

**SELF-REGULATION IN THE US
COMMERCIAL NUCLEAR POWER
INDUSTRY: Why Does It Work And Why
Can't It Be Replicated?**

**CISAC Presentation
May 12, 2015**

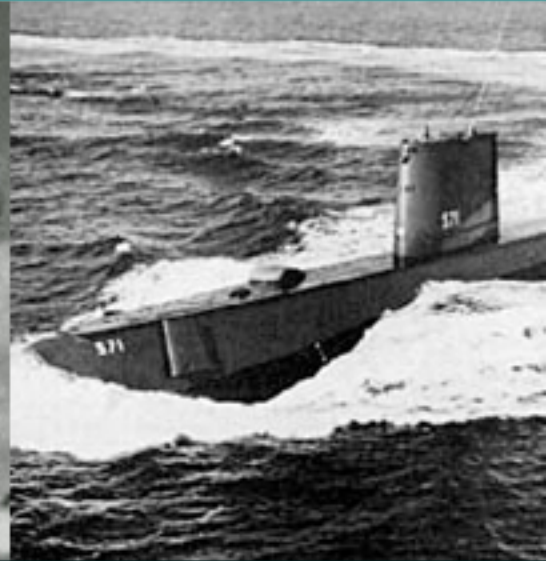
James O. Ellis, Jr.

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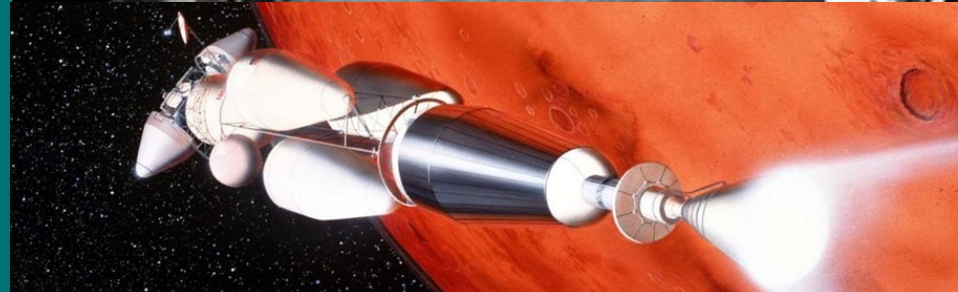
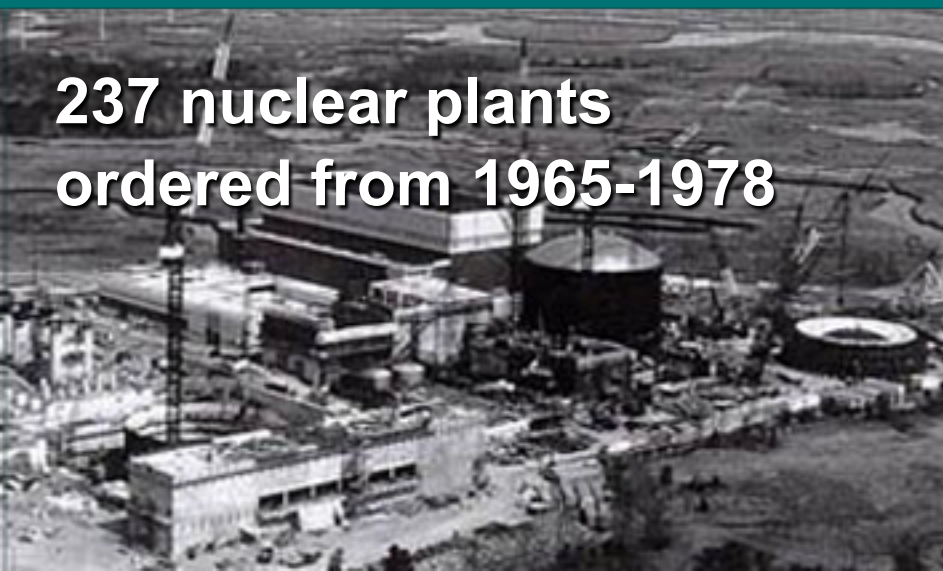
Truer words were never spoken!



