

To: Mohamed Serageldin  
Project File

From: Dave Reeves  
Date: August 27, 2002

RE: Shipbuilding TRI & NTI Emissions Data for 1999

Purpose: The purpose of this memorandum is to provide additional information on the consolidated TRI and NTI emissions data for the 10 largest shipyards in the shipbuilding and ship repair industry. This information will be used as input data for the risk modeling to assess the current risk associated with shipyard surface coating operations.

The attached XL table summarizes the information collected from the TRI and NTI 1999 databases for the 10 largest U.S. shipyards. These shipyards represent the largest (in terms of physical size) shipbuilding and ship repair facilities, as well as the biggest emitters of HAPs and other toxic materials. We made several follow-up phone calls and e-mail inquiries to verify as much of the information as we could in the past weeks. The primary emission sources associated with shipbuilding and ship repair operations are welding, abrasive blasting, solvent cleaning, and surface coating (painting). The TRI data is reported by the individual facilities as facility-wide emissions and does not provide any specific process information. The NTI data comes from a variety of sources and sometimes has breakout information for individual emission points. The following information discusses how the emissions information from the two databases was combined and/or consolidated for each of the 10 shipyards.

1. Avondale. TRI data matched NTI for chromium compounds, ethylbenzene, manganese compounds, nickel compounds, and xylenes. However, NTI did not have any data for glycol ethers (8.2 tons) or 1,2,4-trimethylbenzene (21.05 tons), so the TRI data was used. There were several other compounds reported in the NTI data (relatively low emissions ranging from 0.03 to 0.80 tons) of solvent HAPs and these were also included in the emissions summary.
2. Bath Iron Works. TRI and NTI data matched for chromium compounds, ethylbenzene, manganese compounds, nickel compounds, and xylenes. However, NTI did not have any data for copper compounds (0.06 tons) or 1,2,4-trimethylbenzene (11.87 tons), so the TRI data was used. No other pollutants were reported in the NTI data.
3. Cascade General. Xylenes (mixed isomers) was the only pollutant reported in both the TRI and NTI data and the emissions data matched (5.91 tons).
4. Electric Boat. Lead was the only pollutant reported in both the TRI and NTI data and the emissions data matched (0.0325 tons). However, the NTI data listed a second entry for lead compounds - inorganic (0.744 tons) and this was not included in the combined summary information.
5. Ingalls. TRI data matched NTI for toluene and xylenes. However, NTI did not have any data for copper compounds (1.25 tons), chromium compounds (0.09 tons), manganese compounds (0.27 tons), nickel compounds (0.15 tons), 1,2,4-trimethylbenzene (29.73 tons), or ethylbenzene (5.45 tons), so the TRI data was used. There were several other compounds reported in the NTI data involving various solvent HAPs. We discussed these with the EPA work assignment

manager (WAM) and excluded aniline, bis(2-ethylhexyl)phthalate, o-cresol, epichlorohydrin, hydrazine, p-dioxane, phenol, propylene oxide, and styrene from the emissions summary because these materials are not typically used as solvents in marine coatings or cleaning activities. The NTI data also listed 12 other pollutants (HAP solvents) as facility-wide pollutants ranging from 0.0438 tons (carbon tetrachloride) to 12.53 tons (methyl chloride) and these were included in the emissions summary.

6. Jeffboat. TRI data matched NTI for xylenes. However, the NTI did not match the TRI data for manganese compounds or MEK. We contacted the environmental manager at Jeffboat and verified the welding emission factors (AP-42) used to calculate the manganese emissions and used the reported TRI data (1.62 tons). We also determined that the NTI data for MEK included the amount of MEK shipped off-site as hazardous waste and also decided to use the reported TRI data (30.35 tons). There were several other compounds reported in the NTI data (relatively low emissions ranging from 0.009 to 1.65 tons from “unknown” emission points) of solvent and inorganic HAPs and these were also included in the emissions summary.

7. NASSCO. None of the TRI and NTI data matched for any of the reported pollutants. NASSCO did the best job of identifying which emission point was associated with the NTI data. We used that information to exclude boiler emissions and gasoline engine emissions. The remaining pollutants were identified as coming from “abrasive blasting”, “welding operations”, “painting and surface coating”, or “degreasing and solvent cleaning”. NTI did not have any data for copper compounds (0.16 tons) or 1,2,4-trimethylbenzene (21.12 tons), so the TRI data was used. There were also several metals with very low NTI reported emissions (i.e., 0.000004 tons) with “unknown” listed as the emission point.

8. Newport News. TRI data matched NTI for chromium compounds, ethylbenzene, manganese compounds, nickel compounds, and xylenes. However, NTI did not have any data for lead compounds (0.25 tons) or copper compounds (0.25), so the TRI data was used. There were several other compounds reported in the NTI data (relatively low emissions ranging from 0.34 to 1.87 tons) of primarily solvent HAPs and these were also included in the emissions summary. Glycol ethers were listed in the NTI information, but no emission number was reported.

