities in addition to authorized service centers if that is needed for owners to have such altitude kits installed locally.

(s) If your engines are subject to handheld emission standards on the basis of meeting weight limitations described in the definition of ''handheld'' in § 1054.801, describe your analysis showing that you meet the applicable weight-related restrictions.

(t) State whether your certification is limited for certain engines. If this is the case, describe how you will prevent use of these engines in applications for which they are not certified. This applies for engines such as the following:

(1) Wintertime engines not certified to the specified $HC+NO_X$ standard.

(2) Two-stroke snowthrower engines using the provisions of § 1054.101(d).

(u) Unconditionally certify that all the engines in the emission family comply with the requirements of this part, other referenced parts of the CFR, and the Clean Air Act.

(v) Include good-faith estimates of U.S.-directed production volumes. Include a justification for the estimated production volumes if they are substantially different than actual production volumes in earlier years for similar models. Also indicate whether you expect the engine family to contain only nonroad engines, only stationary engines, or both.

(w) State that you will post a bond as specified in § 1054.690 or describe why those requirements do not apply.

(x) Include the information required by other subparts of this part. For example, include the information required by § 1054.725 if you participate in the ABT program.

(y) Include other applicable information, such as information specified in this part or 40 CFR part 1068 related to requests for exemptions.

(z) Name an agent for service located in the United States. Service on this agent constitutes service on you or any of your officers or employees for any action by EPA or otherwise by the United States related to the requirements of this part.

(aa) For imported engines or equipment, identify the following:

(1) The port(s) at which you have imported your engines (or equipment containing your engines) over the previous 12 months.

(2) The names and addresses of the agents you have authorized to import your engines or equipment.

(3) The location of a test facility in the United States where you can test your engines if we select them for testing under a selective enforcement audit, as specified in 40 CFR part 1068, subpart E.

§ 1054.210 May I get preliminary approval before I complete my application?

If you send us information before you finish the application, we will review it and make any appropriate determinations, especially for questions related to emission family definitions, auxiliary emission control devices, deterioration factors, useful life, testing for service accumulation, maintenance, and delegated final assembly. Decisions made under this section are considered to be preliminary approval, subject to final review and approval. We will generally not reverse a decision where we have given you preliminary approval, unless we find new information supporting a different decision. If you request preliminary approval related to the upcoming model year or the model year after that, we will make the appropriate determinations as soon as practicable. We will generally not provide preliminary approval related to a future model year more than two years ahead of time.

§ 1054.220 How do I amend the maintenance instructions in my application?

You may amend your emission-related maintenance instructions after you submit your application for certification as long as the amended instructions remain consistent with the provisions of § 1054.125. You must send the Designated Compliance Officer a written request to amend your application for certification for an engine family if you want to change the emission-related maintenance instructions in a way that could affect emissions. In your request, describe the proposed changes to the maintenance instructions. If operators follow the original maintenance instructions rather than the newly specified maintenance, this does not allow you to disqualify those engines from in-use testing or deny a warranty claim.

(a) If you are decreasing, replacing, or eliminating any specified maintenance, you may distribute the new maintenance instructions to your customers 30 days after we receive your request, unless we disapprove your request. This would generally include replacing one maintenance step with another. We may approve a shorter time or waive this requirement.

(b) If your requested change would not decrease the specified maintenance, you may distribute the new maintenance instructions anytime after you send your request. For example, this paragraph (b) would cover adding instructions to increase the frequency of filter changes for engines in severe-duty applications.

(c) You need not request approval if you are making only minor corrections (such as correcting typographical mistakes), clarifying your maintenance instructions, or changing instructions for maintenance unrelated to emission control. We may ask you to send us copies of maintenance instructions revised under this paragraph (c).

§ 1054.225 How do I amend my application for certification to include new or modified engines or fuel systems or change an FEL?

Before we issue you a certificate of conformity, you may amend your application to include new or modified engine or fuel-system configurations, subject to the provisions of this section. After we have issued your certificate of conformity, you may send us an amended application requesting that we include new or modified configurations within the scope of the certificate, subject to the provisions of this section.

You must amend your application if any changes occur with respect to any information included in your application.

(a) You must amend your application before you take any of the following actions:

(1) Add an engine or fuel-system configuration to an emission family. In this case, the configuration added must be consistent with other configurations in the emission family with respect to the criteria listed in § 1054.230.

(2) Change a configuration already included in an emission family in a way that may affect emissions, or change any of the components you described in your application for certification. This includes production and design changes that may affect emissions any time during the engine's lifetime.

(3) Modify an FEL for an emission family with respect to exhaust emissions as described in paragraph (f) of this section.

(b) To amend your application for certification, send the Designated Compliance Officer the following information:

(1) Describe in detail the addition or change in the model or configuration you intend to make.

(2) Include engineering evaluations or data showing that the amended emission family complies with all applicable requirements. You may do this by showing that the original emission-data engine or emission-data equipment is still appropriate for showing that the amended family complies with all applicable requirements.

(3) If the original emission-data engine for the engine family is not appropriate to show compliance for the new or modified engine configuration, include new test data showing that the new or modified engine configuration meets the requirements of this part.

(c) We may ask for more test data or engineering evaluations. You must give us these within 30 days after we request them.

(d) For emission families already covered by a certificate of conformity, we will determine whether the existing certificate of conformity covers your new or modified configuration. You may ask for a hearing if we deny your request (see § 1054.820).

(e) For emission families already covered by a certificate of conformity, you may start producing the new or modified configuration anytime after you send us your amended application and before we make a decision under paragraph (d) of this section. However, if we determine that the affected configurations do not meet applicable requirements, we will notify you to cease production of the configurations and may require you to recall the engine or equipment at no expense to the owner. Choosing to produce engines under this paragraph (e) is deemed to be consent to recall all engines or equipment that we determine do not meet applicable emission standards or other requirements and to remedy the nonconformity at no expense to the owner. If you do not provide information required under paragraph (c) of this section within 30 days after we request it, you must stop producing the new or modified engine or equipment.

(f) You may ask us to approve a change to your FEL with respect to exhaust emissions in certain cases after the start of production. The changed FEL may not apply to engines you have already introduced into U.S. commerce, except as described in this paragraph (f). If we approve a changed FEL after the start of production, you must identify the date or serial number for applying the new FEL. If you identify this by month and year, we will consider that a lowered FEL applies on the last day of the month and a raised FEL applies on the first day of the month. You may ask us to approve a change to your FEL in the following cases:

(1) You may ask to raise your FEL for your emission family at any time. In your request, you must show that you will still be able to meet the emission standards as specified in subparts B and H of this part. If you amend your application by submitting new test data to include a newly added or modified engine, as described in paragraph (b)(3) of this section, use the appropriate FELs with corresponding production volumes to calculate emission credits for the model year, as described in subpart H of this part. In all other circumstances, you must use the higher FEL for the entire family to calculate emission credits under subpart H of this part.

(2) You may ask to lower the FEL for your emission family only if you have test data from production engines showing that emissions are below the proposed lower FEL. The lower FEL does not apply to engines you produce before the new FEL starts to apply, as specified in this paragraph (f). Use the appropriate FELs with corresponding production volumes to calculate emission credits for the model year, as described in subpart H of this part.

§ 1054.230 How do I select emission families?

(a) For purposes of certification, divide your product line into families of engines that are expected to have similar emission characteristics throughout their useful life as described in this section. Your emission family is limited to a single model year. For evaporative emissions, group engines into emission families as described in 40 CFR 1060.230.

(b) Group engines into the same emission family for exhaust emissions if they are the same in all the following aspects:

(1) The combustion cycle and fuel. See paragraph (g) of this section for special provisions that apply for dual-fuel engines.

(2) The cooling system (liquid-cooled vs. air-cooled).

(3) Valve configuration (for example, side-valve vs. overhead valve).

(4) Method of air aspiration (for example, turbocharged vs. naturally aspirated).

(5) The number, location, volume, and composition of catalytic converters.

(6) The number and arrangement of cylinders and approximate total displacement.

(7) Engine class, as defined in § 1054.801.

(8) Method of control for engine operation, other than governing (mechanical or electronic).

(9) The numerical level of the applicable emission standards. For example, an engine family may not include engines certified to different family emission limits, though you may change family emission limits without recertifying as specified in § 1054.225.

(10) Useful life.

(c) You may subdivide a group that is identical under paragraph (b) of this section into different emission families if you show the expected emission characteristics are different during the useful life.

(d) You may group engines that are not identical with respect to the things listed in paragraph (b) of this section into the same emission family, as follows:

(1) In unusual circumstances, you may group such engines into the same emission family if you show that their emission characteristics during the useful life will be similar.

(2) If you are a small-volume engine manufacturer, you may group any nonhandheld engines with the same useful life that are subject to the same emission standards into a single emission family.

(3) The provisions of this paragraph (d) do not exempt any engines from meeting all the applicable standards and requirements in subpart B of this part.

(e) Select test engines from the emission family as described in 40 CFR 1065.401.

(f) You may combine engines from different classes into a single emission family under paragraph (d)(1) of this section if you certify the emission family to the more stringent set of standards from the two classes in that model year.

(g) You may certify dual-fuel or flexible-fuel engines in a single engine family. You may include dedicated-fuel versions of this same engine model in the same engine family, as long as they are identical to the engine configuration with respect to that fuel type for the dual-fuel or flexible-fuel version of the engine. For example, if you produce an engine that can alternately run on gasoline and natural gas, you can include the gasoline-only and natural gas-only versions of the engine in the same engine family as the dual-fuel engine if engine operation on each fuel type is identical with or without installation of components for operating on the other fuel.

§ 1054.235 What exhaust emission testing must I perform for my application for a certificate of conformity?

This section describes the exhaust emission testing you must perform to show compliance with the emission standards in §§ 1054.103 and 1054.105. See §§ 1054.240 and 1054.245 and 40 CFR part 1065, subpart E, regarding service accumulation before emission testing.

(a) Select an emission-data engine from each engine family for testing as described in 40 CFR 1065.401. Select a configuration that is most likely to exceed the HC+NO_X standard, using good engineering judgment. Configurations must be tested as they will be produced, including installed governors, if applicable.

(b) Test your emission-data engines using the procedures and equipment specified in subpart F of this part. In the case of dual-fuel engines, measure emissions when operating with each type of fuel for which you intend to certify the engine. In the case of flexible-fuel engines, measure emissions when operating with the fuel mixture that is most likely to cause the engine to exceed the applicable HC+NO_X emission standard, though you may ask us to exclude fuel mixtures that you can show are not likely to occur in use.

(c) We may measure emissions from any of your emission-data engines or other engines from the emission family, as follows:

(1) We may decide to do the testing at your plant or any other facility. If we do this, you must deliver the engine to a test facility we designate. The engine you provide must include appropriate manifolds, aftertreatment devices, electronic control units, and other emission-related components not normally attached directly to the engine block. If we do the testing at your plant, you must schedule it as soon as possible and make available the instruments, personnel, and equipment we need.

(2) If we measure emissions on one of your engines, the results of that testing become the official emission results for the engine.

(3) We may set the adjustable parameters of your engine to any point within the physically adjustable ranges (see § 1054.115(b)).

(4) We may calibrate your engine within normal production tolerances for anything we do not consider an adjustable parameter. For example, this would apply where we determine that an engine parameter is not an adjustable parameter (as defined in § 1054.801) but that it is subject to production variability.

(d) You may ask to use carryover emission data from a previous model year instead of doing new tests, but only if all the following are true:

(1) The emission family from the previous model year differs from the current emission family only with respect to model year or other characteristics unrelated to emissions. You may also ask to add a configuration subject to § 1054.225.

(2) The emission-data engine from the previous model year remains the appropriate emission-data engine under paragraph (b) of this section.

(3) The data show that the emission-data engine would meet all the requirements that apply to the emission family covered by the application for certification. For engines originally tested under the provisions of 40 CFR part 90, you may consider those test procedures to be equivalent to the procedures we specify in subpart F of this part.

(e) We may require you to test another engine of the same or different configuration in addition to the engine(s) tested under paragraph (b) of this section.

(f) If you use an alternate test procedure under 40 CFR 1065.10 and later testing shows that such testing does not produce results that are equivalent to the procedures specified in subpart F of this part, we may reject data you generated using the alternate procedure.

§ 1054.240 How do I demonstrate that my emission family complies with exhaust emission standards?

(a) For purposes of certification, your emission family is considered in compliance with the emission standards in § 1054.101(a) if all emission-data engines representing that family have test results showing deteriorated emission levels at or below these standards. This includes all test points over the course of the durability demonstration. Note that your FELs are considered to be the applicable emission standards with which you must comply if you participate in the ABT program in subpart H of this part.

(b) Your engine family is deemed not to comply if any emission-data engine representing that family has test results showing a deteriorated emission level for any pollutant that is above an applicable emission standard. This includes all test points over the course of the durability demonstration.

(c) Determine a deterioration factor to compare emission levels from the emission-data engine with the applicable emission standards. Section 1054.245 specifies how to test engines to develop deterioration factors that represent the expected deterioration in emissions over your engines' full useful life. Calculate a multiplicative deterioration factor as described in § 1054.245(b). If the deterioration factor is less than one, use one. Specify the deterioration factor to one more significant figure than the emission standard. You may use assigned deterioration factors that we establish for up to 10,000 nonhandheld engines from small-volume emission families in each model year, except that small-volume engine manufacturers may use assigned deterioration factors for any or all of their engine families.

(d) Adjust the official emission results for each tested engine at the low-hour test point by multiplying the measured emissions by the deterioration factor, then rounding the adjusted figure to the same number of decimal places as the emission standard. Compare the rounded emission levels to the emission standard for each emission-data engine. In the case of HC+NO_X standards, add the official emission results and apply the deterioration factor to the sum of the pollutants before rounding. However, if your deterioration factors are based on emission measurements that do not cover the engine's full useful life, apply deterioration factors to each pollutant and then add the results before rounding.

(e) The provisions of this paragraph (e) apply only for engine families with a useful life at or below 300 hours. To apply the deterioration factor to engines other than the original emission-data engine, they must be operated for the same number of hours before starting emission measurements that you used for the original emission-data engine, within one hour. For example, if the original emission-data engine operated for 8 hours before the low-hour emission test, operate the other test engines for 7 to 9 hours before starting emission measurements.

§ 1054.245 How do I determine deterioration factors from exhaust durability testing?

This section describes how to determine deterioration factors, either with pre-existing test data or with new emission measurements.

(a) You may ask us to approve deterioration factors for an emission family based on emission measurements from similar engines if you have already given us these data for certifying other engines in the same or earlier model years. Use good engineering judgment to decide whether the two engines are similar.

(b) If you are unable to determine deterioration factors for an emission family under paragraph (a) of this section, select engines, subsystems, or components for testing. Determine deterioration factors based on service accumulation and related testing. Include consideration of wear and other causes of deterioration expected under typical consumer use. Determine deterioration factors as follows:

(1) Measure emissions from the emission-data engine at a low-hour test point, at the midpoint of the useful life, and at the end of the useful life, except as specifically allowed by this paragraph (b). You may test at additional evenly spaced intermediate points. Collect emission data using measurements to one more decimal place than the emission standard.

(2) Operate the engine over a representative duty cycle for a period at least as long as the useful life (in hours). You may operate the engine continuously. You may also use an engine installed in nonroad equipment to accumulate service hours instead of running the engine only in the laboratory.

(3) In the case of dual-fuel or flexible-fuel engines, you may accumulate service hours on a single emission-data engine using the type or mixture of fuel expected to have the highest combustion and exhaust temperatures. For dual-fuel engines, you must measure emissions on each fuel type at each test point.

(4) You may perform maintenance on emission-data engines as described in § 1054.125 and 40 CFR part 1065, subpart E. If you change one or more spark plugs on an emission-data engine as allowed under § 1054.125, you must measure emissions before and after this maintenance. If you clean or change an air filter on an emission-data engine as allowed under § 1054.125, you must measure emissions before and after every second time you perform this maintenance. Use the average values from these two measurements to calculate deterioration factors. The emission-data engine must meet applicable emission standards before and after maintenance to be considered in compliance, as described in § 1054.240(a) and (b).

(5) Calculate your deterioration factor using a linear least-squares fit of your test data, but treat the low-hour test point as occurring at hour zero. Your deterioration factor is the ratio of the calculated emission level at the point representing the full useful life to the calculated emission level at zero hours.

(6) If you test more than one engine to establish deterioration factors, average the deterioration factors from all the engines before rounding.

(7) If your durability engine fails between 80 percent and 100 percent of useful life, you may use the last emission measurement as the test point representing the full useful life, provided it occurred after at least 80 percent of the useful life.

(8) If your useful life is 1,000 hours or longer, and your durability engine fails between 50 percent and 100 percent of useful life, you may extrapolate your emission results to determine the emission level representing the full useful life, provided emissions were measured at least once after 50 percent of the useful life.

(9) Use good engineering judgment for all aspects of the effort to establish deterioration factors under this paragraph (b).

(10) You may use other testing methods to determine deterioration factors, consistent with good engineering judgment, as long as we approve those methods in advance.

(c) Include the following information in your application for certification:

(1) If you determine your deterioration factors based on test data from a different emission family, explain why this is appropriate and include all the emission measurements on which you base the deterioration factor.

(2) If you do testing to determine deterioration factors, describe the form and extent of service accumulation, including the method you use to accumulate hours.

§ 1054.250 What records must I keep and what reports must I send to EPA?

(a) Send the Designated Compliance Officer information related to your U.S.-directed production volumes as described in § 1054.345. In addition, within 45 days after the end of the model year, you must send us a report describing information about engines you produced during the model year as follows:

(1) State the total production volume for each engine family that is not subject to reporting under § 1054.345.

(2) State the total production volume for any engine family for which you produce engines after completing the reports required in § 1054.345.

(3) If you produced exempted engines under the provisions of § 1054.625(j)(1), report the number of exempted engines you produced for each engine model and identify the buyer or shipping destination for each exempted engine.

(4) For production volumes you report under this paragraph (a), identify whether or not the figures include California sales. Include a separate count of production volumes for California sales if those figures are available.

(b) Organize and maintain the following records:

(1) A copy of all applications and any summary information you send us.

(2) Any of the information we specify in § 1054.205 that you were not required to include in your application.

(3) A detailed history of all emission-data engines. For each engine, describe all of the following:

(i) The emission-data engine's construction, including its origin and buildup, steps you took to ensure that it represents production engines, any components you built specially for it, and all the components you include in your application for certification.

(ii) How you accumulated engine operating hours (service accumulation), including the dates and the number of hours accumulated.

(iii) All maintenance, including modifications, parts changes, and other service, and the dates and reasons for the maintenance.

(iv) All your emission tests, including documentation on routine and standard tests, as specified in part 40 CFR part 1065, and the date and purpose of each test.

(v) All tests to diagnose engine or emission control performance, giving the date and time of each and the reasons for the test.

(vi) Any other significant events.

(4) Production figures for each emission family divided by assembly plant.

(5) Keep a list of engine identification numbers for all the engines you produce under each certificate of conformity.

(c) Keep data from routine emission tests (such as test cell temperatures and relative humidity readings) for one year after we issue the associated certificate of conformity. Keep all other information specified in this section for eight years after we issue your certificate.

(d) Store these records in any format and on any media as long as you can promptly send us organized, written records in English if we ask for them. You must keep these records readily available. We may review them at any time.

§ 1054.255 What decisions may EPA make regarding my certificate of conformity?

(a) If we determine your application is complete and shows that the emission family meets all the requirements of this part and the Clean Air Act, we will issue a certificate of conformity for your emission family for that model year. We may make the approval subject to additional conditions.

(b) We may deny your application for certification if we determine that your emission family fails to comply with emission standards or other requirements of this part or the Clean Air Act. We will base our decision on all available information. If we deny your application, we will explain why in writing.

(c) In addition, we may deny your application or suspend or revoke your certificate if you do any of the following:

(1) Refuse to comply with any testing, reporting, or bonding requirements.

(2) Submit false or incomplete information (paragraph (e) of this section applies if this is fraudulent).

(3) Render inaccurate any test data.

(4) Deny us from completing authorized activities (see 40 CFR 1068.20). This includes a failure to provide reasonable assistance.

(5) Produce engines or equipment for importation into the United States at a location where local law prohibits us from carrying out authorized activities.

(6) Fail to supply requested information or amend your application to include all engines or equipment being produced.

(7) Take any action that otherwise circumvents the intent of the Clean Air Act or this part.

(d) We may void your certificate if you do not keep the records we require or do not give us information as required under this part or the Clean Air Act.

(e) We may void your certificate if we find that you intentionally submitted false or incomplete information.

(f) If we deny your application or suspend, revoke, or void your certificate, you may ask for a hearing (see § 1054.820).

Subpart D—Production-line Testing

§ 1054.300 Applicability.

This subpart specifies requirements for engine manufacturers to test their production engines for exhaust emissions to ensure that the engines are being produced as described in the application for certification. The production-line verification described in 40 CFR part 1060, subpart D, applies for equipment and components for evaporative emissions.

§ 1054.301 When must I test my production-line engines?

(a) If you produce engines that are subject to the requirements of this part, you must test them as described in this subpart, except as follows:

(1) Small-volume engine manufacturers may omit testing under this subpart.

(2) We may exempt small-volume emission families from routine testing under this subpart. Request this exemption in your application for certification and include your basis for projecting a production volume below 5,000 units. We will approve your request if we agree that you have made good-faith estimates of your production volumes. Your exemption is approved when we grant your certificate. You must promptly notify us if your actual production exceeds 5,000 units during the model year. If you exceed the production limit or if there is evidence of a nonconformity, we may require you to test production-line engines under this subpart, or under 40 CFR part 1068, subpart E, even if we have approved an exemption under this paragraph (a)(2).

(b) We may suspend or revoke your certificate of conformity for certain engine families if your production-line engines do not meet the requirements of this part or you do not fulfill your obligations under this subpart (see §§ 1054.325 and 1054.340).

(c) Other regulatory provisions authorize us to suspend, revoke, or void your certificate of conformity, or order recalls for engine families, without regard to whether they have passed these production-line testing requirements. The requirements of this subpart do not affect our ability to do selective enforcement audits, as described in 40 CFR part 1068. Individual engines in families that pass these production-line testing requirements must also conform to all applicable regulations of this part and 40 CFR part 1068.

(d) You may use alternate programs for testing production-line engines in the following circumstances:

(1) You may use analyzers and sampling systems that meet the field-testing requirements of 40 CFR part 1065, subpart J, but not the otherwise applicable requirements in 40 CFR part 1065 for laboratory testing, to demonstrate compliance with emission standards if you double the minimum sampling rate specified in § 1054.310(b). Use measured test results to determine whether engines comply with applicable standards without applying a measurement allowance. This alternate program does not require prior approval but we may disallow use of this option where we determine that use of field-grade equipment would prevent you from being able to demonstrate that your engines are being produced to conform to the specifications in your application for certification.

(2) You may ask to use another alternate program for testing production-line engines. In your request, you must show us that the alternate program gives equal assurance that your products meet the requirements of this part. We may waive some or all of this subpart's requirements if we approve your alternate approach. For example, in certain circumstances you may be able to give us equal assurance that your products meet the requirements of this part by using less rigorous measurement methods if you offset that by increasing the number of test engines.

(e) If you certify an engine family with carryover emission data, as described in § 1054.235(d), and these equivalent engine families consistently pass the production-line testing requirements over the preceding two-year period, you may ask for a reduced testing rate for further production-line testing for that family. The minimum testing rate is one engine per engine family. If we reduce your testing rate, we may limit our approval to any number of model years. In determining whether to approve your request, we may consider the number of engines that have failed the emission tests.

(f) We may ask you to make a reasonable number of production-line engines available for a reasonable time so we can test or inspect them for compliance with the requirements of this part.

§ 1054.305 How must I prepare and test my production-line engines?

This section describes how to prepare and test production-line engines. You must assemble the test engine in a way that represents the assembly procedures for other engines in the engine family. You must ask us to approve any deviations from your normal assembly procedures for other production engines in the engine family.

(a) *Test procedures.* Test your production-line engines using the applicable testing procedures in subpart F of this part to show you meet the emission standards in subpart B of this part.

(b) *Modifying a test engine.* Once an engine is selected for testing (see § 1054.310), you may adjust, repair, prepare, or modify it or check its emissions only if one of the following is true:

(1) You document the need for doing so in your procedures for assembling and inspecting all your production engines and make the action routine for all the engines in the engine family.

(2) This subpart otherwise specifically allows your action.

(3) We approve your action in advance.

(c) *Engine malfunction.* If an engine malfunction prevents further emission testing, ask us to approve your decision to either repair the engine or delete it from the test sequence.

(d) *Setting adjustable parameters.* Before any test, we may require you to adjust any adjustable parameter to any setting within its physically adjustable range.

(1) [Reserved]

(2) We may specify adjustments within the physically adjustable range by considering their effect on emission levels. We may also consider how likely it is that someone will make such an adjustment with in-use equipment.

(3) We may specify an air-fuel ratio within the adjustable range specified in § 1054.115(b).

(e) *Stabilizing emission levels.* Use good engineering judgment to operate your engines before testing such that deterioration factors can be applied appropriately. Determine the stabilization period as follows:

(1) For engine families with a useful life at or below 300 hours, operate the engine for the same number of hours before starting emission measurements that you used for the emission-data engine, within one hour. For example, if the emission-data engine operated for 8 hours before the low-hour emission test, operate the test engines for 7 to 9 hours before starting emission measurements.

(2) For engine families with a useful life above 300 hours, operate each engine for no more than the greater of two periods:

(i) 12 hours.

(ii) The number of hours you operated your emission-data engine for certifying the engine family (see 40 CFR part 1065, subpart E, or the applicable regulations governing how you should prepare your test engine).

(f) *Damage during shipment.* If shipping an engine to a remote facility for production-line testing makes necessary an adjustment or repair, you must wait until after the initial emission test to do this work. We may waive this requirement if the test would be impossible or unsafe or if it would permanently damage the engine. Report to us, in your written report under § 1054.345, all adjustments or repairs you make on test engines before each test.

(g) *Retesting after invalid tests.* You may retest an engine if you determine an emission test is invalid under subpart F of this part. Explain in your written report reasons for invalidating any test and the emission results from all tests. If we determine that you improperly invalidated a test, we may require you to ask for our approval for future testing before substituting results of the new tests for invalid ones.

§ 1054.310 How must I select engines for production-line testing?

(a) Test engines from each engine family as described in this section based on test periods, as follows:

(1) For engine families with projected U.S.-directed production volume of at least 1,600, the test periods are consecutive quarters (3 months). However, if your annual production period is less than 12 months long, you may take the following alternative approach to define quarterly test periods:

(i) If your annual production period is 120 days or less, the whole model year constitutes a single test period.

(ii) If your annual production period is 121 to 210 days, divide the annual production period evenly into two test periods.

(iii) If your annual production period is 211 to 300 days, divide the annual production period evenly into three test periods.

(iv) If your annual production period is 301 days or longer, divide the annual production period evenly into four test periods.

(2) For engine families with projected U.S.-directed production volume below 1,600, the whole model year constitutes a single test period.

(b) Early in each test period, randomly select and test an engine from the end of the assembly line for each engine family.

(1) In the first test period for newly certified engines, randomly select and test one more engine. Then, calculate the required sample size for the model year as described in paragraph (c) of this section.

(2) In later test periods of the same model year, combine the new test result with all previous testing in the model year. Then, calculate the required sample size for the model year as described in paragraph (c) of this section.

(3) In the first test period for engine families relying on previously submitted test data, combine the new test result with the last test result from the previous model year. Then, calculate the required sample size for the model year as described in paragraph (c) of this section. Use the last test result from the previous model year only for this first calculation. For all subsequent calculations, use only results from the current model year.

(c) Calculate the required sample size for each engine family. Separately calculate this figure for $HC+NO_X$ and CO. The required sample size is the greater of these calculated values. Use the following equation:

$$N = \left[\frac{(t_{95} \cdot \sigma)}{(x - STD)} \right]^2 + 1$$

Where:

N = Required sample size for the model year.

t_{95} = 95% confidence coefficient, which depends on the number of tests completed, n, as specified in the table in paragraph (c)(1) of this section. It defines 95% confidence intervals for a one-tail distribution.

σ = Test sample standard deviation (see paragraph (c)(2) of this section).

x = Mean of emission test results of the sample.

STD = Emission standard (or family emission limit, if applicable).

(1) Determine the 95% confidence coefficient, t^{95}, from the following table:

n	t_{95}	n	t_{95}	n	t_{95}
2	6.31	12	1.80	22	1.72

n	t_{95}	n	t_{95}	n	t_{95}
3	2.92	13	1.78	23	1.72
4	2.35	14	1.77	24	1.71
5	2.13	15	1.76	25	1.71
6	2.02	16	1.75	26	1.71
7	1.94	17	1.75	27	1.71
8	1.90	18	1.74	28	1.70
9	1.86	19	1.73	29	1.70
10	1.83	20	1.73	30	1.70
11	1.81	21	1.72	31+	1.65

(2) Calculate the standard deviation, for the test sample using the following formula:

$$\sigma = \left[\sum \frac{(X_i - x)^2}{(n-1)}\right]^{\frac{1}{2}}$$

Where:

X_i = Emission test result for an individual engine.

n = The number of tests completed in an engine family.

(d) Use final deteriorated test results to calculate the variables in the equations in paragraph (c) of this section (see § 1054.315(a)(2)).

(e) After each new test, recalculate the required sample size using the updated mean values, standard deviations, and the appropriate 95-percent confidence coefficient.

(f) Distribute the remaining engine tests evenly throughout the rest of the year. You may need to adjust your schedule for selecting engines if the required sample size changes. If your scheduled quarterly testing for the remainder of the model year is sufficient to meet the calculated sample size, you may wait until the next quarter to do additional testing. Continue to randomly select engines from each engine family.

(g) Continue testing until one of the following things happens:

(1) After completing the minimum number of tests required in paragraph (b) of this section, the number of tests completed in an engine family, n, is greater than the required sample size, N, and the sample mean, x, is less than or equal to the emission standard. For example, if N = 5.1 after the fifth test, the sample-size calculation does not allow you to stop testing.

(2) The engine family does not comply according to § 1054.315.

(3) You test 30 engines from the engine family.

(4) You test one percent of your projected annual U.S.-directed production volume for the engine family, rounded to the nearest whole number. Do not count an engine under this paragraph (g)(4) if it fails to meet an applicable emission standard.

(5) You choose to declare that the engine family does not comply with the requirements of this subpart.

(h) If the sample-size calculation allows you to stop testing for one pollutant but not another, you must continue measuring emission levels of all pollutants for any additional tests required under this section. However, you need not continue making the calculations specified in this subpart for the pollutant for which testing is not required. This paragraph (h) does not affect the number of tests required under this section, the required calculations in § 1054.315, or the remedial steps required under § 1054.320.

(i) You may elect to test more randomly chosen engines than we require under this section. Include these engines in the sample-size calculations.

§ 1054.315 How do I know when my engine family fails the production-line testing requirements?

This section describes the pass-fail criteria for the production-line testing requirements. We apply these criteria on an emission-family basis. See § 1054.320 for the requirements that apply to individual engines that fail a production-line test.

(a) Calculate your test results as follows:

(1) *Initial and final test results.* Calculate and round the test results for each engine. If you do several tests on an engine, calculate the initial results for each test, then add all the test results together and divide by the number of tests. Round this final calculated value for the final test results on that engine.

(2) *Final deteriorated test results.* Apply the deterioration factor for the engine family to the final test results (see § 1054.240(c)).

(3) *Round deteriorated test results.* Round the results to the number of decimal places in the emission standard expressed to one more decimal place.

(b) Construct the following CumSum Equation for each engine family for $HC+NO_X$ and CO emissions:

$$C_i = \text{Max}\,[0 \text{ or } C_{i-1} + X_i - (STD + 0.25 \times \sigma)]$$

Where:

C_i = The current CumSum statistic.

C_{i-1} = The previous CumSum statistic. For the first test, the CumSum statistic is 0 (i.e., $C_1 = 0$).

X_i = The current emission test result for an individual engine.

STD = Emission standard (or family emission limit, if applicable).

(c) Use final deteriorated test results to calculate the variables in the equation in paragraph (b) of this section (see § 1054.315(a)).

(d) After each new test, recalculate the CumSum statistic.

(e) If you test more than the required number of engines, include the results from these additional tests in the CumSum Equation.

(f) After each test, compare the current CumSum statistic, C_i, to the recalculated Action Limit, H, defined as $H = 5.0 \times \sigma$.

(g) If the CumSum statistic exceeds the Action Limit in two consecutive tests, the engine family fails the production-line testing requirements of this subpart. Tell us within ten working days if this happens. You may request to amend the application for certification to raise the FEL of the entire engine family as described in § 1054.225(f).

(h) If you amend the application for certification for an engine family under § 1054.225, do not change any previous calculations of sample size or CumSum statistics for the model year.

§ 1054.320 What happens if one of my production-line engines fails to meet emission standards?

(a) If you have a production-line engine with final deteriorated test results exceeding one or more emission standards (see § 1054.315(a)), the certificate of conformity is automatically suspended for that failing engine. You must take the following actions before your certificate of conformity can cover that engine:

(1) Correct the problem and retest the engine to show it complies with all emission standards.

(2) Include the test results and describe the remedy for each engine in

the written report required under § 1054.345.

(b) You may request to amend the application for certification to raise the FEL of the entire engine family at this point (see § 1054.225).

§ 1054.325 What happens if an engine family fails the production-line testing requirements?

(a) We may suspend your certificate of conformity for an engine family if it fails under § 1054.315. The suspension may apply to all facilities producing engines from an engine family even if you find noncompliant engines only at one facility.

(b) We will tell you in writing if we suspend your certificate in whole or in part. We will not suspend a certificate until at least 15 days after the engine family fails. The suspension is effective when you receive our notice.

(c) Up to 15 days after we suspend the certificate for an engine family, you may ask for a hearing (see § 1054.820). If we agree before a hearing occurs that we used erroneous information in deciding to suspend the certificate, we will reinstate the certificate.

(d) Section 1054.335 specifies steps you must take to remedy the cause of the engine family's production-line failure. All the engines you have produced since the end of the last test period are presumed noncompliant and should be addressed in your proposed remedy. We may require you to apply the remedy to engines produced earlier if we determine that the cause of the failure is likely to have affected the earlier engines.

(e) You may request to amend the application for certification to raise the FEL of the engine family before or after we suspend your certificate as described in § 1054.225(f). We will approve your request if the failure is not caused by a defect and it is clear that you used good engineering judgment in establishing the original FEL.

§ 1054.330 May I sell engines from an engine family with a suspended certificate of conformity?

You may sell engines that you produce after we suspend the engine family's certificate of conformity under § 1054.315 only if one of the following occurs:

(a) You test each engine you produce and show it complies with emission standards that apply.

(b) We conditionally reinstate the certificate for the engine family. We may do so if you agree to recall all the affected engines and remedy any noncompliance at no expense to the owner if later testing shows that the engine family still does not comply.

§ 1054.335 How do I ask EPA to reinstate my suspended certificate?

(a) Send us a written report asking us to reinstate your suspended certificate. In your report, identify the reason for noncompliance, propose a remedy for the engine family, and commit to a date for carrying it out. In your proposed remedy include any quality control measures you propose to keep the problem from happening again.

(b) Give us data from production-line testing that shows the remedied engine family complies with all the emission standards that apply.

§ 1054.340 When may EPA revoke my certificate under this subpart and how may I sell these engines again?

(a) We may revoke your certificate for an engine family in the following cases:

(1) You do not meet the reporting requirements.

(2) Your engine family fails to comply with the requirements of this subpart and your proposed remedy to address a suspended certificate under § 1054.335 is inadequate to solve the problem or requires you to change the engine's design or emission control system.

(b) To sell engines from an engine family with a revoked certificate of conformity, you must modify the engine family and then show it complies with the requirements of this part.

(1) If we determine your proposed design change may not control emissions for the engine's full useful life, we will tell you within five working days after receiving your report. In this case we will decide whether production-line testing will be enough for us to evaluate the change or whether you need to do more testing.

(2) Unless we require more testing, you may show compliance by testing production-line engines as described in this subpart.

(3) We will issue a new or updated certificate of conformity when you have met these requirements.

§ 1054.345 What production-line testing records must I send to EPA?

(a) Within 45 days of the end of each test period, send us a report with the following information:

(1) Describe any facility used to test production-line engines and state its location.

(2) State the total U.S.-directed production volume and number of tests for each engine family.

(3) Describe how you randomly selected engines.

(4) Describe each test engine, including the engine family's identification and the engine's model year, build date, model number, identification number, and number of hours of operation before testing.

(5) Identify how you accumulated hours of operation on the engines and describe the procedure and schedule you used.

(6) Provide the test number; the date, time and duration of testing; test procedure; all initial test results; final test results; and final deteriorated test results for all tests. Provide the emission results for all measured pollutants. Include information for both valid and invalid tests and the reason for any invalidation.

(7) Describe completely and justify any nonroutine adjustment, modification, repair, preparation, maintenance, or test for the test engine if you did not report it separately under this subpart. Include the results of any emission measurements, regardless of the procedure or type of engine.

(8) Provide the CumSum analysis required in § 1054.315 and the sample-size calculation required in § 1054.310 for each engine family.

(9) Report on each failed engine as described in § 1054.320.

(10) State the date the test period ended for each engine family.

(b) We may ask you to add information to your written report so we can determine whether your new engines conform with the requirements of this subpart. We may also ask you to send less information.

(c) An authorized representative of your company must sign the following statement:

We submit this report under sections 208 and 213 of the Clean Air Act. Our production-line testing conformed completely with the requirements of 40 CFR part 1054. We have not changed production processes or quality-control procedures for test engines in a way that might affect emission controls. All the information in this report is true and accurate to the best of my knowledge. I know of the penalties for violating the Clean Air Act and the regulations. (Authorized Company Representative)

(d) Send electronic reports of production-line testing to the Designated Compliance Officer using an approved information format. If you want to use a different format, send us a written request with justification for a waiver.

(e) We will send copies of your reports to anyone from the public who asks for them. Section 1054.815 describes how we treat information you consider confidential.

§ 1054.350 What records must I keep?

(a) Organize and maintain your records as described in this section. We may review your records at any time.

(b) Keep paper or electronic records of your production-line testing for eight years after you complete all the testing required for an engine family in a model year.

(c) Keep a copy of the written reports described in § 1054.345.

(d) Keep the following additional records:

(1) A description of all test equipment for each test cell that you can use to test production-line engines.

(2) The names of supervisors involved in each test.

(3) The name of anyone who authorizes adjusting, repairing, preparing, or modifying a test engine and the names of all supervisors who oversee this work.

(4) If you shipped the engine for testing, the date you shipped it, the associated storage or port facility, and the date the engine arrived at the testing facility.

(5) Any records related to your production-line tests that are not in the written report.

(6) A brief description of any significant events during testing not otherwise described in the written report or in this section.

(7) Any information specified in § 1054.345 that you do not include in your written reports.

(e) If we ask, you must give us a more detailed description of projected or actual production figures for an engine family. We may ask you to divide your production figures by maximum engine power, displacement, fuel type, or assembly plant (if you produce engines at more than one plant).

(f) Keep records of the engine identification number for each engine you produce under each certificate of conformity. You may identify these numbers as a range. Give us these records within 30 days if we ask for them.

(g) We may ask you to keep or send other information necessary to implement this subpart.

Subpart E—In-use Testing

§ 1054.401 General provisions.

We may perform in-use testing of any engines or equipment subject to the standards of this part. We will consult with you as needed for information or special equipment related to testing your engines.

Subpart F—Test Procedures

§ 1054.501 How do I run a valid emission test?

(a) *Applicability.* This subpart is addressed to you as a manufacturer but it applies equally to anyone who does testing for you, and to us when we perform testing to determine if your engines or equipment meet emission standards.

(b) *General requirements.* Use the equipment and procedures for spark-ignition engines in 40 CFR part 1065 to determine whether engines meet the exhaust emission standards, as follows:

(1) Measure the emissions of all regulated pollutants as specified in § 1054.505 and 40 CFR part 1065. See § 1054.650 for special provisions that apply for variable-speed engines (including engines shipped without governors).

(2) Use the fuels and lubricants specified in 40 CFR part 1065, subpart H, for all the testing we require in this part. Except as specified in paragraph (d) of this section, use gasoline meeting the specifications described in 40 CFR 1065.710 for general testing. For service accumulation, use the test fuel or any commercially available fuel that is representative of the fuel that in-use engines will use. You may alternatively use gasoline blended with ethanol as follows:

(i) For handheld engines, you may use the ethanol-blended fuel for certifying engines under this part without our advance approval. If you use the blended fuel for certifying a given engine family, you may also use it for production-line testing or any other testing you perform for that engine family under this part. If you use the blended fuel for certifying a given engine family, we may use the blended fuel or the specified gasoline test fuel with that engine family.

(ii) For nonhandheld engines, you may use the blended fuel for certifying engines under this part without our advance approval. If you use the blended fuel for certifying a given engine family, you must also use it for production-line testing or any other testing you perform for that engine family under this part. If the certification of all your Class I (or Class II) engine families in a given model year is based on test data collected using the blended fuel, we will also use the blended fuel for testing your Class I (or Class II) engines. If the certification of some but not all of your Class I (or Class II) engine families in a given model year is based on test data collected using the blended fuel, we may use the blended fuel or the specified gasoline test fuel for testing any of your Class I (or Class II) engines.

(iii) The blended fuel must consist of a mix of gasoline meeting the specifications described in 40 CFR 1065.710 for general testing and fuel-grade ethanol meeting the specifications described in 40 CFR 1060.501(c) such that the blended fuel has 10.0±1.0 percent ethanol by volume. You may also use ethanol with a higher or lower purity if you show us that it will not affect your ability to demonstrate compliance with the applicable emission standards. You do not need to measure the ethanol concentration of such blended fuels and may instead calculate the blended composition by assuming that the ethanol is pure and mixes perfectly with the base fuel.

(iv) You may ask to use the provisions of this paragraph (b)(2) for a blended test fuel containing less than 10 percent ethanol if your engine is subject to emission standards from other organizations that specify testing with that fuel. If we approve testing with such a fuel, we may test your engines with that test fuel, with gasoline, or with a 10-percent ethanol blend.

(3) Ambient conditions for duty-cycle testing must be within ranges specified in 40 CFR 1065.520, subject to the provisions of § 1054.115(c).

(i) *Corrections.* Emissions may not be corrected for the effects of test temperature or pressure. You may correct emissions for humidity as specified in 40 CFR 1065.670.

(ii) *Intake air temperature.* Measure engine intake air temperature as described in 40 CFR 1065.125, and control it if necessary, consistent with good engineering judgment. For example, since the purpose of this requirement is to ensure that the measured air temperature is consistent with the intake air temperature that would occur during in-use operation at the same ambient temperature, do not cool the intake air and do not measure air temperature at a point where engine heat affects the temperature measurement.

(4) The provisions of 40 CFR 1065.405 describes how to prepare an engine for testing. However, you may consider emission levels stable without measurement after 12 hours of engine operation, except for the following special provisions that apply for engine families with a useful life of 300 hours or less:

(i) We will not approve a stabilization period longer than 12 hours even if you show that emissions are not yet stabilized.

(ii) Identify the number of hours you use to stabilize engines for low-hour emission measurements. You may consider emissions stable at any point less than 12 hours. For example, you may choose a point at which emission levels reach a low value before the effects of deterioration are established.

(5) Prepare your engines for testing by installing a governor that you normally use on production engines, consistent with §§ 1054.235(b) and 1054.505.

(6) During testing, supply the engine with fuel in a manner consistent with how it will be supplied with fuel in use. If you sell engines with complete fuel systems and your production engines will be equipped with a vapor line that routes running loss vapors into the engine's intake system, measure exhaust emissions using a complete fuel system representing a production configuration that sends fuel vapors to the test engine's intake system in a way that represents the expected in-use operation. You may alternatively demonstrate by engineering analysis that your engines will continue to meet emission standards for any amount of running loss vapor that can reasonably be expected during in-use operation.

(7) Determine the carbon mass fraction of fuel, w_c, using a calculation based on measured fuel properties as described in 40 CFR 1065.655(d)(1). You may not use the default values specified in 40 CFR 1065.655(d)(2).

(c) *Special and alternate procedures.* You may use special or alternate procedures to the extent we allow them under 40 CFR 1065.10. The following additional provisions apply:

(1) If you are unable to run the test cycle specified in this part for your engine, use an alternate test cycle that will result in a cycle-weighted emission measurement equivalent to the expected average in-use emissions. This cycle must be approved under 40 CFR 1065.10.

(2) Describe in your application for certification any specially designed fixtures or other hardware if they are needed for proper testing of your engines. (Note: You do not need to specify the size or performance characteristics of engine dynamometers.) You must send us these fixtures or other hardware if we ask for them. We may waive the requirement of § 1054.205(aa) to identify a test facility in the United States for such engine families as long as the projected U.S.-directed production volume of all your engine families using the provisions of this paragraph (c)(2) is less than 5 percent of your total production volume from all engine families certified under this part 1054.

(d) *Wintertime engines.* You may test wintertime engines at the ambient temperatures specified in 40 CFR 1065.520, even though this does not represent in-use operation for these engines (40 CFR 1065.10(c)(1)). In this case, you may use good engineering judgment to modify the test engine as needed to achieve intake temperatures that are analogous to in-use conditions. You may also test wintertime engines at reduced ambient temperatures as specified in 40 CFR 1051.505. Use the gasoline specified for low-temperature testing only if you test your engines at ambient temperatures below 20 °C.

§ 1054.505 How do I test engines?

(a) This section describes how to test engines under steady-state conditions. For handheld engines you must perform tests with discrete-mode sampling. For nonhandheld engines we allow you to perform tests with either discrete-mode or ramped-modal testing methods. You must use the same modal testing method for certification and all other testing you perform for an engine family. If we test your engines to confirm that they meet emission standards, we will use the modal testing method you select for your own testing. If you submit certification test data collected with both discrete-mode and ramped-modal testing (either in your original application or in an amendment to your application), either method may be used for subsequent testing. We may also perform other testing as allowed by the Clean Air Act. Conduct duty-cycle testing as follows:

(1) For discrete-mode testing, sample emissions separately for each mode, then calculate an average emission level for the whole cycle using the weighting factors specified for each mode. In each mode, operate the engine for at least 5 minutes, then sample emissions for at least 1 minute. Control engine speed as specified in this section. Use one of the following methods for confirming torque values for nonhandheld engines:

(i) Calculate torque-related cycle statistics and compare with the established criteria as specified in 40 CFR 1065.514 to confirm that the test is valid.

(ii) Evaluate each mode separately to validate the duty cycle. All torque feedback values recorded during non-idle sampling periods must be within ±2 percent of the reference value or within ±0.27 N·m of the reference value, whichever is greater. Also, the mean torque value during non-idle sampling periods must be within ±1 percent of the reference value or ±0.12 N·m of the reference value, whichever is greater. Control torque during idle as specified in paragraph (c) of this section.

(2) For ramped-modal testing, start sampling at the beginning of the first mode and continue sampling until the end of the last mode. Calculate emissions and cycle statistics the same as for transient testing as specified in 40 CFR part 1065. Unless we specify otherwise, you may simulate the governor for ramped-modal testing consistent with good engineering judgment.

(b) Measure emissions by testing the engine on a dynamometer with the test procedures for constant-speed engines in 40 CFR part 1065 while using one of the steady-state duty cycles identified in this paragraph (b) to determine whether it meets the exhaust emission standards specified in § 1054.101(a). This requirement applies for all engines, including those not meeting the definition of ''constant-speed engine'' in 40 CFR 1065.1001.

(1) For handheld engines, use the two-mode duty cycle described in paragraph (a) of Appendix II of this part. Establish an engine's rated speed as follows:

(i) For ungoverned handheld engines used in fixed-speed applications all having approximately the same nominal in-use operating speed, hold engine speed within 350 rpm of the nominal speed for testing. We may allow you to include in your engine family without additional testing a small number engines that will be installed such that they have a different nominal speed. If your engine family includes a majority of engines with approximately the same nominal in-use operating speed and a substantial number of engines with different nominal speeds, you must test engines as specified in this paragraph (b)(1)(i) and paragraph (b)(1)(ii) of this section.

(ii) For ungoverned handheld engines for which there is not a dominant value for nominal in-use operating speeds, hold engine speed within 350 rpm of the point at which the engine generates maximum power.

(iii) For governed handheld engines, hold engine speed at maximum test speed, as defined in 40 CFR 1065.1001.

(2) For nonhandheld engines, use the six-mode duty cycle or the corresponding ramped-modal cycle described in paragraph (b) of Appendix II of this part. Control engine speeds and torques during idle mode as specified in paragraph (c) of this section and during full-load operating modes as specified in paragraph (d) of this section. For all other modes, control torque as needed to meet the cycle-validation criteria in 40 CFR 1065.514; control the engine speed to within 5 percent of the nominal speed specified in paragraph (d) of this section or let the installed governor (in the production configuration) control engine speed. The governor may be adjusted before emission sampling to target the nominal speed identified in paragraph (d) of this section, but the installed governor must control engine speed throughout the

emission-sampling period whether the governor is adjusted or not. Note that ramped-modal testing involves continuous sampling, so governor adjustments may not occur during such a test. Note also that our testing may involve running the engine with the governor in the standard configuration even if you adjust the governor as described in this paragraph (a)(2) for certification or production-line testing.

(c) During idle mode for nonhandheld engines, operate the engine with the following parameters:

(1) Allow the engine to operate at the idle speed determined by the installed governor. If any production engines from the engine family have a user-selectable idle speed, operate the engine with an installed governor that controls engine speed to the lowest available speed setting.

(2) Keep engine torque under 5 percent of the nominal torque value for Mode 1.

(3) You must conduct testing at the idle mode even if the allowable torque values overlap with those for another specified mode.

(d) During full-load operation for nonhandheld engines, operate the engine with the following parameters:

(1) In normal circumstances, select a test speed of either 3060 rpm or 3600 rpm that is most appropriate for the engine family. If all the engines in the engine family are used in intermediate-speed equipment, select a test speed of 3060 rpm. The test associated with intermediate-speed operation is referred to as the A Cycle. If all the engines in the engine family are used in rated-speed equipment, select a test speed of 3600 rpm. The test associated with rated-speed operation is referred to as the B Cycle. If an engine family includes engines used in both intermediate-speed equipment and rated-speed equipment, select the test speed for emission-data engines that will result in worst-case emissions. In unusual circumstances, you may ask to use a test speed different than that specified in this paragraph (d)(1) if it better represents in-use operation.

(2) Operate the engine ungoverned at wide-open throttle at the test speed established in paragraph (d)(1) of this section until the engine reaches thermal stability as described in 40 CFR 1065.530(a)(2)(ii). Record the torque value after stabilization. Use this value for the full-load torque setting and for denormalizing the rest of the duty cycle.

(3) Control engine speed during emission sampling to stay within 5 percent of the nominal speed identified in paragraph (d)(1) of this section.

(4) The provisions of this paragraph (d) apply instead of the engine mapping procedures in 40 CFR 1065.510.

(e) See 40 CFR part 1065 for detailed specifications of tolerances and calculations.

§ 1054.520 What testing must I perform to establish deterioration factors?

Sections 1054.240 and 1054.245 describe the required methods for testing to establish deterioration factors for an emission family.

Subpart G—Special Compliance Provisions

§ 1054.601 What compliance provisions apply to these engines?

(a) Engine and equipment manufacturers, as well as owners, operators, and rebuilders of engines subject to the requirements of this part, and all other persons, must observe the provisions of this part, the requirements and prohibitions in 40 CFR part 1068, and the provisions of the Clean Air Act.

(b) Note that the provisions of 40 CFR 1068.103(f) prohibit engine manufacturers from deviating from normal production and inventory practices to stockpile engines with a date of manufacture before new or changed emission standards take effect. If your normal practice for producing engines subject to this part 1054 includes maintaining engines in inventory for some engine families for more than 12 months, you must get our prior approval to continue this practice for model years in which emission standards change. Include in your request information showing that this is necessary and it is consistent with your normal business practice. Unless we specify otherwise, include relevant inventory and production records from the preceding eight years. Note that 40 CFR 1068.103(f) applies to any engines inventoried beyond your normal practice and authorizes us to review your records to verify your normal practices, whether or not you maintain the engines in inventory for more than 12 months.

§ 1054.610 What is the exemption for delegated final assembly?

The provisions of 40 CFR 1068.261 related to delegated final assembly do not apply for handheld engines certified under this part 1054. The provisions of 40 CFR 1068.261 apply for nonhandheld engines, with the following exceptions and clarifications:

(a) Through the 2014 model year, you may use the provisions of this section for engines you sell to a distributor, where you establish a contractual arrangement in which you designate the distributor to be your agent in all matters related to compliance with the requirements of this section. Identify each of the distributors you intend to designate as your agent under this paragraph (a) in your application for certification. You may continue to use the provisions of this paragraph (a) this for later model years for specific distributors if we approve it based on your clear and convincing demonstration that each distributor can be expected to comply fully with the requirements of this section and 40 CFR 1068.261. We may set additional conditions beyond the provisions specified in this section to ensure that all engines will be in a certified configuration when installed by the equipment manufacturer.

(b) If you identify distributors as your agents under paragraph (a) of this section, you must perform or arrange for audits of all participating distributors and equipment manufacturers based on the following auditing rate instead of the provisions specified in 40 CFR 1068.261(d)(3)(i) and (ii):

(1) If you sell engines to 48 or more equipment manufacturers under the provisions of this section, you must annually perform or arrange for audits of twelve equipment manufacturers to whom you sell engines under this section. To select individual equipment manufacturers, divide all the affected equipment manufacturers into quartiles based on the number of engines they buy from you; select equal numbers of equipment manufacturers from each quartile each model year as much as possible. Vary the equipment manufacturers selected for auditing from year to year, though audits may be repeated in later model years if you find or suspect that a particular equipment manufacturer is not properly installing aftertreatment devices.

(2) If you sell engines to fewer than 48 equipment manufacturers under the provisions of this section, set up a plan to perform or arrange for audits of each equipment manufacturer on average once every four model years.

§ 1054.612 What special provisions apply for equipment manufacturers modifying certified nonhandheld engines?

The provisions of this section apply for all emission families through the 2014 model year; starting with the 2015 model year, these provisions are limited to small-volume emission families.

(a) *General provisions.* If you buy certified nonhandheld engines for installation in equipment you produce, but you install the engines such that they use intake or exhaust systems that are not part of the originally certified configuration, you become the engine manufacturer for those engines and must certify that they will meet emission standards. We will allow you to utilize the provisions for simplified certification specified in paragraph (b) of this section, as long as your design stays within the overall specifications from the original engine manufacturer (such as exhaust backpressure) and you use a catalyst as described in the original engine manufacturer's application for certification.

(b) *Simplified certification.* You must perform testing with an emission-data engine to show that you meet exhaust emission standards; however, you may use the deterioration factor from the original engine manufacturer. The production-line testing requirements in subpart D of this part do not apply for engines certified under this section. You must meet all the other requirements that apply to engine manufacturers for engines subject to standards under this part. The engine family must have the same useful life value specified by the original engine manufacturer for that engine. In your application for certification describe any differences between the original engine manufacturer's design and yours and explain why the deterioration data generated by the original engine manufacturer is appropriate for your configuration.

(c) *Engine exemption.* As an engine manufacturer, you may produce nonconforming engines for equipment manufacturers as allowed under this section. You do not have to request this exemption for your engines, but you must have written assurance from equipment manufacturers that they need a certain number of exempted engines under this section. Add a removable label to the engines as described in 40 CFR 1068.262.

§ 1054.615 What is the exemption for engines certified to standards for Large SI engines?

(a) An engine is exempt from the requirements of this part if it is in an emission family that has a valid certificate of conformity showing that it meets emission standards and other requirements under 40 CFR part 1048 for the appropriate model year.

(b) The only requirements or prohibitions from this part that apply to an engine that is exempt under this section are in this section.

(c) If your engines do not have the certificate required in paragraph (a) of this section, they will be subject to the provisions of this part. Introducing these engines into U.S. commerce without a valid exemption or certificate of conformity violates the prohibitions in 40 CFR 1068.101(a).

(d) Engines exempted under this section are subject to all the requirements affecting engines under 40 CFR part 1048, including evaporative emission standards. The requirements and restrictions of 40 CFR part 1048 apply to anyone manufacturing these engines, anyone manufacturing equipment that uses these engines, and all other persons in the same manner as if these were nonroad spark-ignition engines above 19 kW.

(e) Engines exempted under this section may not generate or use emission credits under this part 1054.

§ 1054.620 What are the provisions for exempting engines used solely for competition?

The provisions of this section apply for new engines and equipment built on or after January 1, 2010.

(a) We may grant you an exemption from the standards and requirements of this part for a new engine on the grounds that it is to be used solely for competition. The requirements of this part, other than those in this section, do not apply to engines that we exempt for use solely for competition.

(b) We will exempt engines that we determine will be used solely for competition. The basis of our determination is described in paragraphs (c) and (d) of this section. Exemptions granted under this section are good for only one model year and you must request renewal for each subsequent model year. We will not approve your renewal request if we determine the engine will not be used solely for competition.

(c) Engines meeting all the following criteria are considered to be used solely for competition:

(1) Neither the engine nor any equipment containing the engine may be displayed for sale in any public dealership or otherwise offered for sale to the general public. Note that this does not preclude display of these engines as long as they are not available for sale to the general public.

(2) Sale of the equipment in which the engine is installed must be limited to professional competition teams, professional competitors, or other qualified competitors. For replacement engines, the sale of the engine itself must be limited to professional racing teams, professional racers, other qualified racers, or to the original equipment manufacturer.

(3) The engine and the equipment in which it is installed must have performance characteristics that are substantially superior to noncompetitive models.

(4) The engines are intended for use only as specified in paragraph (e) of this section.

(d) You may ask us to approve an exemption for engines not meeting the criteria listed in paragraph (c) of this section as long as you have clear and convincing evidence that the engines will be used solely for competition.

(e) Engines are considered to be used solely for competition only if their use is limited to competition events sanctioned by a state or federal government agency or another widely recognized public organization with authorizing permits for participating competitors. Operation of such engines may include only racing events, trials to qualify for racing events, and practice associated with racing events. Authorized attempts to set speed records are also considered racing events. Engines will not be considered to be used solely for competition if they are ever used for any recreational or other noncompetitive purpose. Any use of exempt engines in recreational events is a violation of 40 CFR 1068.101(b)(4).

(f) You must permanently label engines exempted under this section to clearly indicate that they are to be used only for competition. Failure to properly label an engine will void the exemption for that engine.

(g) If we request it, you must provide us any information we need to determine whether the engines are used solely for competition. This would generally include documentation regarding the number of engines and the ultimate purchaser of each engine as well as any documentation showing an equipment manufacturer's request for an exempted engine. Keep these records for five years.

§ 1054.625 What requirements apply under the Transition Program for Equipment Manufacturers?

The provisions of this section allow equipment manufacturers to produce equipment with Class II engines that are subject to less stringent exhaust emission standards after the Phase 3 emission standards begin to apply. To be eligible to use these provisions, you must follow all the instructions in this section. See § 1054.626 for requirements that apply specifically to companies that manufacture equipment outside the United States and to companies that import such equipment without manufacturing it. Engines and equipment you produce under this section are exempt from the prohibitions in 40 CFR 1068.101(a)(1) with respect to exhaust emissions, subject to the provisions of this section. Except as specified in paragraph (e) of this section, equipment exempted under this section must meet all applicable requirements related to evaporative emissions.

(a) *General.* If you are an equipment manufacturer, you may introduce into U.S. commerce limited numbers of nonroad equipment with Class II engines exempted under this section. You may use the exemptions in this section only if you have primary responsibility for designing and manufacturing equipment and your manufacturing procedures include installing some engines in this equipment. Consider all U.S.-directed equipment production in showing that you meet the requirements of this section, including those from any parent or subsidiary companies and those from any other companies you license to produce equipment for you. If you produce a type of equipment that has more than one engine, count each engine separately. These provisions are available during the first four model years that the Phase 3 exhaust emission standards apply.

(b) *Allowances.* Calculate how many pieces of equipment with exempted engines you may produce under this section by determining your U.S.-directed production volume of equipment with Class II engines from January 1, 2007 through December 31, 2009, calculating your annual average production for this period, and multiplying the average value by 0.3. The same calculation applies for small-volume equipment manufacturers, except that average annual production is multiplied by 2.0. For companies with no eligible production in a given year, calculate annual average production based only on those years in which you produce equipment during the specified period with Class II engines for sale in the United States. Use these allowances for equipment using model year 2011 and later Class II engines. You may use these allowances for equipment you produce before December 31, 2014.

(c) *Access to exempted engines.* You may use one of the following approaches to get exempted engines under this section:

(1) Request a certain number of exempted Class II engines from the engine manufacturer as described in paragraph (j)(1) of this section.

(2) You may make arrangements with the engine manufacturer to receive an engine without an exhaust system and install exhaust systems without aftertreatment that would otherwise be required to meet Phase 3 standards, as described in paragraph (j)(2) of this section. You must follow the engine manufacturer's instructions for installing noncatalyzed mufflers. You must keep records to show which engines you modify as described in this paragraph (c)(2) and make them available to the engine manufacturer for any auditing under the provisions of § 1054.610. If you do not place the label we specify in paragraph (f) of this section adjacent to the engine manufacturer's emission control information label, you must place an additional permanent label as close as possible to the engine's emission control information label where it will be readily visible in the final installation with at least the following items:

(i) Your corporate name and trademark.

(ii) The following statement: ''THIS ENGINE MEETS PHASE 2 STANDARDS UNDER § 1054.625(c)(2).''

(d) *Inclusion of engines not subject to Phase 3 standards.* The following provisions apply to engines that are not subject to Phase 3 standards:

(1) If you use the provisions of 40 CFR 1068.105(a) to use up your inventories of engines not certified to new emission standards, do not include these units in your count of equipment with exempted engines under paragraph (g)(2) of this section.

(2) If you install engines that are exempted from the Phase 3 standards for any reason, other than for equipment-manufacturer allowances under this section, do not include these units in your count of equipment with exempted engines under paragraph (g)(2) of this section. For example, if we grant a hardship exemption for the engine manufacturer, you may count these as compliant engines under this section. This paragraph (d)(2) applies only if the engine has a permanent label describing why it is exempted from the Phase 3 standards.

(e) *Standards.* If you produce equipment with exempted engines under this section, the engines must meet the Phase 2 emission standards specified in 40 CFR part 90. Any equipment using exempted engines under this section is also exempt from the running loss standard specified in § 1054.112.

(f) *Equipment labeling.* You must add a permanent label, written legibly in English, to the engine or another readily visible part of each piece of equipment with exempted engines you produce under this section. This label, which supplements the engine manufacturer's emission control information label, must include at least the following items:

(1) The label heading ''EMISSION CONTROL INFORMATION''.

(2) Your corporate name and trademark.

(3) The calendar year in which the equipment is manufactured.

(4) An e-mail address and phone number to contact for further information, or a Web site that includes this contact information.

(5) The following statement: THIS EQUIPMENT [or identify the type of equipment] HAS AN ENGINE THAT MEETS U.S. EPA EMISSION STANDARDS UNDER 40 CFR 1054.625.

(g) *Notification and reporting.* You must notify us of your intent to produce equipment under the provisions of this section and send us an annual report to verify that you are not exceeding the production limits for equipment with exempted engines, as follows:

(1) Send the Designated Compliance Officer a written notice of your intent before you use the provisions of this section including all the following:

(i) Your company's name and address, and your parent company's name and address, if applicable. Also identify the names of any other companies operating under the same parent company.

(ii) The name, phone number and e-mail address of a person to contact for more information.

(iii) The calendar years in which you expect to use the exemption provisions of this section.

(iv) The name and address of each company you expect to produce engines for the equipment you manufacture under this section.

(v) How many pieces of equipment with exempted engines you may sell under this section, as described in paragraph (b) of this section. Include your production figures for the period from January 1, 2007 through December 31, 2009, including figures broken down by equipment model and calendar year. You may send corrected figures with lower production volumes anytime after your initial notification. To make a correction for higher production volumes, send us the corrected figures by September 30, 2010. We may ask you to give us additional information to confirm your production figures.

(2) For each year that you use the provisions of this section, send the Designated Compliance Officer a written report by March 31 of the following year. Identify the following things in your report:

(i) The total count of equipment with exempted engines you sold in the preceding year, based on actual U.S.-directed production information. If you produce equipment in the 2010 calendar year with exempted engines from the

2011 model year, include these units in your March 31, 2012 report.

(ii) Cumulative figures describing how many pieces of equipment with exempted engines you have produced for all the years you used the provisions of this section.

(iii) The manufacturer of the engine installed in the equipment you produce under this section, if this is different than you specified under paragraph (g)(1)(iv) of this section.

(3) If you send your initial notification under paragraph (g)(1) of this section after the specified deadline, we may approve your use of allowances under this section. In your request, describe why you were unable to meet the deadline.

(h) *Recordkeeping.* Keep the following records of all equipment with exempted engines you produce under this section until at least December 31, 2019:

(1) The model number for each piece of equipment.

(2) Detailed figures for determining how many pieces of equipment with exempted engines you may produce under this section, as described in paragraph (b) of this section.

(3) The notifications and reports we require under paragraph (g) of this section.

(i) *Enforcement.* Producing more exempted engines or equipment than we allow under this section or installing engines that do not meet the emission standards of paragraph (e) of this section violates the prohibitions in 40 CFR 1068.101(a)(1). You must give us the records we require under this section if we ask for them (see 40 CFR 1068.101(a)(2)).

(j) *Provisions for engine manufacturers.* As an engine manufacturer, use one of the following approaches to produce exempted engines under this section:

(1) The provisions of this paragraph (j)(1) apply if you do not use the delegated-assembly provisions of § 1054.610 for any of the engines in an engine family. You must have written assurance from equipment manufacturers or your authorized distributors that they need a certain number of exempted engines under this section. Keep these records for at least five years after you stop producing engines under this section. You must also send us an annual report of the engines you produce under this section, as described under § 1054.250(a). The engines must meet the emission standards in paragraph (e) of this section and you must meet all the requirements of 40 CFR 1068.265. You must meet the labeling requirements in 40 CFR 90.114, but add the following statement instead of the compliance statement in 40 CFR 90.114(b)(7): THIS ENGINE MEETS U.S. EPA EMISSION STANDARDS UNDER 40 CFR 1054.625 AND MUST BE USED ONLY UNDER THOSE FLEXIBILITY PROVISIONS.

(2) The following provisions apply if you notify us that you plan to use the delegated-assembly provisions of § 1054.610 for one or more equipment manufacturers for an engine family:

(i) Include test data in your application for certification showing that your engines will meet the standards specified in paragraph (e) of this section if they have a noncatalyzed muffler in place of the aftertreatment that is part of the certified configuration. Use good engineering judgment for these measurements, which may involve sampling exhaust upstream of the catalyst or operating the engine with a noncatalyzed muffler. This may be based on emission measurements from previous model years if the data is still appropriate for the current engine configuration.

(ii) Produce all your engines with the emission control information label we specify in § 1054.135. The engines must also be labeled as specified in 40 CFR 1068.261.

(iii) Include in the installation instructions required under § 1054.610 any appropriate instructions or limitations on installing noncatalyzed mufflers to ensure that the fully assembled engine will meet the emission standards specified in paragraph (e) of this section. You may identify an appropriate range of backpressures, but this may not involve any instructions related to changing the fuel system for different fueling rates.

(iv) Use one of the following approaches to properly account for emission credits if your engine family generates exhaust emission credits under subpart H of this part:

(A) Multiply the credits calculated under § 1054.705 by 0.9. This is based on the expectation that equipment manufacturers will modify 10 percent of the engines to no longer meet Phase 3 standards.

(B) Include in your emission-credit calculations only those engines for which you can establish that the equipment manufacturer did not use the provisions of this section. This would involve an evaluation for each affected equipment manufacturer. For example, under this provision you may count emission credits for engines that you sell to equipment manufacturers with which you have no contract for delegated assembly. You may also count emission credits for engines that you sell to equipment manufacturers with which you have a delegated-assembly relationship if you confirm that the equipment manufacturer did not use the provisions of this section for those engines.