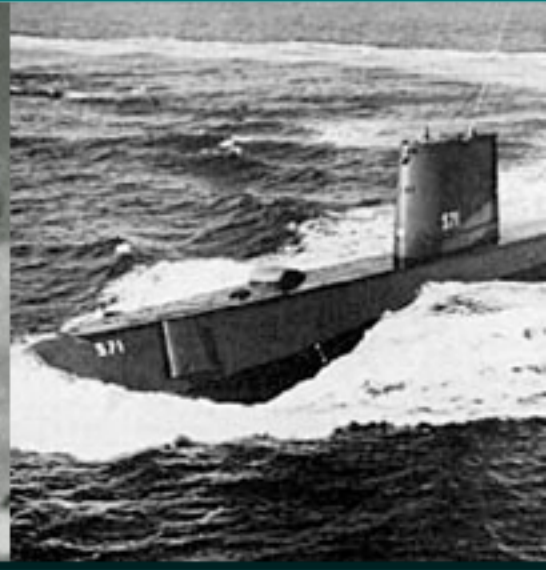
The Birth of Nuclear Energy



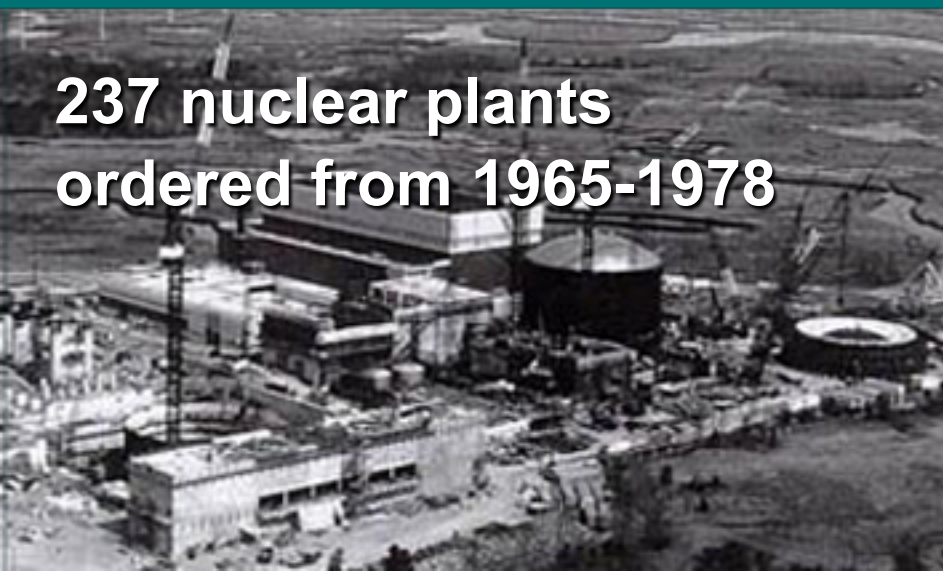
237 nuclear plants
ordered from 1965-1978