9. Norfolk Naval. NTI included several metals and a few solvents with very low emissions (ranging from 0.00001 to 0.0003 tons) from “unknown” emission points and these were included in the emissions summary even though they are not likely to be a risk factor. TRI only listed two compounds emitted by the shipyard and they were not listed on the NTI information. Therefore, the TRI data for copper compounds (0.21 tons) or xylenes (11.9 tons) was used in the emissions summary.

10. NORSHIPCO. TRI data matched NTI for chromium compounds and ethyl benzene. However, NTI did not have any data for copper compounds (14.2 tons) or 1,2,4-trimethylbenzene (5.2 tons), so the TRI data was used. Lead was included on the NTI database, but there was no emission listed.

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08/29/02 03:36 PM

To: "Reeves, David" <dwreeves@rti.org>  
cc: Mohamed Serageldin/RTP/USEPA/US@EPA, "Thorn, Frank" <thorn\_fh@nns.com>  
Subject: RE: TRI Data - Breakdown of Metal Emissions

Dave,

There are several differences between the TRI numbers as reflected in the EPA database (those appearing on the referenced website), and the actual emission numbers. The reason is the use of Code letters for the smaller emission ranges in the TRI report. EPA usage of the Code letter system, especially for public information reporting, has great potential for over-reporting to the public (and your modelers) as illustrated below.

The TRI reporting process gives facilities the option of using 'A', 'B' or 'C' letter codes for emissions ranges of '0 - 10', '11 - 499' and '500 - 999' pounds respectively. EPA, for purposes of the website, gives the midpoint of each coded range reported by the facility as the "Release" value. For this reason, a facility may have Fugitive emissions of 11 pounds and Stack emissions of 11 pounds, (two Code 'B's), but the release value on the chart would show up as 500 pounds (2 x [midpoint of 500 = 250]), when in actuality, the facility only released 22 pounds.

Also, your request listed 'copper' and 'chromium compounds' with reference to painting, blasting and welding. Presumably the copper that you are interested in is that which would be involved with the use of antifouling paints. This copper is in the form of an oxide, which I interpret as a 'copper compound' for TRI purposes, so I have given you a breakdown of our 'copper compounds' release for the three categories.

With regard to your request for a breakdown of 'chromium compounds' and 'lead compounds', the opposite is true. NNS no longer uses chromium(oxide) or lead oxide in paints, and, in fact, only reported 'chromium' or 'lead' releases in 1999 and 2000. I have therefore given you a breakdown for 'chromium' and 'lead' rather than 'chromium compounds' and 'lead compounds'.

\*On a more positive note, the opportunity to 'look back' at year 2000 data has turned up an error that I made in TRI data input. The 'copper compounds' Fugitive release number from painting that I used for calculations was 3000 pounds. This number was pulled off of the wrong cell in an Excel spreadsheet. The actual number should have been 30 pounds. The 'release' from blasting for the same period was 23 pounds. I will submit a revised TRI report reflecting this change.

As I am sure you are aware, there are other source categories of the metals besides the three for which you have requested information. Because of this, the percentages will not equal 100 for each category.

1999:

Copper - No releases from painting, blasting or welding.  
Copper compounds - EPA TRI database lists 250 pounds. Actual

calculated release = 82.7 lbs. (Code 'B')  
Of the 82.7 pounds: painting - 67%, blasting - 33%, welding - 0%.

Chromium - EPA database lists 255 pounds. Actual calculated  
release = 19.4 lbs (One each, Code 'A' and 'B')  
Of the 19.4 pounds: painting - 0%; blasting - 42%; welding - 55%

Nickel - EPA database lists 500 pounds. Actual calculated release  
= 211.7 pounds. (Two Code 'B's)  
Of the 211.7 pounds: painting - 0%, blasting - 4%, welding - 17%

Manganese - EPA database lists 1000 pounds. Actual calculated  
release = 719.3 pounds. (etc.)  
Of the 719.3 pounds: painting - 0%, blasting - 1%, welding - 94%

Lead - EPA database lists 500 pounds. Actual calculated release =  
207.5 pounds.  
Of the 207.5 pounds: painting - 0%, blasting - 0%, welding - 0%

2000:

Copper - EPA database lists 255 pounds. Actual calculated release  
= 229.4 pounds

Of the 229.4 pounds: painting - 0%, blasting - 0%, welding - < 1%

\*Copper compounds - EPA database lists 3,000 pounds. Actual  
calculated release = 53.1 pounds

Of the 53.1 pounds: painting - 57%, blasting - 43%, welding - 0%

Chromium - EPA database lists 255 pounds. Actual calculated  
release = 22.9 pounds  
Of the 22.9 pounds: painting - 0%, blasting - 34%, welding - 55%

Nickel - EPA database lists 500 pounds. Actual calculated release  
= 84.4 pounds  
Of the 84.4 pounds: painting - 0%, blasting - 9%, welding - 17%

Manganese - EPA database lists 755 pounds. Actual calculated  
release = 732.8  
Of the 732.8 pounds: painting - 0%, blasting - 2%, welding - 98%

Lead - EPA database lists 10 pounds. Actual calculated release -  
9.7 pounds  
Of the 9.7 pounds: painting - 0%, blasting - 0%, welding - < 1%