(k) *Additional exemptions for mid-sized companies.* If your annual production of equipment with Class II engines in 2007, 2008, and 2009 is between 5,000 and 50,000 units, you may request additional engine allowances under this section. To do this, notify us by January 31, 2010 if you believe the provisions of this section will not allow you to sell certain equipment models starting in the 2011 model year. In your notification, show us that you will be able to produce a number of Class II equipment models representing at least half your total U.S.-directed production volume in the 2011 model year that will be compliant with all Phase 3 exhaust and evaporative emission standards. Also describe why you need more allowances under this section to accommodate anticipated changes in engine designs resulting from engine manufacturers' compliance with changing exhaust emission standards. Include a proposal for the number of additional allowances you would need, with supporting rationale. We may approve allowances up to a total of 100 percent of the average annual U.S.-directed production volume you report under paragraph (b) of this section (in place of the 30 percent that is otherwise allowed).

§ 1054.626 What special provisions apply to equipment imported under the Transition Program for Equipment Manufacturers?

This section describes requirements that apply to equipment manufacturers using the provisions of § 1054.625 for equipment produced outside the United States. Note that § 1054.625 limits these provisions to equipment manufacturers that install some engines and have primary responsibility for designing and manufacturing equipment. Companies that import equipment into the United States without meeting these criteria are not eligible for allowances under § 1054.625. Such importers may import equipment with exempted engines only as described in paragraph (b) of this section.

(a) You or someone else may import your equipment with exempted engines under this section if you comply with the provisions in § 1054.625 and commit to the following:

(1) Give any EPA inspector or auditor complete and immediate access to inspect and audit, as follows:

(i) Inspections and audits may be announced or unannounced.

(ii) Inspections and audits may be performed by EPA employees or EPA contractors.

(iii) You must provide access to any location where—

(A) Any nonroad engine, equipment, or vehicle is produced or stored.

(B) Documents related to manufacturer operations are kept.

(C) Equipment, engines, or vehicles are tested or stored for testing.

(iv) You must provide any documents requested by an EPA inspector or auditor that are related to matters covered by the inspections or audit.

(v) EPA inspections and audits may include review and copying of any documents related to demonstrating compliance with the exemptions in § 1054.625.

(vi) EPA inspections and audits may include inspection and evaluation of complete or incomplete equipment, engines, or vehicles, and interviewing employees.

(vii) You must make any of your employees available for interview by the EPA inspector or auditor, on request, within a reasonable time period.

(viii) You must provide English language translations of any documents to an EPA inspector or auditor, on request, within 10 working days.

(ix) You must provide English-language interpreters to accompany EPA inspectors and auditors, on request.

(2) Name an agent for service located in the United States. Service on this agent constitutes service on you or any of your officers or employees for any action by EPA or otherwise by the United States related to the requirements of this part.

(3) The forum for any civil or criminal enforcement action related to the provisions of this section for violations of the Clean Air Act or regulations promulgated thereunder shall be governed by the Clean Air Act.

(4) The substantive and procedural laws of the United States shall apply to any civil or criminal enforcement action against you or any of your officers or employees related to the provisions of this section.

(5) Provide the notification required by § 1054.625(g). Include in the notice of intent in § 1054.625(g)(1) a commitment to comply with the requirements and obligations of § 1054.625 and this section. This commitment must be signed by the owner or president.

(6) You, your agents, officers, and employees must not seek to detain or to impose civil or criminal remedies against EPA inspectors or auditors, whether EPA employees or EPA contractors, for actions performed within the scope of EPA employment related to the provisions of this section.

(7) By submitting notification of your intent to use the provisions of § 1054.625, producing and exporting for resale to the United States nonroad equipment under this section, or taking other actions to comply with the requirements of this part, you, your agents, officers, and employees, without exception, become subject to the full operation of the administrative and judicial enforcement powers and provisions of the United States as described in 28 U.S.C. 1605(a)(2), without limitation based on sovereign immunity, for conduct that violates the requirements applicable to you under this part 1054—including such conduct that violates 18 U.S.C. 1001, 42 U.S.C. 7413(c)(2), or other applicable provisions of the Clean Air Act—with respect to actions instituted against you and your agents, officers, and employees in any court or other tribunal in the United States.

(8) Any report or other document you submit to us must be in the English language or include a complete translation in English.

(9) You may be required to post a bond to cover any potential enforcement actions under the Clean Air Act before you or anyone else imports your equipment with exempted engines under this section, as specified in § 1054.690. Use the bond amount specified in § 1054.690 without adjusting for inflation. Note that you may post a single bond to meet the requirements of this section and § 1054.690 together.

(b) The provisions of this paragraph (b) apply to importers that do not install engines into equipment and do not have primary responsibility for designing and manufacturing equipment. Such importers may import equipment with engines exempted under § 1054.625 only if each engine is exempted under an allowance provided to an equipment manufacturer meeting the requirements of § 1054.625 and this section. You must notify us of your intent to use the provisions of this section and send us an annual report, as follows:

(1) Notify the Designated Compliance Officer in writing before you use the provisions of § 1054.625. Include the following information:

(i) Your company's name and address, and your parent company's name and address, if applicable.

(ii) The name and address of the companies that produce the equipment and engines you will be importing under this section.

(iii) Your best estimate of the number of units you will import under this section in the upcoming calendar year, broken down by equipment manufacturer.

(2) For each year that you use the provisions of this section, send the Designated Compliance Officer a written report by March 31 of the following year. Include in your report the total number of engines you imported under this section in the preceding calendar year, broken down by engine manufacturer and by equipment manufacturer.

§ 1054.630 What provisions apply for importation of individual items for personal use?

(a) Any individual may import previously used nonconforming engines for purposes other than resale, but no more than once in any five-year period. This may include up to three nonconforming engines imported at the same time. To import engines under this section, provide to the Customs official the following information:

(1) Identify your name, address, and telephone number.

(2) If you are importing engines under this section on behalf of another person, identify the ultimate engine owner's name, address, and telephone number.

(3) Identify the total number of engines you are importing and specify the make, model, identification number, and original production year of each engine.

(4) State: ''I am importing these previously used engines for personal use. I have not imported any engines under the provisions of 40 CFR 1054.630 within the previous five years. I am not importing these engines for purpose of resale. I authorize EPA enforcement officers to inspect my engines and my facilities as permitted by the Clean Air Act.''

(b) We may require you to send us additional information but you do not need written approval from us to import engines under this section. We will also not require a U.S. Customs Service bond for engines you import under this section.

(c) The provisions of this section may not be used to circumvent emission standards that apply to new engines under this part. For example, you may not purchase new engines and use them in a trivial manner outside of the United States to qualify for importation under this section.

(d) If you violate the provisions of this section, or submit false information to obtain this exemption, you will be subject to civil penalties as specified in 40 CFR 1068.101(a)(2) and (b)(5).

§ 1054.635 What special provisions apply for small-volume engine and equipment manufacturers?

This section describes how we apply the special provisions in this part for small-volume engine and equipment manufacturers.

(a) If you qualify under paragraph (1) or (2) of the definition of small-volume engine manufacturer or under paragraph (1) or (2) of the definition of small-volume equipment manufacturer in § 1054.801, the small-volume provisions apply as specified in this part.

(b) If you are a small business (as defined by the Small Business Administration at 13 CFR 121.201) that manufactures nonroad spark-ignition engines or equipment, but you do not qualify under paragraph (1) or (2) of the definition of small-volume engine manufacturer or under paragraph (1) or (2) of the definition of small-volume equipment manufacturer in § 1054.801, you may ask us to designate you to be a small-volume engine or equipment manufacturer. You may do this whether you began manufacturing engines before, during, or after 2007. We may set other reasonable conditions that are consistent with the intent of this section and the Clean Air Act.

(c) Special provisions apply for small-volume engine and equipment manufacturers, as illustrated by the following examples:

(1) Additional lead time and other provisions related to the transition to new emission standards. See § 1054.145.

(2) More flexible arrangements for creating engine families. See § 1054.230.

(3) Assigned deterioration factors. See § 1054.240.

(4) Waived requirements for production-line testing. See § 1054.301.

(5) Streamlined certification provisions for equipment manufacturers relying on engine manufacturer's design parameters. See § 1054.612.

(6) Additional allowances under the Transition Program for Equipment Manufacturers. See § 1054.625.

(7) Additional special provisions apply for small-volume engine and equipment manufacturers under 40 CFR part 1068. For example, see 40 CFR 1068.250.

(d) Small-volume engine and equipment manufacturers may ask us to waive or modify the requirements of § 1054.690 if this would cause a serious economic hardship, as long as you demonstrate to us in some other way that you will meet any potential compliance-or enforcement-related obligations. In evaluating such a request, we would consider the extent to which there is a risk of noncompliance or nonconformity and the extent to which the manufacturer could be expected to fulfill future regulatory obligations and administrative judgments. We may also consider how many years the manufacturer has certified engines without a violation or a finding of noncompliance to determine whether to adjust applicable asset thresholds or to reduce the minimum bond value. We may set other reasonable conditions to ensure that the manufacturer will meet applicable requirements.

(e) If you use any of the provisions of this part that apply specifically to small-volume manufacturers and we find that you exceed the production limits or otherwise do not qualify as a small-volume manufacturer, we may consider you to be in violation of the requirements that apply for companies that are not small-volume manufacturers for those engines produced in excess of the specified production limits. If you no longer qualify as a small-volume engine manufacturer (based on increased production volumes or other factors), we will work with you to determine a reasonable schedule for complying with additional requirements that apply. For example, if you no longer qualify as a small-volume engine manufacturer shortly before you certify your engines for the next model year, we might allow you to use assigned deterioration factors for one more model year.

§ 1054.640 What special provisions apply to branded engines?

The following provisions apply if you identify the name and trademark of another company instead of your own on your emission control information label, as provided by § 1054.135(c)(2):

(a) You must have a contractual agreement with the other company that obligates that company to take the following steps:

(1) Meet the emission warranty requirements that apply under § 1054.120. This may involve a separate agreement involving reimbursement of warranty-related expenses.

(2) Report all warranty-related information to the certificate holder.

(b) In your application for certification, identify the company whose trademark you will use.

(c) You remain responsible for meeting all the requirements of this chapter, including warranty and defect-reporting provisions.

§ 1054.645 What special provisions apply for converting an engine to use an alternate fuel?

A certificate of conformity is no longer valid for an engine if the engine is modified such that it is not in a configuration covered by the certificate. This section applies if such modifications are done to convert the engine to run on a different fuel type. Such engines may need to be recertified as specified in this section if the certificate is no longer valid for that engine.

(a) Converting a certified new engine to run on a different fuel type violates 40 CFR 1068.101(a)(1) if the modified engine is not covered by a certificate of conformity.

(b) Converting a certified engine that is not new to run on a different fuel type violates 40 CFR 1068.101(b)(1) if the modified engine is not covered by a certificate of conformity. We may specify alternate certification provisions consistent with the requirements of this part. For example, you may certify the modified engine for a partial useful life. For example, if the engine is modified halfway through its original useful life period, you may generally certify the engine based on completing the original useful life period; or if the engine is modified after the original useful life period is past, you may generally certify the engine based on testing that does not involve further durability demonstration.

(c) Engines may be certified using the certification procedures for new engines as specified in this part or using the certification procedures for aftermarket parts as specified in 40 CFR part 85, subpart V. Unless the original engine manufacturer continues to be responsible for the engine as specified in paragraph (d) of this section, you must remove the original engine manufacturer's emission control information label if you recertify the engine.

(d) The original engine manufacturer is not responsible for operation of modified engines in configurations resulting from modifications performed by others. In cases where the modification allows an engine to be operated in either its original configuration or a modified configuration, the original engine manufacturer remains responsible for operation of the modified engine in its original configuration.

(e) Entities producing conversion kits may obtain certificates of conformity for the converted engines. Such entities are engine manufacturers for purposes of this part.

§ 1054.650 What special provisions apply for adding or changing governors?

The special provisions in this section apply for engines that will not be governed to control engine speeds consistent with the constant-speed operation reflected by the duty cycles specified in § 1054.505. We refer to these as constant-speed governors in this section. Paragraph (a) of this section also applies for any engines shipped without installed governors.

(a) The representative-testing requirements of 40 CFR 1065.10(c)(1) related to in-use duty cycles do not apply to engines you produce and ship without constant-speed governors if you comply with all the following requirements:

(1) You must have test data showing that the effectiveness of the engine's emission controls over the expected range of in-use operation will be similar to that measured over the specified duty cycle. Alternatively, if your emission controls depend on maintaining a consistent air-fuel ratio, you may demonstrate that the engine is calibrated to maintain a consistent air-fuel ratio over the expected range of in-use operation.

(2) Describe in your application for certification the data and analysis that supports your conclusion.

(b) It is a violation of the tampering provisions in 40 CFR 1068.101(b)(1) to remove a governor from a certified engine unless you recertify the engine in the modified configuration.

§ 1054.655 What special provisions apply for installing and removing altitude kits?

An action for the purpose of installing or modifying altitude kits and performing other changes to compensate for changing altitude is not considered a prohibited act under 40 CFR 1068.101(b) as long as as it is done consistent with the manufacturer's instructions.

§ 1054.660 What are the provisions for exempting emergency rescue equipment?

The provisions of this section apply for new equipment built on or after January 1, 2010.

(a) Equipment manufacturers may introduce into U.S. commerce equipment that is not certified to current emission standards under the following conditions if the equipment will be used solely in emergency rescue situations:

(1) You must determine annually that no engines certified to current emission standards are available to power the equipment safely and practically. We may review your records supporting this determination at any time.

(2) You may not use exempted engines for the following equipment used to provide remote power to a rescue tool: generators, alternators, compressors, or pumps.

(3) If engines that meet less stringent emission standards are capable of powering your equipment safely and practically, you must use them as a condition of this exemption. You must use available engines meeting the most stringent standards feasible.

(4) You must send the engine manufacturer a written request for each exempted equipment model.

(5) You must notify the Designated Compliance Officer of your intent to use the provisions of this section. We may require you to notify us annually or to send us annual reports describing how you meet the conditions of this section.

(b) For the purposes of this section, ''emergency rescue situations'' means firefighting or other situations in which a person is retrieved from imminent danger.

(c) As an engine manufacturer, you may produce exempt engines under this section without our prior approval if you have a written request for an exempted engine for use in emergency rescue equipment from the equipment manufacturer. You must permanently label engines with the following statement: ''EMERGENCY RESCUE EQUIPMENT—EXEMPT FROM EMISSION STANDARDS UNDER 40 CFR 1054.660.'' Failure to properly label an engine will void the exemption.

(d) We may discontinue an exemption under this section if we find that engines are not used solely for emergency rescue equipment or if we find that a certified engine is available to power the equipment safely and practically.

§ 1054.690 What bond requirements apply for certified engines?

(a) Before introducing certified engines into U.S. commerce, you must post a bond to cover any potential compliance or enforcement actions under the Clean Air Act unless you demonstrate to us in your application for certification that you are able to meet any potential compliance-or enforcement-related obligations, as described in this section. See paragraph (i) of this section for the requirements related to importing engines that have been certified by someone else. Note that you might also post bond under this section to meet your obligations under § 1054.120.

(b) The bonding requirements apply if you do not have long-term assets in the United States meeting any of the following thresholds:

(1) A threshold of $3 million applies if you have been a certificate holder in each of the preceding ten years without failing a test conducted by EPA officials or having been found by EPA to be noncompliant under applicable regulations.

(2) A threshold of $6 million applies if you are a secondary engine manufacturer.

(3) A threshold of $10 million applies if you do not qualify for the smaller bond thresholds in paragraph (b)(1) or (2) of this section.

(c) For the purpose of establishing your level of long-term assets under paragraph (b) of this section, include the values from your most recent balance sheet for buildings, land, and fixed equipment, but subtract depreciation and related long-term liabilities (such as a mortgage). If you have sufficient long-term assets to avoid bond payments under this section, you must identify the location of these assets in your application for certification.

(d) The minimum value of the bond is $500,000. A higher bond value may apply based on the per-engine bond values shown in Table 1 to this section and on the U.S.-directed production volume from each displacement grouping for the calendar year. For example, if you have projected U.S.-directed production volumes of 10,000 engines with 180 cc displacement and 10,000 engines with 400 cc displacement in 2013, the appropriate bond amount is $750,000. Adjust the value of the bond as follows:

(1) If your estimated or actual U.S.-directed production volume in any later calendar year increases beyond the level appropriate for your current bond payment, you must post additional bond to reflect the increased volume within 90 days after you change your estimate or determine the actual production volume. You may not decrease your bond.

(2) If you sell engines without aftertreatment components under the provisions of § 1054.610, you must increase the per-engine bond values for the current year by 20 percent. Round calculated values to the nearest dollar.

TABLE 1 TO § 1054.690—PER-ENGINE BOND VALUES

For engines with displacement falling in the following ranges . . .	The per-engine bond value is . . .
Disp. < 225 cc	$25
225 ≤ Disp. < 740 cc	50
740 ≤ Disp. ≤ 1,000 cc	100
Disp. > 1,000 cc	200

(e) The threshold identified in paragraph (b) of this section and the bond values identified in paragraph (d) of this section are in 2008 dollars. Adjust these values in 2010 and later calendar years by comparing the

Consumer Price Index values published by the Bureau of Labor Statistics for the preceding June and June 2008 (see *ftp://ftp.bls.gov/pub/special.requests/cpi/cpiai.txt*). Round calculated values for the thresholds and for total bond obligations to the nearest thousand dollars.

(f) You may meet the bond requirements of this section by obtaining a bond from a third-party surety that is cited in the U.S. Department of Treasury Circular 570, ''Companies Holding Certificates of Authority as Acceptable Sureties on Federal Bonds and as Acceptable Reinsuring Companies'' (*http://www.fms.treas.gov/c570/c570.html#certified*). You must maintain this bond for every year in which you sell certified engines and for five years after you no longer hold a certificate of conformity.

(g) If you forfeit some or all of your bond in an enforcement action, you must post any appropriate bond for continuing sale within 90 days after you forfeit the bond amount.

(h) You will forfeit the proceeds of the bond posted under this section if you need to satisfy any United States administrative settlement agreement, administrative final order, or judicial judgment against you arising from your violation of this chapter, or violation of 18 U.S.C. 1001, 42 U.S.C. 7413(c)(2), or other applicable provisions of the Clean Air Act.

(i) If you are required to post a bond under this section, you must note that in your application for certification as described in § 1054.205. Your certification is conditioned on your compliance with this section. Your certificate is automatically suspended if you fail to comply with the requirements of this section. We may also revoke your certificate.

(j) The following provisions apply if you import engines for resale when those engines have been certified by someone else (or equipment containing such engines):

(1) You and the certificate holder are each responsible for compliance with the requirements of this part and the Clean Air Act. For example, we may require you to comply with the warranty requirements in the standard-setting part.

(2) You do not need to post bond if the certificate holder complies with the bond requirements of this section. You also do not need to post bond if the certificate holder complies with the asset requirements of this section and the repair-network provisions of § 1054.120(f)(4).

Subpart H—Averaging, Banking, and Trading for Certification

§ 1054.701 General provisions.

(a) You may average, bank, and trade (ABT) emission credits for purposes of certification as described in this subpart to show compliance with the standards of this part. This applies for engines with respect to exhaust emissions and for equipment with respect to evaporative emissions. Participation in this program is voluntary.

(b) The definitions of subpart I of this part apply to this subpart. The following definitions also apply:

(1) *Actual emission credits* means emission credits you have generated that we have verified by reviewing your final report.

(2) *Averaging set* means a set of engines (or equipment) in which emission credits may be exchanged only with other engines (or equipment) in the same averaging set.

(3) *Broker* means any entity that facilitates a trade of emission credits between a buyer and seller.

(4) *Buyer* means the entity that receives emission credits as a result of a trade.

(5) *Family* means engine family for exhaust credits or emission family for evaporative credits.

(6) *Reserved emission credits* means emission credits you have generated that we have not yet verified by reviewing your final report.

(7) *Seller* means the entity that provides emission credits during a trade.

(8) *Standard* means the emission standard that applies under subpart B of this part for engines or fuel-system components not participating in the ABT program of this subpart.

(9) *Trade* means to exchange emission credits, either as a buyer or seller.

(c) The use of emission credits is limited to averaging sets, as follows:

(1) You may not average or exchange exhaust credits with evaporative credits, or vice versa.

(2) Handheld engines and nonhandheld engines are in separate averaging sets with respect to exhaust emissions except as specified in § 1054.740(e). You may use emission credits generated under 40 CFR part 90 for handheld engines subject to the standards in § 1054.103 only if you can demonstrate that those credits were generated by handheld engines, except as specified in § 1054.740(e). You may use emission credits generated under 40 CFR part 90 for nonhandheld engines only if you can demonstrate that those credits were generated by nonhandheld engines, subject to the provisions of § 1054.740.

(3) Equipment using handheld engines and equipment using nonhandheld engines are in separate averaging sets with respect to evaporative emissions. You may not average or exchange evaporative credits between either of these averaging sets.

(4) For purposes of calculating emission credits under this subpart, engines with displacement at or below 80 cc are presumed to be handheld engines. You may treat these as nonhandheld engines for calculating exhaust or evaporative emission credits only for those engines you can demonstrate will be installed in nonhandheld equipment. For example, if 50 percent of engines in a family will be used in nonhandheld equipment, you may calculate the emission credits for 50 percent of the engines to be nonhandheld credits. Use the specified calculation methods for handheld engines to quantify positive or negative exhaust emission credits for all engines at or below 80 cc.

(d) You may not generate evaporative credits based on permeation measurements from metal fuel tanks.

(e) You may not use emission credits generated under this subpart to offset any emissions that exceed an FEL or standard. This applies for all testing, including certification testing, in-use testing, selective enforcement audits, and other production-line testing. However, if exhaust emissions from an engine exceed an exhaust FEL or standard (for example, during a selective enforcement audit), you may use emission credits to recertify the family with a higher FEL that applies only to future production.

(f) Emission credits may be used in the model year they are generated (averaging) and in future model years (banking). Emission credits may not be used for past model years.

(g) You may increase or decrease an exhaust FEL during the model year by amending your application for certification under § 1054.225. See 40 CFR 1060.225 for provisions related to changing an FEL for fuel tank permeation.

(h) Engine and equipment manufacturers certifying with respect to evaporative emissions may use emission credits to demonstrate compliance under this subpart. Component manufacturers may establish FELs for their certified products, but they may not generate or use emission credits under this subpart.

(i) In your application for certification, base your showing of compliance on projected production volumes for engines or equipment intended for sale in the United States. As described in § 1054.730, compliance with the requirements of this subpart is determined at the end of the model year based on actual production volumes for engines or equipment intended for sale in the United States. Do not include any of the following engines or equipment to calculate emission credits:

(1) Engines or equipment exempted under subpart G of this part or under 40 CFR part 1068.

(2) Engines or equipment intended for export.

(3) Engines or equipment that are subject to state emission standards for that model year. However, this restriction does not apply if we determine that the state standards and requirements are equivalent to those of this part and that products sold in such a state will not generate credits under the state program. For example, you may not include engines or equipment certified for California if California has more stringent emission standards for these products or if your products generate or use emission credits under the California program.

(4) Engines or equipment not subject to the requirements of this part, such as those excluded under § 1054.5.

(5) Any other engines or equipment where we indicate elsewhere in this part 1054 that they are not to be included in the calculations of this subpart.

§ 1054.705 How do I generate and calculate exhaust emission credits?

The provisions of this section apply for calculating exhaust emission credits. You may generate exhaust emission credits only if you are a certifying engine manufacturer.

(a) For each participating family, calculate positive or negative emission credits relative to the otherwise applicable emission standard. Calculate positive emission credits for a family that has an FEL below the standard. Calculate negative emission credits for a family that has an FEL above the standard. Sum your positive and negative credits for the model year before rounding. Round the sum of emission credits to the nearest kilogram (kg) using consistent units throughout the following equation:

$$\text{Emission credits (kg)} = (\text{STD} - \text{FEL}) \times (\text{Volume}) \times (\text{Power}) \times (\text{UL}) \times (\text{LF}) \times (10^{-3})$$

Where:

STD = the emission standard, in g/kW-hr.

FEL = the family emission limit for the family, in g/kW-hr.

Volume = the number of engines eligible to participate in the averaging, banking, and trading program within the given family during the model year, as described in § 1054.701(i).

Power = the maximum modal power of the emission-data engine as calculated from the applicable test procedure described in subpart F of this part, in kilowatts.

UL = the useful life for the given family, in hours.

LF = load factor. Use 0.47 for nonhandheld engines and 0.85 for handheld engines. We may specify a different load factor if we approve the use of special test procedures for a family under 40 CFR 1065.10(c)(2), consistent with good engineering judgment.

(b) [Reserved]

§ 1054.706 How do I generate and calculate evaporative emission credits?

The provisions of this section apply for calculating evaporative emission credits related to fuel tank permeation. You may generate credits only if you are a certifying equipment manufacturer. This may include engine manufacturers that make engines with complete fuel systems as described in § 1054.2.

(a) For each participating family, calculate positive or negative emission credits relative to the otherwise applicable emission standard. Calculate positive emission credits for a family that has an FEL below the standard. Calculate negative emission credits for a family that has an FEL above the standard. Sum your positive and negative credits for the model year before rounding. Round the sum of emission credits to the nearest kilogram (kg) using consistent units throughout the following equation:

$$\text{Emission credits (kg)} = (\text{STD} - \text{FEL}) \times (\text{Total Area}) \times (\text{UL}) \times (\text{AF}) \times (365) \times (10^{-3})$$

STD = the emission standard, in $g/m^2/day$.

FEL = the family emission limit for the family, in $g/m^2/day$, as described in paragraph (b) of this section.

Total Area = The combined internal surface area of all fuel tanks in the family, taking production volume into account, in m^2.

UL = 5 years, which represents the useful life for the given family.

AF= adjustment factor. Use 1.0 for testing at 28 °C; use 0.60 for testing at 40 °C.

(b) For calculating credits under paragraph (a) of this section, the emission standard and FEL must both be based on test measurements at the same temperature (28 ° or 40 °C). Determine the FEL for calculating emission credits relative to testing at 28 °C as described in paragraphs (b)(1) and (2) of this section. Determine the FEL for calculating emission credits relative to testing at 40 °C as described in paragraph (b)(3) of this section.

(1) To use an FEL below 5.0 $g/m^2/day$, it must be based on emission measurements.

(2) The provisions of this paragraph (b)(2) apply for all emission families with FELs at or above 5.0 $g/m^2/day$. To calculate emission credits for such emission families, you must choose from one of the following options and apply it to all your emission families with FELs at or above 5.0 $g/m^2/day$:

(i) Option 1: Establish all your FELs based on emission measurements. This may include measurements from a certifying fuel tank manufacturer.

(ii) Option 2: Use an assigned FEL of 10.4 $g/m^2/day$. This would apply without regard to whether any of these emission families have measured emission levels below 10.4 $g/m^2/day$. If any of your fuel tanks were otherwise certified (by you or the fuel tank manufacturer) with an FEL at or above 5.0 $g/m^2/day$, the assigned FEL of 10.4 $g/m^2/day$ applies only for emission credit calculations.

(3) Determine the FEL for calculating emission credits relative to testing at 40 °C as described in paragraph (b)(1) and (2) of this section, but use 8.3 $g/m^2/day$ instead of 5.0 $g/m^2/day$ and use 17.3 $g/m^2/day$ instead of 10.4 $g/m^2/day$.

§ 1054.710 How do I average emission credits?

(a) Averaging is the exchange of emission credits among your families. You may average emission credits only within the same averaging set.

(b) You may certify one or more families to an FEL above the emission standard, subject to the FEL caps and other provisions in subpart B of this part, if you show in your application for certification that your projected balance of all emission-credit transactions in that model year is greater than or equal to zero.

(c) If you certify a family to an FEL that exceeds the otherwise applicable standard, you must obtain enough emission credits to offset the family's deficit by the due date for the final report required in § 1054.730. The emission credits used to address the deficit may come from your other families that generate emission credits in the same model year, from emission credits you have banked, or from emission credits you obtain through trading.

§ 1054.715 How do I bank emission credits?

(a) Banking is the retention of emission credits by the manufacturer generating the emission credits for use in future model years for averaging or trading. You may use banked emission credits only within the averaging set in which they were generated, except as described in this subpart.

(b) You may designate any emission credits you plan to bank in the reports you submit under § 1054.730. During the model year and before the due date for the final report, you may designate your reserved emission credits for averaging or trading.

(c) Reserved credits become actual emission credits when you submit your final report. However, we may revoke these emission credits if we are unable to verify them after reviewing your reports or auditing your records.

§ 1054.720 How do I trade emission credits?

(a) Trading is the exchange of emission credits between manufacturers. You may use traded emission credits for averaging, banking, or further trading transactions. Traded emission credits may be used only within the averaging set in which they were generated, except as described in this subpart.

(b) You may trade actual emission credits as described in this subpart. You may also trade reserved emission credits, but we may revoke these emission credits based on our review of your records or reports or those of the company with which you traded emission credits. You may trade banked credits within an averaging set to any certifying engine or equipment manufacturer.

(c) If a negative emission credit balance results from a transaction, both the buyer and seller are liable, except in cases we deem to involve fraud. See § 1054.255(e) for cases involving fraud. We may void the certificates of all families participating in a trade that results in a manufacturer having a negative balance of emission credits. See § 1054.745.

§ 1054.725 What must I include in my application for certification?

(a) You must declare in your application for certification your intent to use the provisions of this subpart for each family that will be certified using the ABT program. You must also declare the FELs you select for the family for each pollutant for which you are using the ABT program. Your FELs must comply with the specifications of subpart B of this part, including the FEL caps. FELs must be expressed to the same number of decimal places as the emission standard.

(b) Include the following in your application for certification:

(1) A statement that, to the best of your belief, you will not have a negative balance of emission credits for any averaging set when all emission credits are calculated at the end of the year.

(2) Detailed calculations of projected emission credits (positive or negative) based on projected production volumes. We may require you to include similar calculations from your other engine families to demonstrate that you will be able to avoid a negative credit balance for the model year. If you project negative emission credits for a family, state the source of positive emission credits you expect to use to offset the negative emission credits.

§ 1054.730 What ABT reports must I send to EPA?

(a) If any of your families are certified using the ABT provisions of this subpart, you must send an end-of-year report within 90 days after the end of the model year and a final report within 270 days after the end of the model year. We may waive the requirement to send the end-of-year report as long as you send the final report on time.

(b) Your end-of-year and final reports must include the following information for each family participating in the ABT program:

(1) Family designation.

(2) The emission standards that would otherwise apply to the family.

(3) The FEL for each pollutant. If you change the FEL after the start of production, identify the date that you started using the new FEL and/or give the engine identification number for the first engine covered by the new FEL. In this case, identify each applicable FEL and calculate the positive or negative emission credits under each FEL.

(4) The projected and actual production volumes for the model year with a point of retail sale in the United States, as described in § 1054.701(i). For fuel tanks, state the production volume in terms of surface area and production volume for each fuel tank configuration and state the total surface area for the emission family. If you changed an FEL during the model year, identify the actual production volume associated with each FEL.

(5) The maximum modal power of the emission-data engine or the appropriate internal surface area of the fuel tank.

(6) Useful life.

(7) Calculated positive or negative emission credits for the whole family. Identify any emission credits that you traded, as described in paragraph (d)(1) of this section.

(c) Your end-of-year and final reports must include the following additional information:

(1) Show that your net balance of emission credits from all your participating families in each averaging set in the applicable model year is not negative.

(2) State whether you will retain any emission credits for banking.

(3) State that the report's contents are accurate.

(d) If you trade emission credits, you must send us a report within 90 days after the transaction, as follows:

(1) As the seller, you must include the following information in your report:

(i) The corporate names of the buyer and any brokers.

(ii) A copy of any contracts related to the trade.

(iii) The families that generated emission credits for the trade, including the number of emission credits from each family.

(2) As the buyer, you must include the following information in your report:

(i) The corporate names of the seller and any brokers.

(ii) A copy of any contracts related to the trade.

(iii) How you intend to use the emission credits, including the number of emission credits you intend to apply to each family (if known).

(e) Send your reports electronically to the Designated Compliance Officer using an approved information format. If you want to use a different format, send us a written request with justification for a waiver.

(f) Correct errors in your end-of-year report or final report as follows:

(1) You may correct any errors in your end-of-year report when you prepare the final report as long as you send us the final report by the time it is due.

(2) If you or we determine within 270 days after the end of the model year that errors mistakenly decreased your balance of emission credits, you may correct the errors and recalculate the balance of emission credits. You may not make these corrections for errors that are determined more than 270 days after the end of the model year. If you report a negative balance of emission credits, we may disallow corrections under this paragraph (f)(2).

(3) If you or we determine anytime that errors mistakenly increased your balance of emission credits, you must correct the errors and recalculate the balance of emission credits.

§ 1054.735 What records must I keep?

(a) You must organize and maintain your records as described in this section. We may review your records at any time.

(b) Keep the records required by this section for at least eight years after the due date for the end-of-year report. You may not use emission credits for any engines or equipment if you do not keep all the records required under this section. You must therefore keep these records to continue to bank valid credits. Store these records in any format and on any media as long as you can promptly send us organized, written records in English if we ask for them. You must keep these records readily available. We may review them at any time.

(c) Keep a copy of the reports we require in § 1054.730.

(d) Keep records of the engine identification number for each engine or piece of equipment you produce that generates or uses emission credits under the ABT program. You may identify these numbers as a range. If you change the FEL after the start of production, identify the date you started using each FEL and the range of engine identification numbers associated with each FEL.

(e) We may require you to keep additional records or to send us relevant information not required by this section in accordance with the Clean Air Act.

§ 1054.740 What special provisions apply for generating and using emission credits?

(a) You may generate Phase 3 emission credits from 2008 through 2011 model year Class I engines if you voluntarily meet the Phase 3 exhaust emission standards specified in § 1054.105. Divide these into transitional and enduring emission credits as follows:

(1) Transitional credits are based on reducing emissions from Phase 2 levels down to Phase 3 levels. Calculate the value of transitional emission credits as described in § 1054.705, based on setting STD equal to 15.0 g/kW-hr and FEL equal to 10.0 g/kW-hr. You may use these transitional credits only for Class I engines in 2012 through 2014 model years. You may not use these transitional credits for Class II engines.

(2) Enduring credits are based on reducing emissions below Phase 3 levels. Calculate the value of enduring credits as described in § 1054.705, based on setting STD equal to 10.0 g/kW-hr and FEL to the value of the family emission limit you select for the family. You may use these enduring credits for any nonhandheld engines certified to the Phase 3 standards under this part, except as specified in paragraph (d) of this section.

(b) You may generate Phase 3 emission credits from 2008 through 2010 model year Class II engines if you voluntarily meet the Phase 3 exhaust emission standards specified in § 1054.105. Divide these into transitional and enduring emission credits as follows:

(1) Transitional credits are based on reducing emissions from Phase 2 levels down to Phase 3 levels. Calculate the value of transitional emission credits as described in § 1054.705, based on setting STD equal to 11.0 g/kW-hr and FEL equal to 8.0 g/kW-hr. You may use these transitional credits only for Class II engines in 2011 through 2013 model years. You may not use these transitional credits for Class I engines.

(2) Enduring credits are based on reducing emissions below Phase 3 levels. Calculate the value of enduring credits as described in § 1054.705, based on setting STD equal to 8.0 g/kW-hr and FEL to the value of the family emission limit you select for the family. You may use these enduring credits for any nonhandheld engines certified to the Phase 3 standards under this part, except as specified in paragraph (d) of this section.

(c) You may use emission credits generated by Class I and Class II engines subject to Phase 2 emission standards under 40 CFR part 90 to demonstrate compliance with the Phase 3 exhaust emission standards, but only after you have exhausted all transitional credits from engines meeting Phase 3 standards, subject to the conditions of paragraph (d) of this section. You may use these Phase 2 emission credits only in the 2012 and 2013 model years for Class I engines and only in the 2011 through 2013 model years for Class II engines. Determine a maximum number of Phase 2 emission credits for demonstrating compliance with the Phase 3 standards for a given engine class (Class I or Class II) as follows:

(1) Calculate a Phase 2 credit allowance for each engine class based on production information for model years 2007, 2008, and 2009 using the following equation:

$$\text{Credit allowance (kg)} = (\text{Emissions Delta}) \times (\text{Volume}) \times (\text{Avg. Power}) \times (\text{Avg. UL}) \times (\text{LF}) \times (10^{-3})$$

Where:

Emissions Delta = 1.6 g/kW-hr for Class I and 2.1 g/kW-hr for Class II.

Volume = the number of your engines eligible to participate in the averaging, banking, and trading program, as described in § 1054.701(i), based on actual U.S.-directed production volumes.

Avg. Power = the production-weighted average value of the maximum modal power for all your engine families in the engine class, as described in § 1054.705(a), in kilowatts.

Avg. UL = the production-weighted average value of the useful life for all your engine families in the engine class, in hours.

LF = load factor. Use 0.47.

(2) Do not include wintertime engines in the calculation of credit allowances unless they are certified to meet the otherwise applicable $HC+NO_X$ emission standard.

(3) Calculate the average annual Phase 2 credit allowance for each engine class over three model years as specified in paragraph (c)(1) of this section. The resulting average value is the maximum number of Phase 2 emission credits you may use under this paragraph (c) for each engine class.

(4) For 2013 and earlier model years, include in the reports described in § 1054.730 the total allowable number of Phase 2 emission credits and your cumulative totals of Phase 2 credits you have used to comply with the requirements of this part for each engine class.

(d) If you generate enduring emission credits from Class I engines under paragraph (a) of this section, you may not use these for Class II engines in the 2011 or 2012 model year. Similarly, if you generate enduring emission credits from Class II engines under paragraph (b) of this section, you may not use these for Class I engines in the 2012 model year. These restrictions also apply for emission credits you generate for engines subject to the standards of this part in the 2011 or 2012 model year.

(e) You may use Phase 2 or Phase 3 emission credits from nonhandheld engines to demonstrate compliance with the Phase 3 standards for handheld engines subject to the following restrictions:

(1) The handheld family must be certified in 2008 and all later model years using carryover of emission data from an engine family that was most recently certified with new emission data in 2007 or an earlier model year.

(2) The handheld family's FEL may not increase above the level selected for the 2007 model year in later years unless such an increase is based on emission data from production engines.

(3) Your total production of handheld engines certified under this paragraph (e) may not exceed 30,000 in any model year.

§ 1054.745 What can happen if I do not comply with the provisions of this subpart?

(a) For each family participating in the ABT program, the certificate of conformity is conditional upon full compliance with the provisions of this subpart during and after the model year. You are responsible to establish to our satisfaction that you fully comply with applicable requirements. We may void the certificate of conformity for a family if you fail to comply with any provisions of this subpart.

(b) You may certify your family to an FEL above an emission standard based on a projection that you will have enough emission credits to offset the deficit for the family. However, we may void the certificate of conformity if you cannot show in your final report that you have enough actual emission credits to offset a deficit for any pollutant in a family.

(c) We may void the certificate of conformity for a family if you fail to keep records, send reports, or give us information we request.

(d) You may ask for a hearing if we void your certificate under this section (see § 1054.820).

Subpart I—Definitions and Other Reference Information

§ 1054.801 What definitions apply to this part?

The following definitions apply to this part. The definitions apply to all subparts unless we note otherwise. All undefined terms have the meaning the Clean Air Act gives to them. The definitions follow:

Adjustable parameter means any device, system, or element of design that someone can adjust (including those which are difficult to access) and that, if adjusted, may affect emissions or engine performance during emission testing or normal in-use operation. This includes, but is not limited to, parameters related to injection timing and fueling rate. You may ask us to exclude a parameter that is difficult to access if it cannot be adjusted to affect emissions without significantly degrading engine performance, or if you otherwise show us that it will not be adjusted in a way that affects emissions during in-use operation.

Aftertreatment means relating to a catalytic converter, particulate filter, thermal reactor, or any other system, component, or technology mounted downstream of the exhaust valve (or exhaust port) whose design function is to decrease emissions in the engine exhaust before it is exhausted to the environment. Exhaust-gas recirculation (EGR), turbochargers, and oxygen sensors are not aftertreatment.

Alcohol-fueled engine means an engine that is designed to run using an alcohol fuel. For purposes of this definition, alcohol fuels do not include fuels with a nominal alcohol content below 25 percent by volume.

Amphibious vehicle means a vehicle with wheels or tracks that is designed primarily for operation on land and secondarily for operation in water.

Applicable emission standard or *applicable standard* means an emission standard to which an engine (or equipment) is subject. Additionally, if an engine (or equipment) has been or is being certified to another standard or FEL, *applicable emission standard* means the FEL or other standard to which the engine (or equipment) has been or is being certified. This definition does not apply to subpart H of this part.

Auxiliary emission control device means any element of design that senses temperature, motive speed, engine RPM, transmission gear, or any other parameter for the purpose of activating, modulating, delaying, or deactivating the operation of any part of the emission control system.

Brake power means the usable power output of the engine, not including power required to fuel, lubricate, or heat the engine, circulate coolant to the engine, or to operate aftertreatment devices.

Calibration means the set of specifications and tolerances specific to a particular design, version, or application of a component or assembly capable of functionally describing its operation over its working range.

Carryover means relating to certification based on emission data generated from an earlier model year as described in § 1054.235(d).

Certification means relating to the process of obtaining a certificate of conformity for an emission family that complies with the emission standards and requirements in this part.

Certified emission level means the highest deteriorated emission level in an emission family for a given pollutant from either transient or steady-state testing.

Class I means relating to nonhandheld engines with total displacement below 225 cc. See § 1054.101 for special provisions that apply for engines with total displacement at or below 80 cc.

Class II means relating to nonhandheld engines with total displacement at or above 225 cc.

Class III means relating to handheld engines with total displacement below 20 cc.

Class IV means relating to handheld engines with total displacement at or above 20 cc but below 50 cc.

Class V means relating to handheld engines with total displacement at or above 50 cc.

Clean Air Act means the Clean Air Act, as amended, 42 U.S.C. 7401–7671q.

Cold-weather equipment is limited to the following types of handheld equipment: chainsaws, cut-off saws, clearing saws, brush cutters with engines at or above 40cc, commercial earth and wood drills, and ice augers. This includes earth augers if they are also marketed as ice augers.

Crankcase emissions means airborne substances emitted to the atmosphere from any part of the engine crankcase's ventilation or lubrication systems. The crankcase is the housing for the crankshaft and other related internal parts.

Critical emission-related component means any of the following components:

(1) Electronic control units, aftertreatment devices, fuel-metering components, EGR-system components, crankcase-ventilation valves, all components related to charge-air compression and cooling, air filters, spark plugs, and all sensors and actuators associated with any of these components.

(2) Any other component whose primary purpose is to reduce emissions.

Date of manufacture has the meaning given in 40 CFR 1068.30.

Days means calendar days unless otherwise specified. For example, when we specify working days we mean calendar days, excluding weekends and U.S. national holidays.

Designated Compliance Officer means the Manager, Heavy-Duty and Nonroad Engine Group (6405–J), U.S. Environmental Protection Agency, 1200 Pennsylvania Ave., NW., Washington, DC 20460.

Designated Enforcement Officer means the Director, Air Enforcement Division (2242A), U.S. Environmental Protection Agency, 1200 Pennsylvania Ave., NW.,Washington, DC 20460.

Deteriorated emission level means the emission level that results from applying the appropriate deterioration factor to the official emission result of the emission-data engine.

Deterioration factor means the relationship between emissions at the end of useful life and emissions at the low-hour test point (see §§ 1054.240 and 1054.245), expressed in one of the following ways:

(1) For multiplicative deterioration factors, the ratio of emissions at the end of useful life to emissions at the low-hour test point.

(2) For additive deterioration factors, the difference between emissions at the end of useful life and emissions at the low-hour test point.

Discrete-mode means relating to the discrete-mode type of steady-state test described in § 1054.505.

Displacement has the meaning given in § 1054.140.

Dry weight means the weight of the equipment as sold without fuel, oil, or engine coolant.

Dual-fuel engine means an engine designed for operation on two different fuels but not on a continuous mixture of those fuels.

Emission control system means any device, system, or element of design that controls or reduces the emissions of regulated pollutants from an engine.

Emission-data engine means an engine that is tested for certification. This includes engines tested to establish deterioration factors.

Emission-data equipment means an engine, piece of equipment, or fuel system component that is tested for certification. This includes units tested to establish deterioration factors.

Emission family has the meaning given in § 1054.230. We may refer to emission families as ''engine families'' where provisions relate only to exhaust emissions from engines.

Emission-related maintenance means maintenance that substantially affects emissions or is likely to substantially affect emission deterioration.

Engine has the meaning given in 40 CFR 1068.30. This includes complete and partially complete engines.

Engine configuration means a unique combination of engine hardware and calibration within an emission family. Engines within a single engine configuration differ only with respect to normal production variability.

Engine manufacturer means the manufacturer of the engine. See the definition of ''manufacturer'' in this section.

Equipment means any mechanical device commonly known as equipment, including vehicles. If the equipment has an installed engine, the term *equipment* includes the installed engine and fuel system components.

Equipment manufacturer means a manufacturer of nonroad equipment. All nonroad equipment manufacturing entities under the control of the same person are considered to be a single nonroad equipment manufacturer. (Note: In § 1054.626, the term ''equipment manufacturer'' has a narrower meaning that applies only to that section.).

Evaporative means relating to fuel emissions controlled by 40 CFR part 1060. This generally includes emissions that result from permeation of fuel through the fuel-system materials or from ventilation of the fuel system.

Excluded means relating to an engine that either:

(1) Has been determined not to be a nonroad engine, as specified in 40 CFR 1068.30; or

(2) Is a nonroad engine that, according to § 1054.5, is not subject to this part 1054.

Exempted has the meaning given in 40 CFR 1068.30.

Exhaust-gas recirculation (EGR) means a technology that reduces emissions by routing exhaust gases that had been exhausted from the combustion chamber(s) back into the engine to be mixed with incoming air before or during combustion. The use of valve timing to increase the amount of residual exhaust gas in the combustion chamber(s) that is mixed with incoming air before or during combustion is not considered exhaust-gas recirculation for the purposes of this part.

Family emission limit (FEL) means an emission level declared by the manufacturer to serve in place of an otherwise applicable emission standard under the ABT program in subpart H of this part. The family emission limit must be expressed to the same number of decimal places as the emission standard it replaces. The family emission limit serves as the emission standard for the engine family (exhaust) or emission family (evaporative) with respect to all required testing.

Flexible-fuel engine means an engine designed for operation on any mixture of two or more different fuels.

Fuel line means hose or tubing designed to contain liquid fuel (including molded hose or tubing). This does not include any of the following:

(1) Fuel tank vent lines.

(2) Segments of hose or tubing whose external surface is normally exposed to liquid fuel inside the fuel tank.

(3) Hose or tubing designed to return unused fuel from the carburetor to the fuel tank for handheld engines.

(4) Primer bulbs that contain liquid fuel only for priming the engine before starting.

Fuel system means all components involved in transporting, metering, and mixing the fuel from the fuel tank to the combustion chamber(s), including the fuel tank, fuel tank cap, fuel pump, fuel filters, fuel lines, carburetor or fuel-injection components, and all fuel-system vents.

Fuel type means a general category of fuels such as gasoline or natural gas. There can be multiple grades within a single fuel type, such as low-temperature or all-season gasoline.

Good engineering judgment has the meaning given in 40 CFR 1068.30. See 40 CFR 1068.5 for the administrative process we use to evaluate good engineering judgment.

Handheld means relating to equipment that meets any of the following criteria:

(1) It is carried by the operator throughout the performance of its intended function.

(2) It is designed to operate multi-positionally, such as upside down or sideways, to complete its intended function.

(3) It has a combined engine and equipment dry weight under 16.0 kilograms, has no more than two wheels, and at least one of the following attributes is also present:

(i) The operator provides support or carries the equipment throughout the performance of its intended function. Carry means to completely bear the weight of the equipment, including the engine. Support means to hold a piece of equipment in position to prevent it from falling, slipping, or sinking, without carrying it.

(ii) The operator provides support or attitudinal control for the equipment throughout the performance of its intended function. Attitudinal control involves regulating the horizontal or vertical position of the equipment.

(4) It is an auger with a combined engine and equipment dry weight under 22.0 kilograms.

(5) It is used in a recreational application with a combined total vehicle dry weight under 20.0 kilograms. Note that snowmobiles, offroad motorcycles, and all-terrain vehicles are regulated under 40 CFR part 1051 and marine vessels are regulated under 40 CFR part 1045.

(6) It is a hand-supported jackhammer or rammer/compactor. This does not include equipment that can remain upright without operator support, such as a plate compactor.

Hydrocarbon (HC) means the hydrocarbon group on which the emission standards are based for each fuel type, as described in subpart B of this part.

Identification number means a unique specification (for example, a model number/serial number combination) that allows someone to distinguish a particular engine from other similar engines.

Integrated equipment manufacturer means an equipment manufacturer that also manufactures the engines for its equipment. Equipment manufacturers that manufacture the engines for some but not all of their equipment are considered to be integrated manufacturers for that equipment using the manufacturer's own engines.

Intermediate-speed equipment means nonhandheld equipment in which the installed engine is intended for operation at speeds substantially below 3600 rpm.

Low-hour means relating to an engine that is considered to have stabilized emissions and represents the undeteriorated emission level. A low-hour engine typically operates no more than a few hours beyond the minimum stabilization period. However, a low-hour engine could have more hours as long as emissions remain stable. In the absence of other information, a low-hour engine with a useful life of 300 hours or less would generally have operated no more than 15 hours and a low-hour engine with a longer useful life would generally have operated no more than 24 hours.

Manufacture means the physical and engineering process of designing, constructing, and assembling an engine or piece of equipment.

Manufacturer has the meaning given in section 216(1) of the Clean Air Act (42 U.S.C. 7550(1)). In general, this term includes any person who manufactures an engine, vehicle, vessel, or piece of equipment for sale in the United States or otherwise introduces a new nonroad engine or piece of equipment into U.S. commerce. This includes importers who import engines, equipment, or vehicles for resale, but not dealers. All manufacturing entities under the control of the same person are considered to be a single manufacturer.

Marine engine means a nonroad engine that is installed or intended to be installed on a vessel. There are two kinds of marine engines:

(1) Propulsion marine engine means a marine engine that moves a vessel through the water or directs the vessel's movement.

(2) Auxiliary marine engine means a marine engine not used for propulsion. This includes a portable auxiliary marine engine only if its fueling, cooling, or exhaust system is an integral part of the vessel.

Marine generator engine means an auxiliary marine engine used primarily to operate an electrical generator or alternator to produce electric power.

Marine vessel has the meaning given in 1 U.S.C. 3, except that it does not include amphibious vehicles. The definition in 1 U.S.C. 3 very broadly includes every craft capable of being used as a means of transportation on water.

Maximum engine power has the meaning given in § 1054.140.

Maximum test torque has the meaning given in 40 CFR 1065.1001.

Model year has the meaning given in 40 CFR part 1060 for equipment and means one of the following things for engines:

(1) For freshly manufactured engines (see definition of "new nonroad engine," paragraph (1)), model year means your annual new model production period. This must include January 1 of the calendar year for which the model year is named. It may not begin before January 2 of the previous calendar year and it must end by December 31 of the named calendar year. For seasonal production periods not including January 1, model year means the calendar year in which the production occurs, unless you choose to certify the applicable emission family with the following model year. For example, if your production period is June 1, 2010 through November 30, 2010, your model year would be 2010 unless you choose to certify the emission family for model year 2011.

(2) For an engine that is converted to a nonroad engine after being placed into service as a stationary engine, or being certified and placed into service as a motor vehicle engine, model year means the calendar year in which the engine was originally produced. For a motor vehicle engine that is converted to be a nonroad engine without having been certified, model year means the calendar year in which the engine becomes a new nonroad engine. (See definition of "new nonroad engine," paragraph (2).)

(3) For a nonroad engine excluded under § 1054.5 that is later converted to operate in an application that is not excluded, model year means the calendar year in which the engine was originally produced (see definition of "new nonroad engine," paragraph (3)).

(4) For engines that are not freshly manufactured but are installed in new nonroad equipment, model year means the calendar year in which the engine is installed in the new nonroad equipment (see definition of "new nonroad engine," paragraph (4)).

(5) For imported engines:

(i) For imported engines described in paragraph (5)(i) of the definition of "new nonroad engine," *model year* has the meaning given in paragraphs (1) through (4) of this definition.

(ii) For imported engines described in paragraph (5)(ii) of the definition of "new nonroad engine," *model year* means the calendar year in which the engine is assembled in its final certified configuration.

(iii) For imported engines described in paragraph (5)(iii) of the definition of "new nonroad engine," *model year* means the calendar year in which the engine is assembled in its imported configuration, unless specified otherwise in this part or in 40 CFR part 1068.

Motor vehicle has the meaning given in 40 CFR 85.1703(a).

New nonroad engine means any of the following things:

(1) A freshly manufactured nonroad engine for which the ultimate purchaser has never received the equitable or legal title. This kind of engine might commonly be thought of as "brand new." In the case of this paragraph (1), the engine is new from the time it is produced until the ultimate purchaser receives the title or the product is placed into service, whichever comes first.

(2) An engine originally manufactured as a motor vehicle engine or a stationary engine that is later used or intended to be used in a piece of nonroad equipment. In this case, the engine is no longer a motor vehicle or stationary engine and becomes a "new nonroad engine." The engine is no longer new when it is placed into nonroad service. This paragraph (2) applies if a motor vehicle engine or a stationary engine is installed in nonroad equipment, or if a motor vehicle or a piece of stationary equipment is modified (or moved) to become nonroad equipment.

(3) A nonroad engine that has been previously placed into service in an application we exclude under § 1054.5, when that engine is installed in a piece of equipment that is covered by this part 1054. The engine is no longer new when it is placed into nonroad service covered by this part 1054. For example, this would apply to a marine-propulsion engine that is no longer used in a marine vessel but is instead installed in a piece of nonroad equipment subject to the provisions of this part.

(4) An engine not covered by paragraphs (1) through (3) of this definition that is intended to be installed in new nonroad equipment. This generally includes installation of used engines in new equipment. The engine is no longer new when the ultimate purchaser receives a title for the equipment or the product is placed into service, whichever comes first.

(5) An imported nonroad engine, subject to the following provisions:

(i) An imported nonroad engine covered by a certificate of conformity issued under this part that meets the criteria of one or more of paragraphs (1) through (4) of this definition, where the original engine manufacturer holds the certificate, is new as defined by those applicable paragraphs.

(ii) An imported engine that will be covered by a certificate of conformity issued under this part, where someone other than the original engine manufacturer holds the certificate (such as when the engine is modified after its initial assembly), is a new nonroad engine when it is imported. It is no longer new when the ultimate purchaser receives a title for the engine or it is placed into service, whichever comes first.

(iii) An imported nonroad engine that is not covered by a certificate of conformity issued under this part at the time of importation is new. This addresses uncertified engines and equipment initially placed into service that someone seeks to import into the United States. Importation of this kind of engine (or equipment containing such an engine) is generally prohibited by 40 CFR part 1068. However, the importation of such an engine is not prohibited if the engine has a model year before 1997, since it is not subject to standards.

New nonroad equipment means either of the following things:

(1) A nonroad piece of equipment for which the ultimate purchaser has never received the equitable or legal title. The product is no longer new when the ultimate purchaser receives this title or the product is placed into service, whichever comes first.

(2) A nonroad piece of equipment with an engine that becomes new while installed in the equipment. For example a complete piece of equipment that was imported without being covered by a certificate of conformity would be new nonroad equipment because the engine would be considered to be new at the time of importation.

Noncompliant engine or noncompliant equipment means an engine or equipment that was originally covered by a certificate of conformity but is not in the certified configuration or otherwise does not comply with the conditions of the certificate.

Nonconforming engine or nonconforming equipment means an engine or equipment not covered by a certificate of conformity that would otherwise be subject to emission standards.

Nonhandheld means relating to an engine (or equipment) subject to the standards of this part that is not a handheld engine (or equipment).

Nonintegrated equipment manufacturer means an equipment manufacturer that is not an integrated equipment manufacturer. Equipment manufacturers that manufacture the engines for some but not all of their equipment are considered to be nonintegrated manufacturers for that equipment using a different engine manufacturer's engines.

Nonmethane hydrocarbon has the meaning given in 40 CFR 1065.1001. This generally means the difference between the emitted mass of total hydrocarbons and the emitted mass of methane.

Nonroad means relating to nonroad engines or equipment that includes nonroad engines.

Nonroad engine has the meaning given in 40 CFR 1068.30. In general this means all internal-combustion engines except motor vehicle engines, stationary engines, engines used solely for competition, or engines used in aircraft.

Official emission result means the measured emission rate for an emission-data engine on a given duty cycle before the application of any deterioration factor.

Overhead valve means relating to a four-stroke spark-ignition engine in which the intake and exhaust valves are located above the combustion chamber within the cylinder head. Such engines are sometimes referred to as ''valve-in-head'' engines.

Owners manual means a document or collection of documents prepared by the engine manufacturer for the owner or operator to describe appropriate engine maintenance, applicable warranties, and any other information related to operating or keeping the engine. The owners manual is typically provided to the ultimate purchaser at the time of sale. The owners manual may be in paper or electronic format.

Oxides of nitrogen has the meaning given in 40 CFR part 1065.1001

Percent has the meaning given in 40 CFR 1065.1001.

Permeation emissions means fuel that escapes from the fuel system by diffusing through the walls of fuel-system components.

Phase 1 means relating to the Phase 1 emission standards described in 40 CFR 90.103.

Phase 2 means relating to the Phase 2 emission standards described in 40 CFR 90.103.

Phase 3 means relating to the Phase 3 exhaust emission standards described in § 1054.105.

Placed into service means put into initial use for its intended purpose.

Pressurized oil system means a system designed to deliver lubricating oil to internal engine components, including a step to circulate oil through a filter.

Ramped-modal means relating to the ramped-modal type of steady-state test described in § 1054.505.

Rated-speed equipment means nonhandheld equipment in which the installed engine is intended for operation at a rated speed that is nominally 3600 rpm or higher.

Recreational application means an application in which a vehicle is ridden primarily for pleasure. Note that engines used in reduced-scale model vehicles that cannot be ridden (such as model airplanes) are excluded from this part under § 1054.5.

Relating to as used in this section means relating to something in a specific, direct manner. This expression is used in this section only to define terms as adjectives and not to broaden the meaning of the terms.

Revoke has the meaning given in 40 CFR 1068.30. In general this means to terminate the certificate or an exemption for an engine family.

Round has the meaning given in 40 CFR 1065.1001.

Running loss emissions has the meaning given in 40 CFR 1060.801.

Scheduled maintenance means adjusting, repairing, removing, disassembling, cleaning, or replacing components or systems periodically to keep a part or system from failing, malfunctioning, or wearing prematurely. It also may mean actions you expect are necessary to correct an overt indication of failure or malfunction for which periodic maintenance is not appropriate.

Side valve means relating to a four-stroke spark-ignition engine in which the intake and exhaust valves are located to the side of the cylinder, not within the cylinder head. Such engines are sometimes referred to as ''L-head'' engines.

Small-volume emission family means one of the following:

(1) For requirements related to exhaust emissions for nonhandheld engines and to exhaust and evaporative emissions for handheld engines, *small-volume emission family* means any emission family whose U.S.-directed production volume in a given model year is projected at the time of certification to be no more than 5,000 engines.

(2) For requirements related to evaporative emissions for nonhandheld equipment, *small-volume emission family* means any equipment manufacturer's U.S.-directed production volume for identical fuel tank is projected at the time of certification to be no more than 5,000 units. Tanks are generally considered identical if they are produced under a single part number to conform to a single design or blueprint. Tanks should be considered identical if they differ only with respect to production variability, post-production changes (such as different fittings or grommets), supplier, color, or other extraneous design variables.

Small-volume engine manufacturer means one of the following:

(1) For handheld engines, an engine manufacturer that had U.S.-directed production volume of handheld engines of no more than 25,000 handheld engines in any calendar year. For manufacturers owned by a parent company, this production limit applies to the production of the parent company and all its subsidiaries.

(2) For nonhandheld engines, an engine manufacturer that had U.S.-directed production volume of no more

than 10,000 nonhandheld engines in any calendar year. For manufacturers owned by a parent company, this production limit applies to the production of the parent company and all its subsidiaries.

(3) An engine manufacturer that we designate to be a small-volume engine manufacturer under § 1054.635.

Small-volume equipment manufacturer means one of the following:

(1) For handheld equipment, an equipment manufacturer that had a U.S.-directed production volume of no more than 25,000 pieces of handheld equipment in any calendar year. For manufacturers owned by a parent company, this production limit applies to the production of the parent company and all its subsidiaries.

(2) For nonhandheld equipment, an equipment manufacturer with annual U.S.-directed production volumes of no more than 5,000 pieces of nonhandheld equipment in 2007, 2008, and 2009. For manufacturers owned by a parent company, this production limit applies to the production of the parent company and all its subsidiaries.

(3) An equipment manufacturer that we designate to be a small-volume equipment manufacturer under § 1054.635.

Snowthrower engine means an engine used exclusively to power snowthrowers.

Spark-ignition means relating to a gasoline-fueled engine or any other type of engine with a spark plug (or other sparking device) and with operating characteristics significantly similar to the theoretical Otto combustion cycle. Spark-ignition engines usually use a throttle to regulate intake air flow to control power during normal operation.

Steady-state means relating to emission tests in which engine speed and load are held at a finite set of essentially constant values. Steady-state tests are either discrete-mode tests or ramped-modal tests.

Structurally integrated nylon fuel tank has the meaning given in 40 CFR 1060.801.

Subchapter U means the portion of the Code of Federal Regulations including 40 CFR parts 1000 through 1299.

Suspend has the meaning given in 40 CFR 1068.30. In general this means to temporarily discontinue the certificate or an exemption for an engine family.

Test engine means an engine in a test sample.

Test sample means the collection of engines selected from the population of an emission family for emission testing. This may include testing for certification, production-line testing, or in-use testing.

Tethered gas cap means a gas cap that is loosely but permanently connected to the fuel tank.

Thermal reactor means a hot surface in the engine exhaust system that has the effect of significantly lowering emissions of one or more regulated pollutants. Hot surfaces that have an inconsequential effect on emissions are not thermal reactors.

Total hydrocarbon has the meaning given in 40 CFR 1065.1001. This generally means the combined mass of organic compounds measured by the specified procedure for measuring total hydrocarbon, expressed as a hydrocarbon with a hydrogen-to-carbon mass ratio of 1.85:1.

Total hydrocarbon equivalent has the meaning given in 40 CFR 1065.1001. This generally means the sum of the carbon mass contributions of non-oxygenated hydrocarbons, alcohols and aldehydes, or other organic compounds that are measured separately as contained in a gas sample, expressed as exhaust hydrocarbon from petroleum-fueled engines. The hydrogen-to-carbon ratio of the equivalent hydrocarbon is 1.85:1.

Ultimate purchaser means, with respect to any new nonroad equipment or new nonroad engine, the first person who in good faith purchases such new nonroad equipment or new nonroad engine for purposes other than resale.

United States has the meaning given in 40 CFR 1068.30.

Upcoming model year for an emission family means the model year after the one currently in production.

U.S.-directed production volume means the number of engine or equipment units, subject to the requirements of this part, produced by a manufacturer for which the manufacturer has a reasonable assurance that sale was or will be made to ultimate purchasers in the United States.

Useful life means the period during which the engine and equipment are designed to properly function in terms of power output and intended function, without being remanufactured, specified as a number of hours of operation or calendar years, whichever comes first. It is the period during which a nonroad engine is required to comply with all applicable emission standards. See, for example, §§ 1054.107, 1054.110, and 1054.112. If an engine has no hour meter, the specified number of hours does not limit the period during which an in-use engine is required to comply with emission standards unless the degree of service accumulation can be verified separately.

Variable-speed engine means an engine that is not a constant-speed engine.

Vessel means marine vessel.

Void has the meaning given in 40 CFR 1068.30. In general this means to invalidate a certificate or an exemption both retroactively and prospectively.

Volatile liquid fuel means any fuel other than diesel or biodiesel that is a liquid at atmospheric pressure and has a Reid Vapor Pressure higher than 2.0 pounds per square inch.

We (us, our) means the Administrator of the Environmental Protection Agency and any authorized representatives.

Wide-open throttle means maximum throttle opening.

Wintertime engine means an engine used exclusively to power equipment that is used only in wintertime, such as snowthrowers and ice augers.

§ 1054.805 What symbols, acronyms, and abbreviations does this part use?

The following symbols, acronyms, and abbreviations apply to this part:

ABT Averaging, banking, and trading.
cc cubic centimeters.
CFR Code of Federal Regulations.
CH_4 methane.
CO carbon monoxide.
CO_2 carbon dioxide.
EPA Environmental Protection Agency.
FEL Family Emission Limit.
g gram.
HC hydrocarbon.
hr hour.
kPa kilopascals.
kW kilowatts.
N_2O nitrous oxide.
NMHC nonmethane hydrocarbons.
NO_X oxides of nitrogen (NO and NO_2).
psig pounds per square inch of gauge pressure.
RPM revolutions per minute.
THC total hydrocarbon.
THCE total hydrocarbon equivalent.
U.S.C. United States Code.

§ 1054.815 What provisions apply to confidential information?

(a) Clearly show what you consider confidential by marking, circling, bracketing, stamping, or some other method.

(b) We will store your confidential information as described in 40 CFR part 2. Also, we will disclose it only as specified in 40 CFR part 2. This applies both to any information you send us and to any information we collect from inspections, audits, or other site visits.

(c) If you send us a second copy without the confidential information, we will assume it contains nothing confidential whenever we need to release information from it.

(d) If you send us information without claiming it is confidential, we may make it available to the public without further notice to you, as described in 40 CFR 2.204.

§ 1054.820 How do I request a hearing?

(a) You may request a hearing under certain circumstances as described elsewhere in this part. To do this, you must file a written request, including a description of your objection and any supporting data, within 30 days after we make a decision.

(b) For a hearing you request under the provisions of this part, we will approve your request if we find that your request raises a substantial factual issue.

(c) If we agree to hold a hearing, we will use the procedures specified in 40 CFR part 1068, subpart G.

§ 1054.825 What reporting and recordkeeping requirements apply under this part?

Under the Paperwork Reduction Act (44 U.S.C. 3501 *et seq.*), the Office of Management and Budget approves the reporting and recordkeeping specified in the applicable regulations. The following items illustrate the kind of reporting and recordkeeping we require for engines and equipment regulated under this part:

(a) We specify the following requirements related to engine and equipment certification in this part 1054:

(1) In § 1054.20 we require equipment manufacturers to label their equipment if they are relying on component certification.

(2) In § 1054.135 we require engine manufacturers to keep certain records related to duplicate labels sent to equipment manufacturers.

(3) In § 1054.145 we include various reporting and recordkeeping requirements related to interim provisions.

(4) In subpart C of this part we identify a wide range of information required to certify engines.

(5) In §§ 1054.345 and 1054.350 we specify certain records related to production-line testing.

(6) [Reserved]

(7) In subpart G of this part we identify several reporting and recordkeeping items for making demonstrations and getting approval related to various special compliance provisions.

(8) In §§ 1054.725, 1054.730, and 1054.735 we specify certain records related to averaging, banking, and trading.

(b) We specify the following requirements related to equipment and component certification in 40 CFR part 1060:

(1) In 40 CFR 1060.20 we give an overview of principles for reporting information.

(2) In 40 CFR part 1060, subpart C, we identify a wide range of information required to certify products.

(3) In 40 CFR 1060.301 we require manufacturers to make engines or equipment available for our testing if we make such a request.

(4) In 40 CFR 1060.505 we specify information needs for establishing various changes to published test procedures.

(c) We specify the following requirements related to testing in 40 CFR part 1065:

(1) In 40 CFR 1065.2 we give an overview of principles for reporting information.

(2) In 40 CFR 1065.10 and 1065.12 we specify information needs for establishing various changes to published test procedures.

(3) In 40 CFR 1065.25 we establish basic guidelines for storing test information.

(4) In 40 CFR 1065.695 we identify data that may be appropriate for collecting during testing of in-use engines using portable analyzers.

(d) We specify the following requirements related to the general compliance provisions in 40 CFR part 1068:

(1) In 40 CFR 1068.5 we establish a process for evaluating good engineering judgment related to testing and certification.

(2) In 40 CFR 1068.25 we describe general provisions related to sending and keeping information.

(3) In 40 CFR 1068.27 we require manufacturers to make engines available for our testing or inspection if we make such a request.

(4) In 40 CFR 1068.105 we require equipment manufacturers to keep certain records related to duplicate labels from engine manufacturers.