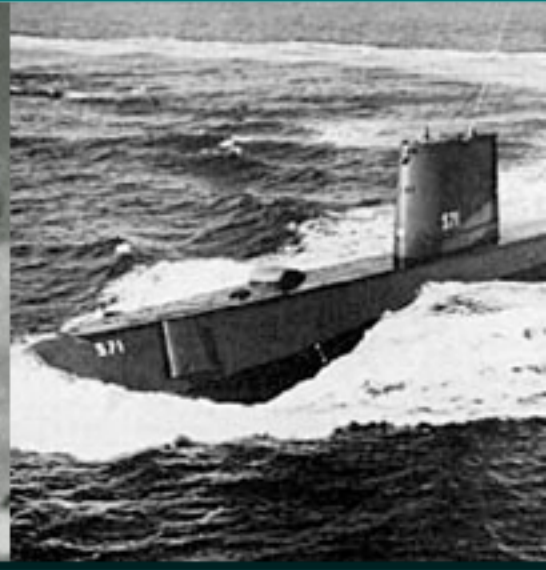
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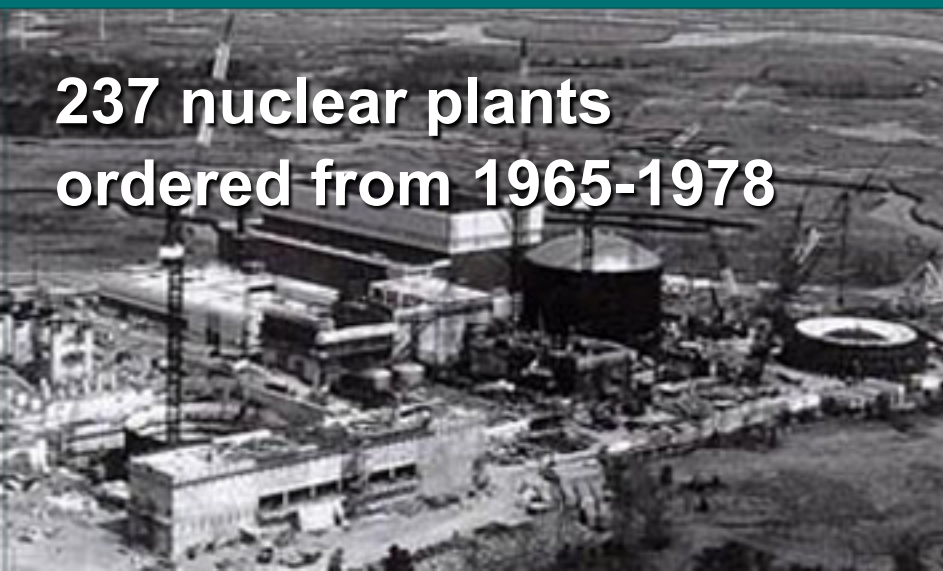
237 nuclear plants
ordered from 1965-1978



The Birth of Nuclear Energy



237 nuclear plants
ordered from 1965-1978



An Industry Challenged



97 nuclear plants cancelled
Billions in capital lost



Background

- INPO FOUNDED IN 1979 AFTER TMI
- QUESTIONS OF INDUSTRY SAFETY AND INTEGRITY
- FEAR OF UNKNOWN; CAUSES AND CONSEQUENCES
- SEVERE LOSS OF PUBLIC TRUST AND CONSEQUENCE
- **NOT AN INDUSTRY ADVOCATE**
- KEMMENY COMMISSION: STANDARDS, SHARING, TRAINING, SIMULATORS

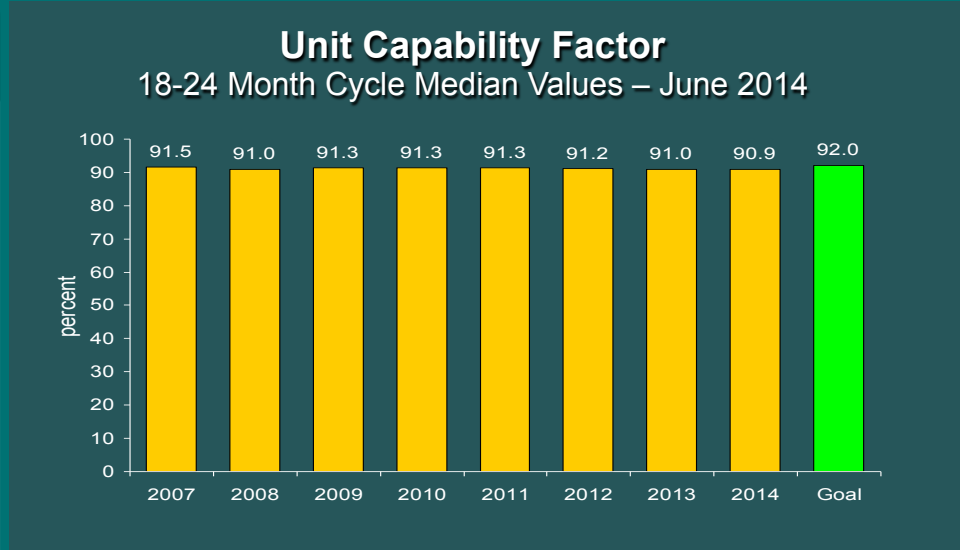
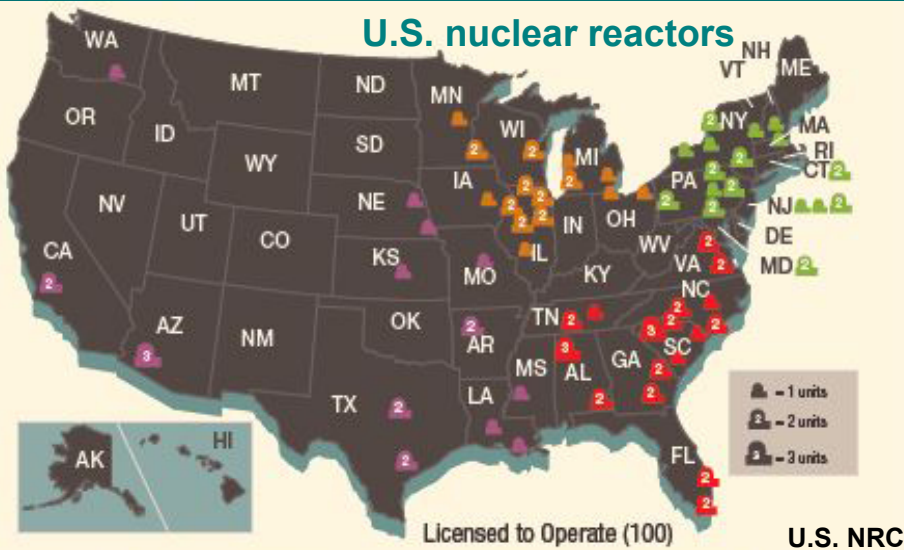
INPO Organization

- NON-GOVERNMENTAL 501 (C) 3; NOT-FOR-PROFIT
- FOUR CORNERSTONES:
 - EVALUATIONS (INCLUDING CORPORATE)
 - TRAINING AND ACCREDITATION
 - ASSISTANCE
 - ANALYSIS
- 26 MEMBERS, ALL U.S. NUCLEAR UTILITIES
- FUNDED BY INDUSTRY DUES

Results

- OPERATIONAL/SAFETY IMPROVEMENT: 63/92, 7/0, 1/6th
- SELF-REGULATION IS NOT PERFECT AND NOT SUFFICIENT: REQUIRES CONSTANT VIGILANCE AND ADAPTATION
- PERIODIC SELF-ASSESSMENTS ARE ESSENTIAL TO IMPROVING PROCESSES AND EFFECTIVENESS
- NEW AREAS REQUIRE NEW SKILLS: RISK ASSESSMENT AND RISK MANAGEMENT, OPERATIONAL DECISION MAKING, LONG-TERM EQUIPMENT STRATEGIES, LEADERSHIP CAPABILITY AND DEVELOPMENT, SAFETY CULTURE, AND CORPORATE GOVERNANCE AND OVERSIGHT

An Industry Reborn



Why INPO Works: 5 Factors

- CEO ENGAGEMENT: BOARD OF DIRECTORS, INSPECTION DEBRIEFS, COMMUNICATION, CEO CONFERENCE
- NUCLEAR SAFETY FOCUS (AND NOTHING ELSE)
“INPO’S MISSION IS TO PROMOTE THE HIGHEST LEVELS OF SAFETY AND RELIABILITY – TO PROMOTE EXCELLENCE – IN THE OPERATION OF COMMERCIAL NUCLEAR POWER PLANTS”
- INDUSTRY SUPPORT: EVALUATIONS, STANDARDS DEVELOPMENT, EARNED CREDIBILITY, ADVISORY GROUPS, LOANED EMPLOYEES, PEER EVALUATORS
- ACCOUNTABILITY: TOUGH LANGUAGE, FORMAL ASSESSMENT PROCESS, NUMERICAL GRADES, CONFIDENTIALITY, FOLLOW-UP ACTIONS, INDUSTRY PRESSURE, INSURANCE RATES
- INDEPENDENCE: FROM BOARD, MEMBERS AND REGULATOR