(5) In 40 CFR 1068.120 we specify recordkeeping related to rebuilding engines.

(6) In 40 CFR part 1068, subpart C, we identify several reporting and recordkeeping items for making demonstrations and getting approval related to various exemptions.

(7) In 40 CFR part 1068, subpart D, we identify several reporting and recordkeeping items for making demonstrations and getting approval related to importing engines.

(8) In 40 CFR 1068.450 and 1068.455 we specify certain records related to testing production-line engines in a selective enforcement audit.

(9) In 40 CFR 1068.501 we specify certain records related to investigating and reporting emission-related defects.

(10) In 40 CFR 1068.525 and 1068.530 we specify certain records related to recalling nonconforming engines.

Appendix I to Part 1054—Summary of Previous Emission Standards

The following standards apply to nonroad spark-ignition engines produced before the model years specified in § 1054.1:

(a) *Handheld engines.* Phase 1 and Phase 2 standards apply for handheld engines as specified in 40 CFR 90.103 and summarized in the following tables:

TABLE 1 TO APPENDIX I—PHASE 1 EMISSION STANDARDS FOR HANDHELD ENGINES (g/kW-hr) [a]

Engine displacement class	HC	NO_X	CO
Class III	295	5.36	805
Class IV	241	5.36	805
Class V	161	5.36	603

[a] Phase 1 standards are based on testing with new engines only.

TABLE 2 TO APPENDIX I—PHASE 2 EMISSION STANDARDS FOR HANDHELD ENGINES (g/kW-hr) [a]

Engine displacement class	$HC+NO_X$	CO
Class III	50	805
Class IV	50	805
Class V	72	603

[a] The standards shown are the fully phased-in standards. See 40 CFR 90.103 for standards that applied during the phase-in period.

(b) *Nonhandheld engines.* Phase 1 and Phase 2 standards apply for nonhandheld engines as specified in 40 CFR 90.103 and summarized in the following tables:

TABLE 3 TO APPENDIX I—PHASE 1 EMISSION STANDARDS FOR NONHANDHELD ENGINES (g/kW-hr) [a]

Engine displacement class	$HC+NO_X$	CO
Class I	16.1	519
Class II	13.4	519

[a] Phase 1 standards are based on testing with new engines only.

TABLE 4 TO APPENDIX I—PHASE 2 EMISSION STANDARDS FOR NONHANDHELD ENGINES (g/kW-hr)

Engine displacement class	$HC+NO_X$	$NMHC+NO_X$	CO
Class I-A ...	50		610
Class I-B ...	40	37	610
Class I	16.1	14.8	610
Class II[a] ...	12.1	11.3	610

[a] The Class II standards shown are the fully phased-in standards. See 40 CFR 90.103 for standards that applied during the phase-in period.

Appendix II to Part 1054—Duty Cycles for Laboratory Testing

(a) Test handheld engines with the following steady-state duty cycle:

G3 mode No.	Engine speed[a]	Torque (percent)[b]	Weighting factors
1	Rated speed	100	0.85
2	Warm idle	0	0.15

[a] Test engines at the specified speeds as described in § 1054.505.
[b] Test engines at 100 percent torque by setting operator demand to maximum. Control torque during idle at its warm idle speed as described in 40 CFR 1065.510.

(b) Test nonhandheld engines with one of the following steady-state duty cycles:

(1) The following duty cycle applies for discrete-mode testing:

G2 mode No.[a]	Torque (percent)[b]	Weighting factors
1	100	0.09
2	75	0.2
3	50	0.29
4	25	0.3
5	10	0.07
6	0	0.05

[a] Control engine speed as described in § 1054.505. Control engine speed for Mode 6 as described in § 1054.505(c) for idle operation.
[b] The percent torque is relative to the value established for full-load torque, as described in § 1054.505.

(2) The following duty cycle applies for ramped-modal testing:

RMC mode[a]	Time in mode (seconds)	Torque (percent)[b, c]
1a Steady-state	41	0
1b Transition	20	*
2a Steady-state	135	100
2b Transition	20	*
3a Steady-state	112	10
3b Transition	20	*
4a Steady-state	337	75
4b Transition	20	*
5a Steady-state	518	25
5b Transition	20	*
6a Steady-state	494	50
6b Transition	20	*
7 Steady-state	43	0

* Linear transition.
[a] Control engine speed as described in § 1054.505. Control engine speed for Mode 6 as described in § 1054.505(c) for idle operation.
[b] Advance from one mode to the next within a 20-second transition phase. During the transition phase, command a linear progression from the torque setting of the current mode to the torque setting of the next mode.
[c] The percent torque is relative to the value established for full-load torque, as described in § 1054.505.

■ § 208. A new part 1060 is added to subchapter U of chapter I to read as follows:

PART 1060—CONTROL OF EVAPORATIVE EMISSIONS FROM NEW AND IN—USE NONROAD AND STATIONARY EQUIPMENT

Authority: 42 U.S.C. 7401–7671q.

Subpart A—Overview and Applicability

§ 1060.1 Which products are subject to this part's requirements?

(a) The standards and other requirements in this part 1060 apply to the fuel lines, fuel tanks, couplings and fittings, and fuel caps used or intended to be used in the following categories of new engines and equipment that are fueled with a volatile liquid fuel (such as gasoline, but not including diesel fuel), and to the equipment in which these components are installed, starting with the model years shown in Table 1 to this section:

(1) Compression-ignition engines we regulate under 40 CFR part 1039. This includes stationary compression-ignition engines we regulate under the provisions of 40 CFR part 1039, as indicated under 40 CFR part 60, subpart IIII. See the evaporative emission standards specified in 40 CFR 1048.105. These engines are considered to be Large SI engines for purposes of this part 1060.

(2) Marine compression-ignition engines we regulate under 40 CFR part 1042. See the evaporative emission standards specified in 40 CFR 1045.112. These engines are considered to be Marine SI engines for purposes of this part 1060.

(3) Marine SI engines we regulate under 40 CFR part 1045. See the evaporative emission standards specified in 40 CFR 1045.112.

(4) Large SI engines we regulate under 40 CFR part 1048. This includes stationary spark-ignition engines subject to standards under 40 CFR parts 1048 or 1054 as indicated in 40 CFR part 60, subpart JJJJ. See the evaporative emission standards specified in 40 CFR 1048.105.

(5) Recreational vehicles and engines we regulate under 40 CFR part 1051 (such as snowmobiles and off-highway motorcycles). This includes highway motorcycles subject to standards under 40 CFR part 1051 as indicated in 40 CFR part 86, subpart E since these motorcycles are considered to be recreational vehicles for purposes of this part 1060. See the evaporative emission standards specified in 40 CFR 1051.110.

(6) Small SI engines we regulate under 40 CFR part 1054. See the evaporative emission standards specified for handheld engines in 40 CFR 1054.110 and for nonhandheld engines in 40 CFR 1054.112.

(7) Portable marine fuel tanks and fuel lines associated with such fuel tanks must meet evaporative emission standards specified in 40 CFR 1045.112. Portable nonroad fuel tanks and fuel lines associated with such fuel tanks must also meet evaporative emission standards specified in 40 CFR 1045.112, whether or not they are used with marine vessels. Portable nonroad fuel tanks are considered to be portable marine fuel tanks for purposes of this part 1060.

(b) The regulations in this part 1060 apply for new replacement components used with any of the engines or equipment specified in paragraph (a) of this section as described in § 1060.601.

(c) Fuel caps are subject to evaporative emission standards at the point of installation on a fuel tank. If a fuel cap is certified for use with Marine SI engines or Small SI engines under the optional standards of § 1060.103, it is subject to all the requirements of this part 1060 as if these optional standards were mandatory.

(d) This part 1060 does not apply to any diesel-fueled engine or any other engine that does not use a volatile liquid fuel. In addition, this part does not apply to any engines or equipment in the following categories even if they use a volatile liquid fuel:

(1) Light-duty motor vehicles (see 40 CFR part 86).

(2) Heavy-duty motor vehicles and heavy-duty motor vehicle engines (see 40 CFR part 86). This part 1060 also does not apply to fuel systems for nonroad engines where such fuel systems are subject to part 86 because they are part of a heavy-duty motor vehicle.

(3) Aircraft engines (see 40 CFR part 87).

(4) Locomotives (see 40 CFR part 92 and 1033).

(5) Land-based nonroad diesel engines we regulate under 40 CFR part 89.

(6) Marine diesel engines we regulate under 40 CFR part 89, 94, or 1042.

(7) Land-based spark-ignition engines at or below 19 kW that we regulate under 40 CFR part 90. Note that there are provisions in 40 CFR part 90 that reference specific portions of this part 1060.

(8) Marine spark-ignition engines we regulate under 40 CFR part 91.

(e) This part 1060 does not apply for fuel lines made wholly of metal.

TABLE 1 TO § 1060.1—PART 1060 APPLICABILITY [a]

Equipment category or subcategory	Fuel line permeation	Tank permeation	Diurnal emissions	Running loss emissions
Marine SI—portable marine fuel tanks.	January 1, 2009 [b]	January 1, 2011	January 1, 2010	Not applicable.
Marine SI—personal watercraft.	January 1, 2009	Model year 2011	Model year 2010	Not applicable.
Marine SI—other vessels with installed fuel tanks.	January 1, 2009 [b]	Model year 2012	July 31, 2011	Not applicable.
Large SI	Model year 2007	Not applicable	Model year 2007 (includes tank permeation).	Model year 2007.
Recreational vehicles	Model year 2008	Model year 2008	Not applicable	Not applicable.
Small SI—handheld	Model year 2012 [c]	Model year 2010 [d]	Not applicable	Not applicable.
Small SI—Class I nonhandheld.	January 1, 2009	Model year 2012	Not applicable [e]	Model year 2012.
Small SI—Class II nonhandheld.	January 1, 2009	Model year 2011	Not applicable [e]	Model year 2011.

[a] Implementation is based on the date of manufacture of the equipment. Where we do not identify a specific date, the emission standards start to apply at the beginning of the model year.

[b] January 1, 2011 for primer bulbs. Standards phase in for under-cowl fuel lines on outboard engines, by length: 30% in 2010, 60% in 2011, 90% in 2012–2014, 100% in 2015.

[c] 2013 for small-volume emission families that do not include cold-weather fuel lines.

[d] 2011 for structurally integrated nylon fuel tanks and 2013 for all small-volume emission families.

[e] Manufacturers may optionally meet diurnal standards as specified in § 1060.105(e).

§ 1060.5 Do the requirements of this part apply to me?

The requirements of this part are generally addressed to the manufacturers that are subject to this part's requirements as described in paragraph (a) of this section. The term ''you'' generally means the manufacturer or manufacturers that are subject to these requirements. Paragraphs (b) through (e) of this section describe which manufacturers may or must certify their products. (Note: § 1060.601(f) allows the certification responsibility to be delegated in certain circumstances.)

(a) *Overall responsibilities.* Manufacturers of the engines, equipment, and fuel-system components described in § 1060.1 are subject to the standards and other requirements of this part 1060 except as otherwise noted. Multiple manufacturers may be subject to these standards and other requirements. For example, when a Small SI equipment manufacturer buys fuel line manufactured by another person and installs them in its equipment, both the equipment manufacturer and the fuel line manufacturer are subject to the standards and other requirements of this part. The following provisions apply in such cases:

(1) Each person meeting the definition of manufacturer for a product that is subject to the standards and other requirements of this part must comply with such requirements. However, if one person complies with a specific requirement for a given product, then all manufacturers are deemed to have complied with that specific requirement. For example, if a Small SI equipment manufacturer uses fuel lines manufactured and certified by another company, the equipment manufacturer is not required to obtain a certificate with respect to the fuel line emission standards. Such an equipment manufacturer remains subject to the standards and other requirements of this part. However, where a provision requires a specific manufacturer to comply with certain provisions, this paragraph (a) does not change or modify such a requirement. For example, this paragraph (a) does not allow you to rely on another company to certify instead of you if we specifically require you to certify.

(2) The requirements of subparts C and D of this part apply to the manufacturer that obtains the certificate of conformity. Other manufacturers are required to comply with the requirements of subparts C and D of this part only when we send notification. In our notification, we will specify a reasonable period for complying with the requirements identified in the notice. See § 1060.601 for the applicability of 40 CFR part 1068 to these other manufacturers.

(3) Certificate holders are responsible for meeting all applicable requirements even if other manufacturers are also subject to those requirements.

(b) *Marine SI.* Certify vessels, engines, and fuel-system components as follows:

(1) Component manufacturers must certify their fuel lines and fuel tanks intended for installation with Marine SI engines and vessels under this part 1060, except as allowed by § 1060.601(f). This includes permeation and diurnal emission standards.

(2) Vessel manufacturers are subject to all the requirements of this part 1060 that apply to Marine SI engines and fuel systems. However, they must certify their vessels to the emission standards specified in §§ 1060.102 through 1060.105 only if one or more of the following conditions apply:

(i) Vessel manufacturers install certified components that are not certified to meet all applicable evaporative emission standards, including both permeation and diurnal standards. This would include vessel manufacturers that make their own fuel tanks. Vessel manufacturers would certify under this part 1060.

(ii) Vessel manufacturers intend to generate or use evaporative emission credits, even if they use only certified components to meet all applicable evaporative emission standards. Vessel manufacturers would certify under part 40 CFR part 1045 using the emission-credit provisions in subpart H of that part to demonstrate compliance with the emission standard.

(3) Engine manufacturers must meet all the requirements of this part 1060 that apply to vessel manufacturers for all fuel-system components they install on their engines. For example, engine manufacturers that install under-cowl fuel lines and fuel tanks must comply with the requirements specified for vessel manufacturers with respect to those components.

(c) *Large SI.* Certify engines, equipment, and fuel-system components as follows:

(1) Engine manufacturers must certify their engines under 40 CFR part 1048.

(2) Equipment manufacturers and component manufacturers may certify fuel lines and fuel tanks intended for use with Large SI engines under this part 1060.

(d) *Recreational vehicles.* Certify vehicles, engines and fuel-system components as follows:

(1) Vehicle manufacturers must certify their vehicles under 40 CFR part 1051.

(2) Engine manufacturers must meet all the requirements of 40 CFR part 1051 that apply to vehicle manufacturers for all fuel-system components they install on their engines. For example, engine manufacturers that install fuel-line segments on the engines they ship to vehicle manufacturers must comply with the requirements specified for equipment manufacturers with respect to those components.

(3) Component manufacturers may certify fuel lines and fuel tanks intended for recreational vehicles under this part 1060.

(e) *Small SI.* Certify engines, equipment, and fuel-system components as follows:

(1) Component manufacturers must certify their fuel lines and fuel tanks intended for Small SI engines and equipment under this part 1060, except as allowed by § 1060.601(f).

(2) Engine manufacturers must meet all the requirements of this part 1060 that apply to equipment manufacturers for all fuel-system components they install on their engines. Engine manufacturers that produce Small SI engines with complete fuel systems are considered the equipment manufacturers for those engines under this part 1060.

(3) Equipment manufacturers must certify their equipment and are subject to all the requirements of this part 1060.

(f) *Summary of certification responsibilities.* Tables 1 through 3 of this section summarize the certification responsibilities for different kinds of manufacturers as described in paragraphs (b) through (e) of this section. The term ''No'' as used in the tables means that a manufacturer is not required to obtain a certificate of conformity under paragraphs (b) through (e) of this section. In situations where multiple manufacturers are subject to the standards and other requirements of this part, such a manufacturer must nevertheless certify if the manufacturer who is required to certify under paragraphs (b) through (e) of this section fails to obtain a certificate of conformity.

TABLE 1 TO § 1060.5—SUMMARY OF ENGINE MANUFACTURER CERTIFICATION RESPONSIBILITIES

Equipment type	Is the engine manufacturer required to certify fuel systems? [a]	Code of Federal Regulations cite for certification
Marine SI	No.	
Large SI	Yes	40 CFR part 1048.
Recreational vehicles	No.	
Small SI	No, unless engines are sold with complete fuel systems	40 CFR part 1060.

[a] Fuel lines and fuel tanks that are attached to or sold with engines must be covered by a certificate of conformity.

TABLE 2 TO § 1060.5—SUMMARY OF EQUIPMENT MANUFACTURER CERTIFICATION RESPONSIBILITIES

Equipment type	Is the equipment manufacturer required to certify fuel systems?	Code of Federal Regulations cite for certification
Marine SI	Yes, but only if vessel manufacturers install uncertified fuel lines or fuel tanks or intend to generate or use evaporative emission credits.	40 CFR part 1060.[a]
Large SI	Allowed but not required	40 CFR part 1060.
Recreational vehicles	Yes, even if vehicle manufacturers install certified components	40 CFR part 1051.
Small SI	Yes	40 CFR part 1060.[a]

[a] See the exhaust standard-setting part for provisions related to generating or using evaporative emission credits.

TABLE 3 OF § 1060.5—SUMMARY OF COMPONENT MANUFACTURER CERTIFICATION RESPONSIBILITIES

Equipment type	Is the component manufacturer required to certify fuel lines and fuel tanks?	Code of Federal Regulations cite for certification
Marine SI	Yes, including portable marine fuel tanks and associated fuel lines	40 CFR part 1060.
Large SI	Allowed but not required	40 CFR part 1060.
Recreational vehicles	Allowed but not required	40 CFR part 1060.
Small SI	Yes [a]	40 CFR part 1060.

[a] See § 1060.601 for an allowance to make contractual arrangements with engine or equipment manufacturers instead of certifying.

§ 1060.10 How is this part organized?

This part 1060 is divided into the following subparts:

(a) Subpart A of this part defines the applicability of part 1060 and gives an overview of regulatory requirements.

(b) Subpart B of this part describes the emission standards and other requirements that must be met to certify equipment or components under this part. Note that § 1060.110 discusses certain interim requirements and compliance provisions that apply only for a limited time.

(c) Subpart C of this part describes how to apply for a certificate of conformity.

(d) Subpart D of this part describes the requirements related to verifying that products are being produced as described in an approved application for certification.

(e) Subpart E of this part describes the requirements related to verifying that products are meeting the standards in use.

(f) Subpart F of this part describes how to measure evaporative emissions.

(g) Subpart G of this part and 40 CFR part 1068 describe requirements, prohibitions, and other provisions that apply to manufacturers, owners, operators, and all others.

(h) Subpart H of this part describes how to certify your equipment or components for inclusion in an emission averaging program allowed by an exhaust standard-setting part.

(i) Subpart I of this part contains definitions and other reference information.

§ 1060.15 Do any other CFR parts apply to me?

(a) There is a separate part of the CFR that includes exhaust emission requirements for each particular application, as described in § 1060.1(a). We refer to these as the exhaust standard-setting parts. In cases where an exhaust standard-setting part includes evaporative requirements, apply this part 1060 as specified in the exhaust standard-setting part, as follows:

(1) The requirements in the exhaust standard-setting part may differ from the requirements in this part. In cases where it is not possible to comply with both the exhaust standard-setting part and this part, you must comply with the requirements in the exhaust standard-setting part. The exhaust standard-setting part may also allow you to deviate from the procedures of this part for other reasons.

(2) The exhaust standard-setting parts may reference some sections of this part 1060 or may allow or require certification under this part 1060. See the exhaust standard-setting parts to determine what provisions of this part 1060 apply for these equipment types.

(b) The requirements and prohibitions of part 1068 of this chapter apply to everyone, including anyone who manufactures, imports, owns, operates, or services any of the fuel systems subject to this part 1060. Part 1068 of this chapter describes general provisions, including the following areas:

(1) Prohibited acts and penalties for engine manufacturers, equipment manufacturers, and others.

(2) Exclusions and exemptions for certain products.

(3) Importing products.

(4) Defect reporting and recall.

(5) Procedures for hearings.

(c) Other parts of this chapter apply if referenced in this part.

§ 1060.30 Submission of information.

(a) This part includes various requirements to record data or other information. Refer to § 1060.825, 40 CFR

1068.25, and the exhaust standard-setting part regarding recordkeeping requirements. If recordkeeping requirements are not specified, store these records in any format and on any media and keep them readily available for one year after you send an associated application for certification, or one year after you generate the data if they do not support an application for certification. You must promptly send us organized, written records in English if we ask for them. We may review them at any time.

(b) The regulations in § 1060.255 and 40 CFR 1068.101 describe your obligation to report truthful and complete information and the consequences of failing to meet this obligation. This includes information not related to certification.

(c) Send all reports and requests for approval to the Designated Compliance Officer (see § 1060.801).

(d) Any written information we require you to send to or receive from another company is deemed to be a required record under this section. Such records are also deemed to be submissions to EPA. We may require you to send us these records whether or not you are a certificate holder.

Subpart B—Emission Standards and Related Requirements

§ 1060.101 What evaporative emission requirements apply under this part?

Products subject to this part must meet emission standards and related requirements as follows:

(a) Section 1060.102 describes permeation emission control requirements for fuel lines.

(b) Section 1060.103 describes permeation emission control requirements for fuel tanks.

(c) Section 1060.104 describes running loss emission control requirements for fuel systems.

(d) Section 1060.105 describes diurnal emission control requirements for fuel tanks.

(e) The following general requirements apply for components and equipment subject to the emission standards in §§ 1060.102 through 1060.105:

(1) *Adjustable parameters.* Components or equipment with adjustable parameters must meet all the requirements of this part for any adjustment in the physically adjustable range.

(2) *Prohibited controls.* The following controls are prohibited:

(i) For anyone to design, manufacture, or install emission control systems so they cause or contribute to an unreasonable risk to public health, welfare, or safety while operating.

(ii) For anyone to design, manufacture, or install emission control systems with features that disable, deactivate, or bypass the emission controls, either actively or passively. For example, you may not include a manual vent that the operator can open to bypass emission controls. You may ask us to allow such features if needed for safety reasons or if the features are fully functional during emission tests described in subpart F of this part.

(3) *Emission credits.* Equipment manufacturers are allowed to comply with the emission standards in this part using evaporative emission credits only if the exhaust standard-setting part explicitly allows it for evaporative emissions. See the exhaust standard-setting part and subpart H of this part for information about complying with evaporative emission credits. For equipment manufacturers to generate or use evaporative emission credits, components must be certified to a family emission limit, which serves as the standard for those components.

(f) This paragraph (f) specifies requirements that apply to equipment manufacturers subject to requirements under this part, whether or not they are subject to and certify to any of the emission standards in §§ 1060.102 through 1060.105. Equipment manufacturers meeting these requirements will be deemed to be certified as in conformity with the requirements of this paragraph (f) without submitting an application for certification, as follows:

(1) *Fuel caps, vents, and carbon canisters.* You are responsible for ensuring that proper caps and vents are installed on each new piece of equipment that is subject to emission standards under this part. The following particular requirements apply to equipment that is subject to running loss or diurnal emission standards, including portable marine fuel tanks:

(i) All equipment must have a tethered fuel cap. Fuel caps must also include a visual, audible, or other physical indication that they have been properly sealed.

(ii) You may not add vents unless they are specified in or allowed by the applicable certificates of conformity.

(iii) If the emission controls rely on carbon canisters, they must be installed in a way that prevents exposing the carbon to water or liquid fuel.

(2) *Fuel-line fittings.* The following requirements apply for fuel-line fittings that will be used with fuel lines that must meet permeation emission standards:

(i) Use good engineering judgment to ensure that all fuel-line fittings will remain securely connected to prevent fuel leakage throughout the useful life of the equipment.

(ii) Fuel lines that are intended to be detachable (such as those for portable marine fuel tanks) must be self-sealing when detached from the fuel tank or engine.

(3) *Refueling.* For any equipment using fuel tanks that are subject to diurnal or permeation emission standards under this part, you must design and build your equipment such that operators can reasonably be expected to fill the fuel tank without spitback or spillage during the refueling event. The following examples illustrate designs that meet this requirement:

(i) Equipment that is commonly refueled using a portable gasoline container should have a fuel tank inlet that is larger than a typical dispensing spout. The fuel tank inlet should be located so the operator can place the nozzle directly in the fuel tank inlet and see the fuel level in the tank while pouring the fuel from an appropriately sized refueling container (either through the tank wall or the fuel tank inlet). We will deem you to comply with the requirements of this paragraph (f)(3)(i) if you design your equipment to meet applicable industry standards related to fuel tank inlets.

(ii) Marine SI vessels with a filler neck extending to the side of the boat should be designed for automatic fuel shutoff. Alternatively, the filler neck should be designed such that the orientation of the filler neck allows dispensed fuel that collects in the filler neck to flow back into the fuel tank. A filler neck that ends with a horizontal or nearly horizontal segment at the opening where fuel is dispensed would not be an acceptable design.

(g) Components and equipment must meet the standards specified in this part throughout the applicable useful life. Where we do not specify procedures for demonstrating the durability of emission controls, use good engineering judgment to ensure that your products will meet the standards throughout the useful life. The useful life is one of the following values:

(1) The useful life in years specified for the components or equipment in the exhaust standard-setting part.

(2) The useful life in years specified for the engine in the exhaust standard-setting part if the exhaust standards are specified for the engine rather than the equipment and there is no useful life given for components or equipment.

(3) Five years if no useful life is specified in years for the components, equipment, or engines in the exhaust standard-setting part.

§ 1060.102 What permeation emission control requirements apply for fuel lines?

(a) Nonmetal fuel lines must meet permeation requirements as follows:

(1) Marine SI fuel lines, including fuel lines associated with outboard engines or portable marine fuel tanks, must meet the permeation requirements in this section.

(2) Large SI fuel lines must meet the permeation requirements specified in 40 CFR 1048.105.

(3) Fuel lines for recreational vehicles must meet the permeation requirements specified in 40 CFR 1051.110 or in this section.

(4) Small SI fuel lines must meet the permeation requirements in this section, unless they are installed in equipment certified to meet diurnal emission standards under § 1060.105(e).

(b) Different categories of nonroad equipment are subject to different requirements with respect to fuel line permeation. Fuel lines are classified based on measured emissions over the test procedure specified for the class.

(c) The regulations in 40 CFR part 1048 require that fuel lines used with Large SI engines must meet the standards for EPA Low-Emission Fuel Lines. The regulations in 40 CFR part 1054 require that fuel lines used with handheld Small SI engines installed in cold-weather equipment must meet the standards for EPA Cold-Weather Fuel Lines. Unless specified otherwise in this subchapter U, fuel lines used with all other engines and equipment subject to the provisions of this part 1060, including fuel lines associated with outboard engines or portable marine fuel tanks, must meet the standards for EPA Nonroad Fuel Lines.

(d) The following standards apply for each fuel line classification:

(1) EPA Low-Emission Fuel Lines must have permeation emissions at or below 10 g/m^2/day when measured according to the test procedure described in § 1060.510.

(2) EPA Nonroad Fuel Lines must have permeation emissions at or below 15 g/m^2/day when measured according to the test procedure described in § 1060.515.

(3) EPA Cold-Weather Fuel Lines must meet the following permeation emission standards when measured according to the test procedure described in § 1060.515:

TABLE 1 TO § 1060.102—PERMEATION STANDARDS FOR EPA COLD-WEATHER FUEL LINES

Model year	Standard (g/m^2/day)
2012	290
2013	275
2014	260
2015	245
2016 and later	225

(e) You may certify fuel lines as follow:

(1) You may certify straight-run fuel lines as sections of any length.

(2) You may certify molded fuel lines in any configuration representing your actual production, subject to the provisions for selecting a worst-case configuration in § 1060.235(b).

(3) You may certify fuel line assemblies as aggregated systems that include multiple sections of fuel line with connectors and fittings. For example, you may certify fuel lines for portable marine fuel tanks as assemblies of fuel hose, primer bulbs, and self-sealing end connections. The length of such an assembly must not be longer than a typical in-use installation and must always be less than 2.5 meters long. You may also certify primer bulbs separately. The standard applies with respect to the total permeation emissions divided by the wetted internal surface area of the assembly. Where it is not practical to determine the actual internal surface area of the assembly, you may assume that the internal surface area per unit length of the assembly is equal to the ratio of internal surface area per unit length of the hose section of the assembly.

§ 1060.103 What permeation emission control requirements apply for fuel tanks?

(a) Fuel tanks must meet permeation requirements as follows:

(1) Marine SI fuel tanks, including engine-mounted fuel tanks and portable marine fuel tanks, must meet the permeation requirements in this section.

(2) Large SI fuel tanks must meet diurnal emission standards as specified in § 1060.105, which includes measurement of permeation emissions. No separate permeation standard applies.

(3) Fuel tanks for recreational vehicles must meet the permeation requirements specified in 40 CFR 1051.110 or in this section.

(4) Small SI fuel tanks must meet the permeation requirements in this section unless they are installed in equipment certified to meet diurnal emission standards under § 1060.105(e).

(b) Permeation emissions from fuel tanks may not exceed 1.5 g/m^2/day when measured at a nominal temperature of 28 °C with the test procedures for tank permeation in § 1060.520. You may also choose to meet a standard of 2.5 g/m^2/day if you perform testing at a nominal temperature of 40 °C under § 1060.520(d).

(c) The exhaust standard-setting part may allow for certification of fuel tanks to a family emission limit for calculating evaporative emission credits as described in subpart H of this part instead of meeting the emission standards in this section.

(d) For purposes of this part, fuel tanks do not include fuel lines that are subject to § 1060.102, petcocks designed for draining fuel, or grommets used with fuel lines. Fuel tanks include other fittings (such as fuel caps, gaskets, and O-rings) that are directly mounted to the fuel tank.

(e) Fuel caps may be certified separately to the permeation emission standard in paragraph (b) of this section using the test procedures specified in § 1060.521. For the purposes of this paragraph (e), gaskets or O-rings that are produced as part of an assembly with the fuel cap are considered part of the fuel cap.

(f) Metal fuel tanks that meet the permeation criteria in § 1060.240(d)(2) or use certified nonmetal fuel caps will be deemed to be certified as in conformity with the requirements of this section without submitting an application for certification.

§ 1060.104 What running loss emission control requirements apply?

(a) Engines and equipment must meet running loss requirements as follows:

(1) Marine SI engines and vessels are not subject to running loss emission standards.

(2) Large SI engines and equipment must prevent fuel boiling during operation as specified in 40 CFR 1048.105.

(3) Recreational vehicles are not subject to running loss emission standards.

(4) Nonhandheld Small SI engines and equipment that are not used in wintertime equipment must meet running loss requirements described in this section. Handheld Small SI engines and equipment are not subject to running loss emission standards.

(b) You must demonstrate control of running loss emissions in one of the following ways if your engines or equipment are subject to the requirements of this section:

(1) Route running loss emissions into the engine intake system so fuel vapors vented from the tank during engine operation are combusted in the engine. This may involve routing vapors through a carbon canister. If another company has certified the engine with respect to exhaust emissions, state in your application for certification that you have followed the engine manufacturer's installation instructions.

(2) Use a fuel tank that remains sealed under normal operating conditions. This may involve a bladder or other means to prevent pressurized fuel tanks.

(3) Get an approved Executive Order from the California Air Resources Board showing that your system meets applicable running loss standards in California.

(c) If you are subject to both running loss and diurnal emission standards, use good engineering judgment to ensure that the emission controls are compatible.

§ 1060.105 What diurnal requirements apply for equipment?

(a) Fuel tanks must meet diurnal emission requirements as follows:

(1) Marine SI fuel tanks, including engine-mounted fuel tanks and portable marine fuel tanks, must meet the requirements related to diurnal emissions specified in this section.

(2) Large SI fuel tanks must meet the requirements related to diurnal emissions specified in 40 CFR 1048.105.

(3) Recreational vehicles are not subject to diurnal emission standards.

(4) Small SI fuel tanks are not subject to diurnal emission standards, except as specified in paragraph (e) of this section.

(b) Diurnal emissions from Marine SI fuel tanks may not exceed 0.40 g/gal/day when measured using the test procedures specified in § 1060.525 for general fuel temperatures. An alternative standard of 0.16 g/gal/day applies for fuel tanks installed in nontrailerable boats when measured using the corresponding fuel temperature profile in § 1060.525. Portable marine fuel tanks are not subject to the requirements of this paragraph (b), but must instead comply with the requirements of paragraphs (c) and (d) of this section.

(c) Portable marine fuel tanks and associated fuel-system components must meet the following requirements:

(1) They must be self-sealing (without any manual vents) when not attached to the engines. The tanks may not vent to the atmosphere when attached to an engine.

(2) They must remain sealed up to a positive pressure of 34.5 kPa (5.0 psig); however, they may contain air inlets that open when there is a vacuum pressure inside the tank.

(d) Detachable fuel lines that are intended for use with portable marine fuel tanks must be self-sealing (without any manual vents) when not attached to the engine or fuel tank.

(e) Manufacturers of nonhandheld Small SI equipment may optionally meet the diurnal emission standards adopted by the California Air Resources Board in the Final Regulation Order, Article 1, Chapter 15, Division 3, Title 13, California Code of Regulations, July 26, 2004 (incorporated by reference in § 1060.810). To meet this requirement, equipment must be certified to the performance standards specified in Title 13 CCR § 2754(a) based on the applicable requirements specified in CP–902 and TP–902, including the requirements related to fuel caps in Title 13 CCR § 2756. Equipment certified under this paragraph (e) does not need to use fuel lines or fuel tanks that have been certified separately. Equipment certified under this paragraph (e) are subject to all the referenced requirements as if these specifications were mandatory.

(f) The following general provisions apply for controlling diurnal emissions:

(1) If you are subject to both running loss and diurnal emission standards, use good engineering judgment to ensure that the emission controls are compatible.

(2) You may not use diurnal emission controls that increase the occurrence of fuel spitback or spillage during in-use refueling. Also, if you use a carbon canister, you must incorporate design features that prevent liquid gasoline from reaching the canister during refueling or as a result of fuel sloshing or fuel expansion.

§ 1060.120 What emission-related warranty requirements apply?

(a) *General requirements.* The certifying manufacturer must warrant to the ultimate purchaser and each subsequent purchaser that the new nonroad equipment, including its evaporative emission control system, meets two conditions:

(1) It is designed, built, and equipped so it conforms at the time of sale to the ultimate purchaser with the requirements of this part.

(2) It is free from defects in materials and workmanship that may keep it from meeting these requirements.

(b) *Warranty period.* Your emission-related warranty must be valid for at least two years from the point of first retail sale.

(c) *Components covered.* The emission-related warranty covers all components whose failure would increase the evaporative emissions, including those listed in 40 CFR part 1068, Appendix I, and those from any other system you develop to control emissions. Your emission-related warranty does not cover components whose failure would not increase evaporative emissions.

(d) *Relationships between manufacturers.*

(1) The emission-related warranty required for equipment manufacturers that certify equipment must cover all specified components even if another company produces the component.

(2) Where an equipment manufacturer fulfills a warranty obligation for a given component, the component manufacturer is deemed to have also met that obligation.

§ 1060.125 What maintenance instructions must I give to buyers?

Give ultimate purchasers written instructions for properly maintaining and using the emission control system. You may not specify any maintenance more frequently than once per year. For example, if you produce cold-weather equipment that requires replacement of fuel cap gaskets or O-rings, provide clear instructions to the ultimate purchaser, including the required replacement interval.

§ 1060.130 What installation instructions must I give to equipment manufacturers?

(a) If you sell a certified fuel-system component for someone else to install in equipment, give the installer instructions for installing it consistent with the requirements of this part.

(b) Make sure the instructions have the following information:

(1) Include the heading: ‘‘Emission-related installation instructions’’.

(2) State: ‘‘Failing to follow these instructions when installing [IDENTIFY COMPONENT(S)] in a piece of nonroad equipment violates federal law (40 CFR 1068.105(b)), subject to fines or other penalties as described in the Clean Air Act.’’

(3) Describe any limits on the range of applications needed to ensure that the component operates consistently with your application for certification. For example:

(i) For fuel tanks sold without fuel caps, you must specify the requirements for the fuel cap, such as the allowable materials, thread pattern, how it must seal, etc. You must also include instructions to tether the fuel cap as described in § 1060.101(f)(1) if you do not sell your fuel tanks with tethered fuel caps.

(ii) If your fuel lines do not meet permeation standards specified in § 1060.102 for EPA Low-Emission Fuel Lines, tell equipment manufacturers not to install the fuel lines with Large SI engines that operate on gasoline or another volatile liquid fuel.

(4) Describe instructions for installing components so they will operate according to design specifications in your application for certification. Specify sufficient detail to ensure that the equipment will meet the applicable standards when your component is installed.

(5) If you certify a component with a family emission limit above the emission standard, be sure to indicate that the equipment manufacturer must have a source of credits to offset the higher emissions. Also indicate the applications for which the regulations allow for compliance using evaporative emission credits.

(6) Instruct the equipment manufacturers that they must comply with the requirements of § 1060.202.

(c) You do not need installation instructions for components you install in your own equipment.

(d) Provide instructions in writing or in an equivalent format. For example, you may post instructions on a publicly available Web site for downloading or printing, provided you keep a copy of these instructions in your records. If you do not provide the instructions in writing, explain in your application for certification how you will ensure that each installer is informed of the installation requirements.

§ 1060.135 How must I label and identify the engines and equipment I produce?

The labeling requirements of this section apply for all equipment manufacturers and for engine manufacturers that certify with respect to evaporative emissions. See § 1060.137 for the labeling requirements that apply separately for fuel lines, fuel tanks, and other fuel-system components.

(a) You must affix a permanent and legible label identifying each engine or piece of equipment before introducing it into U.S. commerce. The label must be—

(1) Attached in one piece so it is not removable without being destroyed or defaced.

(2) Secured to a part of the engine or equipment needed for normal operation and not normally requiring replacement.

(3) Durable and readable for the equipment's entire life.

(4) Written in English.

(5) Readily visible in the final installation. It may be under a hinged door or other readily opened cover. It may not be hidden by any cover attached with screws or any similar designs. Labels on marine vessels must be visible from the helm.

(b) If you hold a certificate for your engine or equipment with respect to evaporative emissions, the engine or equipment label specified in paragraph (a) of this section must—

(1) Include the heading ''EMISSION CONTROL INFORMATION''.

(2) Include your corporate name and trademark. You may identify another company and use its trademark instead of yours if you comply with the provisions of § 1060.640.

(3) State the date of manufacture [MONTH and YEAR] of the equipment; however, you may omit this from the label if you stamp or engrave it on the equipment.

(4) State: ''THIS EQUIPMENT [or VEHICLE or BOAT] MEETS U.S. EPA EVAP STANDARDS.''

(5) Identify the certified fuel-system components installed on the equipment as described in this paragraph (b)(5). Establish a component code for each certified fuel-system component, including those certified by other companies. You may use part numbers, certification numbers, or any other unique code that you or the certifying component manufacturer establish. This identifying information must correspond to printing or other labeling on each certified fuel-system component, whether you or the component manufacturer certifies the individual component. You may identify multiple part numbers if your equipment design might include an option to use more than one component design (such as from multiple component manufacturers). Use one of the following methods to include information on the label that identifies certified fuel-system components:

(i) Use the component codes to identify each certified fuel-system component on the label specified in this paragraph (b).

(ii) Identify the emission family on the label using EPA's standardized designation or an abbreviated equipment code that you establish in your application for certification. Equipment manufacturers that also certify their engines with respect to exhaust emissions may use the same emission family name for both exhaust and evaporative emissions. If you use the provisions of this paragraph (b)(5)(ii), you must identify all the certified fuel-system components and the associated component codes in your application for certification. In this case the label specified in this paragraph (b) may omit the information related to specific fuel-system components.

(c) If you produce equipment without certifying with respect to evaporative emissions, the equipment label specified in paragraph (a) of this section must—

(1) State: ''MEETS U.S. EPA EVAP STANDARDS USING CERTIFIED COMPONENTS.''

(2) Include your corporate name.

(d) You may add information to the emission control information label as follows:

(1) You may identify other emission standards that the engine meets or does not meet (such as California standards). You may include this information by adding it to the statement we specify or by including a separate statement.

(2) You may add other information to ensure that the engine will be properly maintained and used.

(3) You may add appropriate features to prevent counterfeit labels. For example, you may include the engine's unique identification number on the label.

(e) Anyone subject to the labeling requirements in this part 1060 may ask us to approve modified labeling requirements if it is necessary or appropriate. We will approve the request if the alternate label is consistent with the requirements of this part.

§ 1060.137 How must I label and identify the fuel-system components I produce?

The requirements of this section apply for manufacturers of fuel-system components subject to emission standards under this part 1060. However, these requirements do not apply if you produce fuel-system components that will be covered by a certificate of conformity from another company under § 1060.601(f). These requirements also do not apply for components you certify if you also certify the equipment in which the component is installed and meet the labeling requirements in § 1060.135.

(a) Label the following components as described in this section:

(1) All fuel tanks, except for metal fuel tanks that are deemed certified under § 1060.103(f).

(2) Fuel lines. This includes primer bulbs unless they are excluded from the definition of ''fuel line'' under the standard-setting part. Label primer bulbs separately.

(3) Carbon canisters.

(4) Fuel caps, as described in this paragraph (a)(4). Fuel caps must be labeled if they are separately certified under § 1060.103 or if the diurnal control system requires that the fuel

tank hold pressure. Fuel caps must also be labeled if they are attached directly to the fuel tank, unless the fuel tank is certified based on a worst-case fuel cap.

(5) Replaceable pressure-relief assemblies. This does not apply if the component is integral to the fuel tank or fuel cap.

(6) Other components we determine to be critical to the proper functioning of evaporative emission controls.

(b) Label your certified fuel-system components at the time of manufacture. The label must be—

(1) Attached so it is not removable without being destroyed or defaced. This may involve printing directly on the product. For molded products, you may use the mold to apply the label.

(2) Durable and readable for the equipment's entire life.

(3) Written in English.

(c) Except as specified in paragraph (d) of this section, you must create the label specified in paragraph (b) of this section as follows:

(1) Include your corporate name. You may identify another company instead of yours if you comply with the provisions of § 1054.640.

(2) Include EPA's standardized designation for the emission family.

(3) State: ''EPA COMPLIANT''.

(4) Fuel tank labels must identify the FEL, if applicable.

(5) Fuel line labels must identify the applicable permeation level. This may involve any of the following approaches:

(i) Identify the applicable numerical emission standard (such as 15 g/m^2/day).

(ii) Identify the applicable emission standards using EPA classifications (such as EPA Nonroad Fuel Lines).

(iii) Identify the applicable industry standard specification (such as SAE J30 R12).

(6) Fuel line labels must be continuous, with no more than 12 inches before repeating. We will consider labels to be continuous if the space between repeating segments is no longer than that of the repeated information. You may add a continuous stripe or other pattern to help identify the particular type or grade of your products.

(d) You may create an abbreviated label for your components. Such a label may rely on codes to identify the component. The code must at a minimum identify the certification status, your corporate name, and the emission family. For example, XYZ Manufacturing may label its fuel lines as ''EPA–XYZ–A15'' to designate that their ''A15'' family was certified to meet EPA's 15 g/m^2/day standard. If you do this, you must describe the abbreviated label in your application for certification and identify all the associated information specified in paragraph (c) of this section.

(e) You may ask us to approve modified labeling requirements in this section as described in § 1060.135(e).

Subpart C—Certifying Emission Families

§ 1060.201 What are the general requirements for obtaining a certificate of conformity?

Manufacturers of engines, equipment, or fuel-system components may need to certify their products with respect to evaporative emission standards as described in §§ 1060.1 and 1060.601. See § 1060.202 for requirements related to certifying with respect to the requirements specified in § 1060.101(f). The following general requirements apply for obtaining a certificate of conformity:

(a) You must send us a separate application for a certificate of conformity for each emission family. A certificate of conformity for equipment is valid starting with the indicated effective date but it is not valid for any production after December 31 of the model year for which it is issued. No certificate will be issued after December 31 of the model year. A certificate of conformity for a component is valid starting with the indicated effective date but it is not valid for any production after the end of the *production period* for which it is issued.

(b) The application must contain all the information required by this part and must not include false or incomplete statements or information (see § 1060.255).

(c) We may ask you to include less information than we specify in this subpart as long as you maintain all the information required by § 1060.250. For example, equipment manufacturers might use only components that are certified by other companies to meet applicable emission standards, in which case we would not require submission of emission data already submitted by the component manufacturer.

(d) You must use good engineering judgment for all decisions related to your application (see 40 CFR 1068.5).

(e) An authorized representative of your company must approve and sign the application.

(f) See § 1060.255 for provisions describing how we will process your application.

(g) We may specify streamlined procedures for small-volume equipment manufacturers.

§ 1060.202 What are the certification requirements related to the general standards in § 1060.101?

Equipment manufacturers must ensure that their equipment is certified with respect to the general standards specified in § 1060.101(f) as follows:

(a) If § 1060.5 requires you to certify your equipment to any of the emission standards specified in §§ 1060.102 through 1060.105, describe in your application for certification how you will meet the general standards specified in § 1060.101(f).

(b) If § 1060.5 does not require you to certify your equipment to any of the emission standards specified in §§ 1060.102 through 1060.105, your equipment is deemed to be certified with respect to the general standards specified in § 1060.101(f) if you design and produce your equipment to meet those standards.

(1) You must keep records as described in § 1060.210. The other provisions of this part for certificate holders apply only as specified in § 1060.5.

(2) Your equipment is deemed to be certified only to the extent that it meets the general standards in § 1060.101(f). Thus, it is a violation of 40 CFR 1068.101(a)(1) to introduce into U.S. commerce such equipment that does not meet applicable requirements under § 1060.101(f).

(c) Instead of relying on paragraph (b) of this section, you may submit an application for certification and obtain a certificate from us. The provisions of this part apply in the same manner for certificates issued under this paragraph (c) as for any other certificate issued under this part.

§ 1060.205 What must I include in my application?

This section specifies the information that must be in your application, unless we ask you to include less information under § 1060.201(c). We may require you to provide additional information to evaluate your application.

(a) Describe the emission family's specifications and other basic parameters of the emission controls. Describe how you meet the running loss emission control requirements in § 1060.104, if applicable. Describe how you meet any applicable equipment-based requirements of § 1060.101(e) and (f). State whether you are requesting certification for gasoline or some other fuel type. List each distinguishable configuration in the emission family.

(b) Describe the products you selected for testing and the reasons for selecting them.

(c) Describe the test equipment and procedures that you used, including any special or alternate test procedures you used (see § 1060.501).

(d) List the specifications of the test fuel to show that it falls within the required ranges specified in subpart F of this part.

(e) State the equipment applications to which your certification is limited. For example, if your fuel system meets the emission requirements of this part applicable only to handheld Small SI equipment, state that the requested certificate would apply only for handheld Small SI equipment.

(f) Identify the emission family's useful life.

(g) Include the maintenance instructions you will give to the ultimate purchaser of each new nonroad engine (see § 1060.125).

(h) Include the emission-related installation instructions you will provide if someone else will install your component in a piece of nonroad equipment (see § 1060.130).

(i) Describe your emission control information label (see §§ 1060.135 and 1060.137).

(j) Identify the emission standards or FELs to which you are certifying the emission family.

(k) Present emission data to show your products meet the applicable emission standards. Note that §§ 1060.235 and 1060.240 allow you to submit an application in certain cases without new emission data.

(l) State that your product was tested as described in the application (including the test procedures, test parameters, and test fuels) to show you meet the requirements of this part. If you did not do the testing, identify the source of the data.

(m) Report all test results, including those from invalid tests, whether or not they were conducted according to the test procedures of subpart F of this part. We may ask you to send other information to confirm that your tests were valid under the requirements of this part.

(n) Unconditionally certify that all the products in the emission family comply with the requirements of this part, other referenced parts of the CFR, and the Clean Air Act.

(o) Include good-faith estimates of U.S.-directed production volumes. Include a justification for the estimated production volumes if they are substantially different than actual production volumes in earlier years for similar models.

(p) Include other applicable information, such as information required by other subparts of this part.

(q) Name an agent for service located in the United States. Service on this agent constitutes service on you or any of your officers or employees for any action by EPA or otherwise by the United States related to the requirements of this part.

§ 1060.210 What records should equipment manufacturers keep if they do not apply for certification?

If you are an equipment manufacturer that does not need to obtain a certificate of conformity for your equipment as described in § 1060.5, you must keep the records specified in this section to document compliance with applicable requirements. We may review these records at any time. If we ask, you must send us these records within 30 days. You must keep these records for eight years from the end of the model year.

(a) Identify your equipment models and the annual U.S.-directed production volumes for each model.

(b) Identify the emission family names of the certificates that will cover your equipment, the part numbers of those certified components, and the names of the companies that hold the certificates. You must be able to identify this information for each piece of equipment you produce.

(c) Describe how you comply with any emission-related installation instructions, labeling requirements, and the general standards in § 1060.101(e) and (f).

§ 1060.225 How do I amend my application for certification?

Before we issue a certificate of conformity, you may amend your application to include new or modified configurations, subject to the provisions of this section. After we have issued your certificate of conformity, you may send us an amended application requesting that we include new or modified configurations within the scope of the certificate, subject to the provisions of this section. You must amend your application if any changes occur with respect to any information included in your application.

(a) You must amend your application before you take any of the following actions:

(1) Add a configuration to an emission family. In this case, the configuration added must be consistent with other configurations in the emission family with respect to the criteria listed in § 1060.230.

(2) Change a configuration already included in an emission family in a way that may affect emissions, or change any of the components you described in your application for certification. This includes production and design changes that may affect emissions any time during the equipment's lifetime.

(3) Modify an FEL for an emission family as described in paragraph (f) of this section. Note however that component manufacturers may not modify an FEL for their products unless they submit a separate application for a new emission family.

(b) To amend your application for certification, send the Designated Compliance Officer the following information:

(1) Describe in detail the addition or change in the configuration you intend to make.

(2) Include engineering evaluations or data showing that the amended emission family complies with all applicable requirements. You may do this by showing that the original emission data are still appropriate for showing that the amended family complies with all applicable requirements.

(3) If the original emission data for the emission family are not appropriate to show compliance for the new or modified configuration, include new test data showing that the new or modified configuration meets the requirements of this part.

(c) We may ask for more test data or engineering evaluations. Within 30 days after we make our request, you must provide the information or describe your plan for providing it in a timely manner.

(d) For emission families already covered by a certificate of conformity, we will determine whether the existing certificate of conformity covers your new or modified configuration. You may ask for a hearing if we deny your request (see § 1060.820).

(e) For emission families already covered by a certificate of conformity, you may start producing the new or modified configuration anytime after you send us your amended application and before we make a decision under paragraph (d) of this section. However, if we determine that the affected configurations do not meet applicable requirements, we will notify you to cease production of the configurations and may require you to recall the equipment at no expense to the owner. Choosing to produce equipment under this paragraph (e) is deemed to be consent to recall all equipment that we determine do not meet applicable emission standards or other requirements and to remedy the nonconformity at no expense to the owner. If you do not provide information we request under paragraph (c) of this section within 30 days after we request it, you must stop producing the new or modified equipment.

(f) If you hold a certificate of conformity for equipment and you have certified the fuel tank that you install in the equipment, you may ask us to approve a change to your FEL after the start of production. The changed FEL may not apply to equipment you have already introduced into U.S. commerce, except as described in this paragraph (f). If we approve a changed FEL after the start of production, you must identify the date or serial number for applying the new FEL. If you identify this by month and year, we will consider that a lowered FEL applies on the last day of the month and a raised FEL applies on the first day of the month. You may ask us to approve a change to your FEL in the following cases:

(1) You may ask to raise your FEL for your emission family at any time. In your request, you must show that you will still be able to meet the emission standards as specified in the exhaust standard-setting part. If you amend your application by submitting new test data to include a newly added or modified fuel tank configuration, as described in paragraph (b)(3) of this section, use the appropriate FELs with corresponding production volumes to calculate your production-weighted average FEL for the model year. In all other circumstances, you must use the higher FEL for the entire family to calculate your production-weighted average FEL under subpart H of this part.

(2) You may ask to lower the FEL for your emission family only if you have test data from production units showing that emissions are below the proposed lower FEL. The lower FEL applies only for units you produce after we approve the new FEL. Use the appropriate FELs with corresponding production volumes to calculate your production-weighted average FEL for the model year.

(g) Component manufacturers may not change an emission family's FEL under any circumstances. Changing the FEL would require submission of a new application for certification.

§ 1060.230 How do I select emission families?

(a) For purposes of certification, divide your product line into families of equipment (or components) that are expected to have similar emission characteristics throughout their useful life.

(b) Group fuel lines into the same emission family if they are the same in all the following aspects:

(1) Type of material including barrier layer.

(2) Production method.

(3) Types of connectors and fittings (material, approximate wall thickness, etc.) for fuel line assemblies certified together.

(c) Group fuel tanks (or fuel systems including fuel tanks) into the same emission family if they are the same in all the following aspects:

(1) Type of material, including any pigments, plasticizers, UV inhibitors, or other additives that are expected to affect control of emissions.

(2) Production method.

(3) Relevant characteristics of fuel cap design for fuel systems subject to diurnal emission requirements.

(4) Gasket material.

(5) Emission control strategy.

(6) Family emission limit, if applicable.

(d) Group other fuel-system components and equipment into the same emission family if they are the same in all the following aspects:

(1) Emission control strategy and design.

(2) Type of material (such as type of charcoal used in a carbon canister). This criteria does not apply for materials that are unrelated to emission control performance.

(3) The fuel systems meet the running loss emission standard based on the same type of compliance demonstration specified in § 1060.104(b), if applicable.

(e) You may subdivide a group of equipment or components that are identical under paragraphs (b) through (d) of this section into different emission families if you show the expected emission characteristics are different during the useful life.

(f) In unusual circumstances, you may group equipment or components that are not identical with respect to the things listed in paragraph (b) through (d) of this section into the same emission family if you show that their emission characteristics during the useful life will be similar. The provisions of this paragraph (f) do not exempt any engines or equipment from meeting all the applicable standards and requirements in subpart B of this part.

(g) Emission families may include components used in multiple equipment categories. Such families are covered by a single certificate. For example, a single emission family may contain fuel tanks used in both Small SI equipment and Marine SI vessels.

§ 1060.235 What emission testing must I perform for my application for a certificate of conformity?

This section describes the emission testing you must perform to show compliance with the emission standards in subpart B of this part.

(a) Test your products using the procedures and equipment specified in subpart F of this part.

(b) Select an emission-data unit from each emission family for testing. If you are certifying with a family emission limit, you must test at least three emission-data units. In general, you must test a preproduction product that will represent actual production. However, for fuel tank permeation, you may test a tank with standardized geometry provided that it is made of the same material(s) and appropriate wall thickness. In general, the test procedures specify that components or systems be tested rather than complete equipment. For example, to certify your family of Small SI equipment, you would need to test a sample of fuel line for permeation emissions and a fuel tank for permeation emissions. Note that paragraph (e) of this section and § 1060.240 allow you in certain circumstances to certify without testing an emission-data unit from the emission family. Select test components that are most likely to exceed (or have emissions nearer to) the applicable emission standards as follows:

(1) For fuel tanks, consider the following factors associated with higher emission levels:

(i) Smallest average wall thickness (or barrier thickness, as appropriate).

(ii) Greatest extent of pinch welds for tanks using barrier technologies.

(iii) Greatest relative area of gasket material, especially if gaskets are made of high-permeation materials.

(2) For fuel lines, consider the following factors associated with higher emission levels:

(i) Smallest average wall thickness (or barrier thickness, as appropriate).

(ii) Smallest inner diameter.

(c) You may not do maintenance on emission-data units.

(d) We may measure emissions from any of your products from the emission family, as follows:

(1) You must supply your products to us if we choose to perform confirmatory testing.

(2) If we measure emissions on one of your products, the results of that testing become the official emission results for the emission family. Unless we later invalidate these data, we may decide not to consider your data in determining if your emission family meets applicable requirements.

(e) You may ask to use carryover emission data from a previous production period instead of doing new tests, but only if all the following are true:

(1) The emission family from the previous production period differs from

the current emission family only with respect to production period or other characteristics unrelated to emissions. You may also ask to add a configuration subject to § 1060.225.

(2) The emission-data unit from the previous production period remains the appropriate emission-data unit under paragraph (b) of this section. For example, you may not carryover emission data for your family of nylon fuel tanks if you have added a thinner-walled fuel tank than was tested previously.

(3) The data show that the emission-data unit would meet all the requirements that apply to the emission family covered by the application for certification.

(f) We may require you to test another unit of the same or different configuration in addition to the unit(s) tested under paragraph (b) of this section.

(g) If you use an alternate test procedure under § 1060.505, and later testing shows that such testing does not produce results that are equivalent to the procedures specified in this part, we may reject data you generated using the alternate procedure.

§ 1060.240 How do I demonstrate that my emission family complies with evaporative emission standards?

(a) For purposes of certification, your emission family is considered in compliance with an evaporative emission standard in subpart B of this part if you do either of the following:

(1) You have test results showing a certified emission level from the fuel tank or fuel line (as applicable) in the family are at or below the applicable standard.

(2) You comply with design specifications as specified in paragraphs (d) through (f) of this section.

(b) Your emission family is deemed not to comply if any fuel tank or fuel line representing that family has an official emission result above the standard.

(c) Round each official emission result to the same number of decimal places as the emission standard.

(d) You may demonstrate for certification that your emission family complies with the fuel tank permeation standards specified in § 1060.103 with any of the following control technologies:

(1) A coextruded high-density polyethylene fuel tank with a continuous ethylene vinyl alcohol barrier layer (with not more than 40 molar percent ethylene) making up at least 2 percent of the fuel tank's overall wall thickness with any of the following gasket and fuel-cap characteristics:

(i) No nonmetal gaskets or fuel caps.

(ii) All nonmetal gaskets and fuel caps made from low-permeability materials.

(iii) Nonmetal gaskets and fuel caps that are not made from low-permeability materials up to the following limits:

(A) Gaskets with a total exposed surface area less than 0.25 percent of the total inside surface area of the fuel tank. For example, a fuel tank with an inside surface area of 0.40 square meters may use high-permeation gasket material representing a surface area of up to 1,000 mm^2 ($0.25\% \times 1/100 \times 0.40\ m^2 \times 1{,}000{,}000\ mm^2/m^2$). Determine surface area based on the amount of material exposed to liquid fuel.

(B) Fuel caps directly mounted to the fuel tank with the surface area of the fuel cap less than 3.0 percent of the total inside surface area of the fuel tank. Use the smallest inside cross-sectional area of the opening on which the cap is mounted as the fuel cap's surface area.

(2) A metal fuel tank with the gasket and fuel-cap characteristics meeting the specifications in paragraphs (d)(1)(i) through (iii) of this section.

(e) You may demonstrate for certification that your emission family complies with the diurnal emission standards specified in § 1060.105 with any of the following control technologies:

(1) A Marine SI fuel tank sealed up to a positive pressure of 7.0 kPa (1.0 psig); however, the fuel tank may contain air inlets that open when there is a vacuum pressure inside the tank.

(2) A Marine SI fuel tank equipped with a passively purged carbon canister that meets the requirements of this paragraph (e)(2). The carbon must adsorb no more than 0.5 grams of water per gram of carbon at 90% relative humidity and a temperature of 25±5 °C. The carbon granules must have a minimum mean diameter of 3.1 mm based on the procedures in ASTM D2862 (incorporated by reference in § 1060.810). The carbon must also pass a dust attrition test based on ASTM D3802 (incorporated by reference in § 1060.810), except that hardness is defined as the ratio of mean particle diameter before and after the test and the procedure must involve twenty ½-inch steel balls and ten ¾-inch steel balls. Use good engineering judgment in the structural design of the carbon canister. The canister must have a volume compensator or some other device to prevent the carbon pellets from moving within the canister as a result of vibration or changing temperature. The canister must have a minimum working capacity as follows:

(i) You may use the measurement procedures specified by the California Air Resources Board in Attachment 1 to TP–902 to show that canister working capacity is least 3.6 grams of vapor storage capacity per gallon of nominal fuel tank capacity (or 1.4 grams of vapor storage capacity per gallon of nominal fuel tank capacity for fuel tanks used in nontrailerable boats). TP–902 is part of Final Regulation Order, Article 1, Chapter 15, Division 3, Title 13, California Code of Regulations, July 26, 2004 as adopted by the California Air Resources Board (incorporated by reference in § 1060.810).

(ii) You may produce canisters with a minimum carbon volume of 0.040 liters per gallon of nominal fuel tank capacity (or 0.016 liters per gallon for fuel tanks used in nontrailerable boats). The carbon canister must have a minimum effective length-to-diameter ratio of 3.5 and the vapor flow must be directed with the intent of using the whole carbon bed. The carbon must have a minimum carbon working capacity of 90 grams per liter.

(f) We may establish additional design certification options where we find that new test data demonstrate that the use of a different technology design will ensure compliance with the applicable emission standards.

(g) You may not establish a family emission limit below the emission standard for components certified based on design specifications under this section even if actual emission rates are much lower.

§ 1060.250 What records must I keep?

(a) Organize and maintain the following records:

(1) A copy of all applications and any summary information you send us.

(2) Any of the information we specify in § 1060.205 that you were not required to include in your application.

(3) A detailed history of each emission-data unit. For each emission data unit, include all of the following:

(i) The emission-data unit's construction, including its origin and buildup, steps you took to ensure that it represents production equipment, any components you built specially for it, and all the components you include in your application for certification.

(ii) All your emission tests, including documentation on routine and standard tests, and the date and purpose of each test.

(iii) All tests to diagnose emission control performance, giving the date and time of each and the reasons for the test.

(iv) Any other significant events.

(4) Annual production figures for each emission family divided by assembly plant.

(5) Keep a list of equipment identification numbers for all the

equipment you produce under each certificate of conformity.

(b) Keep required data from routine emission tests (such as temperature measurements) for one year after we issue the associated certificate of conformity. Keep all other information specified in paragraph (a) of this section for eight years after we issue your certificate.

(c) Store these records in any format and on any media as long as you can promptly send us organized, written records in English if we ask for them. You must keep these records readily available. We may review them at any time.

§ 1060.255 What decisions may EPA make regarding my certificate of conformity?

(a) If we determine your application is complete and shows that the emission family meets all the requirements of this part and the Clean Air Act, we will issue a certificate of conformity for your emission family for that production period. We may make the approval subject to additional conditions.

(b) We may deny your application for certification if we determine that your emission family fails to comply with emission standards or other requirements of this part or the Clean Air Act. We will base our decision on all available information. If we deny your application, we will explain why in writing.

(c) In addition, we may deny your application or suspend or revoke your certificate if you do any of the following:

(1) Refuse to comply with any testing or reporting requirements.

(2) Submit false or incomplete information (paragraph (e) of this section applies if this is fraudulent).

(3) Render inaccurate any test data.

(4) Deny us from completing authorized activities despite our presenting a warrant or court order (see 40 CFR 1068.20). This includes a failure to provide reasonable assistance.

(5) Produce equipment or components for importation into the United States at a location where local law prohibits us from carrying out authorized activities.

(6) Fail to supply requested information or amend your application to include all equipment or components being produced.

(7) Take any action that otherwise circumvents the intent of the Clean Air Act or this part.

(d) We may void your certificate if you do not keep the records we require or do not give us information when we ask for it.

(e) We may void your certificate if we find that you intentionally submitted false or incomplete information.

(f) If we deny your application or suspend, revoke, or void your certificate, you may ask for a hearing (see § 1060.820).

Subpart D—Production Verification Testing

§ 1060.301 Manufacturer testing.

(a) Using good engineering judgment, you must evaluate production samples to verify that equipment or components you produce are as specified in the certificate of conformity. This may involve testing using certification procedures or other measurements.

(b) You must give us records to document your evaluation if we ask for them.

§ 1060.310 Supplying products to EPA for testing.

Upon our request, you must supply a reasonable number of production samples to us for verification testing.

Subpart E—In-use Testing

§ 1060.401 General Provisions.

We may perform in-use testing of any equipment or fuel-system components subject to the standards of this part.

Subpart F—Test Procedures

§ 1060.501 General testing provisions.

(a) This subpart is addressed to you as a certifying manufacturer but it applies equally to anyone who does testing for you.

(b) Unless we specify otherwise, the terms ''procedures'' and ''test procedures'' in this part include all aspects of testing, including the equipment specifications, calibrations, calculations, and other protocols and procedural specifications needed to measure emissions.

(c) The specification for gasoline to be used for testing is given in 40 CFR 1065.710. Use the grade of gasoline specified for general testing. For testing specified in this part that requires a blend of gasoline and ethanol, blend this grade of gasoline with fuel-grade ethanol meeting the specifications of ASTM D4806 (incorporated by reference in § 1060.810). You do not need to measure the ethanol concentration of such blended fuels and may instead calculate the blended composition by assuming that the ethanol is pure and mixes perfectly with the base fuel. For example, if you mix 10.0 liters of fuel-grade ethanol with 90.0 liters of gasoline, you may assume the resulting mixture is 10.0 percent ethanol. You may use more or less pure ethanol if you can demonstrate that it will not affect your ability to demonstrate compliance with the applicable emission standards. Note that unless we specify otherwise, any references to gasoline-ethanol mixtures containing a specified ethanol concentration means mixtures meeting the provisions of this paragraph (c).

(d) Accuracy and precision of all temperature measurements must be ±1.0 °C or better. If you use multiple sensors to measure differences in temperature, calibrate the sensors so they will be within 0.5 °C of each other when they are in thermal equilibrium at a point within the range of test temperatures (use the starting temperature in Table 1 to § 1060.525 unless this is not feasible).

(e) Accuracy and precision of mass balances must be sufficient to ensure accuracy and precision of two percent or better for emission measurements for products at the maximum level allowed by the standard. The readability of the display may not be coarser than half of the required accuracy and precision. Examples are shown in the following table:

	Example #1	Example #2	Example #3
Applicable standard	1.5 g/m^2/day	1.5 g/m^2/day	15 g/m^2/day.
Internal surface area	1.15 m^2	0.47 m^2	0.070 m^2.
Length of test	14 days	14 days	28 days.
Maximum allowable mass change	24.15 g	9.87 g	1.96 g.
Required accuracy and precision	±0.483 g or better	±0.197 g or better	±0.0392 g or better.
Required readability	0.1 g or better	0.1 g or better	0.01 g or better.

§ 1060.505 Other procedures.

(a) *Your testing.* The procedures in this part apply for all testing you do to show compliance with emission standards, with certain exceptions listed in this section.

(b) *Our testing.* These procedures generally apply for testing that we do to determine if your equipment complies with applicable emission standards. We may perform other testing as allowed by the Clean Air Act.

(c) *Exceptions.* We may allow or require you to use procedures other than those specified in this part in the following cases:

(1) You may request to use special procedures if your equipment cannot be tested using the specified procedures. We will approve your request if we determine that it would produce emission measurements that represent in-use operation and we determine that it can be used to show compliance with the requirements of the standard-setting part.

(2) You may ask to use emission data collected using other procedures, such as those of the California Air Resources Board or the International Organization for Standardization. We will approve this only if you show us that using these other procedures does not affect your ability to show compliance with the applicable emission standards. This generally requires emission levels to be far enough below the applicable emission standards so any test differences do not affect your ability to state unconditionally that your equipment will meet all applicable emission standards when tested using the specified test procedures.

(3) You may request to use alternate procedures that are equivalent to allowed procedures or are more accurate or more precise than allowed procedures. See 40 CFR 1065.12 for a description of the information that is generally required to show that an alternate test procedure is equivalent.

(4) The test procedures are specified for gasoline-fueled equipment. If your equipment will use another volatile liquid fuel instead of gasoline, use a test fuel that is representative of the fuel that will be used with the equipment in use. You may ask us to approve other changes to the test procedures to reflect the effects of using a fuel other than gasoline.

(d) *Approval.* If we require you to request approval to use other procedures under paragraph (c) of this section, you may not use them until we approve your request.

§ 1060.510 How do I test EPA Low-Emission Fuel Lines for permeation emissions?

For EPA Low-Emission Fuel Lines, measure emissions according to SAE J2260, which is incorporated by reference in § 1054.810.

§ 1060.515 How do I test EPA Nonroad Fuel Lines and EPA Cold-Weather Fuel Lines for permeation emissions?

Measure emission as follows for EPA Nonroad Fuel Lines and EPA Cold-Weather Fuel Lines:

(a) Prior to permeation testing, use good engineering judgment to precondition the fuel line by filling it with the fuel specified in this paragraph (a), sealing the openings, and soaking it for at least four weeks at 43 ±5 °C or eight weeks at 23 ± 5 °C.

(1) For EPA Nonroad Fuel Lines, use Fuel CE10, which is Fuel C as specified in ASTM D471 (incorporated by reference in § 1054.810) blended with ethanol such that the blended fuel has 10.0 ± 1.0 percent ethanol by volume.

(2) For EPA Cold-Weather Fuel Lines, use gasoline blended with ethanol such that the blended fuel has 10.0 ± 1.0 percent ethanol by volume.

(b) Drain the fuel line and refill it immediately with the fuel specified in paragraph (a) of this section. Be careful not to spill any fuel.

(c) Measure fuel line permeation emissions using the equipment and procedures for weight-loss testing specified in SAE J30 or SAE J1527 (incorporated by reference in § 1054.810). Start the measurement procedure within 8 hours after draining and refilling the fuel line. Perform the emission test over a sampling period of 14 days.

(d) Use good engineering judgment to test fuel line segments with short length or narrow inner diameter. For example, size the fuel reservoir appropriately for the tested fuel line and take steps to eliminate air bubbles from narrow-diameter fuel lines.

§ 1060.520 How do I test fuel tanks for permeation emissions?

Measure permeation emissions by weighing a sealed fuel tank before and after a temperature-controlled soak.

(a) *Preconditioning durability testing.* Take the following steps before an emission test, in any order, if your emission control technology involves surface treatment or other post-processing treatments such as an epoxy coating:

(1) *Pressure cycling.* Perform a pressure test by sealing the tank and cycling it between +13.8 and −1.7 kPa (+2.0 and −0.5 psig) for 10,000 cycles at a rate of 60 seconds per cycle. The purpose of this test is to represent environmental wall stresses caused by pressure changes and other factors (such as vibration or thermal expansion). If your tank cannot be tested using the pressure cycles specified by this paragraph (a)(1), you may ask to use special test procedures under § 1060.505.

(2) *UV exposure.* Perform a sunlight-exposure test by exposing the tank to an ultraviolet light of at least 24 W/m^2 (0.40 $W\text{-}hr/m^2/min$) on the tank surface for at least 450 hours. Alternatively, the fuel tank may be exposed to direct natural sunlight for an equivalent period of time as long as you ensure that the tank is exposed to at least 450 daylight hours.

(3) *Slosh testing.* Perform a slosh test by filling the tank to 40–50 percent of its capacity with the fuel specified in paragraph (e) of this section and rocking it at a rate of 15 cycles per minute until you reach one million total cycles. Use an angle deviation of +15° to −15° from level.

(b) *Preconditioning fuel soak.* Take the following steps before an emission test:

(1) Fill the tank with the fuel specified in paragraph (e) of this section, seal it, and allow it to soak at 28 ±5°C for at least 20 weeks. Alternatively, the tank may be soaked for at least 10 weeks at 43±5°C. You may count the time of the preconditioning steps in paragraph (a) of this section as part of the preconditioning fuel soak as long as the ambient temperature remains within the specified temperature range and the fuel tank is at least 40 percent full; you may add or replace fuel as needed to conduct the specified durability procedures.

(2) Empty the fuel tank and immediately refill it with the specified test fuel to its nominal capacity. Be careful not to spill any fuel.

(3) Perform durability cycles on fuel caps intended for use with handheld equipment by putting the fuel cap on and taking it off 300 times. Tighten the fuel cap each time in a way that represents the typical in-use experience.

(4) Allow the tank and its contents to equilibrate to the temperatures specified in paragraph (d)(7) of this section. Seal the fuel tank as described in paragraph (b)(5) of this section once the fuel temperatures are stabilized at the test temperature. You must seal the tank no more than eight hours after refueling. Until the fuel tank is sealed, take steps to minimize the vapor losses from the fuel tank, such as keeping the fuel cap loose on the fuel inlet or routing vapors through a vent hose.

(5) Seal the fuel tank as follows:

(i) If fuel tanks are designed for use with a filler neck such that the fuel cap is not directly mounted on the fuel tank, you may seal the fuel inlet with a nonpermeable covering.

(ii) If fuel tanks are designed with fuel caps directly mounted on the fuel tank, take one of the following approaches:

(A) Use a production fuel cap expected to have permeation emissions at least as high as the highest-emitting fuel cap that you expect to be used with fuel tanks from the emission family. It would generally be appropriate to consider an HDPE fuel cap with a nitrile rubber seal to be worst-case.

(B) You may seal the fuel inlet with a nonpermeable covering if you separately measure the permeation from a worst-case fuel cap as described in § 1060.521.

(C) If you use or specify a fuel gasket made of low-permeability material, you may seal the fuel inlet with a nonpermeable covering and calculate an emission rate for the complete fuel tank using a default value of 30 g/m²/day for the fuel cap (or 50 g/m²/day for testing at 40°C). Use the smallest inside cross-sectional area of the opening on which the cap is mounted as the fuel cap's surface area.

(iii) Openings that are not normally sealed on the fuel tank (such as hose-connection fittings and vents in fuel caps) may be sealed using nonpermeable fittings such as metal or fluoropolymer plugs.

(iv) Openings for petcocks that are designed for draining fuel may be sealed using nonpermeable fittings such as metal or fluoropolymer plugs.

(v) Openings for grommets may be sealed using nonpermeable fittings such as metal or fluoropolymer plugs.

(vi) Rather than sealing a fuel tank with nonpermeable fittings, you may produce a fuel tank for testing without machining or stamping those holes.

(c) *Reference tank.* A reference tank is required to correct for buoyancy effects that may occur during testing. Prepare the reference tank as follows:

(1) Obtain a second tank that is identical to the test tank. You may not use a tank that has previously contained fuel or any other contents that might affect its mass stability.

(2) Fill the reference tank with enough glass beads (or other inert material) so the mass of the reference tank is approximately the same as the test tank when filled with fuel. Considering the performance characteristics of your balance, use good engineering judgment to determine how similar the mass of the reference tank needs to be to the mass of the test tank.

(3) Ensure that the inert material is dry.

(4) Seal the tank.

(d) *Permeation test run.* To run the test, take the following steps after preconditioning:

(1) Determine the fuel tank's internal surface area in square-meters, accurate to at least three significant figures. You may use less accurate estimates of the surface area if you make sure not to overestimate the surface area.

(2) Weigh the sealed test tank and record the weight. Place the reference tank on the balance and tare it so it reads zero. Place the sealed test tank on the balance and record the difference between the test tank and the reference tank. This value is M_o. Take this measurement directly after sealing the test tank as specified in paragraphs (b)(4) and (5) of this section.

(3) Carefully place the tank within a temperature-controlled room or enclosure. Do not spill or add any fuel.

(4) Close the room or enclosure as needed to control temperatures and record the time. However, you may need to take steps to prevent an accumulation of hydrocarbon vapors in the room or enclosure that might affect the degree to which fuel permeates through the fuel tank. This might simply involve passive ventilation to allow fresh air exchanges.

(5) Ensure that the measured temperature in the room or enclosure stays within the temperatures specified in paragraph (d)(6) of this section.

(6) Leave the tank in the room or enclosure for the duration of the test run.

(7) Hold the temperature of the room or enclosure at 28 ± 2 °C; measure and record the temperature at least daily. You may alternatively hold the temperature of the room or enclosure at 40 ± 2 °C to demonstrate compliance with the alternative standards specified in § 1060.103(b).

(8) Measure weight loss daily by retaring the balance using the reference tank and weighing the sealed test tank. Calculate the cumulative weight loss in g/m²/day for each measurement. Calculate the coefficient of determination, r^2, based on a linear plot of cumulative weight loss vs. test days as described in 40 CFR 1065.602(k). Continue testing for ten full days or, if r^2 is below 0.95, continue testing until r^2 is at or above 0.95. If r^2 is not at or above 0.95 within 20 days of testing, discontinue the test and precondition the fuel tank further until it has stabilized emission levels, then repeat the testing. The daily measurements must be at approximately the same time each day. You may omit up to two daily measurements in any seven-day period.

(9) Record the difference in mass between the reference tank and the test tank for each measurement. This value is M_i, where *i* is a counter representing the number of days elapsed. Subtract M_i from M_o and divide the difference by the internal surface area of the fuel tank. Divide this g/m² value by the number of test days (using at least two decimal places) to calculate the emission rate in g/m²/day. Example: If a tank with an internal surface area of 0.720 m² weighed 1.31 grams less than the reference tank at the beginning of the test and weighed 9.86 grams less than the reference tank after soaking for 10.03 days, the emission rate would be—

$$((-1.31\ g) - (-9.82\ g)) / 0.720\ m^2 / 10.03\ days = 1.36\ g/m^2/day.$$

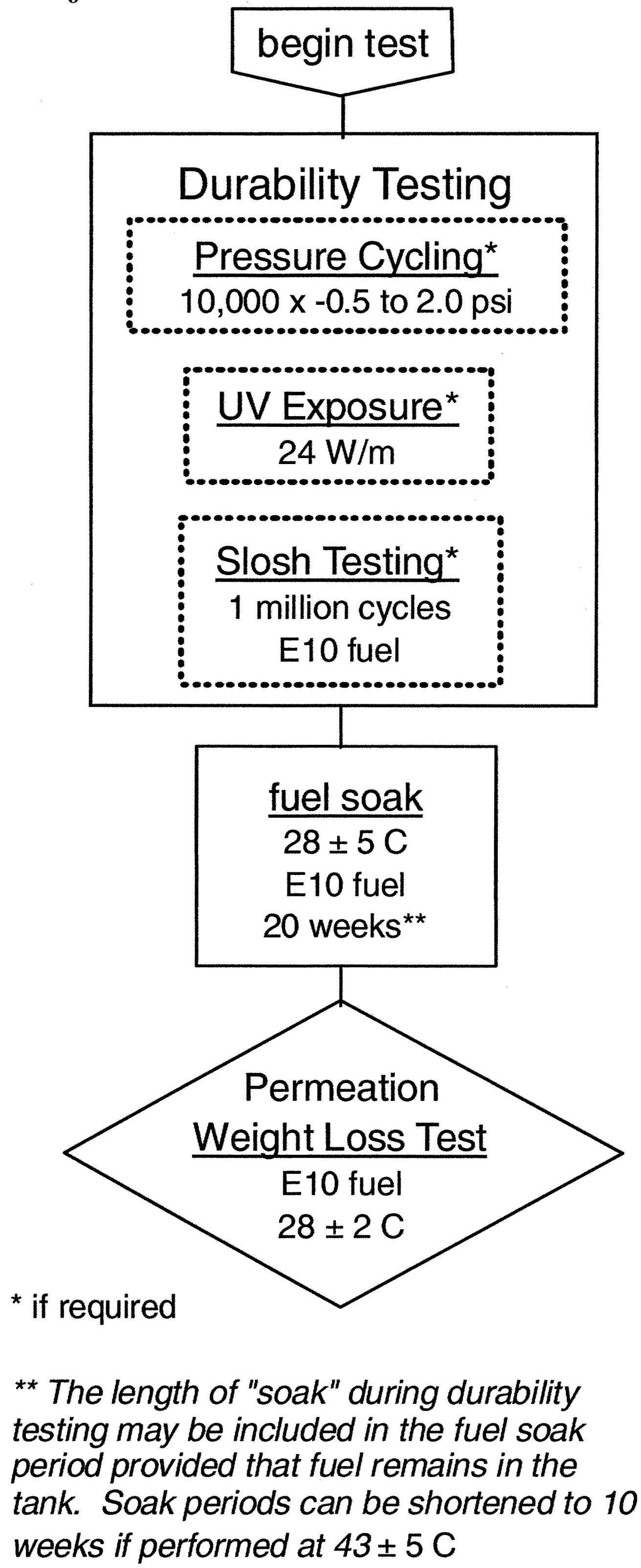
(10) Round your result to the same number of decimal places as the emission standard.

(e) *Fuel specifications.* Use gasoline blended with ethanol such that the blended fuel has 10.0 ± 1.0 percent ethanol by volume as specified in § 1060.501. As an alternative, you may use Fuel CE10, as described in § 1060.515(a)(1).

(f) *Flow chart.* The following figure presents a flow chart for the permeation testing described in this section:

BILLING CODE 6560–50–P

Figure 1 to §1060.520 — Fuel Tank Permeation Test Procedures



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§ 1060.521 How do I test fuel caps for permeation emissions?

If you measure a fuel tank's permeation emissions with a nonpermeable covering in place of the fuel cap under § 1060.520(b)(5)(ii)(B), you must separately measure permeation emissions from a fuel cap. You may show that your fuel tank and fuel cap meet emission standards by certifying them separately or by combining the separate measurements into a single emission rate based on the relative surface areas of the fuel tank and fuel cap. However, you may not combine these emission measurements if you test the fuel cap at a nominal temperature of 28 °C and you test the fuel tank at 40 °C. Measure the fuel cap's permeation emissions as follows:

(a) Select a fuel cap expected to have permeation emissions at least as high as the highest-emitting fuel cap that you expect to be used with fuel tanks from the emission family. Include a gasket that represents production models. If the fuel cap includes vent paths, seal these vents as follows:

(1) If the vent path is through grooves in the gasket, you may use another gasket with no vent grooves if it is otherwise the same as a production gasket.

(2) If the vent path is through the cap, seal any vents for testing.

(b) Attach the fuel cap to a fuel tank with a capacity of at least one liter made of metal or some other impermeable material.

(c) Use the procedures specified in § 1060.520 to measure permeation emissions. Calculate emission rates using the smallest inside cross sectional area of the opening on which the cap is mounted as the fuel cap's surface area.

§ 1060.525 How do I test fuel systems for diurnal emissions?

Use the procedures of this section to determine whether your fuel tanks meet diurnal emission standards as specified in § 1060.105.

(a) Except as specified in paragraph (c) of this section, use the following procedure to measure diurnal emissions:

(1) Diurnal measurements are based on a representative temperature cycle. For marine fuel tanks, the temperature cycle specifies fuel temperatures rather than ambient temperatures. The applicable temperature cycle is indicated in the following table:

TABLE 1 TO § 1060.525—DIURNAL TEMPERATURE PROFILES FOR FUEL TANKS

Time (hours)	Ambient Temperature Profile for Land-based Fuel Tanks (°C)	General Fuel Temperature Profile for Installed Marine Fuel Tanks (°C)	Fuel Temperature Profile for Marine Fuel Tanks Installed in Nontrailerable Boats (°C)
0	22.2	25.6	27.6
1	22.5	25.7	27.6
2	24.2	26.5	27.9
3	26.8	27.9	28.5
4	29.6	29.2	29.0
5	31.9	30.4	29.5
6	33.9	31.4	29.9
7	35.1	32.0	30.1
8	35.4	32.2	30.2
9	35.6	32.2	30.2
10	35.3	32.1	30.2
11	34.5	31.7	30.0
12	33.2	31.0	29.7
13	31.4	30.2	29.4
14	29.7	29.3	29.1
15	28.2	28.6	28.8
16	27.2	28.0	28.5
17	26.1	27.5	28.3
18	25.1	27.0	28.1
19	24.3	26.6	28.0
20	23.7	26.3	27.9
21	23.3	26.1	27.8
22	22.9	25.9	27.7
23	22.6	25.7	27.6
24	22.2	25.6	27.6

(2) Fill the fuel tank to 40 percent of nominal capacity with the gasoline specified in 40 CFR 1065.710 for general testing.

(3) Install a vapor line from any vent ports that would not be sealed in the final in-use configuration. Use a length of vapor line representing the largest inside diameter and shortest length that would be expected with the range of in-use installations for the emission family.

(4) Stabilize the fuel tank at the starting temperature of the applicable temperature profile from paragraph (a)(1) of this section. For sealed fuel systems, replace the fuel cap once the fuel reaches equilibrium at the appropriate starting temperature.

(5) If the fuel tank is equipped with a carbon canister, load the canister with butane or gasoline vapors to its *canister working capacity* as specified in § 1060.240(e)(2)(i) and attach it to the fuel tank in a way that represents a typical in-use configuration.

(6) Place the fuel tank with the carbon canister and vent line in a SHED meeting the specifications of 40 CFR 86.107–96(a)(1). Follow the applicable temperature trace from paragraph (a)(1) of this section for one 24-hour period. You need not measure emissions during this stabilization step.

(7) As soon as possible after the stabilization in paragraph (a)(6) of this section, purge the SHED and follow the applicable temperature trace from paragraph (a)(1) of this section for three consecutive 24-hour periods. Start measuring emissions when you start the temperature profile. The end of the first, second, and third emission sampling periods must occur 1440 ± 6, 2880 ± 6, and 4320 ± 6 minutes, respectively, after starting the measurement procedure. Use the highest of the three emission levels to determine whether your fuel tank meets the diurnal emission standard.

(8) For emission control technologies that rely on a sealed fuel system, you may omit the stabilization step in paragraph (a)(6) of this section and the last two 24-hour periods of emission

measurements in paragraph (a)(7) of this section. For purposes of this paragraph (a), sealed fuel systems include those that rely on pressure-relief valves, limiting flow orifices, bladder fuel tanks, and volume-compensating air bags.

(b) You may subtract your fuel tank's permeation emissions from the measured diurnal emissions if the fuel tank is preconditioned with diurnal test fuel as described in § 1060.520(b) or if you use good engineering judgment to otherwise establish that the fuel tank has stabilized permeation emissions. Measure permeation emissions for subtraction as specified in § 1060.520(c) and (d) before measuring diurnal emissions, except that the permeation measurement must be done with diurnal test fuel at 28 ± 2 °C. Use appropriate units and corrections to subtract the permeation emissions from the fuel tank during the diurnal emission test. You may not subtract a greater mass of emissions under this paragraph (b) than the fuel tank would emit based on meeting the applicable emission standard for permeation.

Subpart G—Special Compliance Provisions

§ 1060.601 How do the prohibitions of 40 CFR 1068.101 apply with respect to the requirements of this part?

(a) As described in § 1060.1, fuel tanks and fuel lines that are used with or intended to be used with new nonroad engines or equipment are subject to evaporative emission standards under this part 1060. This includes portable marine fuel tanks and fuel lines and other fuel-system components associated with portable marine fuel tanks. Note that § 1060.1 specifies an implementation schedule based on the date of manufacture of nonroad equipment, so new fuel tanks and fuel lines are not subject to standards under this part 1060 if they will be installed for use in equipment built before the specified dates for implementing the appropriate standards, subject to the limitations in paragraph (b) of this section. Except as specified in paragraph (f) of this section, fuel-system components that are subject to permeation or diurnal emission standards under this part 1060 must be covered by a valid certificate of conformity before being introduced into U.S. commerce to avoid violating the prohibition of 40 CFR 1068.101(a). To the extent we allow it under the exhaust standard-setting part, fuel-system components may be certified with a family emission limit higher than the specified emission standard. The provisions of this paragraph (a) do not apply to fuel caps.

(b) New replacement fuel tanks and fuel lines must meet the requirements of this part 1060 if they are intended to be used with nonroad engines or equipment regulated under this part 1060, as follows:

(1) *Applicability of standards between January 1, 2012 and December 31, 2019.* Manufacturers, distributors, retailers, and importers must clearly state on the packaging for all replacement components that could reasonably be used with nonroad engines how such components may be used consistent with the prohibition in paragraph (a) of this section. It is presumed that such components are intended for use with nonroad engines regulated under this part 1060 unless the components, or the packaging for such components, clearly identify appropriate restrictions. This requirement does not apply for components that are clearly not intended for use with fuels.

(2) *Applicability of standards after January 1, 2020.* Starting January 1, 2020 it is presumed that replacement components will be used with nonroad engines regulated under this part 1060 if they can reasonably be used with such engines. Manufacturers, distributors, retailers, and importers are therefore obligated to take reasonable steps to ensure that any uncertified components are not used to replace certified components. This would require labeling the components and may also require restricting the sales and requiring the ultimate purchaser to agree to not use the components inappropriately. This requirement does not apply for components that are clearly not intended for use with fuels.

(3) *Applicability of the tampering prohibition.* If a fuel tank or fuel line needing replacement was certified to meet the emission standards in this part with a family emission limit below the otherwise applicable standard, the new replacement fuel tank or fuel line must be certified to current emission standards, but need not be certified with the same or lower family emission limit to avoid violating the tampering prohibition in 40 CFR 1068.101(b)(1).

(c) [Reserved]

(d) Manufacturers that generate or use evaporative emission credits related to Marine SI engines in 40 CFR part 1045 or Small SI engines in 40 CFR part 1054 are subject to the emission standards for which they are generating or using evaporative emission credits. These engines or equipment must therefore be covered by a valid certificate of conformity showing compliance with emission-credit provisions before being introduced into U.S. commerce to avoid violating the prohibition of 40 CFR 1068.101(a).

(e) If there is no valid certificate of conformity for any given evaporative emission standard for new equipment, the manufacturers of the engine, equipment and fuel-system components are each liable for violations of the prohibited acts with respect to the fuel systems and fuel-system components they have introduced into U.S. commerce, including fuel systems and fuel-system components installed in engines or equipment at the time the engines or equipment are introduced into U.S. commerce.

(f) If you manufacture fuel lines or fuel tanks that are subject to the requirements of this part as described in paragraph (a) of this section, 40 CFR 1068.101(a) does not prohibit you from shipping your products directly to an equipment manufacturer or another manufacturer from which you have received a written commitment to be responsible for certifying the components as required under this part 1060. This includes SHED-based certification of Small SI equipment as described in § 1060.105. If you ship fuel lines or fuel tanks under this paragraph (f), you must include documentation that accompanies the shipped products identifying the name and address of the company receiving shipment and stating that the fuel lines or fuel tanks are exempt under the provisions of 40 CFR 1060.601(f).

(g) If new evaporative emission standards apply in a given model year, your equipment in that model year must have fuel-system components that are certified to the new standards, except that you may continue to use up your normal inventory of earlier fuel-system components that were built before the date of the new or changed standards. For example, if your normal inventory practice is to keep on hand a one-month supply of fuel tanks based on your upcoming production schedules, and a new tier of standards starts to apply for the 2012 model year, you may order fuel tanks based on your normal inventory requirements late in the fuel tank manufacturer's 2011 model year and install those fuel tanks in your equipment, regardless of the date of installation. Also, if your model year starts before the end of the calendar year preceding new standards, you may use fuel-system components from the previous model year (or uncertified components if no standards were in place) for those units you produce before January 1 of the year that new standards apply. If emission standards do not change in a given model year, you may continue to install fuel-system components from the previous model year without restriction. You may not circumvent the provisions of 40 CFR 1068.101(a)(1) by stockpiling fuel-system components that were built before new or changed standards take effect.

§ 1060.605 Exemptions from evaporative emission standards.

(a) Except as specified in the exhaust standard-setting part and paragraph (b) of this section, equipment using an engine that is exempt from exhaust emission standards under the provisions in 40 CFR part 1068, subpart C or D, is also exempt from the requirements of this part 1060. For example, engines or equipment exempted from exhaust emission standards for purposes of national security do not need to meet evaporative emission standards. Also, any engine that is exempt from emission standards because it will be used solely for competition does not need to meet evaporative emission standards. Equipment that is exempt from all exhaust emission standards under the standard-setting part are also exempt from the requirements of this part 1060; however, this does not apply for engines that must meet a less stringent exhaust emission standard as a condition of the exemption.

(b) Engines produced under the replacement-engine exemption in 40 CFR 1068.240 must use fuel-system components that meet the evaporative emission standards based on the model year of the engine being replaced subject to the provisions of 40 CFR 1068.265. If no evaporative emission standards applied at that time, no requirements related to evaporative emissions apply to the new engine. Installing a replacement engine does not change the applicability of requirements for the equipment into which the replacement engine is installed.

(c) Engines or equipment that are temporarily exempt from EPA exhaust emission standards are also exempt from the requirements of this part 1060 for the same period as the exhaust exemption.

(d) For equipment powered by more than one engine, all the engines installed in the equipment must be exempt from all applicable EPA exhaust emission standards for the equipment to also be exempt under paragraph (a) or (b) of this section.

(e) In unusual circumstances, we may exempt components or equipment from the requirements of this part 1060 even if the equipment is powered by one or more engines that are subject to EPA exhaust emission standards. See 40 CFR part 1068. Such exemptions will be limited to:

(1) Testing. See 40 CFR 1068.210.

(2) National security. See 40 CFR 1068.225.

(3) Economic hardship. See 40 CFR 1068.245 and 1068.250.

(f) Evaporative emission standards generally apply based on the model year of the equipment, which is determined by the equipment's date of final assembly. However, in the first year of new emission standards, equipment manufacturers may apply evaporative emission standards based on the model year of the engine as shown on the engine's emission control information label. For example, for fuel tank permeation standards starting in 2012, equipment manufacturers may order a batch of 2011 model year engines for installation in 2012 model year equipment, subject to the anti-stockpiling provisions of 40 CFR 1068.105(a). The equipment with the 2011 model year engines would not need to meet fuel tank permeation standards as long as the equipment is fully assembled by December 31, 2012.

§ 1060.640 What special provisions apply to branded equipment?

The following provisions apply if you identify the name and trademark of another company instead of your own on your emission control information label for equipment, as provided by §§ 1060.135 and 1060.137:

(a) You must have a contractual agreement with the other company that obligates that company to take the following steps:

(1) Meet the emission warranty requirements that apply under § 1060.120. This may involve a separate agreement involving reimbursement of warranty-related expenses.

(2) Report all warranty-related information to the certificate holder.

(b) In your application for certification, identify the company whose trademark you will use and describe the arrangements you have made to meet your requirements under this section.

(c) You remain responsible for meeting all the requirements of this chapter, including warranty and defect-reporting provisions.

Subpart H—Averaging, Banking, and Trading Provisions

§ 1060.701 Applicability.

(a) You are allowed to comply with the emission standards in this part with evaporative emission credits only if the exhaust standard-setting part explicitly allows it for evaporative emissions.

(b) The following exhaust standard-setting parts allow some use of evaporative emission credits:

(1) 40 CFR part 1045 for marine vessels.

(2) 40 CFR part 1051 for recreational vehicles.

(3) 40 CFR part 1054 for Small SI equipment.

(c) As specified in 40 CFR part 1048, there is no allowance to generate or use emission credits with Large SI equipment.

§ 1060.705 How do I certify components to an emission level other than the standard under this part or use such components in my equipment?

As specified in this section, a fuel-system component may be certified to a family emission limit (FEL) instead of the otherwise applicable emission standard. Note that the exhaust standard-setting part may apply maximum values for an FEL (i.e., FEL caps).

(a) *Requirements for certifying component manufacturers.* See subpart C of this part for instructions regarding the general requirements for certifying components.

(1) When you submit your application for certification, indicate the FEL to which your components will be certified. This FEL will serve as the applicable standard for your component, and the equipment that uses the component. For example, when the regulations of this part use the phrase ''demonstrate compliance with the applicable emission standard'' it will mean ''demonstrate compliance with the FEL'' for your component.

(2) You may not change the FEL for an emission family. To specify a different FEL for your components, you must send a new application for certification for a new emission family.

(3) Unless your FEL is below all emission standards that could potentially apply, you must ensure that all equipment manufacturers that will use your component are aware of the limitations regarding the conditions under which they may use your component.

(4) It is your responsibility to read the instructions relative to emission-credit provisions in the standard-setting parts identified in § 1060.1.

(b) *Requirements for equipment manufacturers.* See subpart C of this part for instructions regarding your ability to rely on the component manufacturer's certificate.

(1) The FEL of the component will serve as the applicable standard for your equipment.

(2) You may not specify more than one FEL for an emission family at one

time; however, you may change the FEL during the model year as described in § 1060.225(f).

(3) If the FEL is above the emission standard you must ensure that the exhaust standard-setting part allows you to use evaporative emission credits to comply with emission standards and that you will have an adequate source of evaporative emission credits. You must certify your equipment as specified in § 1060.201 and the rest of subpart C of this part.

Subpart I—Definitions and Other Reference Information

§ 1060.801 What definitions apply to this part?

The following definitions apply to this part. The definitions apply to all subparts unless we note otherwise. All undefined terms have the meaning the Clean Air Act gives to them. The definitions follow:

Accuracy and precision means the sum of accuracy and repeatability, as defined in 40 CFR 1065.1001. For example, if a measurement device is determined to have an accuracy of ±1% and a repeatability of ±2%, then its accuracy and precision would be ±3%.

Adjustable parameter means any device, system, or element of design that someone can adjust and that, if adjusted, may affect emissions. You may ask us to exclude a parameter if you show us that it will not be adjusted in use in a way that affects emissions.

Applicable emission standard or *applicable standard* means an emission standard to which a fuel-system component is subject. Additionally, if a fuel-system component has been or is being certified to another standard or FEL, *applicable emission standard* means the FEL or other standard to which the fuel-system component has been or is being certified. This definition does not apply to subpart H of this part.

Canister working capacity means the measured amount of hydrocarbon vapor that can be stored in a canister as specified in § 1060.240(e)(2)(i).

Carbon working capacity means the measured amount of hydrocarbon vapor that can be stored in a given volume of carbon when tested according to ASTM D5228 (incorporated by reference in § 1060.810). See § 1060.240(e)(2)(ii).

Certification means relating to the process of obtaining a certificate of conformity for an emission family that complies with the emission standards and requirements in this part.

Certified emission level means the highest official emission result in an emission family.

Clean Air Act means the Clean Air Act, as amended, 42 U.S.C. 7401–7671q.

Cold-weather equipment is limited to the following types of handheld equipment: Chainsaws, cut-off saws, clearing saws, brush cutters with engines at or above 40cc, commercial earth and wood drills, and ice augers. This includes earth augers if they are also marketed as ice augers.

Configuration means a unique combination of hardware (material, geometry, and size) and calibration within an emission family. Units within a single configuration differ only with respect to normal production variability.

Date of manufacture, means one of the following with respect to equipment:

(1) For outboard engines with under-cowl fuel tanks and for vessels equipped with outboard engines and installed fuel tanks, *date of manufacture* means the date on which the fuel tank is installed.

(2) For all other equipment, *date of manufacture* has the meaning given in 40 CFR 1068.30.

Days means calendar days unless otherwise specified. For example, when we specify working days we mean calendar days, excluding weekends and U.S. national holidays.

Designated Compliance Officer means the Manager, Heavy-Duty and Nonroad Engine Group (6405-J), U.S. Environmental Protection Agency, 1200 Pennsylvania Ave., NW., Washington, DC 20460.

Detachable fuel line means a fuel line or fuel line assembly intended to be used with a portable nonroad fuel tank and which is connected by special fittings to the fuel tank and/or engine for easy disassembly. Fuel lines that require a wrench or other tools to disconnect are not considered detachable fuel lines.

Diurnal emissions means evaporative emissions that occur as a result of venting fuel tank vapors during daily temperature changes while the engine is not operating.

Effective length-to-diameter ratio means the mean vapor path length of a carbon canister divided by the effective diameter of that vapor path. The effective diameter is the diameter of a circle with the same cross-sectional area as the average cross-sectional area of the carbon canister's vapor path.

Emission control system means any device, system, or element of design that controls or reduces the regulated evaporative emissions from a piece of nonroad equipment.

Emission-data unit means a fuel line, fuel tank, fuel system, or fuel-system component that is tested for certification. This includes components tested by EPA.

Emission family has the meaning given in § 1060.230.

Emission-related maintenance means maintenance that substantially affects emissions or is likely to substantially affect emission deterioration.

Equipment means vehicles, marine vessels, and other types of nonroad equipment that are subject to this part's requirements.

Evaporative means relating to fuel emissions that result from permeation of fuel through the fuel-system materials or from ventilation of the fuel system.

Exhaust standard-setting part means the part in the Code of Federal Regulations that contains exhaust emission standards for a particular piece of equipment (or the engine in that piece of equipment). For example, the exhaust standard-setting part for off-highway motorcycles is 40 CFR part 1051. Exhaust standard-setting parts may include evaporative emission requirements or describe how the requirements of this part 1060 apply.

Exposed gasket surface area means the surface area of the gasket inside the fuel tank that is exposed to fuel or fuel vapor. For the purposes of calculating exposed surface area of a gasket, the thickness of the gasket and the outside dimension of the opening being sealed are used. Gasket overhang into the fuel tank should be ignored for the purpose of this calculation.

Family emission limit (FEL) means an emission level declared by the manufacturer to serve in place of an otherwise applicable emission standard under an ABT program specified by the exhaust standard-setting part. The family emission limit must be expressed to the same number of decimal places as the emission standard it replaces. The family emission limit serves as the emission standard for the emission family with respect to all required testing.

Fuel CE10 has the meaning given in § 1060.515(a).

Fuel line means hoses or tubing designed to contain liquid fuel. The exhaust standard-setting part may further specify which types of hoses and tubing are subject to the standards of this part.

Fuel system means all components involved in transporting, metering, and mixing the fuel from the fuel tank to the combustion chamber(s), including the fuel tank, fuel tank cap, fuel pump, fuel filters, fuel lines, carburetor or fuel-injection components, and all fuel-system vents. In the case where the fuel tank cap or other components (excluding fuel lines) are directly mounted on the fuel tank, they are considered to be a part of the fuel tank.

Fuel type means a general category of fuels such as gasoline or natural gas. There can be multiple grades within a single fuel type, such as premium gasoline, regular gasoline, or gasoline with 10 percent ethanol.

Gasoline means one of the following:

(1) For in-use fuels, *gasoline* means fuel that is commonly and commercially know as gasoline, including ethanol blends.

(2) For testing, *gasoline* has the meaning given in subpart F of this part.

Good engineering judgment means judgments made consistent with generally accepted scientific and engineering principles and all available relevant information. See 40 CFR 1068.5 for the administrative process we use to evaluate good engineering judgment.

High-permeability material means any nonmetal material that does not qualify as low-permeability material.

Installed marine fuel tank means a fuel tank designed for delivering fuel to a Marine SI engine, excluding *portable marine fuel tanks.*

Large SI means relating to engines that are subject to evaporative emission standards in 40 CFR part 1048.

Low-permeability material means, for gaskets, a material with permeation emission rates at or below 10 (g-mm)/m^2/day when measured according to SAE J2659 (incorporated by reference in § 1060.810), where the test temperature is 23 °C, the test fuel is Fuel CE10, and testing immediately follows a four-week preconditioning soak with the test fuel.

Manufacture means the physical and engineering process of designing, constructing, and assembling an engine, piece of nonroad equipment, or fuel-system components subject to the requirements of this part.

Manufacturer has the meaning given in section 216(1) of the Clean Air Act (42 U.S.C. 7550(1)). In general, this term includes:

(1) Any person who manufactures an engine or piece of nonroad equipment for sale in the United States or otherwise introduces a new nonroad engine or a piece of new nonroad equipment into U.S. commerce.

(2) Any person who manufactures a fuel-system component for an engine subject to the requirements of this part as described in § 1060.1(a).

(3) Importers who import such products into the United States.

Marine SI means relating to vessels powered by engines that are subject to exhaust emission standards in 40 CFR part 1045.

Marine vessel has the meaning given in 40 CFR § 1045.801, which generally includes all nonroad equipment used as a means of transportation on water.

Model year means one of the following things:

(1) For equipment defined as ''new nonroad equipment'' under paragraph (1) of the definition of ''new nonroad engine,'' model year means one of the following:

(i) Calendar year.

(ii) Your annual new model production period if it is different than the calendar year. This must include January 1 of the calendar year for which the model year is named. It may not begin before January 2 of the previous calendar year and it must end by December 31 of the named calendar year.

(2) For other equipment defined as ''new nonroad equipment'' under paragraph (2) of the definition of ''new nonroad engine,'' model year has the meaning given in the exhaust standard-setting part.

(3) For other equipment defined as ''new nonroad equipment'' under paragraph (3) or paragraph (4) of the definition of ''new nonroad engine,'' model year means the model year of the engine as defined in the exhaust standard-setting part.

New nonroad equipment means equipment meeting one or more of the following criteria:

(1) Nonroad equipment for which the ultimate purchaser has never received the equitable or legal title. The equipment is no longer new when the ultimate purchaser receives this title or the product is placed into service, whichever comes first.

(2) Nonroad equipment that is defined as new under the exhaust standard-setting part. (Note: equipment that is not defined as new under the exhaust standard-setting part may be defined as new under this definition of ''new nonroad equipment.'')

(3) Nonroad equipment with an engine that becomes new (as defined in the exhaust standard-setting part) while installed in the equipment. The equipment is no longer new when it is subsequently placed into service. This paragraph (3) does not apply if the engine becomes new before being installed in the equipment.

(4) Nonroad equipment not covered by a certificate of conformity issued under this part at the time of importation and manufactured after the requirements of this part start to apply (see § 1060.1). The equipment is no longer new when it is subsequently placed into service. Importation of this kind of new nonroad equipment is generally prohibited by 40 CFR part 1068.

Nominal capacity means a fuel tank's volume as specified by the fuel tank manufacturer, using at least two significant figures, based on the maximum volume of fuel the tank can hold with standard refueling techniques.

Nonroad engine has the meaning we give in 40 CFR 1068.30. In general this means all internal-combustion engines except motor vehicle engines, stationary engines, engines used solely for competition, or engines used in aircraft. This part does not apply to all nonroad engines (see § 1060.1).

Nonroad equipment means a piece of equipment that is powered by or intended to be powered by one or more nonroad engines. Note that §§ 1060.5 and 1060.601 describes how we treat outboard engines, portable marine fuel tanks, and associated fuel-system components as nonroad equipment under this part 1060.

Nontrailerable boat means a vessel whose length is 26.0 feet or more, or whose width is more than 8.5 feet.

Official emission result means the measured emission rate for an emission-data unit.

Placed into service means put into initial use for its intended purpose.

Portable marine fuel tank means a portable fuel tank that is used or intended to be used to supply fuel to a marine engine during operation.

Portable nonroad fuel tank means a fuel tank that meets each of the following criteria:

(1) It has design features indicative of use in portable applications, such as a carrying handle and fuel line fitting that can be readily attached to and detached from a nonroad engine.

(2) It has a nominal fuel capacity of 12 gallons or less.

(3) It is designed to supply fuel to an engine while the engine is operating.

(4) It is not used or intended to be used to supply fuel to a marine engine.

Production period means the period in which a component or piece of equipment will be produced under a certificate of conformity. A given production period for an emission family may not include components certified using different test data. A production period may not exceed five years for certified components. Note that the definition of model year includes specifications related to production periods for which a certificate is valid for equipment.

Recreational vehicle means vehicles that are subject to evaporative emission standards in 40 CFR part 1051. This generally includes engines that will be installed in recreational vehicles if the engines are certified separately under 40 CFR 1051.20.

Relating to as used in this section means relating to something in a specific, direct manner. This expression is used in this section only to define terms as adjectives and not to broaden the meaning of the terms.

Revoke has the meaning given in 40 CFR 1068.30. If we revoke a certificate or an exemption, you must apply for a new certificate or exemption before continuing to introduce the affected equipment into U.S. commerce.

Round means to round numbers according to standard procedures as specified in 40 CFR 1065.1001.

Running loss emissions means unburned fuel vapor that escapes from the fuel system to the ambient atmosphere while the engine is operating, excluding permeation emissions and diurnal emissions. Running loss emissions generally result from fuel-temperature increases caused by heat released from in-tank fuel pumps, fuel recirculation, or proximity to heat sources such as the engine or exhaust components.

Sealed means lacking openings to the atmosphere that would allow a measurable amount of liquid or vapor to leak out under normal operating pressures or other pressures specified in this part. For example, you may generally establish a maximum value for operating pressures based on the highest pressure you would observe from an installed fuel tank during continuous equipment operation on a sunny day with ambient temperatures of 35 °C. Sealed fuel systems may have openings for emission controls or for fuel lines needed to route fuel to the engine.

Small SI means relating to engines that are subject to emission standards in 40 CFR part 90 or 1054.

Structurally integrated nylon fuel tank means a fuel tank having all the following characteristics:

(1) The fuel tank is made of a polyamide material that does not contain more than 50 percent by weight of a reinforcing glass fiber or mineral filler and does not contain more than 10 percent by weight of impact modified polyamides that use rubberized agents such as EPDM rubber.

(2) The fuel tank must be used in a cut-off saw or chainsaw or be integrated into a major structural member where, as a single component, the fuel tank material is a primary structural/stress member for other major components such as the engine, transmission, or cutting attachment.

Subchapter U means 40 CFR parts 1000 through 1299.

Suspend has the meaning given in 40 CFR 1068.30. If we suspend a certificate, you may not introduce into U.S. commerce equipment from that emission family unless we reinstate the certificate or approve a new one. If we suspend an exemption, you may not introduce into U.S. commerce equipment that was previously covered by the exemption unless we reinstate the exemption.

Tare means to use a container or other reference mass to zero a balance before weighing a sample. Generally, this means placing the container or reference mass on the balance, allowing it to stabilize, then zeroing the balance without removing the container or reference mass. This allows you to use the balance to determine the difference in mass between the sample and the container or reference mass.

Test sample means the collection of fuel lines, fuel tanks, or fuel systems selected from the population of an emission family for emission testing. This may include certification testing or any kind of confirmatory testing.

Test unit means a piece of fuel line, a fuel tank, or a fuel system in a test sample.

Ultimate purchaser means, with respect to any new nonroad equipment, the first person who in good faith purchases such new nonroad equipment for purposes other than resale.

Ultraviolet light means electromagnetic radiation with a wavelength between 300 and 400 nanometers.

United States has the meaning given in 40 CFR 1068.30.

U.S.-directed production volume means the amount of equipment, subject to the requirements of this part, produced by a manufacturer for which the manufacturer has a reasonable assurance that sale was or will be made to ultimate purchasers in the United States.

Useful life means the period during which new nonroad equipment is required to comply with all applicable emission standards. See § 1060.101.

Void has the meaning given in 40 CFR 1068.30. In general this means to invalidate a certificate or an exemption both retroactively and prospectively.

Volatile liquid fuel means any fuel other than diesel or biodiesel that is a liquid at atmospheric pressure and has a Reid Vapor Pressure higher than 2.0 pounds per square inch.

We (us, our) means the Administrator of the Environmental Protection Agency and any authorized representatives.

Wintertime equipment means equipment using a wintertime engine, as defined in 40 CFR 1054.801. Note this definition applies only for Small SI equipment.

§ 1060.805 What symbols, acronyms, and abbreviations does this part use?

The following symbols, acronyms, and abbreviations apply to this part:

° degree.
ASTM American Society for Testing and Materials.
C Celsius.
CFR Code of Federal Regulations.
EPA Environmental Protection Agency.
FEL family emission limit.
g gram.
gal gallon.
hr hour.
in inch.
kPa kilopascal.
kW kilowatt.
L liter.
m meter.
min minute.
mm millimeter.
psig pounds per square inch of gauge pressure.
SAE Society of Automotive Engineers.
SHED Sealed Housing for Evaporative Determination.
U.S. United States.
U.S.C. United States Code.
W watt.

§ 1060.810 What materials does this part reference?

Documents listed in this section have been incorporated by reference into this part. The Director of the Federal Register approved the incorporation by reference as prescribed in 5 U.S.C. 552(a) and 1 CFR part 51. Anyone may inspect copies at the U.S. EPA, Air and Radiation Docket and Information Center, 1301 Constitution Ave., NW., Room B102, EPA West Building, Washington, DC 20460 or at the National Archives and Records Administration (NARA). For information on the availability of this material at NARA, call 202–741–6030, or go to: *http://www.archives.gov/federal_register/code_of_federal_regulations/ibr_locations.html*.

(a) *ASTM material.* Table 1 to this section lists material from the American Society for Testing and Materials that we have incorporated by reference. The first column lists the number and name of the material. The second column lists the sections of this part where we reference it. Anyone may purchase copies of these materials from the American Society for Testing and Materials, 100 Barr Harbor Dr., P.O. Box C700, West Conshohocken, PA 19428 or *http://www.astm.com*. Table 1 follows:

TABLE 1 TO § 1060.810—ASTM MATERIALS

Document number and name	Part 1060 reference
ASTM D471–06, Standard Test Method for Rubber Property—Effect of Liquids (“ASTM D471”)	1060.515
ASTM D2862–97 (Reapproved 2004), Standard Test Method for Particle Size Distribution of Granular Activated Carbon (“ASTM D2862”)	1060.240
ASTM D3802–79 (Reapproved 2005), Standard Test Method for Ball-Pan Hardness of Activated Carbon (“ASTM D3802”)	1060.240
ASTM D4806–07, Standard Specification for Denatured Fuel Ethanol for Blending with Gasolines for Use as Automotive Spark-Ignition Engine Fuel (“ASTM D4806”)	1060.501
ASTM D5228–92 (Reapproved 2005), Standard Test Method for Determination of Butane Working Capacity of Activated Carbon (“ASTM D5228”)	1060.801

(b) *SAE material.* Table 2 to this section lists material from the Society of Automotive Engineers that we have incorporated by reference. The first column lists the number and name of the material. The second column lists the sections of this part where we reference it. Anyone may purchase copies of these materials from the Society of Automotive Engineers, 400 Commonwealth Drive, Warrendale, PA 15096 or *http://www.sae.org.* Table 2 follows:

TABLE 2 TO § 1060.810—SAE MATERIALS

Document number and name	Part 1060 reference
SAE J30, Fuel and Oil Hoses, June 1998	1060.515
SAE J1527, Marine Fuel Hoses, January 1993 (Issued 1985–12, Revised 1993–02)	1060.515
SAE J2260, Nonmetallic Fuel System Tubing with One or More Layers, November 2004	1060.510
SAE J2659, Test Method to Measure Fluid Permeation of Polymeric Materials by Speciation, December 2003	1060.801

(c) *California Air Resources Board material.* Table 3 to this section lists material from the California Air Resources Board that we have incorporated by reference. The first column lists the number and name of the material. The second column lists the sections of this part where we reference it. Anyone may obtain copies of these materials from California Air Resources Board, Haagen-Smit Laboratory, 9528 Telstar Avenue, El Monte, CA 91731–2990 or *http://www.arb.ca.gov.* Table 3 follows:

TABLE 3 TO § 1060.810—CALIFORNIA AIR RESOURCES BOARD MATERIALS

Document number and name	Part 1060 reference
Final Regulation Order, Article 1, Chapter 15, Division 3, Title 13, California Code of Regulations, July 26, 2004	1060.105, 1060.240

§ 1060.815 What provisions apply to confidential information?

(a) Clearly show what you consider confidential by marking, circling, bracketing, stamping, or some other method.

(b) We will store your confidential information as described in 40 CFR part 2. Also, we will disclose it only as specified in 40 CFR part 2. This applies both to any information you send us and to any information we collect from inspections, audits, or other site visits.

(c) If you send us a second copy without the confidential information, we will assume it contains nothing confidential whenever we need to release information from it.

(d) If you send us information without claiming it is confidential, we may make it available to the public without further notice to you, as described in 40 CFR 2.204.

§ 1060.820 How do I request a hearing?

(a) You may request a hearing under certain circumstances as described elsewhere in this part. To do this, you must file a written request, including a description of your objection and any supporting data, within 30 days after we make a decision.

(b) For a hearing you request under the provisions of this part, we will approve your request if we find that your request raises a substantial factual issue.

(c) If we agree to hold a hearing, we will use the procedures specified in 40 CFR part 1068, subpart G.

§ 1060.825 What reporting and recordkeeping requirements apply under this part?

Under the Paperwork Reduction Act (44 U.S.C. 3501 *et seq*), the Office of Management and Budget approves the reporting and recordkeeping specified in the applicable regulations. The following items illustrate the kind of reporting and recordkeeping we require for products regulated under this part:

(a) We specify the following requirements related to equipment certification in this part 1060:

(1) In 40 CFR 1060.20 we give an overview of principles for reporting information.

(2) In 40 CFR part 1060, subpart C, we identify a wide range of information required to certify engines.

(3) In 40 CFR 1060.301 we require manufacturers to make engines or equipment available for our testing if we make such a request.

(4) In 40 CFR 1060.505 we specify information needs for establishing various changes to published test procedures.

(b) We specify the following requirements related to the general compliance provisions in 40 CFR part 1068:

(1) In 40 CFR 1068.5 we establish a process for evaluating good engineering judgment related to testing and certification.

(2) In 40 CFR 1068.25 we describe general provisions related to sending and keeping information.

(3) In 40 CFR 1068.27 we require manufacturers to make equipment available for our testing or inspection if we make such a request.

(4) In 40 CFR 1068.105 we require equipment manufacturers to keep certain records related to duplicate labels from engine manufacturers.

(5) [Reserved]

(6) In 40 CFR part 1068, subpart C, we identify several reporting and recordkeeping items for making demonstrations and getting approval related to various exemptions.

(7) In 40 CFR part 1068, subpart D, we identify several reporting and recordkeeping items for making demonstrations and getting approval related to importing equipment.

(8) In 40 CFR 1068.450 and 1068.455 we specify certain records related to testing production-line products in a selective enforcement audit.

(9) In 40 CFR 1068.501 we specify certain records related to investigating and reporting emission-related defects.

(10) In 40 CFR 1068.525 and 1068.530 we specify certain records related to recalling nonconforming equipment.

PART 1065—ENGINE-TESTING PROCEDURES

■ 209. The authority citation for part 1065 continues to read as follows:

Authority: 42 U.S.C. 7401–7671q.

Subpart A—[Amended]

■ 210. Section 1065.1 is amended by revising paragraphs (a)(5) and (a)(8) to read as follows:

§ 1065.1 Applicability.

(a) * * *

(5) Marine spark-ignition engines we regulate under 40 CFR part 1045. For earlier model years, manufacturers may use the test procedures in this part or those specified in 40 CFR part 91 according to § 1065.10.

* * * * *

(8) Small nonroad spark-ignition engines we regulate under 40 CFR part 1054 and stationary engines that are certified to the standards in 40 CFR part 1054 as specified in 40 CFR part 60, subpart JJJJ. For earlier model years, manufacturers may use the test procedures in this part or those specified in 40 CFR part 90 according to § 1065.10.

* * * * *

Subpart B—[Amended]

■ 211. Section 1065.125 is amended by revising paragraphs (b) and (c) to read as follows:

§ 1065.125 Engine intake air.

* * * * *

(b) Measure temperature, humidity, and atmospheric pressure near the entrance of the furthest upstream engine or in-use intake system component. This would generally be near the engine's air filter, or near the inlet to the in-use air intake system for engines that have no air filter. For engines with multiple intakes, make measurements near the entrance of each intake.

(1) *Pressure.* You may use a single shared atmospheric pressure meter as long as your laboratory equipment for handling intake air maintains ambient pressure at all intakes within ±1 kPa of the shared atmospheric pressure. For engines with multiple intakes with separate atmospheric pressure measurements at each intake, use an average value for verifying compliance to § 1065.520(b)(2).

(2) *Humidity.* You may use a single shared humidity measurement for intake air as long as your equipment for handling intake air maintains dewpoint at all intakes to within ±0.5 °C of the shared humidity measurement. For engines with multiple intakes with separate humidity measurements at each intake, use a flow-weighted average humidity for NO_X corrections. If individual flows of each intake are not measured, use good engineering judgment to estimate a flow-weighted average humidity.

(3) *Temperature.* Good engineering judgment may require that you shield the temperature sensors or move them upstream of an elbow in the laboratory intake system to prevent measurement errors due to radiant heating from hot engine surfaces or in-use intake system components. You must limit the distance between the temperature sensor and the entrance to the furthest upstream engine or in-use intake system component to no more than 12 times the outer hydraulic diameter of the entrance to the furthest upstream engine or in-use intake system component. However, you may exceed this limit if you use good engineering judgment to show that the temperature at the furthest upstream engine or in-use intake system component meets the specification in paragraph (c) of this section. For engines with multiple intakes, use a flow-weighted average value to verify compliance with the specification in paragraph (c) of this section. If individual flows of each intake are not measured, you may use good engineering judgment to estimate a flow-weighted average temperature. You may also verify that each individual intake complies with the specification in paragraph (c) of this section.

(c) Unless stated otherwise in the standard-setting part, maintain the temperature of intake air to (25 ± 5) °C.

* * * * *

■ 212. Section 1065.170 is amended by revising paragraphs (a)(2), (c)(1), and Figure 1 to read as follows:

§ 1065.170 Batch sampling for gaseous and PM constituents.

* * * * *

(a) * * *

(2) You must follow the requirements in § 1065.140(e)(2) related to PM dilution ratios. For each filter, if you expect the net PM mass on the filter to exceed 400 µg, assuming a 38 mm diameter filter stain area, you may take the following actions in sequence:

(i) For discrete-mode testing only, you may reduce sample time as needed to target a filter loading of 400 µg, but not below the minimum sample time specified in the standard-setting part.

(ii) Reduce filter face velocity as needed to target a filter loading of 400 µg, down to 50 cm/s or less.

(iii) Increase overall dilution ratio above the values specified in § 1065.140(e)(2) to target a filter loading of 400 µg.

* * * * *

(c) * * *

(1) If you use filter-based sampling media to extract and store PM for measurement, your procedure must meet the following specifications:

(i) If you expect that a filter's total surface concentration of PM will exceed 400 µg, assuming a 38 mm diameter filter stain area, for a given test interval, you may use filter media with a minimum initial collection efficiency of 98%; otherwise you must use a filter media with a minimum initial collection efficiency of 99.7%. Collection efficiency must be measured as described in ASTM D2986–95a (incorporated by reference in § 1065.1010), though you may rely on the sample-media manufacturer's measurements reflected in their product ratings to show that you meet this requirement.

(ii) The filter must be circular, with an overall diameter of 46.50 ±0.6 mm and an exposed diameter of at least 38 mm. See the cassette specifications in paragraph (c)(1)(vii) of this section.

(iii) We highly recommend that you use a pure PTFE filter material that does not have any flow-through support bonded to the back and has an overall thickness of 40 ±20 µm. An inert polymer ring may be bonded to the periphery of the filter material for support and for sealing between the filter cassette parts. We consider Polymethylpentene (PMP) and PTFE inert materials for a support ring, but other inert materials may be used. See the cassette specifications in paragraph (c)(1)(vii) of this section. We allow the use of PTFE-coated glass fiber filter material, as long as this filter media selection does not affect your ability to demonstrate compliance with the applicable standards, which we base on a pure PTFE filter material. Note that we will use pure PTFE filter material for compliance testing, and we may require you to use pure PTFE filter material for any compliance testing we require, such as for selective enforcement audits.

(iv) You may request to use other filter materials or sizes under the provisions of § 1065.10.

(v) To minimize turbulent deposition and to deposit PM evenly on a filter, use a filter holder with a 12.5° (from center) divergent cone angle to transition from the transfer-line inside diameter to the exposed diameter of the filter face. Use 300 series stainless steel for this transition.

(vi) Maintain a filter face velocity near 100 cm/s with less than 5% of the recorded flow values exceeding 100 cm/s, unless you expect either the net PM mass on the filter to exceed 400 µg, assuming a 38 mm diameter filter stain area. Measure face velocity as the volumetric flow rate of the sample at the pressure upstream of the filter and temperature of the filter face as measured in § 1065.140(e), divided by the filter's exposed area. You may use the exhaust stack or CVS tunnel pressure for the upstream pressure if the pressure drop through the PM sampler up to the filter is less than 2 kPa.

(vii) Use a clean cassette designed to the specifications of Figure 1 of § 1065.170. In auto changer configurations, you may use cassettes of similar design. Cassettes must be made of one of the following materials: Delrin™, 300 series stainless steel, polycarbonate, acrylonitrile-butadiene-styrene (ABS) resin, or conductive polypropylene. We recommend that you keep filter cassettes clean by periodically washing or wiping them with a compatible solvent applied using a lint-free cloth. Depending upon your cassette material, ethanol (C_2H_5OH) might be an acceptable solvent. Your cleaning frequency will depend on your engine's PM and HC emissions.

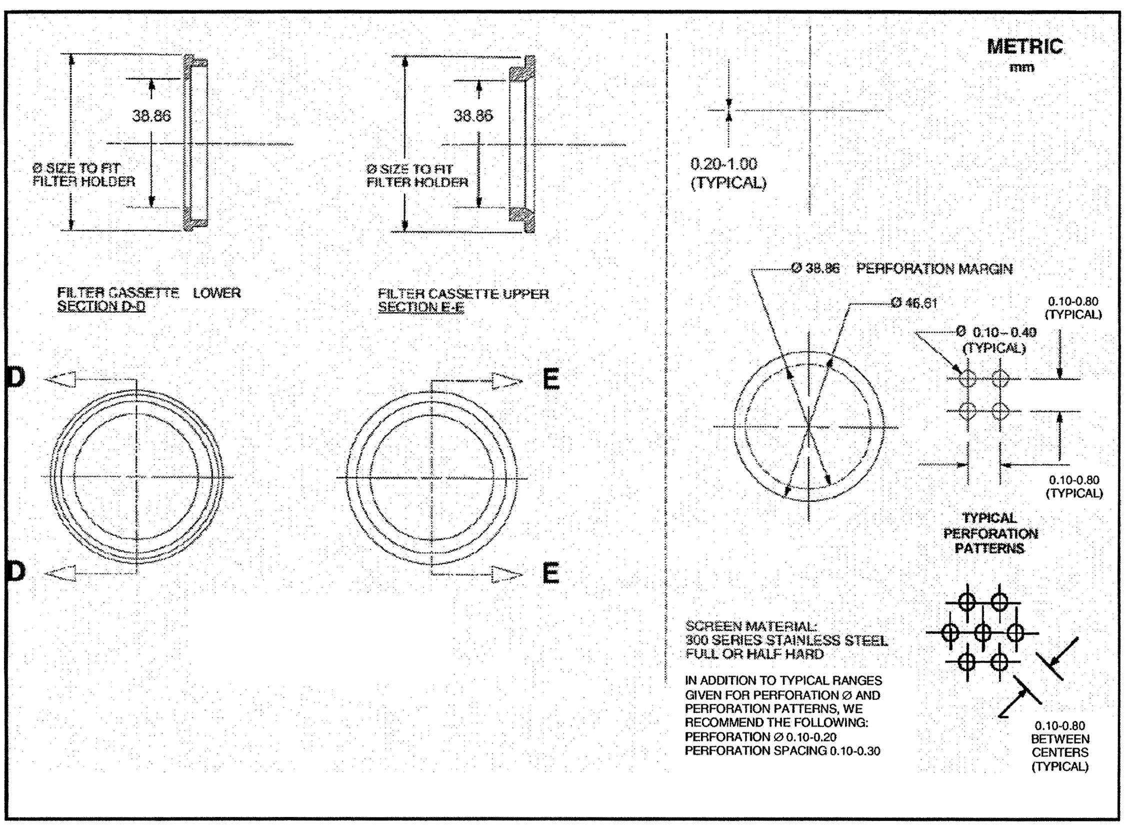
(viii) If you keep the cassette in the filter holder after sampling, prevent flow through the filter until either the holder or cassette is removed from the PM sampler. If you remove the cassettes from filter holders after sampling, transfer the cassette to an individual container that is covered or sealed to prevent communication of semi-volatile matter from one filter to another. If you remove the filter holder, cap the inlet and outlet. Keep them covered or sealed until they return to the stabilization or weighing environments.

(ix) The filters should not be handled outside of the PM stabilization and weighing environments and should be loaded into cassettes, filter holders, or auto changer apparatus before removal from these environments.

* * * * *

BILLING CODE 6560–50–P

Figure 1 of 1065.170



■ 213. Section 1065.190 is amended by revising paragraph (d)(2) to read as follows:

§ 1065.190 PM-stabilization and weighing environments for gravimetric analysis.

* * * * *

(d) * * *

(2) *Dewpoint.* Maintain a dewpoint of 9.5 °C in both environments. This dewpoint will control the amount of water associated with sulfuric acid (H_2SO_4) PM, such that 1.2216 grams of water will be associated with each gram of H_2SO_4.

* * * * *

Subpart C—[Amended]

■ 214. Section 1065.205 is amended by revising Table 1 to read as follows:

§ 1065.205 Performance specifications for measurement instruments.

* * * * *

Table 1 of §1065.205–Recommended performance specifications for measurement instruments

Measurement Instrument	Measured quantity symbol	Complete System Rise time ($t_{10\text{-}90}$) and Fall time ($t_{90\text{-}10}$)[a]	Recording update frequency	Accuracy[b]	Repeatability[b]	Noise[b]
Engine speed transducer	f_n	1 s	1 Hz means	2.0 % of pt. or 0.5 % of max.	1.0 % of pt. or 0.25 % of max.	0.05 % of max
Engine torque transducer	T	1 s	1 Hz means	2.0 % of pt. or 1.0 % of max.	1.0 % of pt. or 0.5 % of max	0.05 % of max.
Electrical work (active-power meter)	W	1 s	1 Hz means	2.0 % of pt. or 0.5 % of max.	1.0 % of pt. or 0.25 % of max.	0.05 % of max
General pressure transducer (not a part of another instrument)	p	5 s	1 Hz	2.0 % of pt. or 1.0 % of max.	1.0 % of pt. or 0.50 % of max.	0.1 % of max
Atmospheric pressure meter used for PM-stabilization and balance environments	p_{atmos}	50 s	5 times per hour	50 Pa	25 Pa	5 Pa
General purpose atmospheric pressure meter	p_{atmos}	50 s	5 times per hour	250 Pa	100Pa	50 Pa
Temperature sensor for PM-stabilization and balance environments	T	50 s	0.1 Hz	0.25 K	0.1 K	0.1 K
Other temperature sensor (not a part of another instrument)	T	10 s	0.5 Hz	0.4 % of pt. K or 0.2 % of max. K	0.2 % of pt. K or 0.1 % of max. K	0.1 % of max
Dewpoint sensor for PM-stabilization and balance environments	T_{dew}	50 s	0.1 Hz	0.25 K	0.1 K	0.02 K
Other dewpoint sensor	T_{dew}	50 s	0.1 Hz	1 K	0.5 K	0.1 K
Fuel flow meter (Fuel totalizer)	$\dot{m}$	5 s (N/A)	1 Hz (N/A)	2.0 % of pt. or 1.5 % of max.	1.0 % of pt. or 0.75 % of max.	0.5 % of max.
Total diluted exhaust meter (CVS) (With heat exchanger before meter)	$\dot{n}$	1 s (5 s)	1 Hz means (1 Hz)	2.0 % of pt. or 1.5 % of max.	1.0 % of pt. or 0.75 % of max.	1.0 % of max.
Dilution air, inlet air, exhaust, and sample flow meters	$\dot{n}$	1 s	1 Hz means of 5 Hz samples	2.5 % of pt. or 1.5 % of max.	1.25 % of pt. or 0.75 % of max.	1.0 % of max.
Continuous gas analyzer	x	5 s	1 Hz	2.0 % of pt. or 2.0 % of meas.	1.0 % of pt. or 1.0 % of meas.	1.0 % of max.
Batch gas analyzer	x	N/A	N/A	2.0 % of pt. or 2.0 % of meas.	1.0 % of pt. or 1.0 % of meas.	1.0 % of max.
Gravimetric PM balance	m_{PM}	N/A	N/A	See §1065.790	0.5 µg	N/A
Inertial PM balance	m_{PM}	5 s	1 Hz	2.0 % of pt. or 2.0 % of meas.	1.0 % of pt. or 1.0 % of meas.	0.2 % of max.

[a] The performance specifications identified in the table apply separately for rise time and fall time.

[b] Accuracy, repeatability, and noise are all determined with the same collected data, as described in §1065.305, and based on absolute values. "pt." refers to the overall flow-weighted mean value expected at the standard; "max." refers to the peak value expected at the standard over any test interval, not the maximum of the instrument's range; "meas" refers to the actual flow-weighted mean measured over any test interval.

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■ 215. Section 1065.272 is amended by revising paragraph (a) to read as follows:

§ 1065.272 Nondispersive ultraviolet analyzer.

(a) *Application.* You may use a nondispersive ultraviolet (NDUV) analyzer to measure NO_X concentration in raw or diluted exhaust for batch or continuous sampling. We generally accept an NDUV for NO_X measurement, even though it measures only NO and NO_2, since conventional engines and aftertreatment systems do not emit significant amounts of other NO_X species. Measure other NO_X species if required by the standard-setting part. Note that good engineering judgment may preclude you from using an NDUV analyzer if sampled exhaust from test engines contains oil (or other contaminants) in sufficiently high concentrations to interfere with proper operation.

* * * * *

Subpart D—[Amended]

■ 216. Section 1065.303 is revised to read as follows:

§ 1065.303 Summary of required calibration and verifications

The following table summarizes the required and recommended calibrations and verifications described in this subpart and indicates when these have to be performed:

TABLE 1 OF § 1065.303—SUMMARY OF REQUIRED CALIBRATION AND VERIFICATIONS

Type of calibration or verification	Minimum frequency [a]
§ 1065.305: Accuracy, repeatability and noise	Accuracy: Not required, but recommended for initial installation. Repeatability: Not required, but recommended for initial installation. Noise: Not required, but recommended for initial installation.
§ 1065.307: Linearity	Speed: Upon initial installation, within 370 days before testing and after major maintenance. Torque: Upon initial installation, within 370 days before testing and after major maintenance. Electrical power: Upon initial installation, within 370 days before testing and after major maintenance. Clean gas and diluted exhaust flows: Upon initial installation, within 370 days before testing and after major maintenance, unless flow is verified by propane check or by carbon or oxygen balance. Raw exhaust flow: Upon initial installation, within 185 days before testing and after major maintenance, unless flow is verified by propane check or by carbon or oxygen balance. Gas analyzers: Upon initial installation, within 35 days before testing and after major maintenance. PM balance: Upon initial installation, within 370 days before testing and after major maintenance. Stand-alone pressure and temperature: Upon initial installation, within 370 days before testing and after major maintenance.
§ 1065.308: Continuous gas analyzer system response and updating-recording verification—for gas analyzers not continuously compensated for other gas species.	Upon initial installation or after system modification that would affect response.
§ 1065.309: Continuous gas analyzer system-response and updating-recording verification—for gas analyzers continuously compensated for other gas species.	Upon initial installation or after system modification that would affect response.
§ 1065.310: Torque	Upon initial installation and after major maintenance.
§ 1065.315: Pressure, temperature, dewpoint	Upon initial installation and after major maintenance.
§ 1065.320: Fuel flow	Upon initial installation and after major maintenance.
§ 1065.325: Intake flow	Upon initial installation and after major maintenance.
§ 1065.330: Exhaust flow	Upon initial installation and after major maintenance.
§ 1065.340: Diluted exhaust flow (CVS)	Upon initial installation and after major maintenance.
§ 1065.341: CVS and batch sampler verification [b]	Upon initial installation, within 35 days before testing, and after major maintenance.
§ 1065.345: Vacuum leak	Before each laboratory test according to subpart F of this part and before each field test according to subpart J of this part.
§ 1065.350: CO_2 NDIR H_2O interference	Upon initial installation and after major maintenance.
§ 1065.355: CO NDIR CO_2 and H_2O interference	Upon initial installation and after major maintenance.
§ 1065.360: FID calibration THC FID optimization, and THC FID verification..	Calibrate all FID analyzers: upon initial installation and after major maintenance. Optimize and determine CH_4 response for THC FID analyzers: upon initial installation and after major maintenance. Verify CH_4 response for THC FID analyzers: upon initial installation, within 185 days before testing, and after major maintenance.
§ 1065.362: Raw exhaust FID O_2 interference	For all FID analyzers: upon initial installation, and after major maintenance. For THC FID analyzers: upon initial installation, after major maintenance, and after FID optimization according to § 1065.360.
§ 1065.365: Nonmethane cutter penetration	Upon initial installation, within 185 days before testing, and after major maintenance.
§ 1065.370: CLD CO_2 and H_2O quench	Upon initial installation and after major maintenance.
§ 1065.372: NDUV HC and H_2O interference	Upon initial installation and after major maintenance.
§ 1065.376: Chiller NO_2 penetration	Upon initial installation and after major maintenance.
§ 1065.378: NO_2-to-NO converter conversion	Upon initial installation, within 35 days before testing, and after major maintenance.
§ 1065.390: PM balance and weighing	Independent verification: upon initial installation, within 370 days before testing, and after major maintenance. Zero, span, and reference sample verifications: within 12 hours of weighing, and after major maintenance.
§ 1065.395: Inertial PM balance and weighing	Independent verification: upon initial installation, within 370 days before testing, and after major maintenance. Other verifications: upon initial installation and after major maintenance.

[a] Perform calibrations and verifications more frequently, according to measurement system manufacturer instructions and good engineering judgment.

[b] The CVS verification described in § 1065.341 is not required for systems that agree within ± 2% based on a chemical balance of carbon or oxygen of the intake air, fuel, and diluted exhaust.

■ 217. Section 1065.307 is amended by revising paragraphs (e)(2) and (e)(3) to read as follows:

§ 1065.307 Linearity verification.