An Effective Self-Regulatory Model

- CEO engagement
- Nuclear safety focus
- Industry support
- Accountability
- Independence and integrity



National Commission on the
BP Deepwater Horizon Oil
Spill and Offshore Drilling

August 25, 2010



“The oil and gas industry
should establish a private
organization to develop,
adopt, and enforce
standards of
excellence...”

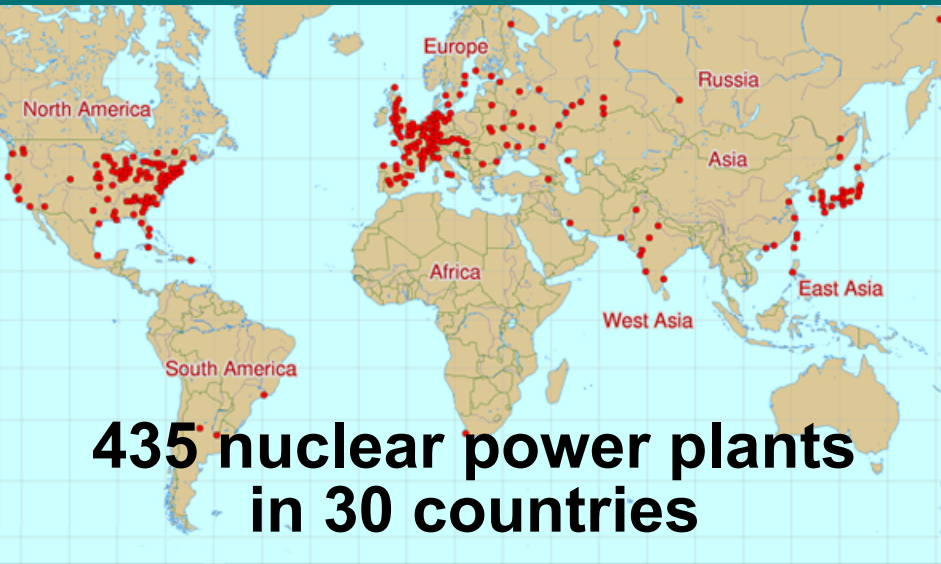
The Details Of How It Really Works

- SHARED CRISIS: REAL COMMON INTERESTS, “HANG TOGETHER...”
- SINGLE STRONG INDUSTRY LEADER: W. S. LEE, DUKE POWER
- ULTIMATUM: MANADATORY MEMBERSHIP
- COLLABORATIVE STANDARDS: POAC (“OPEN BOOK QUIZ”)
- SHARED INSIGHTS: INSPECTION PARTICIPATION, EMPLOYEE EXCHANGE
- COMPLEMENT REGULATOR: EXCELLENCE VS MINIMUM REG. COMPLIANCE, SHARE BURDEN, i.e. ACCREDITATION BY INPO FOR NRC, STANDARDIZED DEFINITIONS
- PEER PRESSURE
- HIGH QUALITY, CREDIBLE PERSONNEL: INDEPENDENT (NON-INDUSTRY) CEO, TECHNICAL PEOPLE WHO HAVE DONE IT... WELL, EXCHANGES
- BOARD OF DIRECTORS: ACTIVE REVIEW, LEGALLY DISTANT, PRACTICALLY INFLUENTIAL, CRITICAL OF THEIR PEERS, HELP DELIVER THE MESSAGE (EVEN TO THEIR OWN TEAMS)

There Are Real Industry Differences

- SINGLE TRANSFORMATIONAL INDUSTRY EVENT
- UTILITIES ARE REGIONAL ENTITIES (THOUGH TRENDS ARE CHANGING); LESS COMPETITION
- ESSENTIALLY IDENTICAL TECHNOLOGY
- NO SECRETS OR INTELLECTUAL PROPERTY CONCERNS
- SEVERAL OTHER INDUSTRIES HAVE EXPLORED THE POSSIBILITY: MEDICAL, REFINERIES, OIL AND GAS EXPLORATION