* * * * *

(e) * * *

(2) The expression ''x_{min}'' refers to the reference value used during the linearity verification that is closest to zero. This is the value used to calculate the first tolerance in Table 1 of this section using the intercept, a_0. Note that this value may be zero, positive, or negative depending on the reference values. For example, if the reference values chosen to validate a pressure transducer vary from −10 to −1 kPa, x_{min} is −1 kPa. If the reference values used to validate a temperature device vary from 290 to 390 K, x_{min} is 290 K.

(3) The expression ''max'' generally refers to the absolute value of the reference value used during the linearity verification that is furthest from zero. This is the value used to scale the first and third tolerances in Table 1 of this section using a_0 and *SEE*. For example, if the reference values chosen to validate a pressure transducer vary from −10 to −1 kPa, then p_{max} is +10 kPa. If the reference values used to validate a temperature device vary from 290 to 390 K, then T_{max} is 390 K. For gas dividers, x_{max} is the undivided, undiluted, span gas concentration. The following are special cases where ''max'' refers to a different value:

(i) For linearity verification with a PM balance, m_{max} refers to the typical mass of a PM filter.

(ii) For linearity verification of torque, T_{max} refers to the manufacturer's specified engine torque peak value of the lowest torque engine to be tested.

* * * * *

■ 218. Section 1065.308 is revised to read as follows:

§ 1065.308 Continuous gas analyzer system-response and updating-recording verification—for gas analyzers not continuously compensated for other gas species.

(a) *Scope and frequency.* This section describes a verification procedure for system response and updating-recording frequency for continuous gas analyzers that output a gas species mole fraction (i.e., concentration) using a single gas detector, i.e., gas analyzers not continuously compensated for other gas species measured with multiple gas detectors. See § 1065.309 for verification procedures that apply to continuous gas analyzers that are continuously compensated for other gas species measured with multiple gas detectors. Perform this verification to determine the system response of the continuous gas analyzer and its sampling system. This verification is required for continuous gas analyzers used for transient or ramped-modal testing. You need not perform this verification for batch gas analyzer systems or for continuous gas analyzer systems that are used only for discrete-mode testing. Perform this verification after initial installation (i.e., test cell commissioning) and after any modifications to the system that would change system response. For example, perform this verification if you add a significant volume to the transfer lines by increasing their length or adding a filter; or if you reduce the frequency at which the gas analyzer updates its output or the frequency at which you sample and record gas-analyzer concentrations.

(b) *Measurement principles.* This test verifies that the updating and recording frequencies match the overall system response to a rapid change in the value of concentrations at the sample probe. Gas analyzers and their sampling systems must be optimized such that their overall response to a rapid change in concentration is updated and recorded at an appropriate frequency to prevent loss of information. This test also verifies that the measurement system meets a minimum response time. You may use the results of this test to determine transformation time, t_{50}, for the purposes of time alignment of continuous data in accordance with § 1065.650(c)(2)(i). You may also use an alternate procedure to determine t_{50} in accordance with good engineering judgment. Note that any such procedure for determining t_{50} must account for both transport delay and analyzer response time.

(c) *System requirements.* Demonstrate that each continuous analyzer has adequate update and recording frequencies and has a minimum rise time and a minimum fall time during a rapid change in gas concentration. You must meet one of the following criteria:

(1) The product of the mean rise time, $t_{10\text{–}90}$, and the frequency at which the system records an updated concentration must be at least 5, and the product of the mean fall time, $t_{90\text{–}10}$, and the frequency at which the system records an updated concentration must be at least 5. If the recording frequency is different than the analyzer's output update frequency, you must use the lower of these two frequencies for this verification, which is referred to as the updating-recording frequency. This verification applies to the nominal updating and recording frequencies. This criterion makes no assumption regarding the frequency content of changes in emission concentrations during emission testing; therefore, it is valid for any testing. Also, the mean rise time must be at or below 10 seconds and the mean fall time must be at or below 10 seconds.

(2) The frequency at which the system records an updated concentration must be at least 5 Hz. This criterion assumes that the frequency content of significant changes in emission concentrations during emission testing do not exceed 1 Hz. Also, the mean rise time must be at or below 10 seconds and the mean fall time must be at or below 10 seconds.

(3) You may use other criteria if we approve the criteria in advance.

(4) You may meet the overall PEMS verification in § 1065.920 instead of the verification in this section for field testing with PEMS.

(d) *Procedure.* Use the following procedure to verify the response of each continuous gas analyzer:

(1) *Instrument setup.* Follow the analyzer manufacturer's start-up and operating instructions. Adjust the measurement system as needed to optimize performance. Run this verification with the analyzer operating in the same manner you will use for emission testing. If the analyzer shares its sampling system with other analyzers, and if gas flow to the other analyzers will affect the system response time, then start up and operate the other analyzers while running this verification test. You may run this verification test on multiple analyzers sharing the same sampling system at the same time. If you use any analog or real-time digital filters during emission testing, you must operate those filters in the same manner during this verification.

(2) *Equipment setup.* We recommend using minimal lengths of gas transfer lines between all connections and fast-acting three-way valves (2 inlets, 1 outlet) to control the flow of zero and blended span gases to the sample system's probe inlet or a tee near the outlet of the probe. Normally the gas flow rate is higher than the probe sample flow rate and the excess is overflowed out the inlet of the probe. If the gas flow rate is lower than the probe flow rate, the gas concentrations must be adjusted to account for the dilution from ambient air drawn into the probe. Select span gases for the species being measured. You may use binary or multi-gas span gases. You may use a gas blending or mixing device to blend span gases. A gas blending or mixing device is recommended when blending span gases diluted in N_2 with span gases diluted in air. You may use a multi-gas

span gas, such as NO-CO-CO_2-C_3H_8-CH_4, to verify multiple analyzers at the same time. If you use standard binary span gases, you must run separate response tests for each analyzer. In designing your experimental setup, avoid pressure pulsations due to stopping the flow through the gas-blending device.

(3) *Data collection.* (i) Start the flow of zero gas.

(ii) Allow for stabilization, accounting for transport delays and the slowest analyzer's full response.

(iii) Start recording data. For this verification you must record data at a frequency greater than or equal to that of the updating-recording frequency used during emission testing. You may not use interpolation or filtering to alter the recorded values.

(iv) Switch the flow to allow the blended span gases to flow to the analyzer. If you intend to use the data from this test to determine t_{50} for time alignment, record this time as t_0.

(v) Allow for transport delays and the slowest analyzer's full response.

(vi) Switch the flow to allow zero gas to flow to the analyzer. If you intend to use the data from this test to determine t_{50} for time alignment, record this time as t_{100}.

(vii) Allow for transport delays and the slowest analyzer's full response.

(viii) Repeat the steps in paragraphs (d)(3)(iv) through (vii) of this section to record seven full cycles, ending with zero gas flowing to the analyzers.

(ix) Stop recording.

(e) *Performance evaluation.* (1) If you choose to demonstrate compliance with paragraph (c)(1) of this section, use the data from paragraph (d)(3) of this section to calculate the mean rise time, $t_{10\text{–}90}$, and mean fall time, $t_{90\text{–}10}$, for each of the analyzers being verified. You may use interpolation between recorded values to determine rise and fall times. If the recording frequency used during emission testing is different from the analyzer's output update frequency, you must use the lower of these two frequencies for this verification. Multiply these times (in seconds) by their respective updating-recording frequencies in Hertz (1/second). The resulting product must be at least 5 for both rise time and fall time. If either value is less than 5, increase the updating-recording frequency, or adjust the flows or design of the sampling system to increase the rise time and fall time as needed. You may also configure analog or digital filters before recording to increase rise and fall times. In no case may the mean rise time or mean fall time be greater than 10 seconds.

(2) If a measurement system fails the criterion in paragraph (e)(1) of this section, ensure that signals from the system are updated and recorded at a frequency of at least 5 Hz. In no case may the mean rise time or mean fall time be greater than 10 seconds.

(3) If a measurement system fails the criteria in paragraphs (e)(1) and (2) of this section, you may use the measurement system only if the deficiency does not adversely affect your ability to show compliance with the applicable standards.

(f) *Transformation time,* t_{50}, determination. If you choose to determine t_{50} for purposes of time alignment using data generated in paragraph (d)(3) of this section, calculate the mean $t_{0\text{–}50}$ and the mean $t_{100\text{–}50}$ from the recorded data. Average these two values to determine the final t_{50} for the purposes of time alignment in accordance with § 1065.650(c)(2)(i).

■ 219. Section 1065.309 is revised to read as follows:

§ 1065.309 Continuous gas analyzer system-response and updating-recording verification—for gas analyzers continuously compensated for other gas species.

(a) *Scope and frequency.* This section describes a verification procedure for system response and updating-recording frequency for continuous gas analyzers that output a single gas species mole fraction (i.e., concentration) based on a continuous combination of multiple gas species measured with multiple detectors (i.e., gas analyzers continuously compensated for other gas species). See § 1065.308 for verification procedures that apply to continuous gas analyzers that are not continuously compensated for other gas species or that use only one detector for gaseous species. Perform this verification to determine the system response of the continuous gas analyzer and its sampling system. This verification is required for continuous gas analyzers used for transient or ramped-modal testing. You need not perform this verification for batch gas analyzers or for continuous gas analyzers that are used only for discrete-mode testing. For this check we consider water vapor a gaseous constituent. This verification does not apply to any processing of individual analyzer signals that are time aligned to their t_{50} times and were verified according to § 1065.308. For example, this verification does not apply to correction for water removed from the sample done in post-processing according to § 1065.659 and it does not apply to NMHC determination from THC and CH_4 according to § 1065.660. Perform this verification after initial installation (i.e., test cell commissioning) and after any modifications to the system that would change the system response.

(b) *Measurement principles.* This procedure verifies that the updating and recording frequencies match the overall system response to a rapid change in the value of concentrations at the sample probe. It indirectly verifies the time-alignment and uniform response of all the continuous gas detectors used to generate a continuously combined/compensated concentration measurement signal. Gas analyzer systems must be optimized such that their overall response to rapid change in concentration is updated and recorded at an appropriate frequency to prevent loss of information. This test also verifies that the measurement system meets a minimum response time. For this procedure, ensure that all compensation algorithms and humidity corrections are turned on. You may use the results of this test to determine transformation time, t_{50}, for the purposes of time alignment of continuous data in accordance with § 1065.650(c)(2)(i). You may also use an alternate procedure to determine t_{50} consistent with good engineering judgment. Note that any such procedure for determining t_{50} must account for both transport delay and analyzer response time.

(c) *System requirements.* Demonstrate that each continuously combined/compensated concentration measurement has adequate updating and recording frequencies and has a minimum rise time and a minimum fall time during a system response to a rapid change in multiple gas concentrations, including H_2O concentration if H_2O compensation is applied. You must meet one of the following criteria:

(1) The product of the mean rise time, $t_{10\text{–}90}$, and the frequency at which the system records an updated concentration must be at least 5, and the product of the mean fall time, $t_{90\text{–}10}$, and the frequency at which the system records an updated concentration must be at least 5. If the recording frequency is different than the update frequency of the continuously combined/compensated signal, you must use the lower of these two frequencies for this verification. This criterion makes no assumption regarding the frequency content of changes in emission concentrations during emission testing; therefore, it is valid for any testing. Also, the mean rise time must be at or below 10 seconds and the mean fall time must be at or below 10 seconds.

(2) The frequency at which the system records an updated concentration must be at least 5 Hz. This criterion assumes that the frequency content of significant

changes in emission concentrations during emission testing do not exceed 1 Hz. Also, the mean rise time must be at or below 10 seconds and the mean fall time must be at or below 10 seconds.

(3) You may use other criteria if we approve them in advance.

(4) You may meet the overall PEMS verification in § 1065.920 instead of the verification in this section for field testing with PEMS.

(d) *Procedure*. Use the following procedure to verify the response of each continuously compensated analyzer (verify the combined signal, not each individual continuously combined concentration signal):

(1) *Instrument setup*. Follow the analyzer manufacturer's start-up and operating instructions. Adjust the measurement system as needed to optimize performance. Run this verification with the analyzer operating in the same manner you will use for emission testing. If the analyzer shares its sampling system with other analyzers, and if gas flow to the other analyzers will affect the system response time, then start up and operate the other analyzers while running this verification test. You may run this verification test on multiple analyzers sharing the same sampling system at the same time. If you use any analog or real-time digital filters during emission testing, you must operate those filters in the same manner during this verification.

(2) *Equipment setup*. We recommend using minimal lengths of gas transfer lines between all connections and fast-acting three-way valves (2 inlets, 1 outlet) to control the flow of zero and blended span gases to the sample system's probe inlet or a tee near the outlet of the probe. Normally the gas flow rate is higher than the probe sample flow rate and the excess is overflowed out the inlet of the probe. If the gas flow rate is lower than the probe flow rate, the gas concentrations must be adjusted to account for the dilution from ambient air drawn into the probe. Select span gases for the species being continuously combined, other than H_2O. Select concentrations of compensating species that will yield concentrations of these species at the analyzer inlet that covers the range of concentrations expected during testing. You may use binary or multi-gas span gases. You may use a gas blending or mixing device to blend span gases. A gas blending or mixing device is recommended when blending span gases diluted in N_2 with span gases diluted in air. You may use a multi-gas span gas, such as $NO–CO–CO_2–C_3H_8–CH_4$, to verify multiple analyzers at the same time. In designing your experimental setup, avoid pressure pulsations due to stopping the flow through the gas blending device. If H_2O correction is applicable, then span gases must be humidified before entering the analyzer; however, you may not humidify NO_2 span gas by passing it through a sealed humidification vessel that contains water. You must humidify NO_2 span gas with another moist gas stream. We recommend humidifying your $NO–CO–CO_2–C_3H_8–CH_4$, balance N_2 blended gas by flowing the gas mixture through a sealed vessel that humidifies the gas by bubbling it through distilled water and then mixing the gas with dry NO_2 gas, balance purified synthetic air. If your system does not use a sample dryer to remove water from the sample gas, you must humidify your span gas to the highest sample H_2O content that you estimate during emission sampling. If your system uses a sample dryer during testing, it must pass the sample dryer verification check in § 1065.342, and you must humidify your span gas to an H_2O content greater than or equal to the level determined in § 1065.145(d)(2). If you are humidifying span gases without NO_2, use good engineering judgment to ensure that the wall temperatures in the transfer lines, fittings, and valves from the humidifying system to the probe are above the dewpoint required for the target H_2O content. If you are humidifying span gases with NO_2, use good engineering judgment to ensure that there is no condensation in the transfer lines, fittings, or valves from the point where humidified gas is mixed with NO_2 span gas to the probe. We recommend that you design your setup so that the wall temperatures in the transfer lines, fittings, and valves from the humidifying system to the probe are at least 5 °C above the local sample gas dewpoint. Operate the measurement and sample handling system as you do for emission testing. Make no modifications to the sample handling system to reduce the risk of condensation. Flow humidified gas through the sampling system before this check to allow stabilization of the measurement system's sampling handling system to occur, as it would for an emission test.

(3) *Data collection*. (i) Start the flow of zero gas.

(ii) Allow for stabilization, accounting for transport delays and the slowest analyzer's full response.

(iii) Start recording data. For this verification you must record data at a frequency greater than or equal to that of the updating-recording frequency used during emission testing. You may not use interpolation or filtering to alter the recorded values.

(iv) Switch the flow to allow the blended span gases to flow to the analyzer. If you intend to use the data from this test to determine t_{50} for time alignment, record this time as t_0.

(v) Allow for transport delays and the slowest analyzer's full response.

(vi) Switch the flow to allow zero gas to flow to the analyzer. If you intend to use the data from this test to determine t_{50} for time alignment, record this time as t_{100}.

(vii) Allow for transport delays and the slowest analyzer's full response.

(viii) Repeat the steps in paragraphs (d)(3)(iv) through (vii) of this section to record seven full cycles, ending with zero gas flowing to the analyzers.

(ix) Stop recording.

(e) *Performance evaluations*. (1) If you choose to demonstrate compliance with paragraph (c)(1) of this section, use the data from paragraph (d)(3) of this section to calculate the mean rise time, $t_{10–90}$, and mean fall time, $t_{90–10}$, for the continuously combined signal from each analyzer being verified. You may use interpolation between recorded values to determine rise and fall times. If the recording frequency used during emission testing is different from the analyzer's output update frequency, you must use the lower of these two frequencies for this verification. Multiply these times (in seconds) by their respective updating-recording frequencies in Hz (1/second). The resulting product must be at least 5 for both rise time and fall time. If either value is less than 5, increase the updating-recording frequency or adjust the flows or design of the sampling system to increase the rise time and fall time as needed. You may also configure analog or digital filters before recording to increase rise and fall times. In no case may the mean rise time or mean fall time be greater than 10 seconds.

(2) If a measurement system fails the criterion in paragraph (e)(1) of this section, ensure that signals from the system are updated and recorded at a frequency of at least 5 Hz. In no case may the mean rise time or mean fall time be greater than 10 seconds.

(3) If a measurement system fails the criteria in paragraphs (e)(1) and (2) of this section, you may use the measurement system only if the deficiency does not adversely affect your ability to show compliance with the applicable standards.

(f) *Transformation time, t_{50}, determination*. If you choose to determine t_{50} for purposes of time alignment using data generated in paragraph (d)(3) of this section, calculate the mean t_{0-50} and the mean t_{100-50} from the recorded data. Average these two values to determine the final t_{50} for the purposes of time alignment in accordance with § 1065.650(c)(2)(i).

■ 220. Section 1065.341 is amended by revising paragraph (d)(4) to read as follows:

§ 1065.341 CVS and batch sampler verification (propane check).

* * * * *

(d) * * *

(4) Overflow zero air at the HC probe inlet or into a tee near the outlet of the probe.

* * * * *

■ 221. Section 1065.342 is amended by revising paragraphs (d) and (e) to read as follows:

§ 1065.342 Sample dryer verification.

* * * * *

(d) *Sample dryer verification procedure*. Use the following method to determine sample dryer performance. Run this verification with the dryer and associated sampling system operating in the same manner you will use for emission testing (including operation of sample pumps). You may run this verification test on multiple sample dryers sharing the same sampling system at the same time. You may run this verification on the sample dryer alone, but you must use the maximum gas flow rate expected during testing. You may use good engineering judgment to develop a different protocol.

(1) Use PTFE or stainless steel tubing to make necessary connections.

(2) Humidify room air, N_2, or purified air by bubbling it through distilled water in a sealed vessel that humidifies the gas to the highest sample water content that you estimate during emission sampling.

(3) Introduce the humidified gas upstream of the sample dryer. You may disconnect the transfer line from the probe and introduce the humidified gas at the inlet of the transfer line of the sample system used during testing. You may use the sample pumps in the sample system to draw gas through the vessel.

(4) Maintain the sample lines, fittings, and valves from the location where the humidified gas water content is measured to the inlet of the sampling system at a temperature at least 5 °C above the local humidified gas dewpoint. For dryers used in NO_X sample systems, verify the sample system components used in this verification prevent aqueous condensation as required in § 1065.145(c)(1)(i). We recommend that the sample system components be maintained at least 5 °C above the local humidified gas dewpoint to prevent aqueous condensation.

(5) Measure the humidified gas dewpoint, T_{dew}, and absolute pressure, p_{total}, as close as possible to the inlet of the sample dryer or inlet of the sample system to verify the water content is at least as high as the highest value that you estimated during emission sampling. You may verify the water content based on any humidity parameter (e.g. mole fraction water, local dewpoint, or absolute humidity).

(6) Measure the humidified gas dewpoint, T_{dew}, and absolute pressure, p_{total}, as close as possible to the outlet of the sample dryer. Note that the dewpoint changes with absolute pressure. If the dewpoint at the sample dryer outlet is measured at a different pressure, then this reading must be corrected to the dewpoint at the sample dryer absolute pressure, p_{total}.

(7) The sample dryer meets the verification if the dewpoint at the sample dryer pressure as measured in paragraph (d)(6) of this section is less than the dewpoint corresponding to the sample dryer specifications as determined in § 1065.145(d)(2) plus 2 °C or if the mole fraction of water as measured in (d)(6) is less than the corresponding sample dryer specifications plus 0.002 mol/mol.

(e) *Alternate sample dryer verification procedure*. The following method may be used in place of the sample dryer verification procedure in (d) of this section. If you use a humidity sensor for continuous monitoring of dewpoint at the sample dryer outlet you may skip the performance check in § 1065.342(d), but you must make sure that the dryer outlet humidity is at or below the minimum value used for quench, interference, and compensation checks.

■ 222. Section 1065.345 is amended by revising paragraph (d)(3) to read as follows:

§ 1065.345 Vacuum-side leak verification.

* * * * *

(d) * * *

(3) Route overflow span gas to the inlet of the sample probe or at a tee fitting in the transfer line near the exit of the probe. You may use a valve upstream of the overflow fitting to prevent overflow of span gas out of the inlet of the probe, but you must then provide an overflow vent in the overflow supply line.

* * * * *

■ 223. Section 1065.350 is amended by revising paragraphs (d)(4) and (d)(5) to read as follows:

§ 1065.350 H_2O interference verification for CO_2 NDIR analyzers.

* * * * *

(d) * * *

(4) Measure the water mole fraction, x_{H2O}, of the humidified test gas, as close as possible to the inlet of the analyzer. For example, measure dewpoint, T_{dew}, and absolute pressure, p_{total}, to calculate x_{H2O}.

(5) Use good engineering judgment to prevent condensation in the transfer lines, fittings, or valves from the point where x_{H2O} is measured to the analyzer. We recommend that you design your system so the wall temperatures in the transfer lines, fittings, and valves from the point where x_{H2O} is measured to the analyzer are at least 5 °C above the local sample gas dewpoint.

* * * * *

■ 224. Section 1065.355 is amended by revising paragraphs (d)(4) and (d)(5) to read as follows:

§ 1065.355 H_2O and CO_2 interference verification for CO NDIR analyzers.

* * * * *

(d) * * *

(4) Measure the water mole fraction, x_{H2O}, of the humidified CO_2 test gas as close as possible to the inlet of the analyzer. For example, measure dewpoint, T_{dew}, and absolute pressure, p_{total}, to calculate x_{H2O}.

(5) Use good engineering judgment to prevent condensation in the transfer lines, fittings, or valves from the point where x_{H2O} is measured to the analyzer. We recommend that you design your system so the wall temperatures in the transfer lines, fittings, and valves from the point where x_{H2O} is measured to the analyzer are at least 5 °C above the local sample gas dewpoint.

* * * * *

■ 225. Section 1065.370 is revised to read as follows:

§ 1065.370 CLD CO_2 and H_2O quench verification.

(a) *Scope and frequency*. If you use a CLD analyzer to measure NO_X, verify the amount of H_2O and CO_2 quench after installing the CLD analyzer and after major maintenance.

(b) *Measurement principles*. H_2O and CO_2 can negatively interfere with a CLD's NO_X response by collisional quenching, which inhibits the chemiluminescent reaction that a CLD utilizes to detect NO_X. This procedure and the calculations in § 1065.675 determine quench and scale the quench results to the maximum mole fraction of

H_2O and the maximum CO_2 concentration expected during emission testing. If the CLD analyzer uses quench compensation algorithms that utilize H_2O and/or CO_2 measurement instruments, evaluate quench with these instruments active and evaluate quench with the compensation algorithms applied.

(c) *System requirements.* A CLD analyzer must have a combined H_2O and CO_2 quench of ± 3% or less, though we strongly recommend a quench of ± 1% or less. Combined quench is the sum of the CO_2 quench determined as described in paragraph (d) of this section, plus the H_2O quench determined in paragraph (e) of this section.

(d) *CO_2 quench verification procedure.* Use the following method to determine CO_2 quench by using a gas divider that blends binary span gases with zero gas as the diluent and meets the specifications in § 1065.248, or use good engineering judgment to develop a different protocol:

(1) Use PTFE or stainless steel tubing to make necessary connections.

(2) Configure the gas divider such that nearly equal amounts of the span and diluent gases are blended with each other.

(3) If the CLD analyzer has an operating mode in which it detects NO-only, as opposed to total NO_X, operate the CLD analyzer in the NO-only operating mode.

(4) Use a CO_2 span gas that meets the specifications of § 1065.750 and a concentration that is approximately twice the maximum CO_2 concentration expected during emission testing.

(5) Use an NO span gas that meets the specifications of § 1065.750 and a concentration that is approximately twice the maximum NO concentration expected during emission testing.

(6) Zero and span the CLD analyzer. Span the CLD analyzer with the NO span gas from paragraph (d)(5) of this section through the gas divider. Connect the NO span gas to the span port of the gas divider; connect a zero gas to the diluent port of the gas divider; use the same nominal blend ratio selected in paragraph (d)(2) of this section; and use the gas divider's output concentration of NO to span the CLD analyzer. Apply gas property corrections as necessary to ensure accurate gas division.

(7) Connect the CO_2 span gas to the span port of the gas divider.

(8) Connect the NO span gas to the diluent port of the gas divider.

(9) While flowing NO and CO_2 through the gas divider, stabilize the output of the gas divider. Determine the CO_2 concentration from the gas divider output, applying gas property correction as necessary to ensure accurate gas division. Record this concentration, x_{CO2act}, and use it in the quench verification calculations in § 1065.675. Alternatively, you may use a simple gas blending device and use an NDIR to determine this CO_2 concentration. If you use an NDIR, it must meet the requirements of this part for laboratory testing and you must span it with the CO_2 span gas from paragraph (d)(4) of this section.

(10) Measure the NO concentration downstream of the gas divider with the CLD analyzer. Allow time for the analyzer response to stabilize. Stabilization time may include time to purge the transfer line and to account for analyzer response. While the analyzer measures the sample's concentration, record the analyzer's output for 30 seconds. Calculate the arithmetic mean concentration from these data, x_{NOmeas}. Record x_{NOmeas}, and use it in the quench verification calculations in § 1065.675.

(11) Calculate the actual NO concentration at the gas divider's outlet, x_{NOact}, based on the span gas concentrations and x_{CO2act} according to Equation 1065.675–2. Use the calculated value in the quench verification calculations in Equation 1065.675–1.

(12) Use the values recorded according to this paragraph (d) and paragraph (e) of this section to calculate quench as described in § 1065.675.

(e) *H_2O quench verification procedure.* Use the following method to determine H_2O quench, or use good engineering judgment to develop a different protocol:

(1) Use PTFE or stainless steel tubing to make necessary connections.

(2) If the CLD analyzer has an operating mode in which it detects NO-only, as opposed to total NO_X, operate the CLD analyzer in the NO-only operating mode.

(3) Use an NO span gas that meets the specifications of § 1065.750 and a concentration that is near the maximum concentration expected during emission testing.

(4) Zero and span the CLD analyzer. Span the CLD analyzer with the NO span gas from paragraph (e)(3) of this section, record the span gas concentration as x_{NOdry}, and use it in the quench verification calculations in § 1065.675.

(5) Humidify the NO span gas by bubbling it through distilled water in a sealed vessel. If the humidified NO span gas sample does not pass through a sample dryer for this verification test, control the vessel temperature to generate an H_2O level approximately equal to the maximum mole fraction of H_2O expected during emission testing. If the humidified NO span gas sample does not pass through a sample dryer, the quench verification calculations in § 1065.675 scale the measured H_2O quench to the highest mole fraction of H_2O expected during emission testing. If the humidified NO span gas sample passes through a dryer for this verification test, control the vessel temperature to generate an H_2O level at least as high as the level determined in § 1065.145(d)(2). For this case, the quench verification calculations in § 1065.675 do not scale the measured H_2O quench.

(6) Introduce the humidified NO test gas into the sample system. You may introduce it upstream or downstream of any sample dryer that is used during emission testing. Note that the sample dryer must meet the sample dryer verification check in § 1065.342.

(7) Measure the mole fraction of H_2O in the humidified NO span gas downstream of the sample dryer, $x_{H2Omeas}$. We recommend that you measure xH_{2Omeas} as close as possible to the CLD analyzer inlet. You may calculate $x_{H2Omeas}$ from measurements of dew point, T_{dew}, and absolute pressure, $p$total.

(8) Use good engineering judgment to prevent condensation in the transfer lines, fittings, or valves from the point where $x_{H2Omeas}$ is measured to the analyzer. We recommend that you design your system so the wall temperatures in the transfer lines, fittings, and valves from the point where $x_{H2Omeas}$ is measured to the analyzer are at least 5 °C above the local sample gas dew point.

(9) Measure the humidified NO span gas concentration with the CLD analyzer. Allow time for the analyzer response to stabilize. Stabilization time may include time to purge the transfer line and to account for analyzer response. While the analyzer measures the sample's concentration, record the analyzer's output for 30 seconds. Calculate the arithmetic mean of these data, x_{NOwet}. Record x_{NOwet} and use it in the quench verification calculations in § 1065.675.

(f) *Corrective action.* If the sum of the H_2O quench plus the CO_2 quench is less than −2% or greater than +2%, take corrective action by repairing or replacing the analyzer. Before running emission tests, verify that the corrective action successfully restored the analyzer to proper functioning.

(g) *Exceptions.* The following exceptions apply:

(1) You may omit this verification if you can show by engineering analysis

that for your NO_X sampling system and your emission calculations procedures, the combined CO_2 and H_2O interference for your NO_X CLD analyzer always affects your brake-specific NO_X emission results within no more than ±1.0% of the applicable NO_X standard.

(2) You may use a NO_X CLD analyzer that you determine does not meet this verification, as long as you try to correct the problem and the measurement deficiency does not adversely affect your ability to show that engines comply with all applicable emission standards.

■ 226. Section 1065.378 is amended by revising paragraph (d)(4) to read as follows:

§ 1065.378 NO_2-to-NO converter conversion verification.

* * * * *

(d) * * *

(4) *Performance evaluation.* Calculate the efficiency of the NO_X converter by substituting the concentrations obtained into the following equation:

$$efficiency = \left(1 + \frac{x_{\mathrm{NOxmeas}} - x_{\mathrm{NOx+O2mix}}}{x_{\mathrm{NO+O2mix}} - x_{\mathrm{NOmeas}}}\right) \cdot 100\%$$

* * * * *

Subpart F—[Amended]

■ 227. Section 1065.510 is amended by revising paragraphs (b)(3) and (b)(6) to read as follows:

§ 1065.510 Engine mapping.

* * * * *

(b) * * *

(3) Operate the engine at its warm idle speed as follows:

(i) For engines with a low-speed governor, set the operator demand to minimum, use the dynamometer or other loading device to target a torque of zero on the engine's primary output shaft, and allow the engine to govern the speed. Measure this warm idle speed; we recommend recording at least 30 values of speed and using the mean of those values.

(ii) For engines without a low-speed governor, operate the engine at warm idle speed and zero torque on the engine's primary output shaft. You may use the dynamometer to target a torque of zero on the engine's primary output shaft, and manipulate the operator demand to control the speed to target the manufacturer-declared value for the lowest engine speed possible with minimum load (also known as manufacturer-declared warm idle speed). You may alternatively use the dynamometer to target the manufacturer-declared warm idle speed and manipulate the operator demand to control the torque on the engine's primary output shaft to zero.

(iii) For variable-speed engines with or without a low-speed governor, if a nonzero idle torque is representative of in-use operation, you may use the dynamometer or operator demand to target the manufacturer-declared idle torque instead of targeting zero torque as specified in paragraphs (b)(3)(i) and (ii) of this section. Control speed as specified in paragraph (b)(3)(i) or (ii) of this section, as applicable. If you use this option for engines with a low-speed governor to measure the warm idle speed with the manufacturer-declared torque at this step, you may use this as the warm-idle speed for cycle generation as specified in paragraph (b)(6) of this section. However, if you identify multiple warm idle torques under paragraph (f)(4)(i) of this section, measure the warm idle speed at only one torque level for this paragraph (b)(3).

* * * * *

(6) For engines with a low-speed governor, if a nonzero idle torque is representative of in-use operation, operate the engine at warm idle with the manufacturer-declared idle torque. Set the operator demand to minimum, use the dynamometer to target the declared idle torque, and allow the engine to govern the speed. Measure this speed and use it as the warm idle speed for cycle generation in § 1065.512. We recommend recording at least 30 values of speed and using the mean of those values. If you identify multiple warm idle torques under paragraph (f)(4)(i) of this section, measure the warm idle speed at each torque. You may map the idle governor at multiple load levels and use this map to determine the measured warm idle speed at the declared idle torque(s).

* * * * *

■ 228. Section 1065.514 is amended by revising paragraph (f)(3) to read as follows:

§ 1065.514 Cycle-validation criteria for operation over specified duty cycles.

* * * * *

(f) * * *

(3) For discrete-mode steady-state testing, apply cycle-validation criteria by treating the sampling periods from the series of test modes as a continuous sampling period, analogous to ramped-modal testing and apply statistical criteria as described in paragraph (f)(1) or (2) of this section.

* * * * *

■ 229. Section 1065.520 is amended by revising paragraphs (g)(4) and (g)(5)(ii) to read as follows:

§ 1065.520 Pre-test verification procedures and pre-test data collection.

* * * * *

(g) * * *

(4) Overflow zero gas at the HC probe inlet or into a tee near the probe outlet.

(5) * * *

(ii) For batch sampling, fill the sample medium (e.g., bag) and record its mean THC concentration.

* * * * *

Subpart G—[Amended]

■ 230. Section 1065.610 is amended by revising paragraphs (a) and (b) to read as follows:

§ 1065.610 Duty cycle generation.

* * * * *

(a) *Maximum test speed, f_{ntest}.* This section generally applies to duty cycles for variable-speed engines. For constant-speed engines subject to duty cycles that specify normalized speed commands, use the no-load governed speed as the measured f_{ntest}. This is the highest engine speed where an engine outputs zero torque. For variable-speed engines, determine the measured f_{ntest} from the power-versus-speed map, generated according to § 1065.510, as follows:

(1) Based on the map, determine maximum power, $P_{\max}$, and the speed at which maximum power occurred, f_{nPmax}. If maximum power occurs at multiple speeds, take f_{nPmax} as the lowest of these speeds. Divide every recorded power by $P_{\max}$ and divide every recorded speed by f_{nPmax}. The result is a normalized power-versus-speed map. Your measured f_{ntest} is the speed at which the sum of the squares of normalized speed and power is maximum. Note that if multiple maximum values are found, f_{ntest} should be taken as the lowest speed of all points with the same maximum sum of squares.

Determine f_{ntest} as follows:

$$f_{ntest} = f_{ni} \text{ at the maximum of } \left(f_{nnormi}^{\ 2} + P_{normi}^{\ 2}\right) \qquad \text{Eq. 1065.610-1}$$

Where:

f_{ntest} = maximum test speed.

i = an indexing variable that represents one recorded value of an engine map.

f_{nnormi} = an engine speed normalized by dividing it by f_{nPmax}.

P_{normi} = an engine power normalized by dividing it by P_{max}.

Example:

(f_{nnorm1} = 1.002, P_{norm1} = 0.978, f_{n1} = 2359.71)
(f_{nnorm2} = 1.004, P_{norm2} = 0.977, f_{n2} = 2364.42)
(f_{nnorm3} = 1.006, P_{norm3} = 0.974, f_{n3} = 2369.13)
($f_{nnorm12}$ + P_{norm1}^2) = ($1.002^2 + 0.978^2$) = 1.960
(f_{nnorm2}^2 + P_{norm2}^2) = ($1.004^2 + 0.977^2$) = 1.963
(f_{nnorm3}^2 + P_{norm3}^2) = ($1.006^2 + 0.974^2$) = 1.961
maximum = 1.963 at i = 2
f_{ntest} = 2364.42 rev/min

(2) For variable-speed engines, transform normalized speeds to reference speeds according to paragraph (c) of this section by using the measured maximum test speed determined according to paragraph (a)(1) of this section—or use your declared maximum test speed, as allowed in § 1065.510.

(3) For constant-speed engines, transform normalized speeds to reference speeds according to paragraph (c) of this section by using the measured no-load governed speed—or use your declared maximum test speed, as allowed in § 1065.510.

(b) *Maximum test torque,* T_{test}. For constant-speed engines, determine the measured T_{test} from the power-versus-speed map, generated according to § 1065.510, as follows:

(1) Based on the map, determine maximum power, P_{max}, and the speed at which maximum power occurs, f_{nPmax}. If maximun power occurs at multiple speeds, take f_{nPmax} as the lowest of these speeds. Divide every recorded power by P_{max} and divide every recorded speed by f_{nPmax}. The result is a normalized power-versus-speed map. Your measured T_{test} is the torque at which the sum of the squares of normalized speed and power is maximum. Note that that if multiple maximum values are found, T_{test} should be taken as the highest torque of all points with the same maximum sum of squares. Determine T_{test} as follows:

$$T_{test} = T_i \text{ at the maximum of } \left(f_{nnormi}^{\ 2} + P_{normi}^{\ 2}\right) \qquad \text{Eq. 1065.610-2}$$

Where:

T_{test} = maximum test torque.

Example:

(f_{nnorm1} = 1.002, P_{norm1} = 0.978, T_1 = 722.62 N·m)
(f_{nnorm2} = 1.004, P_{norm2} = 0.977, T_2 = 720.44 N·m)
(f_{nnorm3} = 1.006, P_{norm3} = 0.974, T_3 = 716.80 N·m)
(f_{nnorm1}^2 + P_{norm1}^2) = ($1.002^2 + 0.978^2$) = 1.960
(f_{nnorm1}^2 + P_{norm1}^2) = ($1.004^2 + 0.977^2$) = 1.963
(f_{nnorm1}^2 + P_{norm1}^2) = ($1.006^2 + 0.974^2$) = 1.961
maximum = 1.963 at i = 2
T_{test} = 720.44 N·m

(2) Transform normalized torques to reference torques according to paragraph (d) of this section by using the measured maximum test torque determined according to paragraph (b)(1) of this section—or use your declared maximum test torque, as allowed in § 1065.510.

* * * * *

■ 231. Section 1065.640 is amended by revising paragraph (a) to read as follows:

§ 1065.640 Flow meter calibration calculations.

* * * * *

(a) *Reference meter conversions.* The calibration equations in this section use molar flow rate, $\dot{n}_{ref}$, as a reference quantity. If your reference meter outputs a flow rate in a different quantity, such as standard volume rate, $\dot{V}_{stdref}$, actual volume rate, $\dot{V}_{actref}$, or mass rate, $\dot{m}_{ref}$, convert your reference meter output to a molar flow rate using the following equations, noting that while values for volume rate, mass rate, pressure, temperature, and molar mass may change during an emission test, you should ensure that they are as constant as practical for each individual set point during a flow meter calibration:

$$\dot{n}_{ref} = \frac{\dot{V}_{stdref} \cdot P_{std}}{T_{std} \cdot R} = \frac{\dot{V}_{actref} \cdot P_{act}}{T_{act} \cdot R} = \frac{\dot{m}_{ref}}{M_{mix}}$$

Eq. 1065.640–1

Where:

$\dot{n}_{ref}$ = reference molar flow rate.

$\dot{V}_{stdref}$ = reference volume flow rate, corrected to a standard pressure and a standard temperature.

$\dot{V}_{actref}$ = reference volume flow rate at the actual pressure and temperature of the flow rate.

$\dot{m}_{ref}$ = reference mass flow.

P_{std} = standard pressure.

P_{act} = actual pressure of the flow rate.

T_{std} = standard temperature.

T_{act} = actual temperature of the flow rate.

R = molar gas constant.

M_{mix} = molar mass of the flow rate.

Example 1:

$\dot{V}_{stdref}$ = 1000.00 ft³/min = 0.471948 m³/s
P = 29.9213 in Hg @ 32 °F = 101325 Pa
T = 68.0 °F = 293.15 K
R = 8.314472 J/(mol·K)

$$\dot{n}_{ref} = \frac{0.471948 \cdot 101325}{293.15 \cdot 8.314472}$$

$\dot{n}_{ref}$ = 19.619 mol/s

Example 2:

$\dot{m}_{ref}$ = 17.2683 kg/min = 287.805 g/s
$\dot{M}_{mix}$ = 28.7805 g/mol

$$\dot{n}_{ref} = \frac{287.805}{28.7805}$$

$\dot{n}_{ref}$ = 10.0000 mol/s

* * * * *

■ 232. Section 1065.645 is amended by revising paragraphs (a) and (b) to read as follows:

§ 1065.645 Amount of water in an ideal gas.

* * * * *

(a) *Vapor pressure of water.* Calculate the vapor pressure of water for a given saturation temperature condition, T_{sat}, as follows, or use good engineering judgment to use a different relationship of the vapor pressure of water to a given saturation temperature condition:

(1) For humidity measurements made at ambient temperatures from (0 to 100) °C, or for humidity measurements made over super-cooled water at ambient temperatures from (−50 to 0) °C, use the following equation:

$$\log_{10}\left(p_{H2O}\right)=10.79574\cdot\left(1-\frac{273.16}{T_{sat}}\right)-5.02800\cdot\log_{10}\left(\frac{T_{sat}}{273.16}\right)+1.50475\cdot10^{-4}\cdot\left(1-10^{-8.2969\cdot\left(\frac{T_{sat}}{273.16}-1\right)}\right)$$

$$+0.42873\cdot10^{-3}\cdot\left(10^{4.76955\cdot\left(1-\frac{273.16}{T_{sat}}\right)}-1\right)-0.2138602 \qquad \text{Eq. 1065.645-1}$$

Where:

p_{H20} = vapor pressure of water at saturation temperature condition, kPa.

T_{sat} = saturation temperature of water at measured conditions, K.

Example:

T_{sat} = 9.5 °C

T_{dsat} = 9.5 + 273.15 = 282.65 K

$$\log_{10}\left(p_{H2O}\right)=10.79574\cdot\left(1-\frac{273.16}{282.65}\right)-5.02800\cdot\log_{10}\left(\frac{282.65}{273.16}\right)+1.50475\cdot10^{-4}\cdot\left(1-10^{-8.2969\cdot\left(\frac{282.65}{273.16}-1\right)}\right)$$

$$+0.42873\cdot10^{-3}\cdot\left(10^{4.76955\left(1-\frac{273.16}{282.65}\right)}-1\right)+0.2138602$$

$\log_{10}(p_{H20})$ = 0.074297

$p_{H20} = 10^{0.074297}$ = 1.186581 kPa

(2) For humidity measurements over ice at ambient temperatures from (−100 to 0) °C, use the following equation:

$$\log_{10}\left(p_{sat}\right)=9.096853\cdot\left(\frac{273.16}{T_{sat}}-1\right)-3.566506\cdot\log_{10}\left(\frac{273.16}{T_{sat}}\right)+0.876812\cdot\left(\frac{T_{sat}}{273.16}-1\right)-0.2138602 \qquad \text{Eq. 1065.645-2}$$

Example:

T_{ice} = −15.4 °C

T_{ice} = −15.4 + 273.15 = 257.75 K

$$\log_{10}\left(p_{sat}\right)=-9.096853\cdot\left(\frac{273.16}{257.75}-1\right)-3.566506\cdot\log_{10}\left(\frac{273.16}{257.75}\right)+$$

$$0.876812\cdot\left(1-\frac{257.75}{273.16}\right)-0.2138602$$

$\log_{10}(p_{H2O})$ = −0.798207

$p_{H2O} = 10^{0.79821}$ = 0.159145 kPa

(b) *Dewpoint.* If you measure humidity as a dewpoint, determine the amount of water in an ideal gas, x_{H2O}, as follows:

$$x_{H2O}=\frac{p_{H2O}}{p_{abs}} \qquad \text{Eq. 1065.645-3}$$

Where:

x_{H2O} = amount of water in an ideal gas.

p_{H2O} = water vapor pressure at the measured dewpoint, $T_{sat} = T_{dew}$.

p_{abs} = wet static absolute pressure at the location of your dewpoint measurement.

Example:

p_{abs} = 99.980 kPa

$T_{sat} = T_{dew}$ = 9.5 °C

Using Eq. 1065.645–1,

p_{H2O} = 1.18489 kPa

x_{H2O} = 1.18489/99.980

x_{H2O} = 0.011851 mol/mol

* * * * *

■ 233. Section 1065.650 is amended by revising paragraphs (b)(3), (c)(2)(i), (d)(8), (e)(4), (f)(2), and (g) and adding paragraph (h) to read as follows:

§ 1065.650 Emission calculations.

* * * * *

(b) * * *

(3) For field testing, you may calculate the ratio of total mass to total work, where these individual values are determined as described in paragraph (f) of this section. You may also use this approach for laboratory testing, consistent with good engineering judgment. This is a special case in which you use a signal linearly

proportional to raw exhaust molar flow rate to determine a value proportional to total emissions. You then use the same linearly proportional signal to determine total work using a chemical balance of fuel, intake air, and exhaust as described in § 1065.655, plus information about your engine's brake-specific fuel consumption. Under this method, flow meters need not meet accuracy specifications, but they must meet the applicable linearity and repeatability specifications in subpart D or subpart J of this part. The result is a brake-specific emission value calculated as follows:

$$e = \frac{\tilde{m}}{\tilde{W}} \qquad \text{Eq. 1065.650-3}$$

Example:

$\tilde{m}$ = 805.5 g
$\tilde{W}$ = 52.102 kW·hr
e_{CO} = 805.5/52.102
e_{CO} = 2.520 g/(kW·hr)

(c) * * *

(2) * * *

(i) *Varying flow rate.* If you continuously sample from a changing exhaust flow rate, time align and then multiply concentration measurements by the flow rate from which you extracted it. Use good engineering judgment to time align flow and concentration data to match transformation time, t_{50}, to within ±1 s. We consider the following to be examples of changing flows that require a continuous multiplication of concentration times molar flow rate: Raw exhaust, exhaust diluted with a constant flow rate of dilution air, and CVS dilution with a CVS flowmeter that does not have an upstream heat exchanger or electronic flow control. This multiplication results in the flow rate of the emission itself. Integrate the emission flow rate over a test interval to determine the total emission. If the total emission is a molar quantity, convert this quantity to a mass by multiplying it by its molar mass, *M*. The result is the mass of the emission, *m*. Calculate *m* for continuous sampling with variable flow using the following equations:

$$m = M \cdot \sum_{i=1}^{N} x_i \cdot \dot{n}_i \cdot \Delta t \qquad \text{Eq. 1065.650-4}$$

Where:

$$\Delta t = 1/f_{\text{record}} \qquad \text{Eq. 1065.650-5}$$

Example:

M_{NMHC} = 13.875389 g/mol
N = 1200
x_{NMHC1} = 84.5 μmol/mol = 84.5 · 10^{-6} mol/mol
x_{NMHC2} = 86.0 μmol/mol = 86.0 · 10^{-6} mol/mol
$\dot{n}_{exh1}$ = 2.876 mol/s
$\dot{n}_{exh2}$ = 2.224 mol/s
f_{record} = 1 Hz
Using Eq. 1065.650–5,
Δt = 1/1 =1 s
m_{NMHC} = 13.875389 · (84.5 · 10^{-6} · 2.876 + 86.0 · 10^{-6} · 2.224 + ... + $x_{NMHC1200}$ · $\dot{n}_{exh}$) · 1
m_{NMHC} = 25.53 g

* * * * *

(d) * * *

(8) You may use a trapezoidal integration method instead of the rectangular integration described in this paragraph (d). To do this, you must integrate the fraction of work between points where the torque is positive. You may assume that speed and torque are linear between data points. You may not set negative values to zero before running the integration.

(e) * * *

(4) The following example shows how to calculate mass of emissions using mean mass rate and mean power:

$\bar{M}_{CO}$ = 28.0101 g/mol
$\bar{x}_{CO}$ = 12.00 mmol/mol = 0.01200 mol/mol
$\bar{\dot{n}}$ = 1.530 mol/s
$\bar{f}_n$ = 3584.5 rev/min = 375.37 rad/s
$\bar{T}$ = 121.50 N · m
$\bar{\dot{m}}$ = 28.0101 · 0.01200 · 1.530
$\bar{\dot{m}}$ = 0.514 g/s = 1850.4 g/hr
$\bar{P}$ = 121.5 · 375.37
$\bar{P}$ = 45607 W
$\bar{P}$ = 45.607 kW
e_{CO} = 1850.4/45.61
e_{CO} = 40.57 g/(kW · hr)

(f) * * *

(2) *Total work.* To calculate a value proportional to total work over a test interval, integrate a value that is proportional to power. Use information about the brake-specific fuel consumption of your engine, e_{fuel}, to convert a signal proportional to fuel flow rate to a signal proportional to power. To determine a signal proportional to fuel flow rate, divide a signal that is proportional to the mass rate of carbon products by the fraction of carbon in your fuel, w_c. You may use a measured w_c or you may use the default values for a given fuel as described in § 1065.655. Calculate the mass rate of carbon from the amount of carbon and water in the exhaust, which you determine with a chemical balance of fuel, intake air, and exhaust as described in § 1065.655. In the chemical balance, you must use concentrations from the flow that generated the signal proportional to molar flow rate, $\tilde{n}$, in paragraph (e)(1) of this section. Calculate a value proportional to total work as follows:

$$W = \sum_{i=1}^{N} \tilde{P}_i \cdot \Delta t \qquad \text{Eq. 1065.650-15}$$

Where:

$$\tilde{P}_i = \frac{\tilde{\dot{m}}_{\mathrm{fuel}i}}{e_{\mathrm{fuel}}} \qquad \text{Eq. 1065.650-16}$$

* * * * *

(g) *Calculating cycle-weighted mean values.* Unless the standard-setting part specifies otherwise, use the approach specified in this paragraph (g) to calculate cycle-weighted means of different test segments or modes. Weighting factors are generally intended to represent the ratio of time spent operating at each mode in a theoretical duty cycle. Use good engineering judgment to calculate the cycle-weighted mean consistent with this intent. The following examples illustrate the two primary methods:

(1) For discrete-mode testing, a cycle-weighted mean may be calculated by dividing the sum of the weighted mass emission rates (weighting factor times mass emission rate in g/hr) by the sum of the weighted brake power (kW). You are not required to have identical sampling times for each mode with this approach.

(2) For any testing where the sampling time for each mode is identical, a cycle-weighted mean may be calculated by dividing the sum of the weighted mass emissions (weighting factor times total mass emission for the mode in g) by the sum of the weighted brake work (kW.hr).

(h) *Rounding.* Round emission values only after all calculations are complete and the result is in g/(kW·hr) or units equivalent to the units of the standard, such as g/(hp·hr). See the definition of ''Round'' in § 1065.1001.

■ 234. Section 1065.655 is amended by revising paragraphs (c) and (d) and adding paragraph (e) to read as follows:

§ 1065.655 Chemical balances of fuel, intake air, and exhaust.

* * * * *

(c) *Chemical balance procedure.* The calculations for a chemical balance involve a system of equations that require iteration. We recommend using a computer to solve this system of equations. You must guess the initial values of up to three quantities: The amount of water in the measured flow, x_{H2Oexh}, fraction of dilution air in diluted exhaust, $x_{dil/exh}$, and the amount of products on a C_1 basis per dry mole of dry measured flow, $x_{Ccombdry}$. You may use time-weighted mean values of combustion air humidity and dilution air humidity in the chemical balance; as long as your combustion air and dilution air humidities remain within tolerances of ±0.0025 mol/mol of their respective mean values over the test interval. For each emission concentration, x, and amount of water, x_{H2Oexh}, you must determine their completely dry concentrations, x_{dry} and $x_{H2Oexhdry}$. You must also use your fuel's atomic hydrogen-to-carbon ratio, α, and oxygen-to-carbon ratio, β. You may measure α and β or you may use default values for a given fuel as described in § 1065.655(d). Use the following steps to complete a chemical balance:

(1) Convert your measured concentrations such as, $x_{CO2meas}$, x_{NOmeas}, and x_{H2Oint}, to dry concentrations by dividing them by one minus the amount of water present during their respective measurements; for example: $x_{H2OxCO2meas}$, $x_{H2OxNOmeas}$, and x_{H2Oint}. If the amount of water present during a ''wet'' measurement is the same as the unknown amount of water in the exhaust flow, x_{H2Oexh}, iteratively solve for that value in the system of equations. If you measure only total NO_X and not NO and NO_2 separately, use good engineering judgment to estimate a split in your total NO_X concentration between NO and NO_2 for the chemical balances. For example, if you measure emissions from a stoichiometric spark-ignition engine, you may assume all NO_X is NO. For a compression-ignition engine, you may assume that your molar concentration of NO_X, x_{NOX}, is 75% NO and 25% NO_2. For NO_2 storage aftertreatment systems, you may assume x_{NOX} is 25% NO and 75% NO_2. Note that for calculating the mass of NO_X emissions, you must use the molar mass of NO_2 for the effective molar mass of all NO_X species, regardless of the actual NO_2 fraction of NO_X.

(2) Enter the equations in paragraph (c)(4) of this section into a computer program to iteratively solve for x_{H2Oexh}, $x_{Ccombdry}$, and $x_{dil/exh}$. Use good engineering judgment to guess initial values for x_{H2Oexh}, $x_{Ccombdry}$, and $x_{dil/exh}$. We recommend guessing an initial amount of water that is about twice the amount of water in your intake or dilution air. We recommend guessing an initial value of $x_{Ccombdry}$ as the sum of your measured CO_2, CO, and THC values. We also recommend guessing an initial $x_{dil/exh}$ between 0.75 and 0.95, such as 0.8. Iterate values in the system of equations until the most recently updated guesses are all within ±1% of their respective most recently calculated values.

(3) Use the following symbols and subscripts in the equations for this paragraph (c):

$x_{dil/exh}$ = Amount of dilution gas or excess air per mole of exhaust.
x_{H2Oexh} = Amount of water in exhaust per mole of exhaust.
$x_{Ccombdry}$ = Amount of carbon from fuel in the exhaust per mole of dry exhaust.
x_{H2dry} = Amount of H_2 in exhaust per amount of dry exhaust.
K_{H2Ogas} = Water-gas reaction equilibrium coefficient. You may use 3.5 or calculate your own value using good engineering judgment.
$x_{H2Oexhdry}$ = Amount of water in exhaust per dry mole of dry exhaust.
$x_{prod/intdry}$ = Amount of dry stoichiometric products per dry mole of intake air.
$x_{dil/exhdry}$ = Amount of dilution gas and/or excess air per mole of dry exhaust.
$x_{int/exhdry}$ = Amount of intake air required to produce actual combustion products per mole of dry (raw or diluted) exhaust.
$x_{raw/exhdry}$ = Amount of undiluted exhaust, without excess air, per mole of dry (raw or diluted) exhaust.
x_{O2int} = Amount of intake air O_2 per mole of intake air.
$x_{CO2intdry}$ = Amount of intake air CO_2 per mole of dry intake air. You may use $x_{CO2intdry}$ = 375 µmol/mol, but we recommend measuring the actual concentration in the intake air.
$x_{H2Ointdry}$ = Amount of intake air H_2O per mole of dry intake air.
x_{CO2int} = Amount of intake air CO_2 per mole of intake air.
x_{CO2dil} = Amount of dilution gas CO_2 per mole of dilution gas.
$x_{CO2dildry}$ = Amount of dilution gas CO_2 per mole of dry dilution gas. If you use air as diluent, you may use $x_{CO2dildry}$ = 375 µmol/mol, but we recommend measuring the actual concentration in the intake air.
$x_{H2Odildry}$ = Amount of dilution gas H_2O per mole of dry dilution gas.
x_{H2Odil} = Amount of dilution gas H_2O per mole of dilution gas.
$x_{[emission]meas}$ = Amount of measured emission in the sample at the respective gas analyzer.
$x_{[emission]dry}$ = Amount of emission per dry mole of dry sample.
$x_{H2O[emission]meas}$ = Amount of water in sample at emission-detection location. Measure or estimate these values according to § 1065.145(d)(2).
x_{H2Oint} = Amount of water in the intake air, based on a humidity measurement of intake air.
α = Atomic hydrogen-to-carbon ratio in fuel.
β = Atomic oxygen-to-carbon ratio in fuel.

(4) Use the following equations to iteratively solve for $x_{dil/exh}$, x_{H2Oexh}, and

$$x_{\text{dil/exh}} = 1 - \frac{x_{\text{raw/exhdry}}}{1 + x_{\text{H2Oexhdry}}} \quad \text{Eq. 1065.655-1}$$

$$x_{\text{H2Oexh}} = \frac{x_{\text{H2Oexhdry}}}{1 + x_{\text{H2Oexhdry}}} \quad \text{Eq. 1065.655-2}$$

$$x_{\text{Ccombdry}} = x_{\text{CO2dry}} + x_{\text{COdry}} + x_{\text{THCdry}} - x_{\text{CO2dil}} \times x_{\text{dil/exhdry}} - x_{\text{CO2int}} \times x_{\text{int/exhdry}} \quad \text{Eq. 1065.655-3}$$

$$x_{\text{H2dry}} = \frac{x_{\text{COdry}} \cdot \left(x_{\text{H2Oexhdry}} - x_{\text{H2Odil}} \cdot x_{\text{dil/exhdry}}\right)}{K_{\text{H2O-gas}} \cdot \left(x_{\text{CO2dry}} - x_{\text{CO2dil}} \cdot x_{\text{dil/exhdry}}\right)} \quad \text{Eq. 1065.655-4}$$

$$x_{\text{H2Oexhdry}} = \frac{\alpha}{2}\left(x_{\text{Ccombdry}} - x_{\text{THCdry}}\right) + x_{\text{H2Odil}} \times x_{\text{dil/exhdry}} + x_{\text{H2Oint}} \times x_{\text{int/exhdry}} - x_{\text{H2dry}} \quad \text{Eq. 1065.655-5}$$

$$x_{\text{dil/exhdry}} = \frac{x_{\text{dil/exh}}}{1 - x_{\text{H2Oexh}}} \quad \text{Eq. 1065.655-6}$$

$$x_{\text{int/exhdry}} = \frac{1}{2 \cdot x_{\text{O2int}}}\left[\left(\frac{\alpha}{2} - \beta + 2\right)\left(x_{\text{Ccombdry}} - x_{\text{THCdry}}\right) - \left(x_{\text{COdry}} - x_{\text{NOdry}} - 2x_{\text{NO2dry}} + x_{\text{H2dry}}\right)\right] \quad \text{Eq. 1065.655-7}$$

$$x_{\text{raw/exhdry}} = \frac{1}{2}\left[\left(\frac{\alpha}{2} + \beta\right)\left(x_{\text{Ccombdry}} - x_{\text{THCdry}}\right) + \left(2x_{\text{THCdry}} + x_{\text{COdry}} - x_{\text{NO2dry}} + x_{\text{H2dry}}\right)\right] + x_{\text{int/exhdry}} \quad \text{Eq. 1065.655-8}$$

$$x_{\text{O2int}} = \frac{0.209820 - x_{\text{CO2intdry}}}{1 + x_{\text{H2Ointdry}}} \quad \text{Eq. 1065.655-9}$$

$$x_{\text{CO2int}} = \frac{x_{\text{CO2intdry}}}{1 + x_{\text{H2Ointdry}}} \quad \text{Eq. 1065.655-10}$$

$$x_{\text{H2Ointdry}} = \frac{x_{\text{H2Oint}}}{1 - x_{\text{H2Oint}}} \quad \text{Eq. 1065.655-11}$$

$$x_{\text{CO2dil}} = \frac{x_{\text{CO2dildry}}}{1 + x_{\text{H2Odildry}}} \quad \text{Eq. 1065.655-12}$$

$$x_{\text{H2Odildry}} = \frac{x_{\text{H2Odil}}}{1 - x_{\text{H2Odil}}} \quad \text{Eq. 1065.655-13}$$

$$x_{\text{COdry}} = \frac{x_{\text{COmeas}}}{1 - x_{\text{H2OCOmeas}}} \quad \text{Eq. 1065.655-14}$$

$$x_{\text{CO2dry}} = \frac{x_{\text{CO2meas}}}{1 - x_{\text{H2OCO2meas}}} \quad \text{Eq. 1065.655-15}$$

$$x_{\text{NOdry}} = \frac{x_{\text{NOmeas}}}{1 - x_{\text{H2ONOmeas}}} \quad \text{Eq. 1065.655-16}$$

$$x_{\text{NO2dry}} = \frac{x_{\text{NO2meas}}}{1 - x_{\text{H2ONO2meas}}} \quad \text{Eq. 1065.655-17}$$

$$x_{\text{THCdry}} = \frac{x_{\text{THCmeas}}}{1 - x_{\text{H2OTHCmeas}}} \quad \text{Eq. 1065.655-18}$$

(5) The following example is a solution for $x_{\text{dil/exh}}$, x_{H2Oexh}, and x_{Ccombdry} using the equations in paragraph (c)(4) of this section:

$$x_{\text{dil/exh}} = 1 - \frac{0.184}{1 + \frac{35.50}{1000}} = 0.822 \; mol/mol$$

$$x_{\text{H2Oexh}} = \frac{35.50}{1 + \frac{35.50}{1000}} = 34.29 \; mmol/mol$$

$$x_{\text{Ccombdry}} = 0.025 + \frac{29.3}{1000000} + \frac{47.6}{1000000} - \frac{0.371}{1000} \times 0.852 - \frac{0.369}{1000} \times 0.172 = 0.0249 \; mol/mol$$

$$x_{\text{H2dry}} = \frac{29.3 \cdot (0.036 - 0.012 \cdot 0.852)}{3.5 \cdot \left(\frac{25.2}{1000} - \frac{0.371}{1000} \cdot 0.852 \right)} = 8.5 \mu mol/mol$$

$$x_{\text{H2Oexhdry}} = \frac{1.8}{2} \left(0.0247 - \frac{47.6}{1000000} \right) + 0.012 \cdot 0.852 + 0.017 \cdot 0.172 - \frac{8.5}{1000000} = 0.036 \; mol/mol$$

$$x_{\text{dil/exhdry}} = \frac{0.822}{1 - 0.036} = 0.852 \; mol/mol$$

$$x_{\text{int/exhdry}} = \frac{1}{2 \cdot 0.206} \left[\left(\frac{1.8}{2} - 0.050 + 2 \right) \left(0.0249 - \frac{47.6}{1000000} \right) - \left(\frac{29.3}{1000000} - \frac{50.4}{1000000} - 2 \cdot \frac{12.1}{1000000} + \frac{8.5}{1000000} \right) \right]$$
$$= 0.172 \; mol/mol$$

$$x_{\text{raw/exhdry}} = \frac{1}{2}\left[\left(\frac{1.8}{2}+0.050\right)\left(0.0249 - \frac{47.6}{1000000}\right)+\left(2\cdot\frac{47.6}{1000000}+\frac{29.3}{1000000}-\frac{12.1}{1000000}+\frac{8.5}{1000000}\right)\right]+0.172$$
$$= 0.184\ mol/mol$$

$$x_{\text{O2int}} = \frac{0.209820-0.000375}{1+\frac{17.22}{1000}} = 0.206\ mol/mol$$

$$x_{\text{CO2int}} = \frac{0.000375\times 1000}{1+\frac{17.22}{1000}} = 0.369\ mmol/mol$$

$$x_{\text{H2Ointdry}} = \frac{16.93}{1-\frac{16.93}{1000}} = 17.22\ mmol/mol$$

$$x_{\text{CO2dil}} = \frac{0.375}{1+\frac{12.01}{1000}} = 0.371\ mmol/mol$$

$$x_{\text{H2Odildry}} = \frac{11.87}{1-\frac{11.87}{1000}} = 12.01\ mmol/mol$$

$$x_{\text{COdry}} = \frac{29.0}{1-\frac{8.601}{1000}} = 29.3\ mmol/mol$$

$$x_{\text{CO2dry}} = \frac{24.98}{1-\frac{8.601}{1000}} = 25.2\ mmol/mol$$

$$x_{\text{NOdry}} = \frac{50.0}{1-\frac{8.601}{1000}} = 50.4\ mmol/mol$$

$$x_{\text{NO2dry}} = \frac{12.0}{1-\frac{8.601}{1000}} = 12.1\ mmol/mol$$

$$x_{\text{THCdry}} = \frac{46}{1-\frac{33.98}{1000}} = 47.6\ mmol/mol$$

$\alpha = 1.8$
$\beta = 0.05$

(d) Carbon mass fraction. Determine carbon mass fraction of fuel, w_c, using one of the following methods:

(1) You may calculate w_C using the following equation based on measured fuel properties:

$$w_C = \frac{1 \cdot M_C}{1 \cdot M_C + \alpha \cdot M_H + \beta \cdot M_O} \qquad \text{Eq. 1065.655-19}$$

Where:

w_C, = carbon mass fraction of fuel
α = atomic hydrogen-to-carbon ratio
β = atomic oxygen-to-carbon ratio
M_C = molar mass of carbon
M_H = molar mass of hydrogen
M_O = molar mass of oxygen

(2) You may use the default values in the following table to determine w_C for a given fuel:

TABLE 1 OF § 1065.655.—DEFAULT VALUES OF α β, AND w_C, FOR VARIOUS FUELS

Fuel	Atomic hydrogen and oxygen-to-carbon ratios $CH\alpha O\beta$	Carbon mass fraction, w_C g/g
Gasoline	$CH_{1.85}O_0$	0.866
#2 Diesel	$CH_{1.80}O_0$	0.869
#1 Diesel	$CH_{1.93}O_0$	0.861
Liquified Petroleum Gas	$CH_{2.64}O_0$	0.819
Natural gas	$CH_{3.78}O_{0.016}$	0.747
Ethanol	$CH_3O_{0.5}$	0.521
Methanol	CH_4O_1	0.375

(e) *Calculated raw exhaust molar flow rate from measured intake air molar flow rate or fuel mass flow rate.* You may calculate the raw exhaust molar flow rate from which you sampled emissions, $\dot{n}_{exh}$, based on the measured intake air molar flow rate, $\dot{n}_{int}$, or the measured fuel mass flow rate, $\dot{m}_{fuel}$, and the values calculated using the chemical balance in paragraph (c) of this section. Note that the chemical balance must be based on raw exhaust gas concentrations. Solve for the chemical balance in paragraph (c) of this section at the same frequency that you update and record $\dot{n}_{int}$ or $\dot{m}_{fuel}$.

(1) *Crankcase flow rate.* If engines are not subject to crankcase controls under the standard-setting part, you may calculate raw exhaust flow based on $\dot{n}_{int}$ or $\dot{m}_{fuel}$ using one of the following:

(i) You may measure flow rate through the crankcase vent and subtract it from the calculated exhaust flow.

(ii) You may estimate flow rate through the crankcase vent by engineering analysis as long as the uncertainty in your calculation does not adversely affect your ability to show that your engines comply with applicable emission standards.

(iii) You may assume your crankcase vent flow rate is zero.

(2) *Intake air molar flow rate calculation.* Based on $\dot{n}_{int}$, calculate $\dot{n}_{exh}$ as follows:

$$\dot{n}_{exh} = \frac{\dot{n}_{int}}{\left(1 + \frac{(x_{int/exhdry} - x_{raw/exhdry})}{(1 + x_{H2Oexhdry})}\right)} \qquad \text{Eq. 1065.655-20}$$

Where:

$\dot{n}_{exh}$ = raw exhaust molar flow rate from which you measured emissions.
$\dot{n}_{int}$ = intake air molar flow rate including humidity in intake air.

Example:

$\dot{n}_{int}$ = 3.780 mol/s
$x_{int/exhdry}$ = 0.69021 mol/mol
$x_{raw/exhdry}$ = 1.10764 mol/mol
$x_{H20exhdry}$ = 107.64 mmol/mol = 0.10764 mol/mol

$$\dot{n}_{exh} = \frac{3.780}{\left(1 + \frac{(0.69021 - 1.10764)}{(1 + 0.10764)}\right)}$$

$\dot{n}_{exh}$ = 6.066 mol/s

(3) *Fuel mass flow rate calculation.* Based on m_{fuel}, calculate $\dot{n}_{exh}$ as follows:

$$\dot{n}_{exh} = \frac{\dot{m}_{fuel} \cdot w_c \cdot \left(1 + x_{H2Oexhdry}\right)}{M_c \cdot x_{Ccombdry}} \qquad \text{Eq. 1065.655-21}$$

Where:

$\dot{n}_{exh}$ = raw exhaust molar flow rate from which you measured emissions.

$\dot{m}_{fuel}$ = fuel flow rate including humidity in intake air.

Example:

$\dot{m}_{fuel}$ = 7.559 g/s

w_C = 0.869 g/g

M_C = 12.0107 g/mol

$x_{Ccombdry}$ = 99.87 mmol/mol = 0.09987 mol/mol

$x_{H20exhdry}$ = 107.64 mmol/mol = 0.10764 mol/mol

$$\dot{n}_{exh} = \frac{7.559 \cdot 0.869 \cdot (1 + 0.10764)}{12.0107 \cdot 0.09987}$$

$\dot{n}_{exh}$ = 6.066 mol/s

■ 235. Section 1065.660 is amended by revising paragraphs (b)(2)(i) and (b)(3) to read as follows:

§ 1065.660 THC and NMHC determination.