The Global Industry



- 72 nuclear plants under construction in 15 countries
- 60+ countries expressing interest
- Challenges

INPO[®]

International
Program



Fukushima Daiichi



- 6 boiling water reactors
- 4,696 megawatts of generating capacity
- 30 million megawatt-hours generated annually

- Magnitude 9.0 earthquake
- 46-foot tsunami



The Future....



“Nuclear power is the only realistic solution to future power needs.”

*Patrick Moore
Co-Founder of Greenpeace*



Fukushima Daiichi Lessons Learned

- Long-term loss of power
- Spent fuel cooling and management
- Earthquake, tsunami, flooding events
- Hydrogen control
- Emergency planning



The Future....



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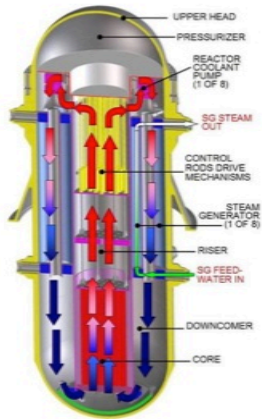


Long-Term Issues

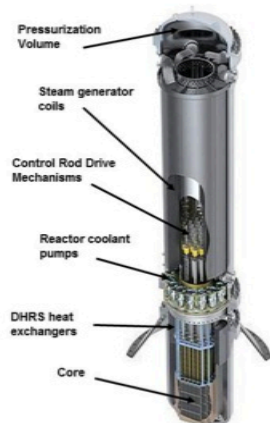
- Prevention vs. response
- New relationships
- International dimensions
- Real challenge, real change
- Opportunities



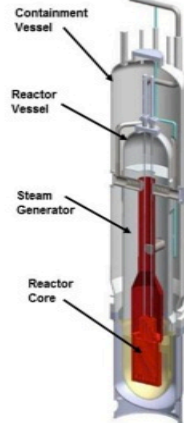
The Future....Or Not?



IRIS (Westinghouse)
335 MWe



mPower (Babcock & Wilcox)
125 MWe



NuScale (NuScale)
45 MWe

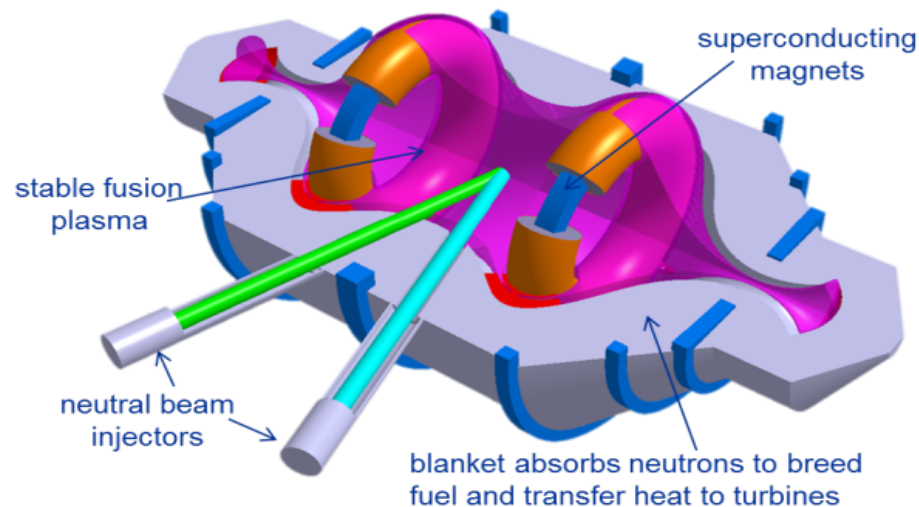
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Long-Term Issues

- Prevention vs. response
- New relationships
- International dimensions
- Real challenge, real change
- Opportunities/Risks/Promise



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