* * * * *

(b) * * *

(2) * * *

(i) Use the following equation for penetration fractions determined using an NMC configuration as outlined in § 1065.365(d):

$$x_{NMHC} = \frac{x_{THC[THC\text{-}FID]cor} - x_{THC[NMC\text{-}FID]} \cdot RF_{CH4[THC\text{-}FID]}}{1 - RFPF_{C2H6[NMC\text{-}FID]} \cdot RF_{CH4[THC\text{-}FID]}} \qquad \text{Eq. 1065.660-2}$$

Where:

x_{NMHC} = concentration of NMHC.

$x_{THC[THC\text{–}FID]cor}$ = concentration of THC, HC contamination and dry-to-wet corrected, as measured by the THC FID during sampling while bypassing the NMC.

$x_{THC[NMC\text{–}FID]}$ = concentration of THC, HC contamination (optional) and dry-to-wet corrected, as measured by the NMC FID during sampling through the NMC.

$RF_{CH4[THC\text{–}FID]}$ = response factor of THC FID to CH_4, according to § 1065.360(d).

$RFPF_{C2H6[NMC\text{–}FID]}$ = nonmethane cutter combined ethane response factor and penetration fraction, according to § 1065.365(d).

Example:

$x_{THC[THC\text{–}FID]cor}$ = 150.3 µmol/mol

$x_{THC[NMC\text{–}FID]}$ = 20.5 µmol/mol

$RFPF_{C2H6[NMC\text{–}FID]}$ = 0.019

$RF_{CH4[THC\text{–}FID]}$ = 1.05

$$x_{NMHC} = \frac{150.3 - 20.5 \cdot 1.05}{1 - 0.019 \cdot 1.05}$$

x_{NMHC} = 131.4 µmol/mol

* * * * *

(3) For a gas chromatograph, calculate x_{NMHC} using the THC analyzer's response factor (*RF*) for CH_4, from § 1065.360, and the HC contamination and wet-to-dry corrected initial THC concentration $x_{THC[THC\text{-}FID]cor}$ as determined in section (a) above as follows:

$$x_{NMHC} = x_{THC[THC\text{-}FID]cor} - RF_{CH4[THC\text{-}FID]} \cdot x_{CH4} \qquad \text{Eq. 1065.660-5}$$

Where:

x_{NMHC} = concentration of NMHC.

$x_{THC[THC\text{-}FID]cor}$ = concentration of THC, HC contamination and dry-to-wet corrected, as measured by the THC FID.

x_{CH4} = concentration of CH_4, HC contamination (optional) and dry-to-wet corrected, as measured by the gas chromatograph FID.

$RF_{CH4[THC\text{-}FID]}$ = response factor of THC-FID to CH_4.

Example:

$x_{THC[THC\text{-}FID][cor}$ = 145.6 µmol/mol

$RF_{CH4[THC\text{-}FID]}$ = 0.970

x_{CH4} = 18.9 µmol/mol

x_{NMHC} = 145.6 − 0.970 · 18.9

x_{NMHC} = 127.3 µmol/mol

■ 236. Section 1065.667 is revised to read as follows:

§ 1065.667 Dilution air background emission correction.

(a) To determine the mass of background emissions to subtract from a diluted exhaust sample, first determine the total flow of dilution air, n_{dil}, over the test interval. This may be a measured quantity or a quantity calculated from the diluted exhaust flow and the flow-weighted mean fraction of dilution air in diluted exhaust, $\bar{x}_{dil/exh}$. Multiply the total flow of dilution air by the mean concentration of a background emission. This may be a time-weighted mean or a flow-weighted mean (e.g., a proportionally sampled background). The product of n_{dil} and the mean concentration of a background emission is the total amount of a background emission. If this is a molar quantity, convert it to a mass by multiplying it by its molar mass, *M*. The result is the mass of the background emission, *m*. In the case of PM, where the mean PM concentration is already in units of mass per mole of sample, $\bar{M}_{PM}$, multiply it by the total amount of dilution air, and the result is the total background mass of PM, m_{PM}. Subtract total background masses from total mass to correct for background emissions.

(b) You may determine the total flow of dilution air by a direct flow measurement. In this case, calculate the total mass of background as described in § 1065.650(c), using the dilution air flow, n_{dil}. Subtract the background mass from the total mass. Use the result in brake-specific emission calculations.

(c) You may determine the total flow of dilution air from the total flow of diluted exhaust and a chemical balance of the fuel, intake air, and exhaust as described in § 1065.655. In this case, calculate the total mass of background as described in § 1065.650(c), using the total flow of diluted exhaust, n_{dexh}, then multiply this result by the flow-weighted mean fraction of dilution air in diluted exhaust, $\bar{x}_{dil/exh}$. Calculate $\bar{x}_{dil/exh}$ using flow-weighted mean concentrations of emissions in the chemical balance, as described in § 1065.655. You may assume that your engine operates stoichiometrically, even if it is a lean-burn engine, such as a compression-ignition engine. Note that for lean-burn engines this assumption could result in an error in emission calculations. This error could occur because the chemical balances in § 1065.655 correct excess air passing through a lean-burn engine as if it was dilution air. If an emission concentration expected at the standard is about 100 times its dilution air background concentration, this error is negligible. However, if an emission concentration expected at the standard is similar to its background concentration, this error could be significant. If this error might affect your ability to show that your engines comply with applicable standards, we recommend that you remove background emissions from dilution air by HEPA filtration, chemical adsorption, or catalytic scrubbing. You might also consider using a partial-flow dilution technique such as a bag mini-diluter, which uses purified air as the dilution air.

(d) The following is an example of using the flow-weighted mean fraction of dilution air in diluted exhaust, $\bar{x}_{dil/exh}$, and the total mass of background emissions calculated using the total flow of diluted exhaust, n_{dexh}, as described in § 1065.650(c):

$$m_{bkgnd} = \bar{x}_{dil/exh} \cdot m_{bkgnddexh} \qquad \text{Eq. 1065.667-1}$$

$$m_{bkgnddexh} = M \cdot \bar{x}_{bkgnd} \cdot n_{dexh} \qquad \text{Eq. 1065.667-2}$$

Example:

$M_{NOx} = 46.0055$ g/mol

$\bar{x}_{bkgnd} = 0.05$ μmol/mol $= 0.05 \cdot 10^{-6}$ mol/mol

$n_{dexh} = 23280.5$ mol

$\bar{x}_{dil/exh} = 0.843$

$m_{bkgndNOxdexh} = 46.0055 \cdot 0.05 \cdot 10^{-6} \cdot 23280.5$

$m_{bkgndNOxdexh} = 0.0536$ g

$m_{bkgndNOx} = 0.843 \cdot 0.0536$

$m_{bkgndNOx} = 0.0452$ g

(e) The following is an example of using the fraction of dilution air in diluted exhaust, $x_{dil/exh}$, and the mass rate of background emissions calculated using the flow rate of diluted exhaust, $\dot{n}_{dexh}$, as described in § 1065.650(c):

$$\dot{m}_{bkgnd} = x_{dil/exh} \cdot \dot{m}_{bkgnddexh} \qquad \text{Eq. 1065.667-3}$$

$$\dot{m}_{bkgnddexh} = M \cdot x_{bkgnd} \cdot \dot{n}_{dexh} \qquad \text{Eq. 1065.667-4}$$

Example:

$M_{NOX} = 46.0055$ g/mol

$x_{bkgnd} = 0.05$ μmol/mol $= 0.05 \cdot 10^{-6}$ mol/mol

$\dot{n}_{dexh} = 23280.5$ mol/s

$x_{dil/exh} = 0.843$

$\dot{m}_{bkgndNOxdexh} = 46.0055 \cdot 0.05 \cdot 10^{-6} \cdot 23280.5$

$\dot{m}_{bkgndNOxdexh} = 0.0536$ g/hr

$\dot{m}_{bkgndNOx} = 0.843 \cdot 0.0536$

$\dot{m}_{bkgndNOx} = 0.0452$ g/hr

■ 237. Section 1065.675 is revised to read as follows:

§ 1065.675 CLD quench verification calculations.

Perform CLD quench-check calculations as follows:

(a) Perform a CLD analyzer quench verification test as described in § 1065.370.

(b) Estimate the maximum expected mole fraction of water during emission testing, x_{H2Oexp}. Make this estimate where the humidified NO span gas was introduced in § 1065.370(e)(6). When estimating the maximum expected mole fraction of water, consider the maximum expected water content in combustion air, fuel combustion products, and dilution air (if applicable). If you introduced the humidified NO span gas into the sample system upstream of a sample dryer during the verification test, you need not estimate the maximum expected mole fraction of water and you must set x_{H2Oexp} equal to $x_{H2Omeas}$.

(c) Estimate the maximum expected CO_2 concentration during emission testing, x_{CO2exp}. Make this estimate at the sample system location where the blended NO and CO_2 span gases are introduced according to § 1065.370(d)(10). When estimating the maximum expected CO_2 concentration, consider the maximum expected CO_2 content in fuel combustion products and dilution air.

(d) Calculate quench as follows:

$$quench = \left(\left(\frac{\frac{x_{NOwet}}{1 - x_{H2Omeas}}}{x_{NOdry}} - 1 \right) \cdot \frac{x_{H2Oexp}}{x_{H2Omeas}} + \left(\frac{x_{NOmeas}}{x_{NOact}} - 1 \right) \cdot \frac{x_{CO2exp}}{x_{CO2act}} \right) \cdot 100\% \qquad \text{Eq. 1065.675-1}$$

Where:

quench = amount of CLD quench.

x_{NOdry} = concentration of NO upstream of a bubbler, according to § 1065.370(e)(4).

x_{NOwet} = measured concentration of NO downstream of a bubbler, according to § 1065.370(e)(9).

x_{H2Oexp} = maximum expected mole fraction of water during emission testing, according to paragraph (b) of this section.

$x_{H2Omeas}$ = measured mole fraction of water during the quench verification, according to § 1065.370(e)(7).

x_{NOmeas} = measured concentration of NO when NO span gas is blended with CO_2 span gas, according to § 1065.370(d)(10).

x_{NOact} = actual concentration of NO when NO span gas is blended with CO_2 span gas, according to § 1065.370(d)(11) and calculated according to Equation 1065.675–2.

x_{CO2exp} = maximum expected concentration of CO_2 during emission testing, according to paragraph (c) of this section.

x_{CO2act} = actual concentration of CO_2 when NO span gas is blended with CO_2 span gas, according to § 1065.370(d)(9).

$$x_{\mathrm{NOact}} = \left(1 - \frac{x_{\mathrm{CO2act}}}{x_{\mathrm{CO2span}}}\right) \cdot x_{\mathrm{NOspan}} \qquad \text{Eq.1065.675} - 2$$

Where:

x_{NOspan} = the NO span gas concentration input to the gas divider, according to § 1065.370(d)(5).

$x_{CO2span}$ = the CO_2 span gas concentration input to the gas divider, according to § 1065.370(d)(4).

Example:

x_{NOdry} = 1800.0 µmol/mol

x_{NOwet} = 1729.6 µmol/mol

x_{H2Oexp} = 0.030 mol/mol

$x_{H2Omeas}$ = 0.030 mol/mol

x_{NOmeas} = 1495.2 µmol/mol

x_{NOspan} = 3001.6 µmol/mol

x_{CO2exp} = 3.2%

$x_{CO2span}$ = 6.00%

x_{CO2act} = 2.98%

$$x_{\mathrm{NOact}} = \left(1 - \frac{2.98}{6.00}\right) \cdot\ 3001.6 = 1510.8\ \mu\mathrm{mol/mol}$$

$$quench = \left(\left(\frac{\dfrac{1729.6}{1-0.030}}{1800.0} - 1 \right) \cdot \frac{0.030}{0.030} + \left(\frac{1495.2}{1510.8} - 1 \right) \cdot \frac{3.2}{2.98} \right) \cdot 100\%$$

quench = (− 0.00939–0.01109) · 100% = − 2.0048% = − 2%

Subpart H—[Amended]

■ 238. Section 1065.701 is amended by redesignating paragraph (e) as paragraph (f) and adding a new paragraph (e) to read as follows:

§ 1065.701 General requirements for test fuels.

* * * * *

(e) Two-stroke fuel/oil mixing. For two-stroke engines, use a fuel/oil mixture meeting the manufacturer's specifications.

* * * * *

■ 239. Section 1065.703 is amended by revising Table 1 to read as follows:

§ 1065.703 Distillate diesel fuel.

* * * * *

TABLE 1 OF § 1065.703—TEST FUEL SPECIFICATIONS FOR DISTILLATE DIESEL FUEL

Item	Units	Ultra low sulfur	Low sulfur	High sulfur	Reference procedure[1]
Cetane Number	—	40–50	40–50	40–50	ASTM D613–05
Distillation range:	°C				
Initial boiling point		171–204	171–204	171–204	ASTM D86–07a.
10 pct. point		204–238	204–238	204–238	
50 pct. point		243–282	243–282	243–282	
90 pct. point		293–332	293–332	293–332	
Endpoint		321–366	321–366	321–366	
Gravity	°API	32–37	32–37	32–37	ASTM D4052–96e01.
Total sulfur, ultra low sulfur	mg/kg	7–15			See 40 CFR 80.580.
Total sulfur, low and high sulfur	mg/kg		300–500	2000–4000	ASTM D2622–07 or alternates as allowed under 40 CFR 80.580.
Aromatics, min. (Remainder shall be paraffins, naphthalenes, and olefins).	g/kg	100	100	100	ASTM D5186–03.
Flashpoint, min.	°C	54	54	54	ASTM D93–07.
Kinematic Viscosity	cSt	2.0–3.2	2.0–3.2	2.0–3.2	ASTM D445–06

[1] ASTM procedures are incorporated by reference in § 1065.1010. See § 1065.701(d) for other allowed procedures.

Subpart J—[Amended]

■ 240. Section 1065.915 is amended by revising paragraph (a) to read as follows:

§ 1065.915 PEMS instruments.

(a) *Instrument specifications.* We recommend that you use PEMS that meet the specifications of subpart C of this part. For unrestricted use of PEMS in a laboratory or similar environment, use a PEMS that meets the same specifications as each lab instrument it replaces. For field testing or for testing with PEMS in a laboratory or similar environment, under the provisions of § 1065.905(b), the specifications in the following table apply instead of the specifications in Table 1 of § 1065.205.

TABLE 1 OF § 1065.915—RECOMMENDED MINIMUM PEMS MEASUREMENT INSTRUMENT PERFORMANCE

Measurement	Measured quantity symbol	Rise time, t_{10-90}, and Fall time, t_{90-10}	Recording update frequency	Accuracy [1]	Repeatability [1]	Noise [1]
Engine speed transducer	f_n	1 s	1 Hz means	5.0 % of pt. or 1.0 % of max.	2.0 % of pt. or 1.0 % of max.	0.5 % of max.
Engine torque estimator, BSFC (This is a signal from an engine's ECM).	T or BSFC	1 s	1 Hz means	8.0 % of pt. or 5 % of max.	2.0 % of pt. or 1.0 % of max.	1.0 % of max.
General pressure transducer (not a part of another instrument).	p	5 s	1 Hz	5.0 % of pt. or 5.0 % of max.	2.0 % of pt. or 0.5 % of max.	1.0 % of max.
Atmospheric pressure meter	p_{atmos}	50 s	0.1 Hz	250 Pa	200 Pa	100 Pa.
General temperature sensor (not a part of another instrument).	T	5 s	1 Hz	1.0 % of pt. K or 5 K.	0.5 % of pt. K or 2 K.	0.5 % of max 0.5 K.
General dewpoint sensor	T_{dew}	50 s	0.1 Hz	3 K	1 K	1 K.
Exhaust flow meter	$\dot{n}$	1 s	1 Hz means	5.0 % of pt. or 3.0 % of max.	2.0 % of pt	2.0 % of max.
Dilution air, inlet air, exhaust, and sample flow meters.	$\dot{n}$	1 s	1 Hz means	2.5 % of pt. or 1.5 % of max.	1.25 % of pt. or 0.75 % of max.	1.0 % of max.
Continuous gas analyzer	x	5 s	1 Hz	4.0 % of pt. or 4.0 % of meas.	2.0 % of pt. or 2.0 % of meas.	1.0 % of max.
Gravimetric PM balance	m_{PM}	N/A	N/A	See § 1065.790	0.5 µg	N/A.
Inertial PM balance	m_{PM}	5 s	1 Hz	4.0 % of pt. or 4.0 % of meas.	2.0 % of pt. or 2.0 % of meas.	1.0 % of max.

[1] Accuracy, repeatability, and noise are all determined with the same collected data, as described in § 1065.305, and based on absolute values. "pt." refers to the overall flow-weighted mean value expected at the standard; "max." refers to the peak value expected at the standard over any test interval, not the maximum of the instrument's range; "meas" refers to the actual flow-weighted mean measured over any test interval.

* * * * *

■ 241. Section 1065.925 is amended by revising paragraph (h)(4) to read as follows:

§ 1065.925 PEMS preparation for field testing.

* * * * *

(h) * * *

(4) Overflow zero or ambient air at the HC probe inlet or into a tee near the probe outlet.

* * * * *

Subpart K—[Amended]

■ 242. Section 1065.1001 is amended by adding definitions for ''Calibration gas'', ''Span gas'', ''Transformation time, t_{50}'', ''t_{0-50}'', and ''t_{100-50}'' in alphabetical order to read as follows:

§ 1065.1001 Definitions.

* * * * *

Calibration gas means a purified gas mixture used to calibrate gas analyzers. Calibration gases must meet the specifications of § 1065.750. Note that calibration gases and span gases are qualitatively the same, but differ in terms of their primary function. Various performance verification checks for gas analyzers and sample handling components might refer to either calibration gases or span gases.

* * * * *

Span gas means a purified gas mixture used to span gas analyzers. Span gases must meet the specifications of § 1065.750. Note that calibration gases and span gases are qualitatively the same, but differ in terms of their primary function. Various performance verification checks for gas analyzers and sample handling components might refer to either calibration gases or span gases.

* * * * *

Transformation time, t_{50}, means the overall system response time to any step change in input, generally the average of the time to reach 50% response to a step increase, t_{0-50}, or to a step decrease, t_{100-50}.

t_{0-50} means the time interval of a measurement system's response after any step increase to the input between the following points:

(1) The point at which the step change is initiated at the sample probe.

(2) The point at which the response has risen 50% of the total amount it will rise in response to the step change.

t_{100-50} means the time interval of a measurement system's response after any step decrease to the input between the following points:

(1) The point at which the step change is initiated at the sample probe.

(2) The point at which the response has fallen 50% of the total amount it will fall in response to the step change.

* * * * *

■ 243. Section 1065.1005 is amended by revising paragraph (a) to read as follows:

§ 1065.1005 Symbols, abbreviations, acronyms, and units of measure.

* * * * *

(a) *Symbols for quantities.* This part uses the following symbols and units of measure for various quantities:

Symbol	Quantity	Unit	Unit symbol	Base SI units
%	percent	0.01	%	10^{-2}
α	atomic hydrogen to carbon ratio	mole per mole	mol/mol	1
A	area	square meter	m^2	m^2
A_0	intercept of least squares regression.			
A_1	slope of least squares regression.			
β	ratio of diameters	meter per meter	m/m	1
β	atomic oxygen to carbon ratio	mole per mole	mol/mol	1
$C^{\#}$	number of carbon atoms in a molecule.			
d	Diameter	meter	m	m
DR	dilution ratio	mole per mol	mol/mol	1
ε	error between a quantity and its reference.			
e	brake-specific basis	gram per kilowatt hour	g/(kW.h)	$g.3.6^{-1} \cdot 10^{6} \cdot m^{-2} \cdot kgs^{2}$
F	F-test statistic.			
f	frequency	hertz	Hz	s^{-1}
f_n	rotational frequency (shaft)	revolutions per minute	rev/min	$2 \cdot pi \cdot 60^{-1} \cdot s^{-1}$
γ	ratio of specific heats	(joule per kilogram kelvin) per (joule per kilogram kelvin).	(J/(kg.K))/(J/(kg.K)).	1
K	correction factor			1
l	length	meter	m	m
μ	viscosity, dynamic	pascal second	Pa's	$m^{-1} \cdot kg \cdot s^{-1}$
M	molar mass[1]	gram per mole	g/mol	$10^{-3} \cdot kg \cdot mol^{-1}$
m	mass	kilogram	kg	kg
$\dot{m}$	mass rate	kilogram per second	kg/s	$kg \cdot s^{-1}$
v	viscosity, kinematic	meter squared per second	m^2/s	$m^2 \cdot s^{-1}$
N	total number in series.			
n	amount of substance	mole	mol	mol
$\dot{n}$	amount of substance rate	mole per second	mol/s	$mol \cdot s^{-1}$
P	power	kilowatt	kW	$10^3 \cdot m^2 \cdot kg \cdot s^{-3}$
PF	penetration fraction.			
p	pressure	pascal	Pa	$m^{-1} \cdot kg \cdot s^{-2}$
ρ	mass density	kilogram per cubic meter	kg/m^3	$kg \cdot m^{-3}$
r	ratio of pressures	pascal per pascal	Pa/Pa	1
R^2	coefficient of determination.			
Ra	average surface roughness	micrometer	μm	m^{-6}
$Re^{\#}$	Reynolds number.			
RF	response factor.			
RH %	relative humidity	0.01	%	10^{-2}
σ	non-biased standard deviation.			
S	Sutherland constant	kelvin	K	K
SEE	standard estimate of error.			
T	absolute temperature	kelvin	K	K
T	Celsius temperature	degree Celsius	°C	K–273.15
T	torque (moment of force)	newton meter	N·m	$m^2 \cdot kg \cdot s^{-2}$
t	time	second	s	s
Δt	time interval, period, 1/frequency	second	s	s
V	volume	cubic meter	m^3	m^3
$\dot{V}$	volume rate	cubic meter per second	m^3/s	$m^3 \cdot s^{-1}$
W	work	kilowatt hour	kW.h	$3.6 \cdot 10^{-6} \cdot m^2 \cdot kg \cdot s^{-2}$
w_c	carbon mass fraction	gram per gram	g/g	1
x	amount of substance mole fraction[2]	mole per mole	mol/mol	1
$\bar{X}$	flow-weighted mean concentration	mole per mole	mol/mol	1
y	generic variable.			

[1] See paragraph (f)(2) of this section for the values to use for molar masses. Note that in the cases of NO_X and HC, the regulations specify effective molar masses based on assumed speciation rather than actual speciation.

[2] Note that mole fractions for THC, THCE, NMHC, NMHCE, and NOTHC are expressed on a C_1 equivalent basis.

* * * * *

■ 244. Section 1065.1010 is amended by revising paragraph (d) to read as follows:

§ 1065.1010 Reference materials.

* * * * *

(d) *SAE material.* Table 4 of this section lists material from the Society of Automotive Engineering that we have incorporated by reference. The first column lists the number and name of the material. The second column lists the sections of this part where we reference it. Anyone may purchase copies of these materials from the Society of Automotive Engineers, 400 Commonwealth Drive, Warrendale, PA 15096 or *http://www.sae.org*. Table 4 follows:

TABLE 4 OF § 1065.1010—SAE MATERIAL

Document number and name	Part 1065 reference
"Optimization of Flame Ionization Detector for Determination of Hydrocarbon in Diluted Automotive Exhausts," Reschke Glen D., SAE 770141	1065.360

* * * * *

■ 245. Part 1068 is revised to read as follows:

PART 1068—GENERAL COMPLIANCE PROVISIONS FOR NONROAD PROGRAMS

Authority: 42 U.S.C. 7401–7671q.

Subpart A—Applicability and Miscellaneous Provisions

§ 1068.1 Does this part apply to me?

(a) The provisions of this part apply to everyone with respect to the following engines and to equipment using the following engines (including owners, operators, parts manufacturers, and persons performing maintenance).

(1) Locomotives we regulate under 40 CFR part 1033.

(2) Land-based nonroad compression-ignition engines we regulate under 40 CFR part 1039.

(3) Stationary compression-ignition engines certified using the provisions of 40 CFR part 1039, as indicated in 40 CFR part 60, subpart IIII.

(4) Marine diesel engines we regulate under 40 CFR part 1042.

(5) Marine spark-ignition engines we regulate under 40 CFR part 1045.

(6) Large nonroad spark-ignition engines we regulate under 40 CFR part 1048.

(7) Stationary spark-ignition engines certified using the provisions of 40 CFR parts 1048 or 1054, as indicated in 40 CFR part 60, subpart JJJJ.

(8) Recreational engines and vehicles we regulate under 40 CFR part 1051 (such as snowmobiles and off-highway motorcycles).

(9) Small nonroad spark-ignition engines we regulate under 40 CFR part 1054.

(b) This part does not apply to any of the following engine or vehicle categories:

(1) Light-duty motor vehicles (see 40 CFR part 86).

(2) Heavy-duty motor vehicles and motor vehicle engines (see 40 CFR part 86).

(3) Aircraft engines (see 40 CFR part 87).

(4) Land-based nonroad diesel engines we regulate under 40 CFR part 89.

(5) Small nonroad spark-ignition engines we regulate under 40 CFR part 90.

(6) Marine spark-ignition engines we regulate under 40 CFR part 91.

(7) Locomotive engines we regulate under 40 CFR part 92.

(8) Marine diesel engines we regulate under 40 CFR parts 89 or 94.

(c) Paragraph (a) of this section identifies the parts of the CFR that define emission standards and other requirements for particular types of engines and equipment. This part 1068 refers to each of these other parts generically as the ''standard-setting part.'' For example, 40 CFR part 1051 is always the standard-setting part for snowmobiles. Follow the provisions of the standard-setting part if they are different than any of the provisions in this part.

(d)(1) The provisions of §§ 1068.30, 1068.310, and 1068.320 apply for stationary spark-ignition engines built on or after January 1, 2004, and for stationary compression-ignition engines built on or after January 1, 2006.

(2) The provisions of §§ 1068.30 and 1068.235 apply for the types of engines/equipment listed in paragraph (a) of this section beginning January 1, 2004, if they are used solely for competition.

§ 1068.2 How does this part apply for engines and how does it apply for equipment?

(a) See the standard-setting part to determine if engine-based and/or equipment-based standards apply. (Note: Some equipment is subject to engine-based standards for exhaust emission and equipment-based standards for evaporative emissions.)

(b) The provisions of this part apply differently depending on whether the engine or equipment is required to be certified.

(1) Subpart A and subpart B of this part apply to engines and equipment, without regard to which is subject to certification requirements in the standard-setting part.

(2) Subparts C, D, and E of this part apply to the engines or to the equipment, whichever is subject to certification requirements in the standard-setting part.

(3) Subpart F of this part generally applies to the engines or to the equipment, whichever is subject to standards under the standard-setting part. However, since subpart F of this part addresses in-use engines and equipment (in which the engine is installed in the equipment), the requirements do not always distinguish between engines and equipment.

(c) For issues related to testing, read the term ''engines/equipment'' to mean engines for engines subject to engine-based testing and equipment for equipment subject to equipment-based testing; otherwise, read the term ''engines/equipment'' to mean engines for sources subject to engine-based standards and equipment for sources subject to equipment-based standards.

(d) When we use the term engines (rather than engines/equipment), read it to mean engines without regard to whether the source is subject to engine-based standards or testing. When we use the term equipment (rather than engines/equipment), read it to mean equipment without regard to whether the source is subject to equipment-based standards or testing. (Note: The definition of ''equipment'' in § 1068.30 includes the engine.)

(e) The terminology convention described in this section is not intended to limit our authority or your obligations under the Clean Air Act.

§ 1068.5 How must manufacturers apply good engineering judgment?

(a) You must use good engineering judgment for decisions related to any requirements under this chapter. This includes your applications for certification, any testing you do to show that your certification, production-line, and in-use engines/equipment comply with requirements that apply to them, and how you select, categorize, determine, and apply these requirements.

(b) If we send you a written request, you must give us a written description of the engineering judgment in question. Respond within 15 working days of receiving our request unless we allow more time.

(c) We may reject your decision if it is not based on good engineering judgment or is otherwise inconsistent with the requirements that apply, based on the following provisions:

(1) We may suspend, revoke, or void a certificate of conformity if we determine you deliberately used incorrect information or overlooked important information, that you did not decide in good faith, or that your decision was not rational.

(2) If we believe a different decision would better reflect good engineering judgment, but none of the provisions of paragraph (c)(1) of this section apply, we will tell you of our concern (and its basis). You will have 30 days to respond to our concerns, or more time if we agree that you need it to generate more information. After considering your information, we will give you a final ruling. If we conclude that you did not use good engineering judgment, we may reject your decision and apply the new ruling to similar situations as soon as possible.

(d) We will tell you in writing of the conclusions we reach under paragraph (c) of this section and explain our reasons for them.

(e) If you disagree with our conclusions, you may file a request for a hearing with the Designated Compliance Officer as described in subpart G of this part. In your request, specify your objections, include data or supporting analysis, and get your authorized representative's signature. If we agree that your request raises a substantial factual issue, we will hold the hearing according to subpart F of this part.

§ 1068.10 What provisions apply to confidential information?

(a) Clearly show what you consider confidential by marking, circling, bracketing, stamping, or some other method.

(b) We will store your confidential information as described in 40 CFR part 2. Also, we will disclose it only as specified in 40 CFR part 2. This applies both to any information you send us and to any information we collect from inspections, audits, or other site visits.

(c) If you send us a second copy without the confidential information, we will assume it contains nothing confidential whenever we need to release information from it.

(d) If you send us information without claiming it is confidential, we may make it available to the public without further notice to you, as described in 40 CFR 2.204.

§ 1068.15 What general provisions apply for EPA decision-making?

(a) The Administrator of the Environmental Protection Agency or any official to whom the Administrator has delegated specific authority may represent the Agency. For more information, ask for a copy of the relevant sections of the EPA Delegations Manual from the Designated Compliance Officer.

(b) The regulations in this part and in the standard-setting part have specific requirements describing how to get EPA approval before you take specific actions. These regulations also allow us to waive some specific requirements. For provisions or flexibilities that we address frequently, we may choose to provide detailed guidance in supplemental compliance instructions for manufacturers. Such instructions will generally state how they relate to the need for pre-approval. Unless we explicitly state so, you should not consider full compliance with the instructions to be equivalent to EPA approval.

§ 1068.20 May EPA enter my facilities for inspections?

(a) We may inspect your testing, manufacturing processes, storage facilities (including port facilities for imported engines and equipment or other relevant facilities), or records, as authorized by the Clean Air Act, to enforce the provisions of this chapter. Inspectors will have authorizing credentials and will limit inspections to reasonable times—usually, normal operating hours.

(b) If we come to inspect, we may or may not have a warrant or court order.

(1) If we do not have a warrant or court order, you may deny us entry.

(2) If we have a warrant or court order, you must allow us to enter the facility and carry out the activities it describes.

(c) We may seek a warrant or court order authorizing an inspection described in this section whether or not we first tried to get your permission to inspect.

(d) We may select any facility to do any of the following:

(1) Inspect and monitor any aspect of engine or equipment manufacturing, assembly, storage, or other procedures, and any facilities where you do them.

(2) Inspect and monitor any aspect of engine or equipment test procedures or test-related activities, including test engine/equipment selection, preparation, service accumulation, emission duty cycles, and maintenance and verification of your test equipment's calibration.

(3) Inspect and copy records or documents related to assembling, storing, selecting, and testing an engine or piece of equipment.

(4) Inspect and photograph any part or aspect of engines or equipment and components you use for assembly.

(e) You must give us reasonable help without charge during an inspection authorized by the Clean Air Act. For example, you may need to help us arrange an inspection with the facility's managers, including clerical support, copying, and translation. You may also need to show us how the facility operates and answer other questions. If we ask in writing to see a particular employee at the inspection, you must ensure that he or she is present (legal counsel may accompany the employee).

(f) If you have facilities in other countries, we expect you to locate them in places where local law does not keep us from inspecting as described in this section. We will not try to inspect if we learn that local law prohibits it, but we may suspend your certificate if we are not allowed to inspect.

§ 1068.25 What information must I give to EPA?

If you are subject to the requirements of this part, we may require you to give us information to evaluate your compliance with any regulations that apply, as authorized by the Clean Air Act. This includes the following things:

(a) You must provide the information we require in this chapter. We may require an authorized representative of your company to approve and sign any submission of information to us, and to certify that the information is accurate and complete.

(b) You must establish and maintain records, perform tests, make reports and provide additional information that we may reasonably require under section 208 of the Clean Air Act (42 U.S.C. 7542). This also applies to engines/equipment we exempt from emission standards or prohibited acts. Unless we specify otherwise, you must keep required records for eight years.

§ 1068.27 May EPA conduct testing with my production engines/equipment?

If we request it, you must make a reasonable number of production-line engines or pieces of production-line equipment available for a reasonable time so we can test or inspect them for compliance with the requirements of this chapter.

§ 1068.30 What definitions apply to this part?

The following definitions apply to this part. The definitions apply to all subparts unless we note otherwise. All undefined terms have the meaning the Clean Air Act gives to them. The definitions follow:

Aftertreatment means relating to a catalytic converter, particulate filter, or any other system, component, or technology mounted downstream of the exhaust valve (or exhaust port) whose design function is to reduce emissions in the engine exhaust before it is exhausted to the environment. Exhaust-gas recirculation (EGR) is not aftertreatment.

Aircraft means any vehicle capable of sustained air travel above treetop heights.

Certificate holder means a manufacturer (including importers) with a currently valid certificate of conformity for at least one family in a given model year.

Clean Air Act means the Clean Air Act, as amended, 42 U.S.C. 7401-7671q.

Date of manufacture means one of the following:

(1) For engines, the date on which the crankshaft is installed in an engine block, with the following exceptions:

(i) For engines produced by secondary engine manufacturers under § 1068.262, date of manufacture means the date the engine is received from the original engine manufacturer. You may assign an earlier date up to 30 days before you received the engine, but not before the crankshaft was installed. You may not assign an earlier date if you cannot demonstrate the date the crankshaft was installed.

(ii) Manufacturers may assign a date of manufacture at a point in the assembly process later than the date otherwise specified under this definition. For example, a manufacturer may use the build date printed on the label or stamped on the engine as the date of manufacture.

(2) For equipment, the date on which the engine is installed, unless otherwise specified in the standard-setting part. Manufacturers may alternatively assign a date of manufacture later in the assembly process.

Days means calendar days, including weekends and holidays.

Defeat device has the meaning given in the standard-setting part.

Designated Compliance Officer means the Manager, Heavy-Duty and Nonroad

Engine Group (6405-J), U.S. Environmental Protection Agency, 1200 Pennsylvania Ave., Washington, DC 20460.

Designated Enforcement Officer means the Director, Air Enforcement Division (2242A), U.S. Environmental Protection Agency, 1200 Pennsylvania Ave., NW.,Washington, DC 20460.

Engine means an engine block with an installed crankshaft. The term engine does not include engine blocks without an installed crankshaft, nor does it include any assembly of engine components that does not include the engine block. (Note: For purposes of this definition, any component that is the primary means of converting an engine's energy into usable work is considered a crankshaft, whether or not it is known commercially as a crankshaft.) This includes complete and partially complete engines as follows:

(1) A complete engine is a fully assembled engine in its final configuration. In the case of equipment-based standards, an engine is not considered complete until it is installed in the equipment, even if the engine itself is fully assembled.

(2) A partially complete engine is an engine that is not fully assembled or is not in its final configuration. Except where we specify otherwise in this part or the standard-setting part, partially complete engines are subject to the same standards and requirements as complete engines. The following would be considered examples of partially complete engines:

(i) An engine that is missing certain emission-related components.

(ii) A new engine that was originally assembled as a motor-vehicle engine that will be recalibrated for use as a nonroad engine.

(iii) A new engine that was originally assembled as a land-based engine that will be modified for use as a marine propulsion engine.

(iv) A short block consisting of a crankshaft and other engine components connected to the engine block, but missing the head assembly.

(v) A long block consisting of all engine components except the fuel system and an intake manifold.

(vi) In the case of equipment-based standards, a fully functioning engine that is not yet installed in the equipment. For example, a fully functioning engine that will be installed in an off-highway motorcycle or a locomotive is considered partially complete until it is installed in the equipment.

Engine-based standard means an emission standard expressed in units of grams of pollutant per kilowatt-hour that applies to the engine. Emission standards are either engine-based or equipment-based. Note that engines may be subject to additional standards such as smoke standards.

Engine-based test means an emission test intended to measure emissions in units of grams of pollutant per kilowatt-hour, without regard to whether the standard applies to the engine or equipment. Note that some products that are subject to engine-based testing are subject to additional test requirements such as for smoke.

Engine/equipment and *engines/equipment* mean engine(s) and/or equipment depending on the context. Specifically these terms mean the following:

(1) Engine(s) when only engine-based standards apply.

(2) Engine(s) for testing issues when engine-based testing applies.

(3) Engine(s) and equipment when both engine-based and equipment-based standards apply.

(4) Equipment when only equipment-based standards apply.

(5) Equipment for testing issues when equipment-based testing applies.

Equipment means one of the following things:

(1) Any vehicle, vessel, or other type of equipment that is subject to the requirements of this part or that uses an engine that is subject to the requirements of this part. An installed engine is part of the equipment.

(2) Fuel-system components that are subject to an equipment-based standard under this chapter. Installed fuel-system components are part of the engine.

Equipment-based standard means an emission standard that applies to the equipment in which an engine is used or to fuel-system components associated with an engine, without regard to how the emissions are measured. If equipment-based standards apply, we require that the equipment or fuel-system components be certified rather than just the engine. Emission standards are either engine-based or equipment-based. For example, recreational vehicles we regulate under 40 CFR part 1051 are subject to equipment-based standards even if emission measurements are based on engine operation alone.

Exempted means relating to engines/equipment that are not required to meet otherwise applicable standards. Exempted engines/equipment must conform to regulatory conditions specified for an exemption in this part 1068 or in the standard-setting part. Exempted engines/equipment are deemed to be ''subject to'' the standards of the standard-setting part even though they are not required to comply with the otherwise applicable requirements. Engines/equipment exempted with respect to a certain tier of standards may be required to comply with an earlier tier of standards as a condition of the exemption; for example, engines exempted with respect to Tier 3 standards may be required to comply with Tier 1 or Tier 2 standards.

Family means engine family or emission family, as applicable under the standard-setting part.

Final deteriorated test result has the meaning given in the standard-setting part. If it is not defined in the standard-setting part, it means the emission level that results from applying all appropriate adjustments (such as deterioration factors) to the measured emission result of the emission-data engine.

Good engineering judgment means judgments made consistent with generally accepted scientific and engineering principles and all available relevant information.

Manufacturer has the meaning given in section 216(1) of the Clean Air Act (42 U.S.C. 7550(1)). In general, this term includes any person who manufactures an engine or piece of equipment for sale in the United States or otherwise introduces a new engine or piece of equipment into U.S. commerce. This includes importers that import new engines or new equipment into the United States for resale. It also includes secondary engine manufacturers.

Model year has the meaning given in the standard-setting part. Unless the standard-setting part specifies otherwise, model year for individual engines/equipment is based on the date of manufacture or a later stage in the assembly process determined by the manufacturer, subject to the limitations described in §§ 1068.103 and 1068.360. The model year of a new engine that is neither certified nor exempt is deemed to be the calendar year in which it is sold, offered for sale, imported, or delivered or otherwise introduced into U.S. commerce.

Motor vehicle has the meaning given in 40 CFR 85.1703(a).

New has the meaning we give it in the standard-setting part.

Nonroad engine means:

(1) Except as discussed in paragraph (2) of this definition, a nonroad engine is an internal combustion engine that meets any of the following criteria:

(i) It is (or will be) used in or on a piece of equipment that is self-propelled or serves a dual purpose by both propelling itself and performing another function (such as garden tractors, off-highway mobile cranes and bulldozers).

(ii) It is (or will be) used in or on a piece of equipment that is intended to be propelled while performing its function (such as lawnmowers and string trimmers).

(iii) By itself or in or on a piece of equipment, it is portable or transportable, meaning designed to be and capable of being carried or moved from one location to another. Indicia of transportability include, but are not limited to, wheels, skids, carrying handles, dolly, trailer, or platform.

(2) An internal combustion engine is not a nonroad engine if it meets any of the following criteria:

(i) The engine is used to propel a motor vehicle, an aircraft, or equipment used solely for competition.

(ii) The engine is regulated under 40 CFR part 60, (or otherwise regulated by a federal New Source Performance Standard promulgated under section 111 of the Clean Air Act (42 U.S.C. 7411)).

(iii) The engine otherwise included in paragraph (1)(iii) of this definition remains or will remain at a location for more than 12 consecutive months or a shorter period of time for an engine located at a seasonal source. A location is any single site at a building, structure, facility, or installation. Any engine (or engines) that replaces an engine at a location and that is intended to perform the same or similar function as the engine replaced will be included in calculating the consecutive time period. An engine located at a seasonal source is an engine that remains at a seasonal source during the full annual operating period of the seasonal source. A seasonal source is a stationary source that remains in a single location on a permanent basis (i.e., at least two years) and that operates at that single location approximately three months (or more) each year. See § 1068.31 for provisions that apply if the engine is removed from the location.

Operating hours means:

(1) For engine and equipment storage areas or facilities, times during which people other than custodians and security personnel are at work near, and can access, a storage area or facility.

(2) For other areas or facilities, times during which an assembly line operates or any of the following activities occurs:

(i) Testing, maintenance, or service accumulation.

(ii) Production or compilation of records.

(iii) Certification testing.

(iv) Translation of designs from the test stage to the production stage.

(v) Engine or equipment manufacture or assembly.

Piece of equipment means any vehicle, vessel, locomotive, aircraft, or other type of equipment using engines to which this part applies.

Placed into service means used for its intended purpose.

Reasonable technical basis means information that would lead a person familiar with engine design and function to reasonably believe a conclusion related to compliance with the requirements of this part. For example, it would be reasonable to believe that parts performing the same function as the original parts (and to the same degree) would control emissions to the same degree as the original parts.

Relating to as used in this section means relating to something in a specific, direct manner. This expression is used in this section only to define terms as adjectives and not to broaden the meaning of the terms.

Replacement engine means an engine exempted as a replacement engine under § 1068.240.

Revoke means to terminate the certificate or an exemption for a family. If we revoke a certificate or exemption, you must apply for a new certificate or exemption before continuing to introduce the affected engines/equipment into U.S. commerce. This does not apply to engines/equipment you no longer possess.

Secondary engine manufacturer means anyone who produces a new engine by modifying a complete or partially complete engine that was made by a different company. For the purpose of this definition, ''modifying'' does not include making changes that do not remove an engine from its original certified configuration. Secondary engine manufacturing includes, for example, converting automotive engines for use in industrial applications, or land-based engines for use in marine applications. This applies whether it involves a complete or partially complete engine and whether the engine was previously certified to emission standards or not. Manufacturers controlled by the manufacturer of the base engine (or by an entity that also controls the manufacturer of the base engine) are not secondary engine manufacturers; rather, both entities are considered to be one manufacturer for purposes of this part. This definition applies equally to equipment manufacturers that modify engines. Also, equipment manufacturers that certify to equipment-based standards using engines produced by another company are deemed to be secondary engine manufacturers. Companies importing complete engines into the United States are not secondary engine manufacturers regardless of the procedures and relationships between companies for assembling the engines.

Small business means either of the following:

(1) A company that qualifies under the standard-setting part for special provisions for small businesses or small-volume manufacturers.

(2) A company that qualifies as a small business under the regulations adopted by the Small Business Administration at 13 CFR 121.201 if the standard-setting part does not establish such qualifying criteria.

Standard-setting part means a part in the Code of Federal Regulations that defines emission standards for a particular engine and/or piece of equipment (see § 1068.1(a)). For example, the standard-setting part for marine spark-ignition engines is 40 CFR part 1045. For provisions related to evaporative emissions, the standard-setting part may be 40 CFR part 1060, as specified in 40 CFR 1060.1.

Suspend means to temporarily discontinue the certificate or an exemption for a family. If we suspend a certificate, you may not introduce into U.S. commerce engines/equipment from that family unless we reinstate the certificate or approve a new one. If we suspend an exemption, you may not introduce into U.S. commerce engines/equipment that were previously covered by the exemption unless we reinstate the exemption.

Ultimate purchaser means the first person who in good faith purchases a new nonroad engine or new piece of equipment for purposes other than resale.

United States means the States, the District of Columbia, the Commonwealth of Puerto Rico, the Commonwealth of the Northern Mariana Islands, Guam, American Samoa, and the U.S. Virgin Islands.

U.S.-directed production volume means the number of engine/equipment units, subject to the requirements of this part, produced by a manufacturer for which the manufacturer has a reasonable assurance that sale was or will be made to ultimate purchasers in the United States.

Void means to invalidate a certificate or an exemption ab initio. If we void a certificate, all the engines/equipment introduced into U.S. commerce under that family for that model year are considered noncompliant, and you are liable for all engines/equipment introduced into U.S. commerce under the certificate and may face civil or criminal penalties or both. This applies equally to all engines/equipment in the family, including engines/equipment introduced into U.S. commerce before we voided the certificate. If we void an exemption, all the engines/equipment introduced into U.S. commerce under that exemption are considered uncertified (or nonconforming), and you are liable for engines/equipment introduced into U.S. commerce under the exemption and may face civil or criminal penalties or both. You may not introduce into U.S. commerce any additional engines/equipment using the voided exemption.

Voluntary emission recall means a repair, adjustment, or modification program voluntarily initiated and conducted by a manufacturer to remedy any emission-related defect for which engine owners have been notified.

We (us, our) means the Administrator of the Environmental Protection Agency and any authorized representatives.

§ 1068.31 What provisions apply to nonroad or stationary engines that change their status?

This section specifies the provisions that apply when an engine previously used in a nonroad application is subsequently used in an application other than a nonroad application, or when an engine previously used in a stationary application (i.e., an engine that was not used as a nonroad engine and that was not used to propel a motor vehicle, an aircraft, or equipment used solely for competition) is moved.

(a) Changing the status of a stationary engine to be a new nonroad engine as described in paragraph (b) of this section is a violation of § 1068.101(a)(1) or (b)(3) unless the engine has been certified to be compliant with all requirements of this chapter that apply to new nonroad engines of the same type (for example, a compression-ignition engine rated at 40 kW) and model year, and is in its certified configuration. Note that the definitions of ''model year'' in the standard-setting parts generally identify the engine's original date of manufacture as the basis for determining which standards apply if it becomes a nonroad engine after it is no longer new. For example, see 40 CFR 1039.801 and 1048.801.

(b) A stationary engine becomes a new nonroad engine if—

(1) It is used in an application that meets the criteria specified in paragraphs (1)(i) or (ii) in the definition of ''nonroad engine'' in § 1068.30.

(2) It meets the criteria specified in paragraph (1)(iii) of the definition of ''nonroad engine'' in § 1068.30 and is moved so that it fails to meet (or no longer meets) the criteria specified in paragraph (2)(iii) in the definition of ''nonroad engine'' in § 1068.30.

(c) A stationary engine does not become a new nonroad engine if it is moved but continues to meet the criteria specified in paragraph (2)(iii) in the definition of ''nonroad engine'' in § 1068.30 in its new location. For example, a transportable engine that is used in a single specific location for 18 months and is later moved to a second specific location where it will remain for at least 12 months is considered to be a stationary engine in both locations. Note that for engines that are neither portable nor transportable in actual use, the residence-time restrictions in the definition of ''nonroad engine'' generally do not apply.

(d) Changing the status of a nonroad engine to be a new stationary engine as described in paragraph (e) of this section is a violation of § 1068.101(a)(1) unless the engine complies with all the requirements of this chapter for new stationary engines of the same type (for example, a compression-ignition engine rated at 40 kW) and model year. For a new stationary engine that is required to be certified under 40 CFR part 60, the engine must have been certified to be compliant with all the requirements that apply to new stationary engines of the same type and model year, and must be in its certified configuration.

(e) A nonroad engine ceases to be a nonroad engine and becomes a new stationary engine if—

(1) At any time, it meets the criteria specified in paragraph (2)(iii) in the definition of ''nonroad engine'' in § 1068.30. For example, a portable generator engine ceases to be a nonroad engine if it is used or will be used in a single specific location for 12 months or longer. If we determine that an engine will be or has been used in a single specific location for 12 months or longer, it ceased to be a nonroad engine when it was placed in that location.

(2) It is otherwise regulated by a federal New Source Performance Standard promulgated under section 111 of the Clean Air Act (42 U.S.C. 7411).

(f) A nonroad engine ceases to be a nonroad engine if it is used to propel a motor vehicle, an aircraft, or equipment used solely for competition. See 40 CFR part 86 for requirements applicable to motor vehicles and motor vehicle engines. See 40 CFR part 87 for requirements applicable to aircraft and aircraft engines. See § 1068.235 for requirements applicable to equipment used solely for competition.

§ 1068.35 What symbols, acronyms, and abbreviations does this part use?

The following symbols, acronyms, and abbreviations apply to this part:

$ U.S. dollars.
CFR Code of Federal Regulations.
disp engine displacement.
EPA Environmental Protection Agency.
kW kilowatt.
L/cyl liters per cylinder.
NARA National Archives and Records Administration.
NO_X Oxides of nitrogen.
SAE Society of Automotive Engineers.
SEA selective enforcement audit.
U.S. United States.
U.S.C. United States Code.

§ 1068.40 What special provisions apply for implementing technical amendments?

During the 12 months following the effective date of any change in the provisions of this part, you may ask to apply the previously applicable provisions. We will generally approve your request if you can demonstrate that it would be impractical to comply with the new requirements. We may consider the potential for adverse environmental impacts in our decision. Similarly, in unusual circumstances, you may ask for relief under this section from new requirements that apply under the standard-setting part.

§ 1068.45 General labeling provisions.

The provisions of this part and the standard-setting part include a variety of labeling requirements. The following general provisions apply:

(a) *Permanent labels*. Where we specify that you apply a permanent label, you must meet the following requirements unless the standard-setting part includes other specific label requirements:

(1) Attach the label so no one can remove it without destroying or defacing it.

(2) Make sure it is durable and readable for the engine/equipment's entire life.

(3) Secure it to a part of the engine/equipment needed for normal operation and not normally requiring replacement.

(4) Write it in English.

(5) Make the labels readily visible to the average person after all installation and assembly are complete.

(b) *Removable labels*. Where we specify that you apply a removable label, it must meet the following conditions:

(1) You must attach the label in a way that does not allow it to be separated from the engine/equipment without a deliberate effort. Note that for exemptions requiring removable labels, the exemption no longer applies once the label is separated from the engine/equipment.

(2) The label must be durable and readable throughout the period of its

intended purpose. This period generally includes all distribution in U.S. commerce during which the exemption applies.

(3) Except as specified in paragraph (c) of this section, the label must be attached directly to the engine/equipment in a visible location. We consider a tag that meets the specified requirements to be an attached label.

(c) *Labels on packaging.* This part or the standard-setting part may in certain cases allow you to label the packaging if you ship engines/equipment packaged together instead of applying a removable label to engines/equipment individually. For example, this may involve packaging engines together by attaching them to a rack, binding them together on a pallet, or enclosing them in a box. The provisions of this paragraph (c) also apply for engines/equipment boxed individually where you do not apply labels directly to the engines/equipment. The following provisions apply if you label the packaging instead of labeling engines/equipment individually:

(1) You may use the provisions of this paragraph (c) only if all the engines/equipment packaged together need the same label.

(2) You must place the label on the package in a readily visible location. This may require labeling the package in multiple locations.

(3) You must package the engines/equipment such that the labels will not be separated from the engines/equipment or otherwise become unreadable throughout the period that the label applies. For example, labels required for shipping engines to a secondary engine manufacturer under § 1068.262 must remain attached and readable until they reach the secondary engine manufacturer. Similarly, removable labels specified in § 1068.240 for replacement engines must remain attached and readable until they reach the point of final installation.

(4) You are in violation of § 1068.101(a)(1) if such engines/equipment are removed from the package or are otherwise separated from the label before reaching the point at which the label is no longer needed.

(d) *Temporary consumer labels.* Where we specify that you apply temporary consumer labels (including tags), each label must meet the following conditions:

(1) You must attach the label in a way that does not allow it to be separated from the engine/equipment without a deliberate effort.

(2) The label must be sufficiently durable to be readable until it reaches the ultimate purchaser.

(3) The label must be attached directly to the engine/equipment in a visible location.

(e) *Prohibitions against removing labels.* Removing permanent labels may be a violation of § 1068.101(b)(7). Removing temporary or removable labels prematurely may also be a violation of § 1068.101(b)(7).

(f) *Identifying emission control systems.* If the standard-setting part specifies that you use standardized terms and abbreviations to identify emission control systems, use terms and abbreviations consistent with SAE J1930 (incorporated by reference in § 1068.95).

§ 1068.95 What materials does this part reference?

Documents listed in this section have been incorporated by reference into this part. The Director of the Federal Register approved the incorporation by reference as prescribed in 5 U.S.C. 552(a) and 1 CFR part 51. Anyone may inspect copies at the U.S. EPA, Air and Radiation Docket and Information Center, 1301 Constitution Ave., NW., Room B102, EPA West Building, Washington, DC 20460 or at the National Archives and Records Administration (NARA). For information on the availability of this material at NARA, call 202–741–6030, or go to: *http://www.archives.gov/federal_register/code_of_federal_regulations/ibr_locations.html.*

(a) *SAE material.* Table 1 to this section lists material from the Society of Automotive Engineers that we have incorporated by reference. The first column lists the number and name of the material. The second column lists the sections of this part where we reference it. Anyone may purchase copies of these materials from the Society of Automotive Engineers, 400 Commonwealth Drive, Warrendale, PA 15096 or *http://www.sae.org.* Table 1 follows:

TABLE 1 TO § 1068.95—SAE MATERIALS

Document number and name	Part 1068 reference
SAE J1930, Electrical/Electronic Systems Diagnostic Terms, Definitions, Abbreviations, and Acronyms, revised April 2002	1068.95

(b) [Reserved]

Subpart B—Prohibited Actions and Related Requirements

§ 1068.101 What general actions does this regulation prohibit?

This section specifies actions that are prohibited and the maximum civil penalties that we can assess for each violation in accordance with 42 U.S.C. 7522 and 7524. The maximum penalty values listed in paragraphs (a) and (b) of this section are shown for calendar year 2004. As described in paragraph (e) of this section, maximum penalty limits for later years are set forth in 40 CFR part 19.

(a) The following prohibitions and requirements apply to manufacturers of new engines, manufacturers of equipment containing these engines, and manufacturers of new equipment, except as described in subparts C and D of this part:

(1) *Introduction into commerce.* You may not sell, offer for sale, or introduce or deliver into commerce in the United States or import into the United States any new engine/equipment after emission standards take effect for the engine/equipment, unless it is covered by a valid certificate of conformity for its model year and has the required label or tag. You also may not take any of the actions listed in the previous sentence with respect to any equipment containing an engine subject to this part's provisions unless the engine is covered by a valid certificate of conformity for its model year and has the required engine label or tag. We may assess a civil penalty up to $32,500 for each engine or piece of equipment in violation.

(i) For purposes of this paragraph (a)(1), a valid certificate of conformity is one that applies for the same model year as the model year of the equipment (except as allowed by § 1068.105(a)), covers the appropriate category of engines/equipment (such as locomotive or Marine SI), and conforms to all requirements specified for equipment in the standard-setting part. Engines/equipment are considered not covered by a certificate unless they are in a configuration described in the application for certification.

(ii) The requirements of this paragraph (a)(1) also cover new engines you produce to replace an older engine in a piece of equipment, unless the engine qualifies for the replacement-engine exemption in § 1068.240.

(iii) For engines used in equipment subject to equipment-based standards, you may not sell, offer for sale, or introduce or deliver into commerce in the United States or import into the United States any new engine unless it is covered by a valid certificate of conformity for its model year and has the required label or tag. See the standard-setting part for more information about how this prohibition applies.

(2) *Reporting and recordkeeping.* This chapter requires you to record certain types of information to show that you meet our standards. You must comply with these requirements to make and maintain required records (including those described in § 1068.501). You may not deny us access to your records or the ability to copy your records if we have the authority to see or copy them. Also, you must give us complete and accurate reports and information without delay as required under this chapter. Failure to comply with the requirements of this paragraph is prohibited. We may assess a civil penalty up to $32,500 for each day you are in violation. In addition, knowingly submitting false information is a violation of 18 U.S.C. 1001, which may involve criminal penalties and up to five years imprisonment.

(3) *Testing and access to facilities.* You may not keep us from entering your facility to test engines/equipment or inspect if we are authorized to do so. Also, you must perform the tests we require (or have the tests done for you). Failure to perform this testing is prohibited. We may assess a civil penalty up to $32,500 for each day you are in violation.

(b) The following prohibitions apply to everyone with respect to the engines and equipment to which this part applies:

(1) *Tampering.* You may not remove or render inoperative any device or element of design installed on or in engines/equipment in compliance with the regulations prior to its sale and delivery to the ultimate purchaser. You also may not knowingly remove or render inoperative any such device or element of design after such sale and delivery to the ultimate purchaser. This includes, for example, operating an engine without a supply of appropriate quality urea if the emissions control system relies on urea to reduce NO_X emissions or the use of incorrect fuel or engine oil that renders the emissions control system inoperative. Section 1068.120 describes how this applies to rebuilding engines. See the standard-setting part, which may include additional provisions regarding actions prohibited by this requirement. For a manufacturer or dealer, we may assess a civil penalty up to $32,500 for each engine or piece of equipment in violation. For anyone else, we may assess a civil penalty up to $2,750 for each day an engine or piece of equipment is operated in violation. This prohibition does not apply in any of the following situations:

(i) You need to repair the engine/equipment and you restore it to proper functioning when the repair is complete.

(ii) You need to modify the engine/equipment to respond to a temporary emergency and you restore it to proper functioning as soon as possible.

(iii) You modify new engines/equipment that another manufacturer has already certified to meet emission standards and recertify them under your own family. In this case you must tell the original manufacturer not to include the modified engines/equipment in the original family.

(2) *Defeat devices.* You may not knowingly manufacture, sell, offer to sell, or install, any part that bypasses, impairs, defeats, or disables the control of emissions of any regulated pollutant, except as explicitly allowed by the standard-setting part. We may assess a civil penalty up to $2,750 for each part in violation.

(3) *Stationary engines.* For an engine that is excluded from any requirements of this chapter because it is a stationary engine, you may not move it or install it in any mobile equipment except as allowed by the provisions of this chapter. You may not circumvent or attempt to circumvent the residence-time requirements of paragraph (2)(iii) of the nonroad engine definition in § 1068.30. Anyone violating this paragraph (b)(3) is deemed to be a manufacturer in violation of paragraph (a)(1) of this section. We may assess a civil penalty up to $32,500 for each day you are in violation.

(4) *Competition engines/equipment.* For uncertified engines/equipment that are excluded or exempted from any requirements of this chapter because they are to be used solely for competition, you may not use any of them in a manner that is inconsistent with use solely for competition. Anyone violating this paragraph (b)(4) is deemed to be a manufacturer in violation of paragraph (a)(1) of this section. We may assess a civil penalty up to $32,500 for each day you are in violation.

(5) *Importation.* You may not import an uncertified engine or piece of equipment if it is defined to be new in the standard-setting part with a model year for which emission standards applied. Anyone violating this paragraph (b)(5) is deemed to be a manufacturer in violation of paragraph (a)(1) of this section. We may assess a civil penalty up to $32,500 for each day you are in violation. Note the following:

(i) The definition of new is broad for imported engines/equipment; uncertified engines and equipment (including used engines and equipment) are generally considered to be new when imported.

(ii) Used engines/equipment that were originally manufactured before applicable EPA standards were in effect are generally not subject to emission standards.

(6) *Warranty, recall, and maintenance instructions.* You must meet your obligation to honor your emission-related warranty under § 1068.115, including any commitments you identify in your application for certification. You must also fulfill all applicable requirements under subpart F of this part related to emission-related defects and recalls. You must also provide emission-related installation and maintenance instructions as described in the standard-setting part. Failure to meet these obligations is prohibited. Also, except as specifically provided by regulation, you are prohibited from directly or indirectly communicating to the ultimate purchaser or a later purchaser that the emission-related warranty is valid only if the owner has service performed at authorized facilities or only if the owner uses authorized parts, components, or systems. We may assess a civil penalty up to $32,500 for each engine or piece of equipment in violation.

(7) *Labeling.* (i) You may not remove or alter an emission control information label or other required permanent label except as specified in this paragraph (b)(7) or otherwise allowed by this chapter. Removing or altering an emission control information label is a violation of paragraph (b)(1) of this section. However, it is not a violation to remove a label in the following circumstances:

(A) The engine is destroyed, is permanently disassembled, or otherwise loses its identity such that the original title to the engine is no longer valid.

(B) The regulations specifically direct you to remove the label. For example, see § 1068.235.

(C) The part on which the label is mounted needs to be replaced. In this case, you must have a replacement part with a duplicate of the original label installed by the certifying manufacturer or an authorized agent, except that the replacement label may omit the date of manufacture if applicable. We generally require labels to be permanently attached to parts that will not normally be replaced, but this provision allows for replacements in unusual circumstances, such as damage in a collision or other accident.

(D) The original label is incorrect, provided that it is replaced with the correct label from the certifying manufacturer or an authorized agent. This allowance to replace incorrect labels does not affect whether the application of an incorrect original label is a violation.

(ii) Removing or altering a temporary or removable label contrary to the provisions of this paragraph (b)(7)(ii) is a violation of paragraph (b)(1) of this section.

(A) For labels identifying temporary exemptions, you may not remove or alter the label while the engine/equipment is in an exempt status. The exemption is automatically revoked for each engine/equipment for which the label has been removed.

(B) For temporary or removable consumer information labels, only the ultimate purchaser may remove the label.

(iii) You may not apply a false emission control information label. You also may not manufacture, sell, or offer to sell false labels. The application, manufacture, sale, or offer for sale of false labels is a violation of this section (such as paragraph (a)(1) or (b)(2) of this section). Note that applying an otherwise valid emission control information label to the wrong engine is considered to be applying a false label.

(c) If you cause someone to commit a prohibited act in paragraph (a) or (b) of this section, you are in violation of that prohibition.

(d) Exemptions from these prohibitions are described in subparts C and D of this part and in the standard-setting part.

(e) The standard-setting parts describe more requirements and prohibitions that apply to manufacturers (including importers) and others under this chapter.

(f) The specification of prohibitions and penalties in this part does not limit the prohibitions and penalties described in the Clean Air Act. Additionally, a single act may trigger multiple violations under this section and the Act. We may pursue all available administrative, civil, or criminal remedies for those violations even if the regulation references only a single prohibited act in this section.

(g) [Reserved]

(h) The maximum penalty values listed in paragraphs (a) and (b) of this section are shown for calendar year 2004. Maximum penalty limits for later years may be adjusted based on the Consumer Price Index. The specific regulatory provisions for changing the maximum penalties, published in 40 CFR part 19, reference the applicable U.S. Code citation on which the prohibited action is based. The following table is shown here for informational purposes:

TABLE 1 OF § 1068.101—LEGAL CITATION FOR SPECIFIC PROHIBITIONS FOR DETERMINING MAXIMUM PENALTY AMOUNTS

Part 1068 regulatory citation of prohibited action	General description of prohibition	U.S. Code citation for Clean Air Act authority
§ 1068.101 (a)(1)	Introduction into U.S. commerce of an uncertified source	42 U.S.C. 7522(a)(1) and (a)(4).
§ 1068.101(a)(2)	Failure to provide information	42 U.S.C. 7522(a)(2).
§ 1068.101(a)(3)	Denying access to facilities	42 U.S.C. 7522(a)(2).
§ 1068.101(b)(1)	Tampering with emission controls by a manufacturer or dealer	42 U.S.C. 7522(a)(3).
	Tampering with emission controls by someone other than a manufacturer or dealer.	
§ 1068.101(b)(2)	Sale or use of a defeat device	42 U.S.C. 7522(a)(3).
§ 1068.101(b)(3)	Mobile use of a stationary engine	42 U.S.C. 7522(a)(1) and (a)(4).
§ 1068.101(b)(4)	Noncompetitive use of uncertified engines/equipment that is exempted for competition.	42 U.S.C. 7522(a)(1) and (a)(4).
§ 1068.101(b)(5)	Importation of an uncertified source	42 U.S.C. 7522(a)(1) and (a)(4).
§ 1068.101(b)(6)	Recall and warranty	42 U.S.C. 7522(a)(4).
§ 1068.101(b)(7)	Removing labels	42 U.S.C. 7522(a)(3).

1068.103 What are the provisions related to the duration and applicability of certificates of conformity?

(a) Engines/equipment covered by a certificate of conformity are limited to those that are produced during the period specified in the certificate and conform to the specifications described in the certificate and the associated application for certification. For example, if the application for certification specifies certain engine models or production facilities, the certificate does not cover any models that are not specified and it does not cover engines/equipment produced at production facilities that are not specified.

(b) Unless the standard-setting part specifies otherwise, determine the production period corresponding to each certificate of conformity as specified in this paragraph (b). In general, the production period is the manufacturer's annual production period identified as a model year.

(1) For engines/equipment subject to emission standards based on model years, the first day of the annual production period can be no earlier than January 2 of the calendar year preceding the year for which the model year is named, or the earliest date of manufacture for any engine/equipment in the engine family, whichever is later. The last day of the annual production period can be no later than December 31 of the calendar year for which the model year is named or the latest date of manufacture for any engine/equipment in the engine family, whichever is sooner.

(2) For fuel-system components certified to evaporative emission standards based on production periods rather than model years, the production period is either the calendar year or a longer period we specify consistent with the manufacturer's normal production practices.

(c) A certificate of conformity will not cover engines/equipment you produce with a date of manufacture earlier than the date you submit the application for certification for the family. You may start to produce engines/equipment after you submit an application for certification and before the effective date of a certificate of conformity, subject to the following conditions:

(1) The engines/equipment must conform in all material respects to the engines/equipment described in your application. Note that if we require you to modify your application, you must ensure that all engines/equipment conform to the specifications of the modified application.

(2) The engines/equipment may not be sold, offered for sale, introduced into commerce, or delivered for introduction into U.S. commerce before the effective date of the certificate of conformity.

(3) You must notify us in your application for certification that you plan to use the provisions of this paragraph (c) and when you intend to start production. If the standard-setting part specifies mandatory testing for production-line engines, you must start testing as directed in the standard-setting part based on your actual start of production, even if that occurs before we approve your certification. You must also agree to give us full opportunity to inspect and/or test the engines/equipment during and after production. For example, we must have the opportunity to specify selective enforcement audits as allowed by the standard-setting part and the Clean Air Act as if the engines/equipment were produced after the effective date of the certificate.

(4) See § 1068.262 for special provisions that apply for secondary engine manufacturers receiving shipment of partially complete engines before the effective date of a certificate.

(d) Engines/equipment with a date of manufacture after December 31 of the calendar year for which a model year is named are not covered by the certificate of conformity for that model year. You must submit an application for a new certificate of conformity demonstrating compliance with applicable standards even if the engines/equipment are identical to those built before December 31.

(e) The flexible approach to naming the annual production period described in paragraph (b)(1) of this section is intended to allow you to introduce new products at any point during the year. This is based on the expectation that production periods generally run on consistent schedules from year to year. You may not use this flexibility to arrange your production periods such that you can avoid annual certification.

(f) An engine is generally assigned a model year based on its date of manufacture, which is typically based on the date the crankshaft is installed in the engine (see § 1068.30). You may not circumvent the provisions of § 1068.101(a)(1) by stockpiling engines with a date of manufacture before new or changed emission standards take effect by deviating from your normal production and inventory practices. (For purposes of this paragraph (f), normal production and inventory practices means those practices you typically use for similar families in years in which emission standards do not change. We may require you to provide us routine production and inventory records that document your normal practices for the preceding eight years.) For most engines you should plan to complete the assembly of an engine of a given model year within the first week after the end of the model year if new emission standards start to apply in that model year. For special circumstances it may be appropriate for your normal business practice to involve more time. For engines with per-cylinder displacement below 2.5 liters, we would consider it to be a violation to complete the assembly of an engine of a given model year more than 30 days after the end of the model year for that engine family if new emission standards start to apply in that year. For example, in the case where new standards apply in the 2010 model year, and your normal production period is based on the calendar year, you must complete the assembly of all your 2009 model year engines before January 31, 2010, or an earlier date consistent with your normal production and inventory practices. For engines with per-cylinder displacement at or above 2.5 liters, this time may not exceed 60 days. Note that for the purposes of this paragraph (f), an engine shipped under § 1068.261 is deemed to be a complete engine. Note also that § 1068.245 allows flexibility for additional time in unusual circumstances. Note finally that disassembly of complete engines and reassembly (such as for shipment) does not affect the determination of model year; the provisions of this paragraph (f) apply based on the date on which initial assembly is complete.

§ 1068.105 What other provisions apply to me specifically if I manufacture equipment needing certified engines?

This section describes general provisions that apply to equipment manufacturers for sources subject to engine-based standards. See the standard-setting part for any requirements that apply for certain applications. See § 1068.101 for penalties associated with violations under this section and for other prohibitions related to your equipment.

(a) *Transitioning to new engine-based standards.* If new engine-based emission standards apply in a given model year, your equipment in that calendar year must have engines that are certified to the new standards, except that you may continue to use up your normal inventory of earlier engines that were built before the date of the new or changed standards. (Note: this paragraph (a) does not apply in the case of new remanufacturing standards.) For example, if your normal inventory practice is to keep on hand a one-month supply of engines based on your upcoming production schedules, and a new tier of standards starts to apply for the 2015 model year, you may order engines consistent with your normal inventory requirements late in the engine manufacturer's 2014 model year and install those engines in your equipment, regardless of the date of installation. Also, if your model year starts before the end of the calendar year preceding new standards, you may use engines from the previous model year for those units you produce before January 1 of the year that new standards apply. If emission standards for the engine do not change in a given model year, you may continue to install engines from the previous model year without restriction. You may not circumvent the provisions of § 1068.101(a)(1) by stockpiling engines that were built before new or changed standards take effect. Note that this allowance does not apply for equipment subject to equipment-based standards. See 40 CFR 1060.601 for similar provisions that apply for equipment subject to evaporative emission standards.

(b) *Installing engines or certified components.* The provisions in § 1068.101(a)(1) generally prohibit you from introducing into U.S. commerce any new equipment that includes engines not covered by a certificate of conformity. In addition, you must follow the engine manufacturer's emission-related installation instructions. For example, you may need to constrain where you place an exhaust aftertreatment device or integrate into your equipment models a device for sending visual or audible signals to the operator. Similarly, you must follow the emission-related installation instructions from the manufacturer of a component that has been certified for controlling evaporative emissions under 40 CFR part 1060. Not meeting the manufacturer's emission-related installation instructions is a violation of one or more of the prohibitions of

§ 1068.101. See § 1068.261 for special provisions that apply when the engine manufacturer delegates final assembly of emission controls to you.

(c) *Attaching a duplicate label.* If you obscure the engine's label, you must do four things to avoid violating § 1068.101(a)(1):

(1) Send a request for duplicate labels in writing on your company's letterhead to the engine manufacturer. Include the following information in your request:

(i) Identify the type of equipment and the specific engine and equipment models needing duplicate labels.

(ii) Identify the family (from the original engine label).

(iii) State the reason that you need a duplicate label for each equipment model.

(iv) Identify the number of duplicate labels you will need.

(2) Permanently attach the duplicate label to your equipment by securing it to a part needed for normal operation and not normally requiring replacement. Make sure an average person can easily read it.

(3) Destroy any unused duplicate labels if you find that you will not need them.

(4) Keep the following records for at least eight years after the end of the model year identified on the engine label:

(i) Keep a copy of your written request.

(ii) Keep drawings or descriptions that show how you apply the duplicate labels to your equipment.

(iii) Maintain a count of those duplicate labels you use and those you destroy.

§ 1068.110 What other provisions apply to engines/equipment in service?

(a) *Aftermarket parts and service.* As the certifying manufacturer, you may not require anyone to use your parts or service to maintain or repair an engine or piece of equipment, unless we approve this in your application for certification. It is a violation of the Clean Air Act for anyone to manufacture any part if one of its main effects is to reduce the effectiveness of the emission controls. See § 1068.101(b)(2).

(b) *Certifying aftermarket parts.* As the manufacturer or rebuilder of an aftermarket engine or equipment part, you may—but are not required to—certify according to 40 CFR part 85, subpart V, that using the part will not cause engines/equipment to fail to meet emission standards. Whether you certify or not, you must keep any information showing how your parts or service affect emissions.

(c) *Compliance with standards.* We may test engines and equipment to investigate compliance with emission standards and other requirements. We may also require the manufacturer to do this testing.

(d) *Defeat devices.* We may test engines and equipment to investigate potential defeat devices. We may also require the manufacturer to do this testing. If we choose to investigate one of your designs, we may require you to show us that it does not have a defeat device. To do this, you may have to share with us information regarding test programs, engineering evaluations, design specifications, calibrations, on-board computer algorithms, and design strategies. It is a violation of the Clean Air Act for anyone to make, install or use defeat devices. See § 1068.101(b)(2) and the standard-setting part.

(e) *Warranty and maintenance.* Owners are responsible for properly maintaining their engines/equipment; however, owners may make warranty claims against the manufacturer for all expenses related to diagnosing and repairing or replacing emission-related parts, as described in § 1068.115. Manufacturers may ask to limit diagnosis and repair to authorized service facilities, provided this does not limit their ability to meet their warranty obligations under § 1068.115. The warranty period begins when the equipment is first placed into service. See the standard-setting part for specific requirements. It is a violation of the Clean Air Act for anyone to disable emission controls; see § 1068.101(b)(1) and the standard-setting part.

§ 1068.115 When must manufacturers honor emission-related warranty claims?

Section 207(a) of the Clean Air Act (42 U.S.C. 7541(a)) requires certifying manufacturers to warrant to purchasers that their engines/equipment are designed, built, and equipped to conform at the time of sale to the applicable regulations for their full useful life, including a warranty that the engines/equipment are free from defects in materials and workmanship that would cause any engine/equipment to fail to conform to the applicable regulations during the specified warranty period. This section codifies the warranty requirements of section 207(a) without intending to limit these requirements.

(a) As a certifying manufacturer, you may deny warranty claims only for failures that have been caused by the owner's or operator's improper maintenance or use, by accidents for which you have no responsibility, or by acts of God. For example, you would not need to honor warranty claims for failures that have been directly caused by the operator's abuse of the engine/equipment or the operator's use of the engine/equipment in a manner for which it was not designed and are not attributable to you in any way.

(b) As a certifying manufacturer, you may not deny emission-related warranty claims based on any of the following:

(1) Maintenance or other service you or your authorized facilities performed.

(2) Engine/equipment repair work that an operator performed to correct an unsafe, emergency condition attributable to you as long as the operator tries to restore the engine/equipment to its proper configuration as soon as possible.

(3) Any action or inaction by the operator unrelated to the warranty claim.

(4) Maintenance that was performed more frequently than you specify.

(5) Anything that is your fault or responsibility.

(6) The use of any fuel that is commonly available where the equipment operates unless your written maintenance instructions state that this fuel would harm the equipment's emission control system and operators can readily find the proper fuel.

§ 1068.120 What requirements must I follow to rebuild engines?

(a) This section describes the steps to take when rebuilding engines to avoid violating the tampering prohibition in § 1068.101(b)(1). These requirements apply to anyone rebuilding an engine subject to this part, but the recordkeeping requirements in paragraphs (j) and (k) of this section apply only to businesses. For maintenance or service that is not rebuilding, including any maintenance related to evaporative emission controls, you may not make changes that might increase emissions of any regulated pollutant, but you do not need to keep any records.

(b) The term ''rebuilding'' refers to a rebuild of an engine or engine system, including a major overhaul in which you replace the engine's pistons or power assemblies or make other changes that significantly increase the service life of the engine. It also includes replacing or rebuilding an engine's turbocharger or aftercooler or the engine's systems for fuel metering or electronic control so that it significantly increases the service life of the engine. For these provisions, rebuilding may or may not involve removing the engine from the equipment. Rebuilding does not normally include the following:

(1) Scheduled emission-related maintenance that the standard-setting

part allows during the useful life period (such as replacing fuel injectors).

(2) Unscheduled maintenance that occurs commonly within the useful life period. For example, replacing a water pump is not rebuilding an engine.

(c) [Reserved]

(d) If you rebuild an engine or engine system, you must have a reasonable technical basis for knowing that the rebuilt engine's emission control system performs as well as, or better than, it performs in its certified configuration. Identify the model year of the resulting engine configuration. You have a reasonable basis if you meet two main conditions:

(1) Install parts—new, used, or rebuilt—so a person familiar with engine design and function would reasonably believe that the engine with those parts will control emissions of all pollutants at least to the same degree as with the original parts. For example, it would be reasonable to believe that parts performing the same function as the original parts (and to the same degree) would control emissions to the same degree as the original parts.

(2) Adjust parameters or change design elements only according to the original engine manufacturer's instructions. Or, if you differ from these instructions, you must have data or some other technical basis to show you should not expect in-use emissions to increase.

(e) If the rebuilt engine remains installed or is reinstalled in the same piece of equipment, you must rebuild it to the original configuration or another certified configuration of the same or later model year.

(f) A rebuilt engine may replace another certified engine in a piece of equipment only if the engine was rebuilt to a certified configuration meeting equivalent or more stringent emission standards. Note that a certified configuration would generally include more than one model year. A rebuilt engine being installed that is from the same model year or a newer model year than the engine being replaced meets this requirement. The following examples illustrate the provisions of this paragraph (f):

(1) In most cases, you may use a rebuilt Tier 2 engine to replace a Tier 1 engine or another Tier 2 engine.

(2) You may use a rebuilt Tier 1 engine to replace a Tier 2 engine if the two engines differ only with respect to model year or other characteristics unrelated to emissions since such engines would be considered to be in the same configuration. This may occur if the Tier 1 engine had emission levels below the Tier 2 standards or if the Tier 2 engine was certified with a Family Emission Limit for calculating emission credits.

(3) You may use a rebuilt engine that originally met the Tier 1 standards without certification, as provided under 40 CFR 1068.265, to replace a certified Tier 1 engine. This may occur for engines produced under a Transition Program for Equipment Manufacturers such as that described in 40 CFR 1039.625.

(4) You may never replace a certified engine with an engine rebuilt to a configuration that does not meet EPA emission standards. Note that a configuration is considered to meet EPA emission standards if it was previously certified or was otherwise shown to meet emission standards (see § 1068.265).

(g) Do not erase or reset emission-related codes or signals from onboard monitoring systems without diagnosing and responding appropriately to any diagnostic codes. This requirement applies regardless of the manufacturer's reason for installing the monitoring system and regardless of its form or interface. Clear any codes from diagnostic systems when you return the rebuilt engine to service. Do not disable a diagnostic signal without addressing its cause.

(h) When you rebuild an engine, check, clean, adjust, repair, or replace all emission-related components (listed in Appendix I of this part) as needed according to the original manufacturer's recommended practice. In particular, replace oxygen sensors, replace the catalyst if there is evidence of malfunction, clean gaseous fuel-system components, and replace fuel injectors (if applicable), unless you have a reasonable technical basis for believing any of these components do not need replacement.

(i) If you are installing an engine that someone else has rebuilt, check all emission-related components listed in Appendix I of this part as needed according to the original manufacturer's recommended practice.

(j) Keep at least the following records for all engines except spark-ignition engines with total displacement below 225 cc:

(1) Identify the hours of operation (or mileage, as appropriate) at the time of rebuild. These may be noted as approximate values if the engine has no hour meter (or odometer).

(2) Identify the work done on the engine or any emission-related control components, including a listing of parts and components you used.

(3) Describe any engine parameter adjustments.

(4) Identify any emission-related codes or signals you responded to and reset.

(k) You must show us or send us your records if we ask for them. Keep records for at least two years after rebuilding an engine. Keep them in any format that allows us to readily review them.

(1) You do not need to keep information that is not reasonably available through normal business practices. We do not expect you to have information that you cannot reasonably access.

(2) You do not need to keep records of what other companies do.

(3) You may keep records based on families rather than individual engines if that is the way you normally do business.

§ 1068.125 What happens if I violate the regulations?

(a) *Civil penalties and injunctions.* We may bring a civil action to assess and recover civil penalties and/or enjoin and restrain violations in the United States District Court for the district where you allegedly violated a requirement, or the district where you live or have your main place of business. Actions to assess civil penalties or restrain violations of § 1068.101 must be brought by and in the name of the United States. The selected court has jurisdiction to restrain violations and assess civil penalties.

(1) To determine the amount of a civil penalty and reach a just conclusion, the court considers these factors:

(i) The seriousness of your violation.

(ii) How much you benefited or saved because of the violation.

(iii) The size of your business.

(iv) Your history of compliance with Title II of the Clean Air Act (42 U.S.C. 7401–7590).

(v) What you did to remedy the violation.

(vi) How the penalty will affect your ability to continue in business.

(vii) Such other matters as justice may require.

(2) Subpoenas for witnesses who must attend a district court in any district may apply to any other district.

(b) *Administrative penalties.* Instead of bringing a civil action, we may assess administrative penalties if the total is less than $270,000 against you individually. This maximum penalty may be greater if the Administrator and the Attorney General jointly determine that a greater administrative penalty assessment is appropriate, or if the limit is adjusted under 40 CFR part 19. No court may review this determination. Before we assess an administrative penalty, you may ask for a hearing (subject to 40 CFR part 22). The Administrator may compromise or remit, with or without conditions, any administrative penalty that may be imposed under this section.

(1) To determine the amount of an administrative penalty, we will consider the factors described in paragraph (a)(1) of this section.

(2) An administrative order we issue under this paragraph (b) becomes final 30 days after we issue it unless you ask for judicial review by that time (see paragraph (c) of this section). You may ask for review by any of the district courts listed in paragraph (a) of this section. Send the Administrator a copy of the filing by certified mail.

(3) We will not pursue an administrative penalty for a particular violation if either of the following two conditions is true:

(i) We are separately prosecuting the violation under this subpart.

(ii) We have issued a final order for a violation, no longer subject to judicial review, for which you have already paid a penalty.

(c) *Judicial review.* If you ask a court to review a civil or administrative penalty, we will file in the appropriate court within 30 days of your request a certified copy or certified index of the record on which the court or the Administrator issued the order.

(1) The judge may set aside or remand any order issued under this section only if one of the following is true:

(i) Substantial evidence does not exist in the record, taken as a whole, to support finding a violation.

(ii) The Administrator's assessment of the penalty is an abuse of discretion.

(2) The judge may not add civil penalties unless our penalty is an abuse of discretion that favors you.

(d) *Effect of enforcement actions on other requirements.* Our pursuit of civil or administrative penalties does not affect or limit our authority to enforce any provisions of this chapter.

(e) *Penalties.* In any proceedings, the United States government may seek to collect civil penalties assessed under this section.

(1) Once a penalty assessment is final, if you do not pay it, the Administrator will ask the Attorney General to bring a civil action in an appropriate district court to recover the money. We may collect interest from the date of the final order or final judgment at rates established by the Internal Revenue Code of 1986 (26 U.S.C. 6621(a)(2)). In this action to collect overdue penalties, the court will not review the validity, amount, and appropriateness of the penalty.

(2) In addition, if you do not pay the full amount of a penalty on time, you must then pay more to cover interest, enforcement expenses (including attorney's fees and costs for collection), and a quarterly nonpayment penalty for each quarter you do not pay. The quarterly nonpayment penalty is 10 percent of your total penalties plus any unpaid nonpayment penalties from previous quarters.

Subpart C—Exemptions and Exclusions

§ 1068.201 Does EPA exempt or exclude any engines/equipment from the prohibited acts?

We may exempt new engines/equipment from some or all of the prohibited acts or requirements of this part under provisions described in this subpart. We may exempt engines/equipment already placed in service in the United States from the prohibition in § 1068.101(b)(1) if the exemption for engines/equipment used solely for competition applies (see § 1068.235). In addition, see § 1068.1 and the standard-setting parts to determine if other engines/equipment are excluded from some or all of the regulations in this chapter.

(a) This subpart identifies which engines/equipment qualify for exemptions and what information we need. We may ask for more information.

(b) If you violate any of the terms, conditions, instructions, or requirements to qualify for an exemption, we may void, revoke, or suspend the exemption.

(c) If you use an exemption under this subpart, we may require you to add a permanent label to your exempted engines/equipment. You may ask us to modify these labeling requirements if it is appropriate for your engine/equipment.

(d) If you produce engines/equipment we exempt under this subpart, we may require you to make and keep records, perform tests, make reports and provide information as needed to reasonably evaluate the validity of the exemption.

(e) If you own or operate engines/equipment we exempt under this subpart, we may require you to provide information as needed to reasonably evaluate the validity of the exemption.

(f) Subpart D of this part describes how we apply these exemptions to engines/equipment you import (or intend to import).

(g) If you want to ask for an exemption or need more information, write to the Designated Compliance Officer.

(h) You may ask us to modify the administrative requirements for the exemptions described in this subpart. We may approve your request if we determine that such approval is consistent with the intent of this part. For example, waivable administrative requirements might include some reporting requirements, but would not include any eligibility requirements or use restrictions.

(i) If you want to take an action with respect to an exempted or excluded engine/equipment that is prohibited by the exemption or exclusion, such as selling it, you need to certify the engine/equipment. We will issue a certificate of conformity if you send us an application for certification showing that you meet all the applicable requirements from the standard-setting part and pay the appropriate fee. Alternatively, we may allow you to include in an existing certified engine family those engines/equipment you modify (or otherwise demonstrate) to be identical to engines/equipment already covered by the certificate. We would base such an approval on our review of any appropriate documentation. These engines/equipment must have emission control information labels that accurately describe their status.

§ 1068.210 What are the provisions for exempting test engines/equipment?

(a) We may exempt engines/equipment that you will use for research, investigations, studies, demonstrations, or training. Note that you are not required to get an exemption under this section for engines that are exempted under other provisions of this part, such as the manufacturer-owned exemption in § 1068.215.

(b) Anyone may ask for a testing exemption.

(c) If you are a certificate holder, you may request an exemption for engines/equipment you intend to include in test programs over a two-year period.

(1) In your request, tell us the maximum number of engines/equipment involved and describe how you will make sure exempted engines/equipment are used only for this testing.

(2) Give us the information described in paragraph (d) of this section if we ask for it.

(d) If you are not a certificate holder, do all the following things:

(1) Show that the proposed test program has a valid purpose under paragraph (a) of this section.

(2) Show you need an exemption to achieve the purpose of the test program (time constraints may be a basis for needing an exemption, but the cost of certification alone is not).

(3) Estimate the duration of the proposed test program and the number of engines/equipment involved.

(4) Allow us to monitor the testing.

(5) Describe how you will ensure that you stay within this exemption's purposes. Address at least the following things:

(i) The technical nature of the test.

(ii) The test site.

(iii) The duration and accumulated engine/equipment operation associated with the test.

(iv) Ownership and control of the engines/equipment involved in the test.

(v) The intended final disposition of the engines/equipment.

(vi) How you will identify, record, and make available the engine/equipment identification numbers.

(vii) The means or procedure for recording test results.

(e) If we approve your request for a testing exemption, we will send you a letter or a memorandum for your signature describing the basis and scope of the exemption. The exemption does not take effect until we receive the signed letter or memorandum from you. It will also include any necessary terms and conditions, which normally require you to do the following:

(1) Stay within the scope of the exemption.

(2) Create and maintain adequate records that we may inspect.

(3) Add a permanent label to all engines/equipment exempted under this section, consistent with § 1068.45, with at least the following items:

(i) The label heading ''EMISSION CONTROL INFORMATION''.

(ii) Your corporate name and trademark.

(iii) Engine displacement, family identification, and model year of the engine/equipment (as applicable), or whom to contact for further information.

(iv) One of these statements (as applicable):

(A) ''THIS ENGINE IS EXEMPT UNDER 40 CFR 1068.210 OR 1068.215 FROM EMISSION STANDARDS AND RELATED REQUIREMENTS.''

(B) ''THIS EQUIPMENT IS EXEMPT UNDER 40 CFR 1068.210 OR 1068.215 FROM EMISSION STANDARDS AND RELATED REQUIREMENTS.''

(4) Tell us when the test program is finished.

(5) Tell us the final disposition of the engines/equipment.

(6) Send us a written confirmation that you meet the terms and conditions of this exemption.

§ 1068.215 What are the provisions for exempting manufacturer-owned engines/equipment?

(a) You are eligible for the exemption for manufacturer-owned engines/equipment only if you are a certificate holder.

(b) Engines/equipment may be exempt without a request if they are nonconforming engines/equipment under your ownership, possession, and control and you operate them to develop products, assess production methods, or promote your engines/equipment in the marketplace. You may not loan, lease, sell, or use the engine/equipment to generate revenue, either by itself or for an engine installed in a piece of equipment. Note that this paragraph (b) does not prevent the sale or shipment of a partially complete engine to a secondary engine manufacturer that will meet the requirements of this paragraph (b). See § 1068.262 for provisions related to shipping partially complete engines to secondary engine manufacturers.

(c) To use this exemption, you must do three things:

(1) Establish, maintain, and keep adequately organized and indexed information on all exempted engines/equipment, including the engine/equipment identification number, the use of the engine/equipment on exempt status, and the final disposition of any engine/equipment removed from exempt status.

(2) Let us access these records, as described in § 1068.20.

(3) Add a permanent label to all engines/equipment exempted under this section, consistent with § 1068.45, with at least the following items:

(i) The label heading ''EMISSION CONTROL INFORMATION''.

(ii) Your corporate name and trademark.

(iii) Family identification and model year of the engine/equipment (as applicable), or whom to contact for further information.

(iv) One of these statements (as applicable):

(A) ''THIS ENGINE IS EXEMPT UNDER 40 CFR 1068.210 OR 1068.215 FROM EMISSION STANDARDS AND RELATED REQUIREMENTS.''

(B) ''THIS EQUIPMENT IS EXEMPT UNDER 40 CFR 1068.210 OR 1068.215 FROM EMISSION STANDARDS AND RELATED REQUIREMENTS.''

§ 1068.220 What are the provisions for exempting display engines/equipment?

(a) Anyone may request an exemption for display engines/equipment.

(b) Nonconforming display engines/equipment will be exempted if they are used only for displays in the interest of a business or the general public. This exemption does not apply to engines/equipment displayed for private use, private collections, or any other purpose we determine is inappropriate for a display exemption.

(c) You may operate the exempted engine/equipment, but only if we approve specific operation that is part of the display.

(d) You may sell or lease the exempted engine/equipment only with our advance approval; you may not use it to generate revenue.

(e) To use this exemption, you must add a permanent label to all engines/equipment exempted under this section, consistent with § 1068.45, with at least the following items:

(1) The label heading ''EMISSION CONTROL INFORMATION''.

(2) Your corporate name and trademark.

(3) Engine displacement, family identification, and model year of the engine/equipment (as applicable), or whom to contact for further information.

(4) One of these statements (as applicable):

(i) ''THIS ENGINE IS EXEMPT UNDER 40 CFR 1068.220 FROM EMISSION STANDARDS AND RELATED REQUIREMENTS.''

(ii) ''THIS EQUIPMENT IS EXEMPT UNDER 40 CFR 1068.220 FROM EMISSION STANDARDS AND RELATED REQUIREMENTS.''

(f) We may set other conditions for approval of this exemption.

§ 1068.225 What are the provisions for exempting engines/equipment for national security?

(a) You are eligible for the exemption for national security only if you are a manufacturer.

(b) Your engine/equipment is exempt without a request if it will be used or owned by an agency of the federal government responsible for national defense, where the equipment has armor, permanently attached weaponry, or other substantial features typical of military combat.

(c) You may request a national security exemption for engines/equipment not meeting the conditions of paragraph (b) of this section as long as your request is endorsed by an agency of the federal government responsible for national defense. In your request, explain why you need the exemption.

(d) Add a permanent label to all engines/equipment exempted under this section, consistent with § 1068.45, with at least the following items:

(1) The label heading ''EMISSION CONTROL INFORMATION''.

(2) Your corporate name and trademark.

(3) Engine displacement, family identification, and model year of the engine/equipment (as applicable), or whom to contact for further information.

(4) One of these statements (as applicable):

(i) ''THIS ENGINE HAS AN EXEMPTION FOR NATIONAL SECURITY UNDER 40 CFR 1068.225.''

(ii) ''THIS EQUIPMENT HAS AN EXEMPTION FOR NATIONAL SECURITY UNDER 40 CFR 1068.225.''

§ 1068.230 What are the provisions for exempting engines/equipment for export?

The provisions of this section apply differently depending on the country to which the engines/equipment are being exported.

(a) We will not exempt new engines/equipment if you export them to a country with emission standards identical to ours, in which case they must be covered by a certificate of conformity. Where we determine that such engines/equipment will not be placed into service in the United States, the following provisions apply for special export-only certification:

(1) The engines/equipment must be covered by a certificate of conformity or equivalent approval issued by the destination country.

(2) To get an export-only certificate of conformity, send the Designated Compliance Officer a request. We may require you to provide information such as documentation of the foreign certification and related test data.

(3) No fees apply for export-only certification.

(4) The engines/equipment must be labeled as specified in paragraph (d) of this section.

(5) This export-only certificate is not considered a valid certificate of conformity with respect to the prohibition in § 1068.101(a)(1) for sale to ultimate purchasers in the United States. These engines/equipment also may not reenter the United States unless the regulations of this chapter otherwise allow it.

(b) Engines/equipment exported to a country not covered by paragraph (a) of this section are exempt from the prohibited acts in this part without a request. If you produce exempt engines/equipment for export and any of them are sold or offered for sale to an ultimate purchaser in the United States, we will void the exemption for those engines/equipment.

(c) Except as specified in paragraph (d) of this section, label exempted engines/equipment (including shipping containers if the label on the engine/equipment will be obscured by the container) with a label showing that they are not certified for sale or use in the United States. This label may be permanent or removable. See § 1068.45 for provisions related to the use of removable labels and applying labels to containers without labeling individual engines/equipment. The label must include your corporate name and trademark and one of the following statements (as applicable):

(1) ''THIS ENGINE IS SOLELY FOR EXPORT AND IS THEREFORE EXEMPT UNDER 40 CFR 1068.230 FROM U.S. EMISSION STANDARDS AND RELATED REQUIREMENTS.''

(2) ''THIS EQUIPMENT IS SOLELY FOR EXPORT AND IS THEREFORE EXEMPT UNDER 40 CFR 1068.230 FROM U.S. EMISSION STANDARDS AND RELATED REQUIREMENTS.''

(d) You must apply a permanent label as specified in this paragraph (d) for engines/equipment certified under paragraph (a) of this section. You may apply a permanent label as specified in this paragraph (d) instead of the label specified in paragraph (c) of this section for exempted engines/equipment. Add a permanent label meeting the requirements of the destination country and include in the bill of lading a statement that the engines/equipment must be exported to avoid violating EPA regulations. We may modify applicable labeling requirements to align with the labeling requirements that apply for the destination country.

(e) We may set other reasonable conditions to ensure that engines/equipment exempted under this section are not placed into service in the United States.

(f) Exemptions under this section expire once engines are no longer in the United States. Therefore exemptions under this section do not allow engines to be imported back into the United States.

§ 1068.235 What are the provisions for exempting engines/equipment used solely for competition?

(a) New engines/equipment you produce that are used solely for competition are generally excluded from emission standards. See the standard-setting parts for specific provisions where applicable.

(b) If you modify any engines/equipment after they have been placed into service in the United States so they will be used solely for competition, they are exempt without request. This exemption applies only to the prohibition in § 1068.101(b)(1) and is valid only as long as the engine/equipment is used solely for competition. You may not use the provisions of this paragraph (b) to circumvent the requirements that apply to the sale of new competition engines under the standard-setting part.

(c) If you modify any engines/equipment under paragraph (b) of this section, you must destroy the original emission labels. If you loan, lease, sell, or give any of these engines/equipment to someone else, you must tell the new owner (or operator, if applicable) in writing that they may be used only for competition.

§ 1068.240 What are the provisions for exempting new replacement engines?

The prohibitions in § 1068.101(a)(1) do not apply to a new engine if it is exempt under this section as a replacement engine. For purposes of this section, a replacement engine is a new engine that is used to replace an engine that has already been placed into service (whether the previous engine is replaced in whole or in part with a new engine).

(a) *General provisions.* You are eligible for the exemption for new replacement engines only if you are a certificate holder. Note that this exemption does not apply for locomotives (40 CFR 1033.601) and that unique provisions apply to marine compression-ignition engines (40 CFR 1042.615). Paragraphs (b) and (c) describe two different approaches for exempting new replacement engines where the engines are specially built to correspond to an earlier model year that was subject to less stringent standards than those that apply for current production (or is no longer covered by a certificate of conformity). Paragraphs (d) and (e) describe a simpler approach for exempting partially complete new replacement engines that are built under a certificate of conformity that is valid for producing engines for the current model year.

(b) *Previous-tier replacement engines with tracking.* You may produce any number of new replacement engines under this section if all the following conditions are true:

(1) You produce a new engine to replace an engine already placed into service in a piece of equipment.

(2) The engine being replaced was not originally subject to emission standards or was originally subject to less stringent emission standards than those that would otherwise apply to the new engine. The provisions of this paragraph (b) also apply for engines that were originally certified to the same standards that apply for the current model year if you no longer have a

certificate of conformity to continue producing that engine configuration.

(3) You determine that you do not produce an engine certified to meet current requirements that has the appropriate physical or performance characteristics to repower the equipment. If the engine being replaced was made by a different company, you must make this determination also for engines produced by this other company. You must keep records to document your basis for making this determination.

(4) You or your agent takes possession of the old engine or confirms that the old engine has been destroyed.

(5) If the old engine was subject to emission standards, you must make the new replacement engine in a configuration identical in all material respects to the old engine and meet the requirements of § 1068.265. You may alternatively make the new replacement engine in a configuration identical in all material respects to another certified engine of the same or later model year as long as the engine is not certified with a family emission limit higher than that of the old engine.

(6) You add a permanent label, consistent with § 1068.45, with your corporate name and trademark and the following additional information:

(i) Add the following statement if the engine being replaced was not subject to any emission standards under this chapter:

THIS ENGINE DOES NOT COMPLY WITH U.S. EPA NONROAD EMISSION REQUIREMENTS. SELLING OR INSTALLING THIS ENGINE FOR ANY PURPOSE OTHER THAN TO REPLACE A NONROAD ENGINE BUILT BEFORE JANUARY 1, [Insert appropriate year reflecting when the earliest tier of standards began to apply to engines of that size and type] MAY BE A VIOLATION OF FEDERAL LAW SUBJECT TO CIVIL PENALTY.

(ii) Add the following statement if the engine being replaced was subject to emission standards:

THIS ENGINE COMPLIES WITH U.S. EPA NONROAD EMISSION REQUIREMENTS FOR [Identify the appropriate emission standards (by model year, tier, or emission levels) for the replaced engine] ENGINES UNDER 40 CFR 1068.240. SELLING OR INSTALLING THIS ENGINE FOR ANY PURPOSE OTHER THAN TO REPLACE A [Identify the appropriate emission standards for the replaced engine, by model year(s), tier(s), or emission levels)] ENGINE MAY BE A VIOLATION OF FEDERAL LAW SUBJECT TO CIVIL PENALTY.

(c) *Previous-tier replacement engines without tracking.* You may produce a limited number of new replacement engines that are not from a currently certified engine family under the provisions of this paragraph (c). This would apply, for example, for engine configurations that were certified in an earlier model year but are no longer covered by a certificate of conformity. You must comply with the requirements of paragraph (b) of this section for any number of replacement engines you produce in excess of what we allow under this paragraph (c). The following provisions apply to engines exempted under this paragraph (c):

(1) You may produce a limited number of replacement engines under this paragraph (c) representing 0.5 percent of your annual production volumes for each category and subcategory of engines identified in Table 1 to this section (1.0 percent through 2013). Calculate this number by multiplying your annual U.S.-directed production volume by 0.005 (or 0.01 through 2013) and rounding to the nearest whole number. Determine the appropriate production volume by identifying the highest total annual U.S.-directed production volume of engines from the previous three model years for all your certified engines from each category or subcategory identified in Table 1 to this section, as applicable. In unusual circumstances, you may ask us to base your production limits on U.S.-directed production volume for a model year more than three years prior. Include only those stationary engines from your U.S.-directed production volume that are certified under one of the standard-setting parts identified in Table 1 to this section. Do not include any exempted engines you produce as part of your U.S.-directed production volume, even if those engines must meet emission standards as a condition of the exemption. Include U.S.-directed engines produced by any parent or subsidiary companies and those from any other companies you license to produce engines for you.

(2) Count every exempted new replacement engine from your total U.S.-directed production volume that you produce in a given calendar year under this paragraph (c), including partially complete engines, except for the following:

(i) Engines built to specifications for an earlier model year under paragraph (b) of this section.

(ii) Partially complete engines exempted under paragraph (d) or (e) of this section.

(3) Send the Designated Compliance Officer a report by February 15 of the year following any year in which you produced exempted replacement engines under this paragraph (c). In your report include the total number of replacement engines you produce under this paragraph (c) for each category or subcategory, as appropriate, and the corresponding total production volumes determined under paragraph (c)(1) of this section. If you send us a report under this paragraph (c)(3), you must also include the total number of replacement engines you produced under paragraphs (b), (d), and (e) of this section. You may include this information in production reports required under the standard-setting part.

(4) Add a permanent label as specified in paragraph (b)(6) of this section. For partially complete engines, you may alternatively add a permanent or removable label as specified in paragraph (d) of this section, except that the appropriate regulatory cite is 40 CFR 1068.240(c).

(5) You may not use the provisions of this paragraph (c) for any engines in the following engine categories or subcategories:

(i) Land-based nonroad compression-ignition engines we regulate under 40 CFR part 1039 with a per-cylinder displacement at or above 7.0 liters.

(ii) Marine compression-ignition engines we regulate under 40 CFR part 1042 with a per-cylinder displacement at or above 7.0 liters.

(iii) Locomotive engines we regulate under 40 CFR part 1033.

(d) *Current-tier replacement engines for engine-based standards.* You may introduce into U.S. commerce short blocks or other partially complete engines from a currently certified engine family as replacement components for in-use equipment powered by engines you originally produced. You must be able to identify all the engine models and model years for which the partially complete engine may properly be used for replacement purposes. You must label the engine as follows:

(1) If you have a reasonable basis to believe that the fully assembled engine will include the original emission control information label, you may add a removable label to the engine with your corporate name and trademark and the statement: ''This replacement engine is exempt under 40 CFR 1068.240(d).'' This would generally apply if all the engine models that are compatible with the replacement engine were covered by a certificate of conformity and they were labeled in a position on the engine or equipment that is not included as part of the partially complete engine being shipped for replacement purposes.

Removable labels must meet the requirements specified in § 1068.45.

(2) If you do not qualify for using a removable label in paragraph (d)(1) of this section, you must add a permanent label in a readily visible location, though it may be obscured after installation in a piece of equipment. Include on the permanent label your corporate name and trademark, the engine's part number (or other identifying information), and the statement: ''This replacement engine is exempt under 40 CFR 1068.240(d).'' If there is not enough space for this statement, you may alternatively add: ''REPLACEMENT'' or ''SERVICE ENGINE''. For purposes of this paragraph (d)(2), engine part numbers permanently stamped or engraved on the engine are considered to be included on the label.

(e) *Current-tier replacement engines for equipment-based standards.* In the case of equipment subject to equipment-based standards, you may introduce into U.S. commerce engines that are identical to engines covered by a current certificate of conformity demonstrating compliance with currently applicable standards where the engines will be installed as replacement engines. These engines might be fully assembled, but we would consider them to be partially complete engines because they are not yet installed in the equipment. You must be able to identify all the engine and equipment models and model years for which such an engine may properly be used for replacement purposes. Add a permanent or removable label to these engines as described in paragraph (d) of this section, except that the appropriate regulatory cite is 40 CFR 1068.240(e).

(f) *Emission credits.* Replacement engines exempted under this section may not generate or use emission credits under the standard-setting part nor be part of any associated credit calculations.

(g) *Circumvention.* The provisions of this section may not be used to circumvent emission standards that apply to new engines under the standard-setting part.

(1) The provisions of this section are intended to allow for replacement of engines that fail prematurely if none of the following is true:

(i) The engine can reasonably be repaired or rebuilt.

(ii) A different used engine (including rebuilt engines) can be used, consistent with applicable regulations. Note that the regulations limit the use of used engines from certain categories, such as converting land-based engines for use in marine vessels.

(iii) A new certified engine is available with the appropriate physical and performance characteristics.

(2) Anyone installing an exempted new replacement engine is deemed to be a manufacturer of a new engine with respect to the prohibitions of § 1068.101(a)(1). This applies to all engines exempted under this section.

(3) The stockpiling restrictions specified in § 1068.103(f) do not apply for engines that will be introduced into U.S. commerce only as allowed by this section. The model year restrictions specified in § 1068.103(f) do not apply for engines produced under paragraphs (d) and (e) of this section if you can demonstrate that the engines will be used only as replacement engines.

TABLE 1 TO § 1068.240—ENGINE CATEGORIES AND SUBCATEGORIES FOR STREAMLINED COMPLIANCE PROVISIONS FOR NEW REPLACEMENT ENGINES

Engine category	Standard-setting part [1]	Engine subcategories
Highway CI	40 CFR part 86	disp. < 0.6 L/cyl 0.6 ≤ disp. < 1.2 L/cyl disp. ≥ 1.2 L/cyl
Nonroad CI, Stationary CI, and Marine CI	40 CFR part 1039, or 40 CFR part 1042	disp. < 0.6 L/cyl 0.6 ≤ disp. < 1.2 L/cyl 1.2 ≤ disp. < 2.5 L/cyl 2.5 ≤ disp. < 7.0 L/cyl
Marine SI	40 CFR part 1045	outboard. personal watercraft.
Large SI, Stationary SI, and Marine SI (sterndrive/ inboard only).	40 CFR part 1048 or 40 CFR part 1045	all engines.
Recreational vehicles	40 CFR part 1051	off-highway motorcycle. all-terrain vehicle. snowmobile.
Small SI and Stationary SI	40 CFR part 1054	handheld. Class I. Class II.

[1] Include an engine as being subject to the identified standard-setting part if it will eventually be subject to emission standards under that part. For example, if you certify marine compression-ignition engines under part 94, count those as if they were already subject to part 1042.

§ 1068.245 What temporary provisions address hardship due to unusual circumstances?

(a) After considering the circumstances, we may permit you to introduce into U.S. commerce engines/equipment that do not comply with emission-related requirements for a limited time if all the following conditions apply:

(1) Unusual circumstances that are clearly outside your control prevent you from meeting requirements from this chapter.

(2) You exercised prudent planning and were not able to avoid the violation; you have taken all reasonable steps to minimize the extent of the nonconformity.

(3) No other allowances are available under the regulations in this chapter to avoid the impending violation, including the provisions of § 1068.250.

(4) Not having the exemption will jeopardize the solvency of your company.

(b) If your unusual circumstances are only related to compliance with the model-year provisions of § 1068.103(f), we may grant hardship under this section without a demonstration that the solvency of your company is in jeopardy as follows:

(1) You must demonstrate that the conditions specified in paragraphs (a)(1) through (3) of this section apply.

(2) Your engines/equipment must comply with standards and other requirements that would have applied if assembly were completed on schedule.

(3) You may generally request this exemption only for engines/equipment for which assembly has been substantially completed; you may not begin assembly of any additional engines/equipment under this exemption after the cause for delay has occurred. We may make an exception to this general restriction for secondary engine manufacturers.

(4) As an example, if your normal production process involves purchase of partially complete engines and a supplier fails to deliver all the ordered engines in time for your assembly according to your previously established schedule as a result of a fire at its factory, you may request that we treat those engine as if they had been completed on the original schedule. Note that we would grant relief only for those engines where you had a reasonable basis for expecting the engines to be delivered on time based on past performance and terms of purchase.

(c) To apply for an exemption, you must send the Designated Compliance Officer a written request as soon as possible before you are in violation. In your request, show that you meet all the conditions and requirements in paragraph (a) of this section.

(d) Include in your request a plan showing how you will meet all the applicable requirements as quickly as possible.

(e) You must give us other relevant information if we ask for it.

(f) We may include reasonable additional conditions on an approval granted under this section, including provisions to recover or otherwise address the lost environmental benefit or paying fees to offset any economic gain resulting from the exemption. For example, in the case of multiple tiers of emission standards, we may require that you meet the standards from the previous tier whether or not your hardship is granted under paragraph (b) of this section.

(g) Add a permanent label to all engines/equipment exempted under this section, consistent with § 1068.45, with at least the following items:

(1) The label heading ''EMISSION CONTROL INFORMATION''.

(2) Your corporate name and trademark.

(3) Engine displacement (in liters or cubic centimeters), and model year of the engine/equipment, (as applicable); or whom to contact for further information. We may also require that you include maximum engine power.

(4) A statement describing the engine's status as an exempted engine:

(i) If the engine/equipment does not meet any emission standards, add one of the following statements:

(A) ''THIS ENGINE IS EXEMPT UNDER 40 CFR 1068.245 FROM EMISSION STANDARDS AND RELATED REQUIREMENTS.''

(B) ''THIS EQUIPMENT IS EXEMPT UNDER 40 CFR 1068.245 FROM EMISSION STANDARDS AND RELATED REQUIREMENTS.''

(ii) If the engines/equipment meet alternate emission standards as a condition of an exemption under this section, we may specify a different statement to identify the alternate emission standards.

§ 1068.250 What are the provisions for extending compliance deadlines for small businesses under hardship?

(a) After considering the circumstances, we may extend the compliance deadline for you to meet new or revised emission standards as long as you meet all the conditions and requirements in this section.

(b) You must be a small business to be eligible for this exemption.

(c) Send the Designated Compliance Officer a written request for an extension. In your request, show that all the following conditions and requirements apply:

(1) You have taken all possible business, technical, and economic steps to comply.

(i) In the case of importers of engines/equipment produced by other companies, show that you attempted to find a manufacturer capable of supplying complying products as soon as you became aware of the applicable requirements but were unable to do so.

(ii) For all other manufacturers, show that the burden of compliance costs prevents you from meeting the requirements of this chapter.

(2) Not having the exemption will jeopardize the solvency of your company.

(3) No other allowances are available under the regulations in this chapter to avoid the impending violation.

(d) In describing the steps you have taken to comply under paragraph (c)(1) of this section, include at least the following information:

(1) Describe your business plan, showing the range of projects active or under consideration.

(2) Describe your current and projected financial status, with and without the burden of complying fully with the applicable regulations in this chapter.

(3) Describe your efforts to raise capital to comply with regulations in this chapter (this may not apply for importers).

(4) Identify the engineering and technical steps you have taken or those you plan to take to comply with regulations in this chapter.

(5) Identify the level of compliance you can achieve. For example, you may be able to produce engines/equipment that meet a somewhat less stringent emission standard than the regulations in this chapter require.

(e) Include in your request a plan showing how you will meet all the applicable requirements as quickly as possible.

(f) You must give us other relevant information if we ask for it.

(g) An authorized representative of your company must sign the request and include the statement: ''All the information in this request is true and accurate to the best of my knowledge.''

(h) Send your request for this extension at least nine months before the relevant deadline. If different deadlines apply to companies that are not small-volume manufacturers, do not send your request before the regulations in question apply to the other manufacturers. Otherwise, do not send your request more than three years before the relevant deadline.

(i) We may include reasonable requirements on an approval granted under this section, including provisions to recover or otherwise address the lost environmental benefit. For example, we may require that you meet a less stringent emission standard or buy and use available emission credits.

(j) We may approve extensions of the compliance deadlines as reasonable under the circumstances up to one model year at a time, and up to three years total.

(k) Add a permanent label to all engines/equipment exempted under this section, consistent with § 1068.45, with at least the following items:

(1) The label heading ''EMISSION CONTROL INFORMATION''.

(2) Your corporate name and trademark.

(3) Engine displacement (in liters or cubic centimeters), and model year of the engine/equipment (as applicable); or

whom to contact for further information. We may also require that you include maximum engine power.

(4) A statement describing the engine's status as an exempted engine:

(i) If the engine/equipment does not meet any emission standards, add one of the following statements:

(A) ''THIS ENGINE IS EXEMPT UNDER 40 CFR 1068.250 FROM EMISSION STANDARDS AND RELATED REQUIREMENTS.''

(B) ''THIS EQUIPMENT IS EXEMPT UNDER 40 CFR 1068.250 FROM EMISSION STANDARDS AND RELATED REQUIREMENTS.''

(ii) If the engine/equipment meets alternate emission standards as a condition of an exemption under this section, we may specify a different statement to identify the alternate emission standards.

§ 1068.255 What are the provisions for exempting engines and fuel-system components for hardship for equipment manufacturers and secondary engine manufacturers?

This section describes how, in unusual circumstances, we may approve an exemption to prevent hardship to an equipment manufacturer or a secondary engine manufacturer. This section does not apply to products that are subject to equipment-based exhaust emission standards.

(a) *Equipment exemption.* As an equipment manufacturer, you may ask for approval to produce exempted equipment for up to 12 months. We will generally limit this to the first year that new or revised emission standards apply. Send the Designated Compliance Officer a written request for an exemption before you are in violation. In your request, you must show you are not at fault for the impending violation and that you would face serious economic hardship if we do not grant the exemption. This exemption is not available under this paragraph (a) if you manufacture the engine or fuel-system components you need for your own equipment, or if complying engines or fuel-system components are available from other manufacturers that could be used in your equipment, unless we allow it elsewhere in this chapter. We may impose other conditions, including provisions to use products meeting less stringent emission standards or to recover the lost environmental benefit. In determining whether to grant the exemptions, we will consider all relevant factors, including the following:

(1) The number of engines or fuel-system components involved.

(2) The size of your company and your ability to endure the hardship.

(3) The amount of time you had to redesign your equipment to accommodate complying products.

(4) Whether there was any breach of contract by a supplier.

(5) The potential for market disruption.

(b) *Engine and fuel-system component exemption.* As an engine manufacturer or fuel-system component manufacturer, you may produce nonconforming products for the equipment we exempt in paragraph (a) of this section. You do not have to request this exemption but you must have written assurance from equipment manufacturers that they need a certain number of exempted products under this section. Label engines or fuel-system components as follows, consistent with § 1068.45:

(1) *Engines.* Add a permanent label to all engines/equipment exempted under this section with at least the following items:

(i) The label heading ''EMISSION CONTROL INFORMATION''.

(ii) Your corporate name and trademark.

(iii) Engine displacement (in liters or cubic centimeters) and model year of the engine, or whom to contact for further information. We may also require that you include maximum engine power.

(iv) If the engine does not meet any emission standards: ''THIS ENGINE IS EXEMPT UNDER 40 CFR 1068.255 FROM EMISSION STANDARDS AND RELATED REQUIREMENTS.'' If the engine meets alternate emission standards as a condition of an exemption under this section, we may specify a different statement to identify the alternate emission standards.

(2) *Fuel-system components.* Add a permanent label to all engines/equipment exempted under this section with at least the following items:

(i) Your corporate name and trademark.

(ii) The statement ''EXEMPT UNDER 40 CFR 1068.255''.

(c) *Secondary engine manufacturers.* As a secondary engine manufacturer, you may ask for approval to produce exempted engines under this section for up to 12 months. We may require you to certify your engines to compliance levels above the emission standards that apply. For example, in the case of multiple tiers of emission standards, we may require you to meet the standards from the previous tier.

(1) The provisions in paragraph (a) of this section that apply to equipment manufacturers requesting an exemption apply equally to you except that you may manufacture the engines. Before we approve an exemption under this section, we will generally require that you commit to a plan to make up the lost environmental benefit.

(i) If you produce uncertified engines under this exemption, we will calculate the lost environmental benefit based on our best estimate of uncontrolled emission rates for your engines.

(ii) If you produce engines under this exemption that are certified to a compliance level less stringent than the emission standards that would otherwise apply, we will calculate the lost environmental benefit based on the compliance level you select for your engines.

(2) The labeling requirements in paragraph (b) of this section apply to your exempted engines; however, if you certify engines to specific compliance levels, state on the label the compliance levels that apply to each engine.

§ 1068.260 What general provisions apply for selling or shipping engines that are not yet in their certified configuration?

Except as specified in paragraph (e) of this section, all new engines in the United States are presumed to be subject to the prohibitions of § 1068.101, which generally require that all new engines be in a certified configuration before being introduced into U.S. commerce. All emission-related components generally need to be installed on an engine for such an engine to be in its certified configuration. This section specifies clarifications and exemptions related to these requirements for engines. Except for paragraph (c) of this section, the provisions of this section generally apply for engine-based standards but not for equipment-based standards.

(a) You may ship engines with emission-related components that are not yet assembled to the engine in circumstances where the final assembly depends on equipment design parameters and shipment of the fully assembled engine is impractical. For example, you may generally ship aftertreatment devices along with engines rather than installing them on the engine before shipment. You do not need an exemption to ship an engine under this paragraph (a) but we may require you to describe how you plan to use this provision in your application for certification.

(b) You do not need an exemption to ship engines without specific components if they are not emission-related components identified in Appendix I of this part. For example, you may generally ship engines without radiators needed to cool the engine. You may ask us at the time of certification to allow you to ship your engines without other equipment-related components (such as a vehicle speed sensor) that are described in your application for certification. If we allow it, we may specify conditions that we determine are needed to ensure that shipping the engine without such components will not result in the engine being operated outside of its certified configuration.

(c) If you are a certificate holder, you may ask us to provide a temporary exemption to allow you to ship or transport partially complete engines between two of your facilities as long as you maintain ownership and control of the engines until they reach their destination. We may also allow this where you do not maintain actual ownership and control of the engines (such as hiring a shipping company to transport the engines) but only if you demonstrate that the engines will be transported only according to your specifications. See § 1068.261(b) for the provisions that apply instead of this paragraph (c) for the special case of integrated manufacturers using the delegated-assembly exemption. Send your request for this exemption to the Designated Compliance Officer in your application for certification, if applicable; in this case, your exemption is approved when we grant your certificate. You may send your request in a separate submission if you will not be the certificate holder for the engines in question. We may require you to take specific steps to ensure that such engines are in a certified configuration before reaching the ultimate purchaser. Note that since this is a temporary exemption, it does not allow you to sell or otherwise distribute to ultimate purchasers an engine in an uncertified configuration. Note also that the exempted engine remains new and subject to emission standards (see definition of ''exempted'' in § 1068.30) until its title is transferred to the ultimate purchaser or it otherwise ceases to be new.

(d) See § 1068.261 for delegated-assembly provisions in which certificate-holding manufacturers introduce into U.S. commerce engines that are not yet equipped with certain emission-related components. See § 1068.262 for provisions related to manufacturers introducing into U.S. commerce partially complete engines for which a secondary engine manufacturer holds the certificate of conformity.

(e) Engines used in hobby vehicles are not presumed to be engines subject to the prohibitions of § 1068.101. Hobby vehicles are reduced-scale models of vehicles that are not capable of transporting a person. Other engines that do not have a valid certificate of conformity or exemption when introduced into U.S. commerce are presumed to be engines subject to the prohibitions of § 1068.101 unless we determine that such engines are excluded from the prohibitions of § 1068.101.

(f) While we presume that new nonhobby engines are subject to the prohibitions of § 1068.101, we may determine that a specific engine is not subject to these prohibitions based on information you provide or other information that is available to us. For example, the provisions of this part 1068 and the standard-setting parts provide for exemptions in certain circumstances. Also, some engines are subject to separate prohibitions under subchapter C instead of the prohibitions of § 1068.101 (see for example, 40 CFR 89.1003).

§ 1068.261 What provisions apply for selling or shipping certified engines that are not yet in the certified configuration?

This section describes an exemption that allows certificate holders to sell or ship engines that are missing certain emission-related components if those components will be installed by an equipment manufacturer. This section does not apply to equipment subject to equipment-based standards. See the standard-setting part to determine whether and how the provisions of this section apply. (Note: See § 1068.262 for provisions related to manufacturers introducing into U.S. commerce partially complete engines for which someone else holds the certificate of conformity.) This exemption is temporary as described in paragraph (f) of this section.

(a) Shipping an engine separately from an aftertreatment component that you have specified as part of its certified configuration will not be a violation of the prohibitions in § 1068.101(a)(1) subject to the provisions in this section.

(b) If you manufacture engines and install them in equipment you also produce, you must take steps to ensure that your facilities, procedures, and production records are set up to ensure that equipment and engines are assembled in their proper certified configurations. For example, you may demonstrate compliance with the requirements of this section by maintaining a database showing how you pair aftertreatment components with the appropriate engines such that the final product is in its certified configuration.

(c) If you include the price of all aftertreatment components in the price of the engine and ship the aftertreatment components directly to the equipment manufacturer, or arrange for separate shipment by the component manufacturer to the equipment manufacturer, all the following conditions apply:

(1) Apply for and receive a certificate of conformity for the engine and its emission control system before shipment as described in the standard-setting part. For an existing certificate of conformity, amend the application for certification by describing your plans to use the provisions of this section as described in paragraph (c)(8) of this section.

(2) Provide installation instructions in enough detail to ensure that the engine will be in its certified configuration if someone follows these instructions. Provide the installation instructions in a timely manner, generally directly after you receive an order for shipping engines or earlier. If you apply removable labels as described in paragraph (c)(7)(i) of this section, include an instruction for the equipment manufacturer to remove the label after installing the appropriate aftertreatment component.

(3) Have a contractual agreement with the equipment manufacturer obligating the equipment manufacturer to complete the final assembly of the engine so it is in its certified configuration when final assembly is complete. This agreement must also obligate the equipment manufacturer to provide the affidavits required under paragraph (c)(4) of this section.

(4) Take appropriate additional steps to ensure that all engines will be in a certified configuration when installed by the equipment manufacturer. At a minimum, you must obtain annual affidavits from every equipment manufacturer to which you sell engines under this section. Include engines that you sell to distributors or dealers. The affidavits must list the part numbers of the aftertreatment devices that equipment manufacturers install on each engine they purchase from you under this section and include confirmation that the number of aftertreatment devices received were sufficient for the number of engines involved.

(5) Describe in your application for certification how you plan to use the provisions of this section and any steps you plan to take under paragraph(c)(4) of this section.

(6) Keep records to document how many engines you produce under this exemption. Also, keep records to document your contractual agreements under paragraph (c)(3) of this section. Keep all these records for five years after

the end of the applicable model year and make them available to us upon request.

(7) Make sure the engine has the emission control information label we require under the standard-setting part. Include additional labeling using one of the following approaches:

(i) Apply an additional removable label in a way that makes it unlikely that the engine will be installed in equipment other than in its certified configuration. The label must identify the engine as incomplete and include a clear statement that failing to install the aftertreatment device, or otherwise failing to bring the engine into its certified configuration, is a violation of federal law subject to civil penalty.

(ii) Add the statement ''DELEGATED ASSEMBLY'' to the permanent emission control information label. You may alternatively add the abbreviated statement ''DEL ASSY'' if there is not enough room on the label.

(8) Describe the following things in your application for certification:

(i) How you plan to use the provisions of this section.

(ii) A detailed plan for auditing equipment manufacturers, as described in paragraph (d)(3) of this section, if applicable.

(iii) All other steps you plan to take under paragraph (c)(4) of this section.

(9) If one of your engines produced under this section is selected for production-line testing or a selective enforcement audit, you must arrange to get a randomly selected aftertreatment component from either the equipment manufacturer or the equipment manufacturer's supplier. You may keep an inventory of these randomly selected parts, consistent with good engineering judgment and the intent of this section. You may obtain such aftertreatment components from any point in the normal distribution from the aftertreatment component manufacturer to the equipment manufacturer. Keep records describing how you randomly selected these aftertreatment components, consistent with the requirements specified in the standard-setting part.

(10) Note that for purposes of importation, you may itemize your invoice to identify separate costs for engines and aftertreatment components that will be shipped separately. A copy of your invoice from the aftertreatment manufacturer may be needed to avoid payment of importation duties for the engine that also include the value of aftertreatment components.

(d) If you do not include the price of all aftertreatment components in the price of the engine, you must meet all the conditions described in paragraphs (c)(1) through (9) of this section, with the following additional provisions:

(1) The contractual agreement described in paragraph (c)(3) of this section must include a commitment that the equipment manufacturer will do the following things:

(i) Purchase the aftertreatment components you have specified in your application for certification and keep records to document these purchases.

(ii) Cooperate with the audits described in paragraph (d)(3) of this section.

(2) You must have written confirmation that the equipment manufacturer has ordered the appropriate type of aftertreatment components for an initial shipment of engines under this section. For the purpose of this paragraph (d)(2), initial shipment means the first shipment of engines that are subject to new or more stringent emissions standard (or the first shipment of engines using the provisions of this section) to a given equipment manufacturer for a given engine family. For the purpose of this paragraph (d)(2), you may treat as a single engine family those engine families from different model years that differ only with respect to model year or other characteristics unrelated to emissions. You must receive the written confirmation within 30 days after shipment. If you do not receive written confirmation within 30 days, you may not ship any more engines from that engine family to that equipment manufacturer until you have the written confirmation. Note that it may be appropriate to obtain subsequent written confirmations to ensure compliance with this section, as described in paragraph (c)(4) of this section.

(3) You must perform or arrange for audits of equipment manufacturers as follows:

(i) If you sell engines to 16 or more equipment manufacturers under the provisions of this section, you must annually perform or arrange for audits of four equipment manufacturers to whom you sell engines under this section. To select individual equipment manufacturers, divide all the affected equipment manufacturers into quartiles based on the number of engines they buy from you; select a single equipment manufacturer from each quartile each model year. Vary the equipment manufacturers selected for auditing from year to year, though you may repeat an audit in a later model year if you find or suspect that a particular equipment manufacturer is not properly installing aftertreatment devices.

(ii) If you sell engines to fewer than 16 equipment manufacturers under the provisions of this section, set up a plan to perform or arrange for audits of each equipment manufacturer on average once every four model years.

(iii) Starting with the 2019 model year, if you sell engines to fewer than 40 equipment manufacturers under the provisions of this section, you may ask us to approve a reduced auditing rate. We may approve an alternate plan that involves audits of each equipment manufacturer on average once every ten model years as long as you show that you have met the auditing requirements in preceding years without finding noncompliance or improper procedures.

(iv) To meet these audit requirements, you or your agent must at a minimum inspect the assembling companies' procedures and production records to monitor their compliance with your instructions, investigate some assembled engines, and confirm that the number of aftertreatment devices shipped were sufficient for the number of engines produced.

(v) You must keep records of these audits for five years after the end of the applicable model year.

(e) The following provisions apply if you ship engines without air filters or other portions of the air intake system that are specifically identified by part number (or other specific part reference) in the application for certification such that the shipped engine is not in its certified configuration. You do not need an exemption under this section to ship engines without air intake system components if you instead describe in your installation instructions how equipment manufacturers should use components meeting certain functional specifications.

(1) If you are using the provisions of this section to ship an engine without aftertreatment, apply all the provisions of this section to ensure that each engine, including its intake system, is in its certified configuration before it reaches the ultimate purchaser.

(2) If you are not using the provisions of this section to ship an engine without aftertreatment, shipping an engine without air-intake components that you have specified as part of its certified configuration will not be a violation of the prohibitions in § 1068.101(a) if you follow the provisions specified in paragraph (b) or paragraphs (c)(1) through (9) of this section. If we find there is a problem, we may require you to perform audits as specified in paragraph (d)(3) of this section.

(f) Once the equipment manufacturer takes possession of an engine exempted under this section and the engine reaches the point of final equipment assembly, the exemption expires and the engine is subject to all the prohibitions in § 1068.101. Note that the engine's model year does not change based on the date the equipment manufacturer adds the aftertreatment device and/or air filter under this section.

(g) You may use the provisions of this section for engines you sell to a distributor as described in this paragraph (g) using one of the following approaches:

(1) You may sell engines through a distributor if you comply with the provisions of paragraph (d) of this section with respect to the equipment manufacturer.

(2) You may treat the distributor as the equipment manufacturer as described in this paragraph (g)(2) for all applicable requirements and prohibitions. Such distributors must bring engines into their final certified configuration. This may include shipping the engine with the appropriate aftertreatment device and/or air filter, but without completing the assembly with all the components. The exemptions expire for such engines when the distributor no longer has control of them.

(h) You must notify us within 15 days if you find from an audit or another source that engines produced under this section are not in a certified configuration at the point of final assembly or that an equipment manufacturer has otherwise failed to meet its obligations under this section. If this occurs, send us a report describing the circumstances related to the noncompliance within 75 days after you notify us.

(i) We may suspend, revoke, or void an exemption under this section, as follows:

(1) We may suspend or revoke your exemption for a specific equipment manufacturer if any of the engines are not in a certified configuration after installation in that manufacturer's equipment, or if we determine that the equipment manufacturer has otherwise failed to comply with the requirements of this section. We may also suspend or revoke your exemption for other engine families with respect to the equipment manufacturer unless you demonstrate that the noncompliance is limited to a specific engine family. You may not use this exemption for future shipments to the affected equipment manufacturer without taking action beyond the minimum steps specified in this section, such as performing on-site audits. We will approve further use of this exemption only if you convince us that you have adequately addressed the factors causing the noncompliance.

(2) We may suspend or revoke your exemption for the entire engine family if we determine that you have failed to comply with the requirements of this section. If we make an adverse decision with respect to the exemption for any of your engine families under this paragraph (i), this exemption will not apply for future certificates unless you convince us that the factors causing the noncompliance do not apply to the other engine families. We may also set additional conditions beyond the provisions specified in this section.

(3) We may void your exemption for the entire engine family if you intentionally submit false or incomplete information or fail to keep and provide to EPA the records required by this section. Note that all records and reports required under this section (whether generated by the engine manufacturer, equipment manufacturer, or others) are subject to the prohibition in § 1068.101(a)(2), which prohibits the submission of false or incomplete information. For example, the affidavits required by this section are considered a submission.

(j) You are liable for the in-use compliance of any engine that is exempt under this section.

(k) It is a violation of § 1068.101(a)(1) for any person to introduce into U.S. commerce a previously exempted engine, including as part of a piece of equipment, without complying fully with the installation instructions.

§ 1068.262 What are the provisions for temporarily exempting engines for shipment to secondary engine manufacturers?

This section specifies when manufacturers may introduce into U.S. commerce partially complete engines that have an exemption or a certificate of conformity held by a secondary engine manufacturer and are not yet in a certified configuration. See the standard-setting part to determine whether and how the provisions of this section apply. (Note: See § 1068.261 for provisions related to manufacturers introducing into U.S. commerce partially complete engines for which they hold the certificate of conformity.) This exemption is temporary as described in paragraph (g) of this section.

(a) The provisions of this section generally apply where the secondary engine manufacturer has substantial control over the design and assembly of emission controls. In determining whether a manufacturer has substantial control over the design and assembly of emission controls, we would consider the degree to which the secondary engine manufacturer would be able to ensure that the engine will conform to the regulations in its final configuration. Such secondary engine manufacturers may finish assembly of partially complete engines in the following cases:

(1) You obtain an engine that is not fully assembled with the intent to manufacture a complete engine.

(2) You obtain an engine with the intent to modify it before it reaches the ultimate purchaser.

(3) You obtain an engine with the intent to install it in equipment that will be subject to equipment-based standards.

(b) Manufacturers may introduce into U.S. commerce partially complete engines as described in this section if they have a written request for such engines from a secondary engine manufacturer that has certified the engine and will finish the engine assembly. The written request must include a statement that the secondary engine manufacturer has a certificate of conformity for the engine and identify a valid engine family name associated with each engine model ordered (or the basis for an exemption if applicable, as specified in paragraph (e) of this section). The original engine manufacturer must apply a removable label meeting the requirements of § 1068.45 that identifies the corporate name of the original manufacturer and states that the engine is exempt under the provisions of § 1068.262. The name of the certifying manufacturer must also be on the label or, alternatively, on the bill of lading that accompanies the engines during shipment. The original engine manufacturer may not apply a permanent emission control information label identifying the engine's eventual status as a certified engine.

(c) The manufacturer that will hold the certificate must include the following information in its application for certification:

(1) Identify the original engine manufacturer of the partially complete engine or of the complete engine you will modify.

(2) Describe briefly how and where final assembly will be completed. Specify how you have the ability to ensure that the engines will conform to the regulations in their final configuration. (Note: Paragraph (a) of this section prohibits using the provisions of this section unless you have substantial control over the design and assembly of emission controls.)

(3) State unconditionally that you will not distribute the engines without conforming to all applicable regulations.

(d) If you are a certificate holder, you may receive shipment of partially complete engines after you apply for a certificate of conformity but before the certificate's effective date. In this case, all the provisions of § 1068.103(c)(1) through (3) apply. This exemption allows the original manufacturer to ship engines after you have applied for a certificate of conformity. Manufacturers may introduce into U.S. commerce partially complete engines as described in this paragraph (d) if they have a written request for such engines from a secondary engine manufacturer stating that the application for certification has been submitted (instead of the information we specify in paragraph (b) of this section). We may set additional conditions under this paragraph (d) to prevent circumvention of regulatory requirements. Consistent with § 1068.103(c), we may also revoke an exemption under this paragraph (d) if we have reason to believe that the application for certification will not be approved or that the engines will otherwise not reach a certified configuration before reaching the ultimate purchaser. This may require that you export the engines.

(e) The provisions of this section also apply for shipping partially complete engines if the engine is covered by a valid exemption and there is no valid engine family name that could be used to represent the engine model. Unless we approve otherwise in advance, you may do this only when shipping engines to secondary engine manufacturers that are certificate holders. In this case, the secondary engine manufacturer must identify the regulatory cite identifying the applicable exemption instead of a valid engine family name when ordering engines from the original engine manufacturer.

(f) If secondary engine manufacturers determine after receiving an engine under this section that the engine will not be covered by a certificate or exemption as planned, they may ask us to allow for shipment of the engines back to the original engine manufacturer or to another secondary engine manufacturer. This might occur in the case of an incorrect shipment or excess inventory. We may modify the provisions of this section as appropriate to address these cases.

(g) Both original and secondary engine manufacturers must keep the records described in this section for at least five years, including the written request for engines and the bill of lading for each shipment (if applicable). The written request is deemed to be a submission to EPA and is thus subject to the reporting requirements of 40 CFR 1068.101(a)(2).

(h) These provisions are intended only to allow you to obtain or transport engines in the specific circumstances identified in this section so any exemption under this section expires when the engine reaches the point of final assembly identified in accordance paragraph (c)(2) of this section.

(i) For purposes of this section, an allowance to introduce engines into U.S. commerce includes a conditional allowance to sell, introduce, or deliver such partially complete engines into commerce in the United States or import them into the United States. It does not include a general allowance to offer such partially complete engines for sale because this exemption is intended to apply only for cases in which the certificate holder already has an arrangement to purchase the engines from the original engine manufacturer. This exemption does not allow the original engine manufacturer to subsequently offer the engines for sale to a different manufacturer who will hold the certificate unless that second manufacturer has also complied with the requirements of this part. The exemption does not apply for any individual engines that are not labeled as specified in this section or which are shipped to someone who is not a certificate holder.

(j) We may suspend, revoke, or void an exemption under this section, as follows:

(1) We may suspend or revoke your exemption if you fail to meet the requirements of this section. We may suspend or revoke your exemption for a specific secondary engine manufacturer if that manufacturer sells engines that are in not in a certified configuration in violation of the regulations. We may disallow this exemption for future shipments to the affected secondary engine manufacturer or set additional conditions to ensure that engines will be assembled in the certified configuration.

(2) We may void your exemption for all the affected engines if you intentionally submit false or incomplete information or fail to keep and provide to EPA the records required by this section.

(3) The exemption is void for an engine that is shipped to a company that is not a certificate holder or for an engine that is shipped to a secondary engine manufacturer that is not in compliance with the requirements of this section.

(k) No exemption is needed to import equipment that does not include an engine. No exemption is available under this section for equipment subject to equipment-based standards if the engine has been installed.

§ 1068.265 What provisions apply to engines/equipment that are conditionally exempted from certification?

In some cases, exempted engines may need to meet alternate emission standards as a condition of the exemption. For example, replacement engines exempted under § 1068.240 in many cases need to meet the same standards as the engines they are replacing. The standard-setting part may similarly exempt engines/equipment from all certification requirements, or allow us to exempt engines/equipment from all certification requirements for certain cases, but require the engines/equipment to meet alternate standards. In these cases, all the following provisions apply:

(a) Your engines/equipment must meet the alternate standards we specify in (or pursuant to) the exemption section, and all other requirements applicable to engines/equipment that are subject to such standards.

(b) You need not apply for and receive a certificate for the exempt engines/equipment. However, you must comply with all the requirements and obligations that would apply to the engines/equipment if you had received a certificate of conformity for them unless we specifically waive certain requirements.

(c) You must have emission data from test engines/equipment using the appropriate procedures that demonstrate compliance with the alternate standards unless the engines/equipment are identical in all material respects to engines/equipment that you have previously certified to standards that are the same as, or more stringent than, the alternate standards. Note that ''engines/equipment that you have previously certified'' does not include any engines/equipment initially covered by a certificate that was later voided or otherwise invalidated, or engines/equipment that we have determined did not fully conform to the regulations.

(d) See the provisions of the applicable exemption for labeling instructions, including those related to the compliance statement and other modifications to the label otherwise required in the standard-setting part. If we do not identify specific labeling requirements for an exempted engine, you must meet the labeling requirements in the standard-setting part, with the following exceptions:

(1) Modify the family designation by eliminating the character that identifies the model year.

(2) We may also specify alternative language to replace the compliance statement otherwise required in the standard-setting part.

(e) You may not generate emission credits for averaging, banking, or trading with engines/equipment meeting requirements under the provisions of this section.

(f) Keep records to show that you meet the alternate standards as follows:

(1) If your exempted engines/ equipment are identical to previously certified engines/equipment, keep your most recent application for certification for the certified family.

(2) If you previously certified a similar family, but have modified the exempted engines/equipment in a way that changes them from their previously certified configuration, keep your most recent application for certification for the certified family, a description of the relevant changes, and any test data or engineering evaluations that support your conclusions.

(3) If you have not previously certified a similar family, keep all the records we specify for the application for certification and any additional records the standard-setting part requires you to keep.

(g) We may require you to send us an annual report of the engines/equipment you produce under this section.

Subpart D—Imports

§ 1068.301 What general provisions apply?

(a) This subpart applies to you if you import into the United States engines or equipment subject to EPA emission standards or equipment containing engines subject to EPA emission standards.

(b) In general, engines/equipment that you import must be covered by a certificate of conformity unless they were built before emission standards started to apply. This subpart describes the limited cases where we allow importation of exempt or excluded engines/equipment. For equipment not subject to equipment-based exhaust emission standards, an exemption of the engine allows you to import the equipment.

(c) U.S. Customs and Border Protection may prevent you from importing engines or equipment if you do not meet the requirements of this subpart. In addition, U.S. Customs and Border Protection regulations may contain other requirements for engines/ equipment imported into the United States (see 19 CFR Chapter I).

(d) Complete the appropriate EPA declaration form before importing any engines or equipment. These forms are available on the Internet at *http://www.epa.gov/OTAQ/imports/ or by phone at 734–214–4100.* Importers must keep the forms for five years and make them available promptly upon request.

§ 1068.305 How do I get an exemption or exclusion for imported engines/equipment?

(a) You must meet the requirements of the specific exemption or exclusion you intend to use, including any labeling requirements that apply, and complete the appropriate declaration form described in § 1068.301(d).

(b) If we ask for it, prepare a written request in which you do the following:

(1) Give your name, address, telephone number, and taxpayer identification number.

(2) Give the engine/equipment owner's name, address, telephone number, and taxpayer identification number.

(3) Identify the make, model, identification number, and original production year of all engines/ equipment.

(4) Identify which exemption or exclusion in this subpart allows you to import nonconforming engines/ equipment and describe how your engine/equipment qualifies.

(5) Tell us where you will keep your engines/equipment if you might need to store them until we approve your request.

(6) Authorize us to inspect or test your engines/equipment as the Clean Air Act allows.

(c) We may ask for more information.

(d) You may import the nonconforming engines/equipment you identify in your request if you get prior written approval from us. U.S. Customs and Border Protection may require you to present the approval letter. We may temporarily or permanently approve the exemptions or exclusions, as described in this subpart.

§ 1068.310 What are the exclusions for imported engines/equipment?

If you show us that your engines/ equipment qualify under one of the paragraphs of this section, we will approve your request to import such excluded engines/equipment. You must have our approval before importing engines/equipment under paragraph (a) of this section. You may, but are not required to request our approval to import the engines/equipment under paragraph (b) through (c) of this section. The following engines/equipment are excluded:

(a) *Engines/equipment used solely for competition.* Engines/equipment that you demonstrate will be used solely for competition are excluded from the restrictions on imports in § 1068.301(b), but only if they are properly labeled. See the standard-setting part for provisions related to this demonstration. Section 1068.101(b)(4) prohibits anyone from using these excluded engines/ equipment for purposes other than competition.

(b) *Stationary engines.* The definition of nonroad engine in § 1068.30 does not include certain engines used in stationary applications. Such engines (and equipment containing such engines) may be subject to the standards of 40 CFR part 60. Engines that are excluded from the definition of nonroad engine in this part and are not required to be certified to standards under 40 CFR part 60 are not subject to the restrictions on imports in § 1068.301(b), but only if they are properly labeled and there is clear and convincing evidence that each engine will be used in a stationary application (see paragraph (2)(iii) of the definition of "Nonroad engine"). Section 1068.101 restricts the use of stationary engines for non-stationary purposes unless they are certified under 40 CFR part 60 to the same standards that would apply to nonroad engines for the same model year.

(c) *Hobby engines.* The standard-setting parts exclude engines used in reduced-scale models of vehicles that are not capable of transporting a person.

(d) *Other engines/equipment.* The standard-setting parts may exclude engines/equipment used in certain applications. For example, engines used in aircraft are generally excluded. Engines/equipment used in underground mining are excluded if they are regulated by the Mine Safety and Health Administration.

(e) *Labeling.* For engines/equipment imported under paragraph (a) or (b) of this section, you must add a permanent label, consistent with § 1068.45, with at least the following items unless the standard-setting part includes other specific labeling requirements or we approve alternate label language that is more accurate for your engine/ equipment:

(1) Include the heading "EMISSION CONTROL INFORMATION".

(2) Include your full corporate name and trademark.

(3) State the engine displacement (in liters or cubic centimeters). We may also require that you include maximum engine power. If the engine's power is not established, state the approximate power.

(4) State: "THIS ENGINE IS EXEMPT FROM THE REQUIREMENTS OF [identify the part referenced in § 1068.1(a) that would otherwise apply],

AS PROVIDED IN [identify the paragraph authorizing the exemption (for example, ''40 CFR 1068.315(a)'')]. INSTALLING THIS ENGINE IN ANY DIFFERENT APPLICATION MAY BE A VIOLATION OF FEDERAL LAW SUBJECT TO CIVIL PENALTY.''

§ 1068.315 What are the permanent exemptions for imported engines/equipment?

We may approve a permanent exemption from the restrictions on imports under § 1068.301(b) under the following conditions:

(a) *National security exemption.* You may import an engine or piece of equipment under the national security exemption in § 1068.225, but only if it is properly labeled.

(b) *Manufacturer-owned engine/equipment exemption.* You may import manufacturer-owned engines/equipment, as described in § 1068.215.

(c) *Replacement engine exemption.* You may import a nonconforming replacement engine as described in § 1068.240. To use this exemption, you must be a certificate holder for a family we regulate under the same part as the replacement engine.

(d) *Extraordinary circumstances exemption.* You may import a nonconforming engine or piece of equipment if we grant hardship relief as described in § 1068.245.

(e) *Small-volume manufacturer exemption.* You may import a nonconforming engine or piece of equipment if we grant hardship relief for a small-volume manufacturer, as described in § 1068.250.

(f) *Equipment-manufacturer hardship exemption.* You may import a nonconforming engine if we grant an exemption for the transition to new or revised emission standards, as described in § 1068.255.

(g) [Reserved]

(h) *Identical configuration exemption.* Unless specified otherwise in the standard-setting part, you may import nonconforming engines/equipment if they are identical to certified engines/equipment produced by the same manufacturer, subject to the following provisions:

(1) You must meet all the following criteria:

(i) You have owned the engines/equipment for at least six months.

(ii) You agree not to sell, lease, donate, trade, or otherwise transfer ownership of the engines/equipment for at least five years. During this period, the only acceptable way to dispose of the engines/equipment is to destroy or export them.

(iii) You use data or evidence sufficient to show that the engines/equipment are in a configuration that is identical to engines/equipment the original manufacturer has certified to meet emission standards that apply at the time the manufacturer finished assembling or modifying the engines/equipment in question. If you modify the engines/equipment to make them identical, you must completely follow the original manufacturer's written instructions.

(2) We will tell you in writing if we find the information insufficient to show that the engines/equipment are eligible for this exemption. In this case, we will not consider your request further until you address our concerns.

(i) *Ancient engine/equipment exemption.* If you are not the original engine/equipment manufacturer, you may import nonconforming engines/equipment that are subject to a standard-setting part and were first manufactured at least 21 years earlier, as long as they are still in their original configurations.

§ 1068.325 What are the temporary exemptions for imported engines/equipment?

You may import engines/equipment under certain temporary exemptions, subject to the conditions in this section. We may ask U.S. Customs and Border Protection to require a specific bond amount to make sure you comply with the requirements of this subpart. You may not sell or lease one of these engines/equipment while it is in the United States. You must eventually export the engine/equipment as we describe in this section unless it conforms to a certificate of conformity or it qualifies for one of the permanent exemptions in § 1068.315.

(a) *Exemption for repairs or alterations.* You may temporarily import nonconforming engines/equipment under bond solely for repair or alteration, subject to our advance approval as described in paragraph (j) of this section. You may operate the engine/equipment in the United States only as necessary to repair it, alter it, or ship it to or from the service location. Export the engine/equipment directly after servicing is complete.

(b) *Testing exemption.* You may temporarily import nonconforming engines/equipment under bond for testing if you follow the requirements of § 1068.210, subject to our advance approval as described in paragraph (j) of this section. You may operate the engines/equipment in the United States only as needed to perform tests. This exemption expires one year after you import the engine/equipment unless we approve an extension. The engine/equipment must be exported before the exemption expires.

(c) *Display exemption.* You may temporarily import nonconforming engines/equipment under bond for display if you follow the requirements of § 1068.220, subject to our advance approval as described in paragraph (j) of this section. This exemption expires one year after you import the engine/equipment, unless we approve your request for an extension. We may approve an extension of up to one more year for each request, but no more than three years total. The engine/equipment must be exported by the time the exemption expires or directly after the display concludes, whichever comes first.

(d) *Export exemption.* You may temporarily import nonconforming engines/equipment to export them, as described in § 1068.230. You may operate the engine/equipment in the United States only as needed to prepare it for export. Label the engine/equipment as described in § 1068.230.

(e) *Diplomatic or military exemption.* You may temporarily import nonconforming engines/equipment without bond if you represent a foreign government in a diplomatic or military capacity. In your request to the Designated Compliance Officer (see § 1068.305), include either written confirmation from the U.S. State Department that you qualify for this exemption or a copy of your orders for military duty in the United States. We will rely on the State Department or your military orders to determine when your diplomatic or military status expires, at which time you must export your exempt engines/equipment.

(f) *Delegated-assembly exemption.* You may import a nonconforming engine for final assembly under the provisions of § 1068.261.

(g) *Partially complete engine exemption.* You may import an engine if another company already has a certificate of conformity and will be modifying the engine to be in its final, certified configuration under the provisions of § 1068.262. You may also import a partially complete engine by shipping it from one of your facilities to another under the provisions of § 1068.260(c).

(h) [Reserved]

(i) *Approvals.* For the exemptions in this section requiring our approval, you must send a request to the Designated Compliance Officer before importing the engines/equipment. We will approve your request if you meet all the applicable requirements and conditions. If another section separately requires that you request approval for the exemption, you may combine the information requirements in a single request. Include the following information in your request:

(1) Identify the importer of the engine/equipment and the applicable postal address, e-mail address, and telephone number.

(2) Identify the engine/equipment owner and the applicable postal address, e-mail address, and telephone number.

(3) Identify the engine/equipment by model number (or name), serial number, and original production year.

(4) Identify the specific regulatory provision under which you are seeking an exemption.

(5) Authorize EPA enforcement officers to conduct inspections or testing as allowed under the Clean Air Act.

(6) Include any additional information we specify for demonstrating that you qualify for the exemption.

§ 1068.335 What are the penalties for violations?

(a) *All imported engines/equipment.* Unless you comply with the provisions of this subpart, importation of nonconforming engines/equipment violates sections 203 and 213(d) of the Clean Air Act (42 U.S.C. 7522 and 7547(d)). You may then have to export the engines/equipment, pay civil penalties, or both. U.S. Customs and Border Protection may seize unlawfully imported engines and equipment.

(b) *Temporarily imported engines/equipment.* If you do not comply with the provisions of this subpart for a temporary exemption under § 1068.325, you may forfeit the total amount of the bond in addition to the sanctions we identify in paragraph (a) of this section. We will consider an engine or piece of equipment to be exported if it has been destroyed or delivered to U.S. Customs and Border Protection for export or other disposition under applicable Customs laws and regulations. EPA or U.S. Customs and Border Protection may offer you a grace period to allow you to export temporarily exempted engines/equipment without penalty after the exemption expires.

§ 1068.360 What restrictions apply to assigning a model year to imported engines and equipment?

This section includes limitations on assigning a model year to engines and equipment that are imported in a year later than the model year in which they were manufactured, except as specified in paragraph (e) of this section.

(a) The term ''model year'' is defined in each of the standard-setting parts. These definitions may vary slightly to address the different categories of engines and equipment. Except as specified in paragraphs (b) and (c) of this section, the emission standards and other emission-related requirements that apply for an imported engine or piece of equipment are determined by the model year as defined in the applicable standard-setting part and the provisions of 40 CFR 1068.105(a).

(b) This paragraph (b) applies for the importation of new engines and new equipment in any calendar year that is more than one year after the named model year of the engine or equipment when emission control requirements applying to current engines are different than for engines or equipment in the named model year, unless they are imported under special provisions for Independent Commercial Importers as allowed under the standard-setting part. Regardless of what other provisions of this subchapter U specify for the model year of the engine or equipment, such engines and equipment are deemed to have an applicable model year no more than one year earlier than the calendar year in which they are imported. For example, a new engine identified as a 2007 model-year product that is imported on January 31, 2010 will be treated as a 2009 model-year engine; the same engine will be treated as a 2010 model-year engine if it is imported any time in calendar year 2011.

(c) If you claim that an engine or piece of equipment is not subject to standards–or is subject to standards less stringent than those currently in place—based on its original manufacture date because it has already been placed into service, you must provide clear and convincing evidence that it has already been placed into service. Such evidence must generally include, but not be limited to, documentary evidence of purchase and maintenance history and visible wear that is consistent with the reported manufacture date. Importing products for resale or importing more than one engine or piece of equipment at a time would generally require a greater degree of evidence under this paragraph (c). If you do not satisfactorily demonstrate that the engine or equipment has already been placed into service, the provisions of paragraph (b) of this section apply.

(d) Nothing in this section should be interpreted to allow circumvention of the requirements of this part by mis-stating or mis-labeling the model year of engines or equipment. For example, this section does not permit engines imported in the same year that they are manufactured to be treated as an engine manufactured in the previous year. To verify compliance with the provisions of this section, we may require you to verify the original manufacture date of the engine or equipment based on manufacturing records, title-transfer documents, service records, or other documentation.

(e) If all the current emission control requirements are the same as in the named model year, the provisions of this section do not apply.

Subpart E—Selective Enforcement Auditing

§ 1068.401 What is a selective enforcement audit?

(a) We may conduct or require you to conduct emission tests on your production engines/equipment in a selective enforcement audit. This requirement is independent of any requirement for you to routinely test production-line engines/equipment. For products subject to equipment-based standards, but tested using engine-based test procedures, this subpart applies to the engines and/or the equipment, as applicable. Otherwise this subpart applies to engines for products subject to engine-based standards and to equipment for products subject to equipment-based standards.

(b) If we send you a signed test order, you must follow its directions and the provisions of this subpart. We may tell you where to test the engines/equipment. This may be where you produce the engines/equipment or any other emission testing facility.

(c) If we select one or more of your families for a selective enforcement audit, we will send the test order to the person who signed the application for certification or we will deliver it in person.

(d) If we do not select a testing facility, notify the Designated Compliance Officer within one working day of receiving the test order where you will test your engines/equipment.

(e) You must do everything we require in the audit without delay.

§ 1068.405 What is in a test order?

(a) In the test order, we will specify the following things:

(1) The family and configuration (if any) we have identified for testing.

(2) The engine/equipment assembly plant, storage facility, or (if you import the engines/equipment) port facility from which you must select engines/equipment.

(3) The procedure for selecting engines/equipment for testing, including a selection rate.

(4) The test procedures, duty cycles, and test points, as appropriate, for testing the engines/equipment to show that they meet emission standards.

(b) We may state that we will select the test engines/equipment.

(c) We may identify alternate families or configurations for testing in case we determine the intended engines/equipment are not available for testing or if you do not produce enough engines/equipment to meet the minimum rate for selecting test engines/equipment.

(d) We may include other directions or information in the test order.

(e) We may ask you to show us that you meet any additional requirements that apply to your engines/equipment (closed crankcases, for example).

(f) In anticipation of a potential audit, you may give us a list of your preferred families and the corresponding assembly plants, storage facilities, or (if you import the engines/equipment) port facilities from which we should select engines/equipment for testing. The information would apply only for a single model year so it would be best to include this information in your application for certification. If you give us this list before we issue a test order, we will consider your recommendations, but we may select different engines/equipment.

(g) If you also do routine production-line testing with the selected family in the same time period, the test order will tell you what changes you might need to make in your production-line testing schedule.

§ 1068.410 How must I select and prepare my engines/equipment?

(a) *Selecting engines/equipment.* Select engines/equipment as described in the test order. If you are unable to select test engines/equipment this way, you may ask us to approve an alternate plan as long as you make the request before you start selecting engines/equipment.

(b) *Assembling engines/equipment.* Produce and assemble test engines/equipment using your normal production and assembly process for that family.

(1) Notify us directly if you make any change in your production, assembly, or quality control processes that might affect emissions between the time you receive the test order and the time you finish selecting test engines/equipment.

(2) If you do not fully assemble engines/equipment at the specified location, we will describe in the test order how to select components to finish assembling the engines/equipment. Assemble these components onto the test engines/equipment using your documented assembly and quality control procedures.

(c) *Modifying engines/equipment.* Once an engine or piece of equipment is selected for testing, you may adjust, repair, prepare, or modify it or check its emissions only if one of the following is true:

(1) You document the need for doing so in your procedures for assembling and inspecting all your production engines/equipment and make the action routine for all the engines/equipment in the family.

(2) This subpart otherwise allows your action.

(3) We approve your action in advance.

(d) *Engine/equipment malfunction.* If an engine/equipment malfunction prevents further emission testing, ask us to approve your decision to either repair the engine or delete it from the test sequence.

(e) *Setting adjustable parameters.* Before any test, we may adjust or require you to adjust any adjustable parameter to any setting within its physically adjustable range.

(1) We may adjust or require you to adjust idle speed outside the physically adjustable range as needed until the engine has stabilized emission levels (see paragraph (f) of this section). We may ask you for information needed to establish an alternate minimum idle speed.

(2) We may make or specify adjustments within the physically adjustable range by considering their effect on emission levels. We may also consider how likely it is that someone will make such an adjustment with in-use engines/equipment.

(f) *Stabilizing emission levels.* (1) Before you test production-line engines/equipment for exhaust emission, you may operate the engine/equipment to stabilize the exhaust emission levels. Using good engineering judgment, operate your engines/equipment in a way that represents the way production engines/equipment will be used. You may operate each engine or piece of equipment for no more than the greater of two periods:

(i) 50 hours.

(ii) The number of hours you operated your emission-data engine/equipment for certifying the family (see 40 CFR part 1065, subpart E).

(2) Use good engineering judgment and follow the standard-setting part to stabilize equipment for evaporative emissions, where appropriate.

(g) *Damage during shipment.* If shipping the engine/equipment to a remote facility for testing under a selective enforcement audit makes necessary an adjustment or repair, you must wait until after the initial emission test to do this work. We may waive this requirement if the test would be impossible or unsafe or if it would permanently damage the engine/equipment. Report to us, in your written report under § 1068.450, all adjustments or repairs you make on test engines/equipment before each test.

(h) *Shipping engines/equipment.* If you need to ship engines/equipment to another facility for testing, make sure the test engines/equipment arrive at the test facility within 24 hours after being selected. You may ask that we allow more time if you are unable to do this.

(i) *Retesting after invalid tests.* You may retest an engine or piece of equipment if you determine an emission test is invalid under the standard-setting part. Explain in your written report reasons for invalidating any test and the emission results from all tests. If you retest an engine or piece of equipment and, within ten days after testing, ask to substitute results of the new tests for the original ones, we will answer within ten days after we receive your information.

(j) *Retesting after reaching a fail decision.* You may retest your engines/equipment once a fail decision for the audit has been reached based on the first test on each engine or piece of equipment under § 1068.420(c). You may test each engine or piece of equipment up to a total of three times, but you must perform the same number of tests on each engine or piece of equipment. You may further operate the engine/equipment to stabilize emission levels before testing, subject to the provisions of paragraph (f) of this section. We may approve retesting at other times if you send us a request with satisfactory justification.

§ 1068.415 How do I test my engines/equipment?

(a) Use the test procedures specified in the standard-setting part for showing that your engines/equipment meet emission standards. The test order will give further testing instructions.

(b) If no test cells are available at a given facility, you may make alternate testing arrangements with our approval.

(c) Test at least two engines/equipment in each 24-hour period (including void tests). However, if your projected U.S. nonroad sales within the family are less than 7,500 for the year, you may test a minimum of one per 24-hour period. If you request and justify it, we may approve a lower testing rate.

(d) For exhaust emissions, accumulate service on test engines/equipment at a minimum rate of 6 hours per engine or piece of equipment during each 24-hour period. The first 24-hour period for service accumulation begins when you finish preparing an engine or piece of equipment for testing. The minimum service accumulation rate does not apply on weekends or holidays. You may ask us to approve a lower service accumulation rate. We may require you to accumulate hours more rapidly than the minimum rate, as appropriate. Plan your service accumulation to allow testing at the rate specified in paragraph (c) of this section. Select operation for accumulating operating hours on your test engines/equipment to represent normal in-use operation for the family.

(e) Test engines/equipment in the same order you select them.

§ 1068.420 How do I know when my engine family fails an SEA?

(a) A failed engine or piece of equipment is one whose final deteriorated test results exceed an applicable emission standard for any regulated pollutant.

(b) Continue testing engines/equipment until you reach a pass decision for all pollutants or a fail decision for one pollutant.

(c) You reach a pass decision for the SEA requirements when the number of failed engines/equipment is less than or equal to the pass decision number in Appendix A to this subpart for the total number of engines/equipment tested. You reach a fail decision for the SEA requirements when the number of failed engines/equipment is greater than or equal to the fail decision number in Appendix A to this subpart for the total number of engines/equipment you test. An acceptable quality level of 40 percent is the basis for the pass or fail decision.

(d) Consider test results in the same order as the engine/equipment testing sequence.

(e) If you reach a pass decision for one pollutant, but need to continue testing for another pollutant, we will disregard these later test results for the pollutant with the pass decision.

(f) Appendix A to this subpart lists multiple sampling plans. Use the sampling plan for the projected sales volume you reported in your application for the audited family.

(g) We may choose to stop testing after any number of tests.

(h) If we test some of your engines/equipment in addition to your own testing, we may decide not to include your test results as official data for those engines/equipment if there is substantial disagreement between your testing and our testing. We will reinstate your data as valid if you show us that we made an error and your data are correct.

(i) If we rely on our test data instead of yours, we will notify you in writing of our decision and the reasons we believe your facility is not appropriate for doing the tests we require under this subpart. You may request in writing that we consider your test results from the same facility for future testing if you show us that you have made changes to resolve the problem.

§ 1068.425 What happens if one of my production-line engines/equipment exceeds the emission standards?

(a) If one of your production-line engines/equipment fails to meet one or more emission standards (see § 1068.420), the certificate of conformity is automatically suspended for that engine or piece of equipment. You must take the following actions before your certificate of conformity can cover that engine or piece of equipment:

(1) Correct the problem and retest the engine/equipment to show it complies with all emission standards.

(2) Include in your written report a description of the test results and the remedy for each engine or piece of equipment (see § 1068.450).

(b) You may ask for a hearing at any time to determine whether the tests and sampling methods were proper (see subpart G of this part).

§ 1068.430 What happens if a family fails an SEA?

(a) We may suspend your certificate of conformity for a family if it fails the SEA under § 1068.420. The suspension may apply to all facilities producing engines/equipment from a family even if you find noncompliant engines/equipment only at one facility.

(b) We will tell you in writing if we suspend your certificate in whole or in part. We will not suspend a certificate until at least 15 days after the family fails the SEA. The suspension is effective when you receive our notice.

(c) You may ask for a hearing to determine whether the tests and sampling methods were proper (see subpart G of this part) up to 15 days after we suspend the certificate for a family. If we agree that we used erroneous information in deciding to suspend the certificate before a hearing is held, we will reinstate the certificate.

§ 1068.435 May I sell engines/equipment from a family with a suspended certificate of conformity?

You may sell engines/equipment that you produce after we suspend the family's certificate of conformity only if one of the following occurs:

(a) You test each engine or piece of equipment you produce and show it complies with emission standards that apply.

(b) We conditionally reinstate the certificate for the family. We may do so if you agree to recall all the affected engines/equipment and remedy any noncompliance at no expense to the owner if later testing shows that engines/equipment in the family still do not comply.

§ 1068.440 How do I ask EPA to reinstate my suspended certificate?

(a) Send us a written report asking us to reinstate your suspended certificate. In your report, identify the reason for the SEA failure, propose a remedy, and commit to a date for carrying it out. In your proposed remedy include any quality control measures you propose to keep the problem from happening again.

(b) Give us data from production-line testing showing that engines/equipment in the remedied family comply with all the emission standards that apply.

§ 1068.445 When may EPA revoke my certificate under this subpart and how may I sell these engines/equipment again?

(a) We may revoke your certificate for a family in the following cases:

(1) You do not meet the reporting requirements under this subpart.

(2) Your family fails an SEA and your proposed remedy to address a suspended certificate is inadequate to solve the problem or requires you to change the engine/equipment's design or emission control system.

(b) To sell engines/equipment from a family with a revoked certificate of conformity, you must modify the family and then show it complies with the applicable requirements.

(1) If we determine your proposed design change may not control emissions for the engine/equipment's full useful life, we will tell you within five working days after receiving your report. In this case we will decide whether production-line testing will be enough for us to evaluate the change or whether you need to do more testing.

(2) Unless we require more testing, you may show compliance by testing production-line engines/equipment as described in this subpart.

(3) We will issue a new or updated certificate of conformity when you have met these requirements.

§ 1068.450 What records must I send to EPA?

(a) Within 30 days of the end of each audit, send us a report with the following information:

(1) Describe any facility used to test production-line engines/equipment and state its location.

(2) State the total U.S.-directed production volume and number of tests for each family.

(3) Describe your test engines/equipment, including the family's identification and the engine/equipment's model year, build date, model number, identification number, and number of hours of operation before testing for each test engine or piece of equipment.

(4) Identify where you accumulated hours of operation on the engines/equipment and describe the procedure and schedule you used.

(5) Provide the test number; the date, time and duration of testing; test procedure; initial test results before and after rounding; final test results; and final deteriorated test results for all tests. Provide the emission figures for all measured pollutants. Include information for both valid and invalid tests and the reason for any invalidation.

(6) Describe completely and justify any nonroutine adjustment, modification, repair, preparation, maintenance, or test for the test engine/equipment if you did not report it separately under this subpart. Include the results of any emission measurements, regardless of the procedure or type of equipment.

(7) Report on each failed engine or piece of equipment as described in § 1068.425.

(b) We may ask you to add information to your written report, so we can determine whether your new engines/equipment conform with the requirements of this subpart.

(c) An authorized representative of your company must sign the following statement: We submit this report under Sections 208 and 213 of the Clean Air Act. Our testing conformed completely with the requirements of 40 CFR part 1068. We have not changed production processes or quality-control procedures for the family in a way that might affect the emission control from production engines/equipment. All the information in this report is true and accurate to the best of my knowledge. I know of the penalties for violating the Clean Air Act and the regulations. (Authorized Company Representative)

(d) Send reports of your testing to the Designated Compliance Officer using an approved information format. If you want to use a different format, send us a written request with justification for a waiver.

(e) We may post test results on publicly accessible databases and we will send copies of your reports to anyone from the public who asks for them. We will not release information about your sales or production volumes, which is all we will consider confidential.

§ 1068.455 What records must I keep?

(a) We may review your records at any time so it is important to keep required information readily available. Organize and maintain your records as described in this section.

(b) Keep paper records for testing under this subpart for one full year after you complete all the testing required for the selective enforcement audit. For additional storage, you may use any format or media.

(c) Keep a copy of the written reports described in § 1068.450.

(d) Keep the following additional records:

(1) The names of supervisors involved in each test.

(2) The name of anyone who authorizes adjusting, repairing, preparing, or modifying a test engine/equipment and the names of all supervisors who oversee this work.

(3) If you shipped the engine/equipment for testing, the date you shipped it, the associated storage or port facility, and the date the engine/equipment arrived at the testing facility.

(4) Any records related to your audit that are not in the written report.

(5) A brief description of any significant events during testing not otherwise described in the written report or in this section.

(e) If we ask, you must give us projected or actual production for a family. Include each assembly plant if you produce engines/equipment at more than one plant.

(f) We may ask you to keep or send other information necessary to implement this subpart.

Appendix A to Subpart E of Part 1068—Plans for Selective Enforcement Auditing

The following tables describe sampling plans for selective enforcement audits, as described in § 1068.420:

TABLE A–1—SAMPLING PLAN CODE LETTER

Projected family sales	Code letter [1]	Minimum number of tests		Maximum number of tests
		To pass	To fail	
20–50	AA	3	5	20
20–99	A	4	6	30
100–299	B	5	6	40
300–499	C	5	6	50
500 +	D	5	6	60

[1] A manufacturer may optionally use either the sampling plan for code letter "AA" or sampling plan for code letter "A" for Selective Enforcement Audits of families with annual sales between 20 and 50 engines/equipment. Additionally, the manufacturer may switch between these plans during the audit.

TABLE A–2—SAMPLING PLANS FOR DIFFERENT ENGINE FAMILY SALES VOLUMES

Stage [a]	AA		A		B		C		D	
	Pass #	Fail #	Pass #	Fail #	Pass #	Fail #	Pass #	Fail #	Pass #	Fail #
1	....	....	....	....	....	....	....	....	....	......
2	....	....	....	....	....	....	....	....	....	......
3	0	....	....	....	....	....	....	....	....	......
4	0	....	0	....	....	....	....	....	....	......
5	1	5	0	....	0	....	0	....	0	......
6	1	6	1	6	1	6	0	6	0	6
7	2	6	1	7	1	7	1	7	1	7

TABLE A–2—SAMPLING PLANS FOR DIFFERENT ENGINE FAMILY SALES VOLUMES—Continued

Stage [a]	AA		A		B		C		D	
	Pass #	Fail #	Pass #	Fail #	Pass #	Fail #	Pass #	Fail #	Pass #	Fail #
8	2	7	2	7	2	7	2	7	2	8
9	3	7	2	8	2	8	2	8	2	8
10	3	8	3	8	3	8	3	9	3	9
11	4	8	3	8	3	9	3	9	3	9
12	4	9	4	9	4	9	4	10	4	10
13	5	9	5	10	4	10	4	10	4	10
14	5	10	5	10	5	10	5	11	5	11
15	6	10	6	11	5	11	5	11	5	11
16	6	10	6	11	6	12	6	12	6	12
17	7	10	7	12	6	12	6	12	6	12
18	8	10	7	12	7	13	7	13	7	13
19	8	10	8	13	8	13	7	13	7	13
20	9	10	8	13	8	14	8	14	8	14
21	....	....	9	14	9	14	8	14	8	14
22	....	....	10	14	9	15	9	15	9	15
23	....	....	10	15	10	15	10	15	9	15
24	....	....	11	15	10	16	10	16	10	16
25	....	....	11	16	11	16	11	16	11	16
26	....	....	12	16	11	17	11	17	11	17
27	....	....	12	17	12	17	12	17	12	17
28	....	....	13	17	12	18	12	18	12	18
29	....	....	14	17	13	18	13	18	13	19
30	....	....	16	17	13	19	13	19	13	19
31	....	....	....	....	14	19	14	19	14	20
32	....	....	....	....	14	20	14	20	14	20
33	....	....	....	....	15	20	15	20	15	21
34	....	....	....	....	16	21	15	21	15	21
35	....	....	....	....	16	21	16	21	16	22
36	....	....	....	....	17	22	16	22	16	22
37	....	....	....	....	17	22	17	22	17	23
38	....	....	....	....	18	22	18	23	17	23
39	....	....	....	....	18	22	18	23	18	24
40	....	....	....	....	21	22	19	24	18	24
41	....	....	....	....	....	....	19	24	19	25
42	....	....	....	....	....	....	20	25	19	26
43	....	....	....	....	....	....	20	25	20	26
44	....	....	....	....	....	....	21	26	21	27
45	....	....	....	....	....	....	21	27	21	27
46	....	....	....	....	....	....	22	27	22	28
47	....	....	....	....	....	....	22	27	22	28
48	....	....	....	....	....	....	23	27	23	29
49	....	....	....	....	....	....	23	27	23	29
50	....	....	....	....	....	....	26	27	24	30
51	....	....	....	....	....	....	....	....	24	30
52	....	....	....	....	....	....	....	....	25	31
53	....	....	....	....	....	....	....	....	25	31
54	....	....	....	....	....	....	....	....	26	32
55	....	....	....	....	....	....	....	....	26	32
56	....	....	....	....	....	....	....	....	27	33
57	....	....	....	....	....	....	....	....	27	33
58	....	....	....	....	....	....	....	....	28	33
59	....	....	....	....	....	....	....	....	28	33
60	....	....	....	....	....	....	....	....	32	33

[a] Stage refers to the cumulative number of engines/equipment tested.

Subpart F—Reporting Defects and Recalling Engines/Equipment

§ 1068.501 How do I report emission-related defects?

This section addresses the certificate holder's responsibility to investigate and report emission-related defects in design, materials, or workmanship. The provisions of this section do not limit your liability under this part or the Clean Air Act. For example, selling an engine/equipment that does not conform to your application for certification is a violation of § 1068.101(a)(1) independent of the requirements of this section. The requirements of this section apply separately to each certificate holder if there is more than one certificate holder for the equipment.

(a) *General provisions.* As a certifying manufacturer, you must investigate in certain circumstances whether engines/equipment that have been introduced into U.S. commerce under your certificate have incorrect, improperly installed, or otherwise defective emission-related components or systems. This includes defects in design, materials, or workmanship. You must also send us reports as specified by this section.

(1) This section addresses defects for any of the following emission-related components or systems containing the following components:

(i) Electronic control units, aftertreatment devices, fuel-metering components, EGR-system components, crankcase-ventilation valves, all components related to charge-air compression and cooling, and all sensors associated with any of these components.

(ii) For engines and equipment subject to evaporative emission standards, fuel tanks, fuel caps, and fuel lines and connectors.

(iii) Any other component whose primary purpose is to reduce emissions.

(iv) Any other component whose failure might increase emissions of any regulated pollutant without significantly degrading engine/equipment performance.

(2) The requirements of this section relate to defects in any of the components or systems identified in paragraph (a)(1) of this section if the defects might affect any of the parameters or specifications in Appendix II of this part or might otherwise affect the emissions of any regulated pollutant.

(3) For the purposes of this section, defects do not include damage to emission-related components or systems (or maladjustment of parameters) caused by owners improperly maintaining or abusing their engines/equipment.

(4) The requirements of this section do not apply to emission control information labels. Note however, that § 1068.101(a)(1) prohibits the sale of engines/equipment without proper labels, which also applies to misprinted labels.

(5) You must track the information specified in paragraph (b)(1) of this section. You must assess this data at least every three months to evaluate whether you exceed the thresholds specified in paragraphs (e) and (f) of this section. Where thresholds are based on a percentage of engines/equipment in the family, use actual sales figures for the whole model year when they become available. Use projected sales figures until the actual sales figures become available. You are not required to collect additional information other than that specified in paragraph (b)(1) of this section before reaching a threshold for an investigation specified in paragraph (e) of this section.

(6) You may ask us to allow you to use alternate methods for tracking, investigating, reporting, and correcting emission-related defects. In your request, explain and demonstrate why you believe your alternate system will be at least as effective in the aggregate in tracking, identifying, investigating, evaluating, reporting, and correcting potential and actual emissions-related defects as the requirements in this section. In this case, provide all available data necessary to demonstrate why an alternate system is appropriate for your engines/equipment and how it will result in a system at least as effective as that required under this section.

(7) If we determine that emission-related defects result in a substantial number of properly maintained and used engines/equipment not conforming to the regulations of this chapter during their useful life, we may order you to conduct a recall of your engines/equipment (see § 1068.505).

(8) Send all reports required by this section to the Designated Enforcement Officer.

(9) This section distinguishes between defects and possible defects. A possible defect exists anytime there is an indication that an emission-related component or system might have a defect, as described in paragraph (b)(1) of this section.

(b) *Investigation of possible defects.* Investigate possible defects as follows:

(1) If the number of engines/equipment that have a possible defect, as defined by this paragraph (b)(1), exceeds a threshold specified in paragraph (e) of this section, you must conduct an investigation to determine if an emission-related component or system is actually defective. You must classify an engine/equipment component or system as having a possible defect if any of the following sources of information shows there is a significant possibility that a defect exists:

(i) A warranty claim is submitted for the component, whether this is under your emission-related warranty or any other warranty.

(ii) Your quality-assurance procedures suggest that a defect may exist.

(iii) You receive any other information for which good engineering judgment would indicate the component or system may be defective, such as information from dealers, field-service personnel, equipment manufacturers, hotline complaints, or engine diagnostic systems.

(2) If the number of shipped replacement parts for any individual component is high enough that good engineering judgment would indicate a significant possibility that a defect exists, you must conduct an investigation to determine if it is actually defective. Note that this paragraph (b)(2) does not require data-tracking or recording provisions related to shipment of replacement parts.

(3) Your investigation must be prompt, thorough, consider all relevant information, follow accepted scientific and engineering principles, and be designed to obtain all the information specified in paragraph (d) of this section.

(4) Your investigation needs to consider possible defects that occur only within the useful life period, or within five years after the end of the model year, whichever is longer.

(5) You must continue your investigation until you are able to show that there is no emission-related defect or you obtain all the information specified for a defect report in paragraph (d) of this section.

(6) If a component with a possible defect is used in additional families or model years, you must investigate whether the component may be defective when used in these additional families or model years, and include these results in any defect report you send under paragraph (c) of this section.

(7) If your initial investigation concludes that the number of engines/equipment with a defect is fewer than any of the thresholds specified in paragraph (f) of this section, but other information later becomes available that may show that the number of engines/equipment with a defect exceeds a threshold, then you must resume your investigation. If you resume an investigation, you must include the information from the earlier investigation to determine whether to send a defect report.

(c) *Reporting defects.* You must send us a defect report in either of the following cases:

(1) Your investigation shows that the number of engines/equipment with a defect exceeds a threshold specified in paragraph (f) of this section. Send the defect report within 21 days after the date you identify this number of defective engines/equipment. See paragraph (h) of this section for reporting requirements that apply if the number of engines/equipment with a defect does not exceed any of the thresholds in paragraph (f) of this section.

(2) You know there are emission-related defects for a component or system in a number of engines/equipment that exceeds a threshold specified in paragraph (f) of this section, regardless of how you obtain this information. Send the defect report within 21 days after you learn that the number of defects exceeds a threshold.

Send us an updated defect report anytime you have significant additional information.

(d) *Contents of a defect report.* Include the following information in a defect report:

(1) Your corporate name and a person to contact regarding this defect.

(2) A description of the defect, including a summary of any engineering analyses and associated data, if available.

(3) A description of the engines/equipment that have the defect, including families, models, and range of production dates.

(4) An estimate of the number and percentage of each class or category of affected engines/equipment that have the defect, and an explanation of how you determined this number. Describe any statistical methods you used under paragraph (g)(6) of this section.

(5) An estimate of the defect's impact on emissions, with an explanation of how you calculated this estimate and a summary of any emission data demonstrating the impact of the defect, if available.

(6) A description of your plan for addressing the defect or an explanation of your reasons for not believing the defects must be addressed.

(e) *Thresholds for conducting a defect investigation.* You must begin a defect investigation based on the following number of engines/equipment that may have the defect:

(1) For engines/equipment with maximum engine power at or below 560 kW:

(i) For families with annual sales below 500 units: 50 or more engines/equipment.

(ii) For families with annual sales from 500 to 50,000 units: more than 10.0 percent of the total number of engines/equipment in the family.

(iii) For families with annual sales from 50,000 to 550,000 units: more than the total number of engines/equipment represented by the following equation:

$$\text{Investigation threshold} = 5{,}000 + (\text{Production units}—50{,}000) \times 0.04$$

(iv) For families with annual sales above 550,000 units: 25,000 or more engines/equipment.

(2) For engines/equipment with maximum engine power greater than 560 kW:

(i) For families with annual sales below 250 units: 25 or more engines/equipment.

(ii) For families with annual sales at or above 250 units: more than 10.0 percent of the total number of engines/equipment in the family.

(f) *Thresholds for filing a defect report.* You must send a defect report based on the following number of engines/equipment that have the defect:

(1) For engines/equipment with maximum engine power at or below 560 kW:

(i) For families with annual sales below 1,000 units: 20 or more engines/equipment.

(ii) For families with annual sales from 1,000 to 50,000 units: more than 2.0 percent of the total number of engines/equipment in the family.

(iii) For families with annual sales from 50,000 to 550,000 units: more than the total number of engines/equipment represented by the following equation:

$$\text{Reporting threshold} = 1{,}000 + (\text{Production units}—50{,}000) \times 0.01$$

(iv) For families with annual sales above 550,000 units: 6,000 or more engines/equipment.

(2) For engines/equipment with maximum engine power greater than 560 kW:

(i) For families with annual sales below 150 units: 10 or more engines/equipment.

(ii) For families with annual sales from 150 to 750 units: 15 or more engines/equipment.

(iii) For families with annual sales above 750 units: more than 2.0 percent of the total number of engines/equipment in the family.

(g) *How to count defects.* (1) Track defects separately for each model year and family as much as possible. If information is not identifiable by model year or family, use good engineering judgment to evaluate whether you exceed a threshold in paragraph (e) or (f) of this section. Consider only your U.S.-directed production volume.

(2) Within a family, track defects together for all components or systems that are the same in all material respects. If multiple companies separately supply a particular component or system, treat each company's component or system as unique.

(3) For engine-based standards, if a possible defect is not attributed to any specific part of the engine, consider the complete engine a distinct component for evaluating whether you exceed a threshold in paragraph (e) of this section. For equipment-based standards, if a possible defect is not attributed to any specific part of the equipment, consider the complete piece of equipment a distinct component for evaluating whether you exceed a threshold in paragraph (e) of this section.

(4) If you correct defects before they reach the ultimate purchaser as a result of your quality-assurance procedures, count these against the investigation thresholds in paragraph (e) of this section unless you routinely check every engine or piece of equipment in the family. Do not count any corrected defects as actual defects under paragraph (f) of this section.

(5) Use aggregated data from all the different sources identified in paragraph (b)(1) of this section to determine whether you exceed a threshold in paragraphs (e) and (f) of this section.

(6) If information is readily available to conclude that the possible defects identified in paragraph (b)(1) of this section are actual defects, count these toward the reporting thresholds in paragraph (f) of this section.

(7) During an investigation, use appropriate statistical methods to project defect rates for engines/equipment that you are not otherwise able to evaluate. For example, if 75 percent of the components replaced under warranty are available for evaluation, it would be appropriate to extrapolate known information on failure rates to the components that are unavailable for evaluation. Take steps as necessary to prevent bias in sampled data. Make adjusted calculations to take into account any bias that may remain.

(h) *Investigation reports.* Once you trigger an investigation threshold under paragraph (e) of this section, you must report your progress and conclusions. In your reports, include the information specified in paragraph (d) of this section, or explain why the information is not relevant. Send us the following reports:

(1) While you are investigating, send us mid-year and end-of-year reports to describe the methods you are using and the status of the investigation. Send these status reports no later than June 30 and December 31 of each year.

(2) If you find that the number of components or systems with an emission-related defect exceeds a threshold specified in paragraph (f) of this section, send us a report describing your findings within 21 days after the date you reach this conclusion.

(3) If you find that the number of components or systems with an emission-related defect does not exceed any of the thresholds specified in paragraph (f) of this section, send us a final report supporting this conclusion. For example, you may exclude warranty claims that resulted from misdiagnosis and you may exclude defects caused by improper maintenance, improper use, or misfueling. Send this report within 21 days after the date you reach this conclusion.

(i) *Future production.* If you identify a design or manufacturing defect that prevents engines/equipment from meeting the requirements of this part, you must correct the defect as soon as possible for future production of engines/equipment in every family affected by the defect. This applies without regard to whether you are required to conduct a defect investigation or submit a defect report under this section.

§ 1068.505 How does the recall program work?

(a) If we make a determination that a substantial number of properly maintained and used engines/equipment do not conform to the regulations of this chapter during their useful life, you must submit a plan to remedy the nonconformity of your engines/equipment. We will notify you of our determination in writing. Our notice will identify the class or category of engines/equipment affected and describe how we reached our conclusion. If this happens, you must meet the requirements and follow the instructions in this subpart. You must remedy at your expense noncompliant engines/equipment that have been properly maintained and used, as described in § 1068.510(a)(7). You may not transfer this expense to a dealer (or equipment manufacturer for engine-based standards) through a franchise or other agreement.

(b) You may ask for a hearing if you disagree with our determination (see subpart G of this part).

(c) Unless we withdraw the determination of noncompliance, you must respond to it by sending a remedial plan to the Designated Compliance Officer by the later of these two deadlines:

(1) Within 60 days after we notify you.

(2) Within 60 days after a hearing.

(d) Once you have sold engines/equipment to the ultimate purchaser, we may inspect or test the engines/equipment only if the purchaser permits it, or if state or local inspection programs separately provide for it.

(e) You may ask us to allow you to conduct your recall differently than specified in this subpart, consistent with section 207(c) of the Clean Air Act (42 U.S.C. 7541(c)).

(f) You may do a voluntary recall under § 1068.535 unless we have made the determination described in § 1068.535(a).

(g) For purposes of recall, owner means someone who owns an engine or piece of equipment affected by a remedial plan.

§ 1068.510 How do I prepare and apply my remedial plan?

(a) In your remedial plan, describe all of the following:

(1) The class or category of engines/equipment to be recalled, including the number of engines/equipment involved and the model year or other information needed to identify the engines/equipment.

(2) The modifications, alterations, repairs, corrections, adjustments, or other changes you will make to correct the affected engines/equipment.

(3) A brief description of the studies, tests, and data that support the effectiveness of the remedy you propose to use.

(4) The instructions you will send to those who will repair the engines/equipment under the remedial plan.

(5) How you will determine the owners' names and addresses.

(6) How you will notify owners; include copies of any notification letters.

(7) The proper maintenance or use you will specify, if any, as a condition to be eligible for repair under the remedial plan. Describe how these specifications meet the provisions of paragraph (e) of this section. Describe how the owners should show they meet your conditions.

(8) The steps owners must take for you to do the repair. You may set a date or a range of dates, specify the amount of time you need, and designate certain facilities to do the repairs.

(9) Which company (or group) you will assign to do or manage the repairs.

(10) If your employees or authorized warranty agents will not be doing the work, state who will and describe their qualifications.

(11) How you will ensure an adequate and timely supply of parts.

(12) The effect of proposed changes on fuel consumption, driveability, and safety of the engines/equipment you will recall; include a brief summary of the information supporting these conclusions.

(13) How you intend to label the engines/equipment you repair and where you will place the label on the engine/equipment (see § 1068.515).

(b) We may require you to add information to your remedial plan.

(c) We may require you to test the proposed repair to show it will remedy the noncompliance.

(d) Use all reasonable means to locate owners. We may require you to use government or commercial registration lists to get owners' names and addresses so your notice will be effective.

(e) The maintenance or use that you specify as a condition for eligibility under the remedial plan may include only things you can show would cause noncompliance. Do not require use of a component or service identified by brand, trade, or corporate name unless we approved this approach with your original certificate of conformity. Also, do not place conditions on who maintained the engine/equipment.

(f) We may require you to adjust your repair plan if we determine owners would be without their engines or equipment for an unreasonably long time.

(g) We will tell you in writing within 15 days of receiving your remedial plan whether we have approved or disapproved it. We will explain our reasons for any disapproval.

(h) Begin notifying owners within 15 days after we approve your remedial plan. If we hold a hearing, but do not change our position about the noncompliance, you must begin notifying owners within 60 days after we complete the hearing unless we specify otherwise.

§ 1068.515 How do I mark or label repaired engines/equipment?

(a) Attach a label to engines/equipment you repair under the remedial plan. At your discretion, you may label or mark engines/equipment you inspect but do not repair.

(b) Make the label from a durable material suitable for its planned location. Make sure no one can remove the label without destroying or defacing it.

(c) On the label, designate the specific recall campaign and state where you repaired or inspected the engine/equipment.

(d) We may waive or modify the labeling requirements if we determine they are overly burdensome.

§ 1068.520 How do I notify affected owners?

(a) Notify owners by first class mail or e-mail unless we say otherwise. We may require you to use certified mail. Include the following in your notice:

(1) State: ''The U.S. Environmental Protection Agency has determined that your engine/equipment may be emitting pollutants in excess of the federal emission standards as defined in Title 40 of the Code of Federal Regulations. These emission standards were established to protect the public health or welfare from air pollution.''

(2) State that you (or someone you designate) will repair these engines/equipment at your expense.

(3) If we approved maintenance and use conditions in your remedial plan, state that you will make these repairs

only if owners show their engines/equipment meet the conditions for proper maintenance and use. Describe these conditions and how owners should prove their engines/equipment are eligible for repair.

(4) Describe the components your repair will affect and say generally how you will repair the engines/equipment.

(5) State that the engine/equipment, if not repaired, may fail an emission inspection test if state or local law requires one.

(6) Describe any adverse effects on its performance or driveability that would be caused by not repairing the engine/equipment.

(7) Describe any adverse effects on the functions of other components that would be caused by not repairing the engine/equipment.

(8) Specify the date you will start the repairs, the amount of time you will need to do them, and where you will do them. Include any other information owners may need to know.

(9) Allow for the owner to inform you using one of the following methods if they have sold the engine/equipment:

(i) Send a self-addressed card that owners can mail back to you; include a space for owners to write the name and address of a buyer.

(ii) Provide owners with a toll-free number and an e-mail address or Web site they can use to identify the name and address of a buyer.

(10) State that owners should call you at a phone number you give to report any difficulty in obtaining repairs.

(11) State: ''To ensure your full protection under the emission warranty on your [engine/equipment] by federal law, and your right to participate in future recalls, we recommend you have your [engine/equipment] serviced as soon as possible. We may consider your not servicing it to be improper maintenance.''

(b) We may require you to add information to your notice or to send more notices.

(c) You may not in any communication with owners or dealers say or imply that your noncompliance does not exist or that it will not degrade air quality.

§ 1068.525 What records must I send to EPA?

(a) Send us a copy of all communications related to the remedial plan you sent to dealers and others doing the repairs. Mail or e-mail us the information at the same time you send it to others.

(b) From the time you begin to notify owners, send us a report within 25 days of the end of each calendar quarter. Send reports for six consecutive quarters or until all the engines/equipment are inspected, whichever comes first. In these reports, identify the following:

(1) The range of dates you needed to notify owners.

(2) The total number of notices sent.

(3) The number of engines/equipment you estimate fall under the remedial plan (explain how you determined this number).

(4) The cumulative number of engines/equipment you inspected under the remedial plan.

(5) The cumulative number of these engines/equipment you found needed the specified repair.

(6) The cumulative number of these engines/equipment you have repaired.

(7) The cumulative number of engines/equipment you determined to be unavailable due to exportation, theft, retirement, or other reasons (specify).

(8) The cumulative number of engines/equipment you disqualified for not being properly maintained or used.

(c) If your estimated number of engines/equipment falling under the remedial plan changes, change the estimate in your next report and add an explanation for the change.

(d) We may ask for more information.

(e) We may waive reporting requirements or adjust the reporting schedule.

(f) If anyone asks to see the information in your reports, we will follow the provisions of § 1068.10 for handling confidential information.

§ 1068.530 What records must I keep?

We may review your records at any time so it is important that you keep required information readily available. Keep records associated with your recall campaign for three years after you send the last report we require under § 1068.525(b). Organize and maintain your records as described in this section.

(a) Keep a paper copy of the written reports described in § 1068.525.

(b) Keep a record of the names and addresses of owners you notified. For each engine or piece of equipment, state whether you did any of the following:

(1) Inspected the engine/equipment.

(2) Disqualified the engine/equipment for not being properly maintained or used.

(3) Completed the prescribed repairs.

(c) You may keep the records in paragraph (b) of this section in any form we can inspect, including computer databases.

§ 1068.535 How can I do a voluntary recall for emission-related problems?

If we have made a determination that a substantial number of properly maintained and used engines/equipment do not conform to the regulations of this chapter during their useful life, you may not use a voluntary recall or other alternate means to meet your obligation to remedy the noncompliance. Thus, this section applies only if you learn that your family does not meet the requirements of this chapter and we have not made such a determination.

(a) To do a voluntary recall under this section, first send the Designated Compliance Officer a plan, following the guidelines in § 1068.510. Within 15 days, we will send you our comments on your plan.

(b) Once we approve your plan, start notifying owners and carrying out the specified repairs. Make reasonable efforts to carry out the recall as quickly as possible.

(c) From the time you start the recall campaign, send us a report within 25 days of the end of each calendar quarter, following the guidelines in § 1068.525(b). Send reports for six consecutive quarters or until all the engines/equipment are inspected, whichever comes first.

(d) Keep your reports and the supporting information as described in § 1068.530.

Subpart G—Hearings

§ 1068.601 What are the procedures for hearings?

If we agree to hold a hearing related to our decision to order a recall under § 1068.505, we will hold the hearing according to the provisions of 40 CFR 85.1807. For any other issues, you may request an informal hearing as described in 40 CFR 86.1853–01.

Appendix I to Part 1068—Emission-Related Components

This appendix specifies emission-related components that we refer to for describing such things as emission-related warranty or requirements related to rebuilding engines. Note that inclusion of a component in Section III of this Appendix does not make it an emission-related component for engines/equipment that are not subject to evaporative emission standards.

I. For exhaust emissions, emission-related components include any engine parts related to the following systems:

1. Air-induction system.
2. Fuel system.
3. Ignition system.
4. Exhaust gas recirculation systems.

II. The following parts are also considered emission-related components for exhaust emissions:

1. Aftertreatment devices.
2. Crankcase ventilation valves.
3. Sensors.
4. Electronic control units.

III. The following parts are considered emission-related components for evaporative emissions:

1. Fuel Tank.
2. Fuel Cap.
3. Fuel Line.
4. Fuel Line Fittings.
5. Clamps*.
6. Pressure Relief Valves*.
7. Control Valves*.
8. Control Solenoids*.
9. Electronic Controls*.
10. Vacuum Control Diaphragms*.
11. Control Cables*.
12. Control Linkages*.
13. Purge Valves.
14. Vapor Hoses.
15. Liquid/Vapor Separator.
16. Carbon Canister.
17. Canister Mounting Brackets.
18. Carburetor Purge Port Connector.

*As related to the evaporative emission control system.

IV. Emission-related components also include any other part whose only purpose is to reduce emissions or whose failure will increase emissions without significantly degrading engine/equipment performance.

Appendix II to Part 1068—Emission-Related Parameters and Specifications

This appendix specifies emission-related parameters and specifications that we refer to for describing such things as emission-related defects or requirements related to rebuilding engines.

I. Basic Engine Parameters for Reciprocating Engines.

1. Compression ratio.
2. Type of air aspiration (natural, Roots-blown, supercharged, turbocharged).
3. Valves (intake and exhaust).
a. Head diameter dimension.
b. Valve lifter or actuator type and valve lash dimension.
4. Camshaft timing.
a. Valve opening—intake exhaust (degrees from top-dead center or bottom-dead center).
b. Valve closing—intake exhaust (degrees from top-dead center or bottom-dead center).
c. Valve overlap (degrees).
5. Ports—two stroke engines (intake and/or exhaust).
a. Flow area.
b. Opening timing (degrees from top-dead center or bottom-dead center).
c. Closing timing (degrees from top-dead center or bottom-dead center).

II. Intake Air System.

1. Roots blower/supercharger/turbocharger calibration.
2. Charge air cooling.
a. Type (air-to-air; air-to-liquid).
b. Type of liquid cooling (engine coolant, dedicated cooling system).
c. Performance.
3. Temperature control system calibration.
4. Maximum allowable inlet air restriction.

III. Fuel System.

1. General.
a. Engine idle speed.
b. Engine idle mixture.
2. Carburetion.
a. Air-fuel flow calibration.
b. Idle mixture.
c. Transient enrichment system calibration.
d. Starting enrichment system calibration.
e. Altitude compensation system calibration.
f. Hot idle compensation system calibration.
3. Fuel injection for spark-ignition engines.
a. Control parameters and calibrations.
b. Idle mixture.
c. Fuel shutoff system calibration.
d. Starting enrichment system calibration.
e. Transient enrichment system calibration.
f. Air-fuel flow calibration.
g. Altitude compensation system calibration.
h. Operating pressure(s).
i. Injector timing calibration.
4. Fuel injection for compression-ignition engines.
a. Control parameters and calibrations.
b. Transient enrichment system calibration.
c. Air-fuel flow calibration.
d. Altitude compensation system calibration.
e. Operating pressure(s).
f. Injector timing calibration.

IV. Ignition System for Spark-ignition Engines.

1. Control parameters and calibration.
2. Initial timing setting.
3. Dwell setting.
4. Altitude compensation system calibration.
5. Spark plug voltage.

V. Engine Cooling System—thermostat calibration.

VI. Exhaust System—maximum allowable back pressure.

VII. System for Controlling Exhaust Emissions.

1. Air injection system.
a. Control parameters and calibrations.
b. Pump flow rate.
2. EGR system.
a. Control parameters and calibrations.
b. EGR valve flow calibration.
3. Catalytic converter system.
a. Active surface area.
b. Volume of catalyst.
c. Conversion efficiency.
4. Backpressure.

VIII. System for Controlling Crankcase Emissions.

1. Control parameters and calibrations.
2. Valve calibrations.

IX. Auxiliary Emission Control Devices (AECD).

1. Control parameters and calibrations.
2. Component calibration(s).

X. System for Controlling Evaporative Emissions.

1. Control parameters and calibrations.
2. Fuel tank.
a. Volume.
b. Pressure and vacuum relief settings.

XI. Warning Systems Related to Emission Controls.

1. Control parameters and calibrations.
2. Component calibrations.

Appendix III to Part 1068—High-Altitude Counties

In some cases the standard-setting part includes requirements or other specifications that apply for high-altitude counties. The following counties have substantial populated areas above 4,000 feet above sea level and are therefore considered to be high-altitude counties:

STATE OF ARIZONA

Apache
Cochise
Coconino
Navajo
Yavapai

STATE OF COLORADO

Adams
Alamosa
Arapahoe
Archuleta
Boulder
Chaffee
Cheyenne
Clear Creek
Conejos
Costilla
Crowley
Custer
Delta
Denver
Dolores
Douglas
Eagle
Elbert
El Paso
Fremont
Garfield
Gilpin
Grand
Gunnison
Hinsdale
Huerfano
Jackson
Jefferson
Kit Carson
Lake
La Plata
Larimer
Las Animas
Lincoln
Mesa
Mineral
Moffat
Montezuma
Montrose
Morgan
Otero
Ouray
Park
Pitkin
Pueblo
Rio Blanco
Rio Grande
Routt
Saguache
San Juan
San Miguel
Summit
Teller
Washington
Weld

STATE OF IDAHO

Bannock
Bear Lake
Bingham
Blaine
Bonneville
Butte

Camas
Caribou
Cassia
Clark
Custer
Franklin
Fremont
Jefferson
Lemhi
Madison
Minidoka
Oneida
Power
Teton
Valley

STATE OF MONTANA

Beaverhead
Deer Lodge
Gallatin
Jefferson
Judith Basin
Powell
Madison
Meagher
Park
Silver Bow
Wheatland

STATE OF NEBRASKA

Banner
Cheyenne
Kimball
Sioux

STATE OF NEVADA

Carson City
Douglas
Elko
Esmeralda
Eureka
Humboldt
Lander
Lincoln
Lyon
Mineral
Nye
Pershing
Storey
Washoe
White Pine

STATE OF NEW MEXICO

Bernalillo
Catron
Colfax
Curry
De Baca
Grant
Guadalupe
Harding
Hidalgo
Lincoln
Los Alamos
Luna
McKinley
Mora
Otero
Rio Arriba
Roosevelt
Sandoval
San Juan
San Miguel
Santa Fe
Sierra
Socorro
Taos
Torrance
Union
Valencia

STATE OF OREGON

Harney
Lake
Klamath

STATE OF TEXAS

Jeff Davis
Judspeth
Parmer

STATE OF UTAH

Beaver
Box Elder
Cache
Carbon
Daggett
Davis
Duchesne
Emery
Garfield
Grand
Iron
Juab
Kane
Millard
Morgan
Piute
Rich
Salt Lake
San Juan
Sanpete
Sevier
Summit
Tooele
Uintah
Utah
Wasatch
Wayne
Weber

STATE OF WYOMING

Albany
Campbell
Carbon
Converse
Fremont
Goshen
Hot Springs
Johnson
Laramie
Lincoln
Natrona
Niobrara
Park
Platte
Sublette
Sweetwater
Teton
Uinta
Washakie
Weston

■ 246. A new part 1074 is added to subchapter U of chapter I to read as follows:

PART 1074—PREEMPTION OF STATE STANDARDS AND PROCEDURES FOR WAIVER OF FEDERAL PREEMPTION FOR NONROAD ENGINES AND NONROAD VEHICLES

Subpart A—Applicability and General Provisions

Sec.

Subpart B—Procedures for Authorization

Authority: 42 U.S.C. 7401–7671q.

Subpart A—Applicability and General Provisions

§ 1074.1 Applicability.

The requirements of this part apply with respect to state and local standards and other requirements relating to the control of emissions from nonroad engines and nonroad vehicles.

§ 1074.5 Definitions.

The definitions in this section apply to this part. As used in this part, all undefined terms have the meaning the Act gives to them. The definitions follow:

Act means the Clean Air Act, as amended, 42 U.S.C. 7401–7671q.

Administrator means the Administrator of the Environmental Protection Agency and any authorized representatives.

Commercial means an activity engaged in as a vocation.

Construction equipment or vehicle means any internal combustion engine-powered machine primarily used in construction and located on commercial construction sites.

Engine used in a locomotive means either an engine placed in a locomotive to move other equipment, freight, or passenger traffic, or an engine mounted on a locomotive to provide auxiliary power.

Farm equipment or vehicle means any internal combustion engine-powered machine primarily used in the commercial production and/or commercial harvesting of food, fiber, wood, or commercial organic products or for the processing of such products for further use on the farm.

Locomotive means a piece of equipment meeting the definition of locomotive in 40 CFR 1033.901 that is propelled by a nonroad engine.

New has the following meanings:

(1) For locomotives, new has the meaning given in 40 CFR 1033.901.

(2) For engines used in locomotives, new means an engine incorporated in (or intended to be incorporated in) in a new locomotive.

(3) For other nonroad engines and equipment, new means a domestic or imported nonroad engine or nonroad vehicle the equitable or legal title to which has never been transferred to an ultimate purchaser. Where the equitable or legal title to an engine or vehicle is not transferred to an ultimate purchaser until after the engine or vehicle is placed into service, then the engine or vehicle will no longer be new once it is placed into service. A nonroad engine or vehicle is placed into service when it is used for its functional purposes. This paragraph (3) does not apply to locomotives or engines used in locomotives.

Nonroad engine has the meaning given in 40 CFR 1068.30

Primarily used means used 51 percent or more.

States and localities means any or all of the states, commonwealths, and territories in the United States including the District of Columbia and any or all of their political subdivisions.

Ultimate purchaser means the first person who in good faith purchases a new nonroad engine or new nonroad vehicle or equipment for purposes other than resale.

United States has the meaning given in 40 CFR 1068.30.

§ 1074.10 Scope of preemption.

(a) States and localities are preempted from adopting or enforcing standards or other requirements relating to the control of emissions from new engines smaller than 175 horsepower that are primarily used in farm or construction equipment or vehicles, as defined in this part. For equipment that is used in applications in addition to farming or construction activities, if the equipment is primarily used as farm and/or construction equipment or vehicles (as defined in this part), it is considered farm or construction equipment or vehicles.

(b) For nonroad engines or vehicles other than those described in paragraph (a) of this section and § 1074.12, States and localities are preempted from enforcing any standards or other requirements relating to control of emissions from nonroad engines or vehicles except as provided in subpart B of this part.

§ 1074.12 Scope of preemption-specific provisions for locomotives and locomotive engines

(a) States and localities are preempted from adopting or enforcing standards or other requirements relating to the control of emissions from new locomotives and new engines used in locomotives.

(b) During a period equivalent in length to 133 percent of the useful life, expressed as MW-hrs (or miles where applicable), beginning at the point at which the locomotive or engine becomes new, those standards or other requirements which are preempted include, but are not limited to, the following: emission standards, mandatory fleet average standards, certification requirements, retrofit and aftermarket equipment requirements, and nonfederal in-use testing requirements. The standards and other requirements specified in the preceding sentence are preempted whether applicable to new or other locomotives or locomotive engines.

Subpart B—Procedures for Authorization

§ 1074.101 Procedures for California nonroad authorization requests.

(a) California must request authorization from the Administrator to enforce its adopted standards and other requirements relating to control of emissions from nonroad engines or vehicles that are not preempted by § 1074.10(a) or § 1074.12. The request must include the record on which the state rulemaking was based.

(b) After receiving the authorization request, the Administrator will provide notice and opportunity for a public hearing regarding such requests.

§ 1074.105 Criteria for granting authorization.

(a) The Administrator will grant the authorization if California determines that its standards will be, in the aggregate, at least as protective of public health and welfare as otherwise applicable federal standards.

(b) The authorization will not be granted if the Administrator finds that any of the following are true:

(1) California's determination is arbitrary and capricious.

(2) California does not need such standards to meet compelling and extraordinary conditions.

(3) The California standards and accompanying enforcement procedures are not consistent with section 209 of the Act (42 U.S.C. 7543).

(c) In considering any request from California to authorize the state to adopt or enforce standards or other requirements relating to control of emissions from new nonroad spark-ignition engines smaller than 50 horsepower, the Administrator will give appropriate consideration to safety factors (including the potential increased risk of burn or fire) associated with compliance with the California standard.

§ 1074.110 Adoption of California standards by other states.

(a) Except as described in paragraph (b) of this section, any state other than California that has plan provisions approved under Part D of Title I of the Act (42 U.S.C. 7501 to 7515) may adopt and enforce emission standards for any period for nonroad engines and vehicles subject to the following requirements:

(1) The state must provide notice to the Administrator that it has adopted such standards.

(2) Such standards may not apply to new engines smaller than 175 horsepower that are used in farm or construction equipment or vehicles, or to new locomotives or new engines used in locomotives.

(3) Such standards and implementation and enforcement must be identical, for the period concerned, to the California standards authorized by the Administrator.

(4) The state must adopt such standards at least two years before the standards first take effect.

(5) California must have adopted such standards two years before the standards first take effect in the state that is adopting them under this section.

(b) States and localities, other than the State of California, may not adopt or attempt to enforce any standard or other requirement applicable to the control of emissions from spark-ignition engines smaller than 50 horsepower, except standards or other requirements that were adopted by that state before September 1, 2003.

§ 1074.115 Relationship of federal and state standards.

If state standards apply to a new nonroad engine or vehicle pursuant to authorization granted under section 209 of the Act (42 U.S.C. 7543), compliance with such state standards will be treated as compliance with the otherwise applicable standards of this chapter for engines or vehicles introduced into commerce in that state.

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