

A Status Report on the U.S. Nuclear Program

Commissioner William C. Ostendorff
United States Nuclear Regulatory Commission

American Nuclear Society
October 30, 2013

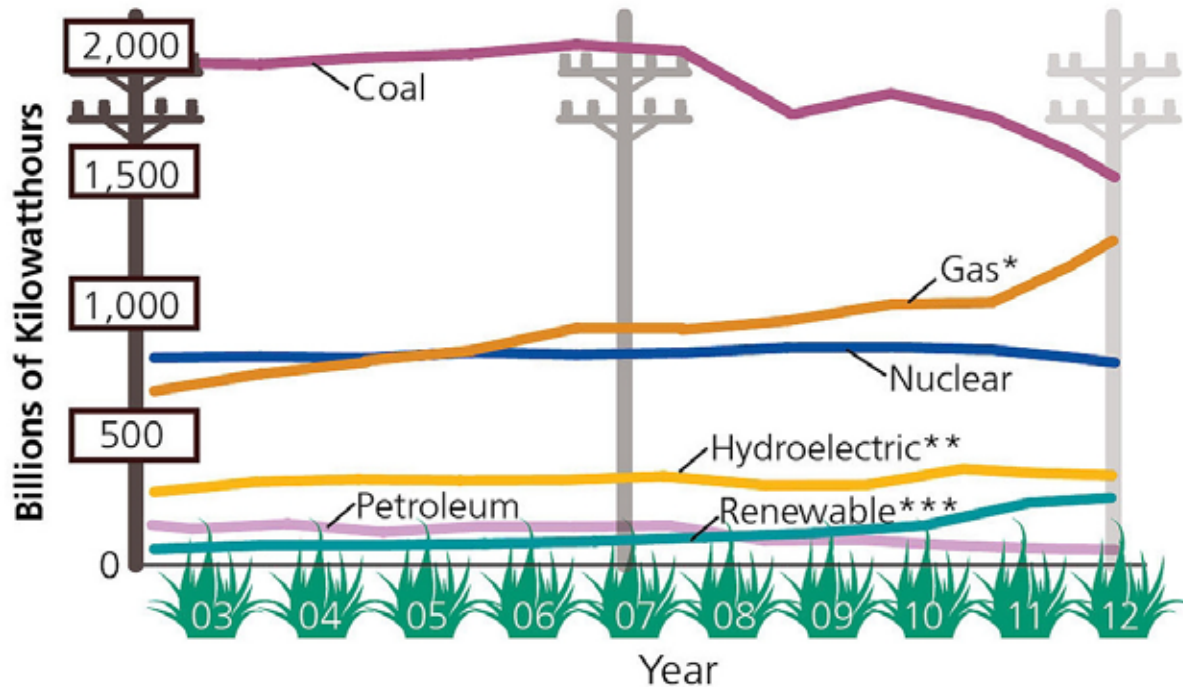
Agenda

- Operating Reactors
- New Reactor Construction
- High Level Waste Disposal – Yucca Mountain



Current Status of U.S. Nuclear Power: Generation

U.S. Net Electric Generation by Energy Source, 2003–2012



* Gas includes natural gas, blast furnace gas, propane gas, and other manufactured and waste gases derived from fossil fuel.

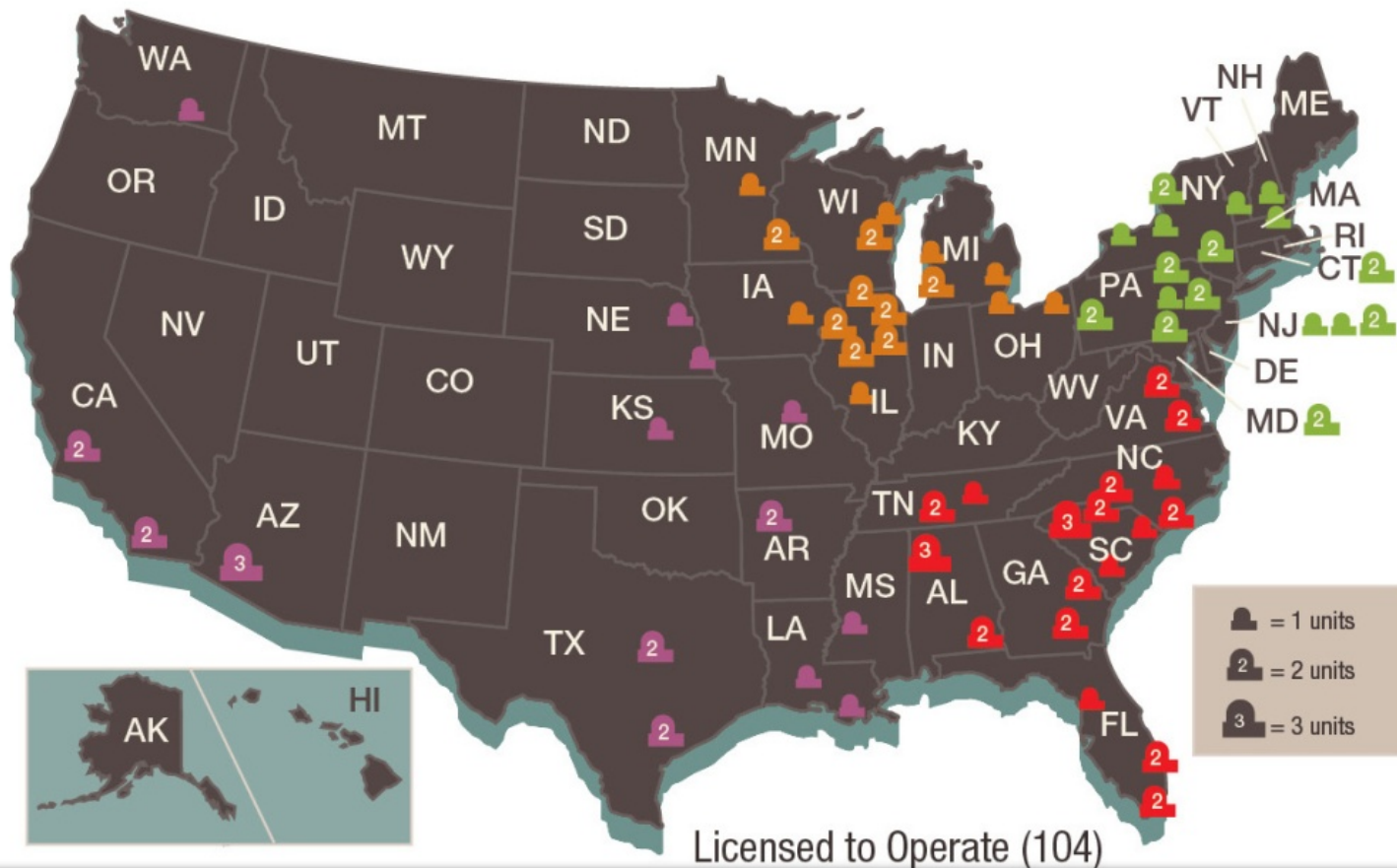
** Hydroelectric includes conventional hydroelectric and hydroelectric pumped storage.

*** Renewable energy includes geothermal, wood and nonwood waste, wind, and solar energy.

Source: DOE/EIA, May 2013, www.eia.doe.gov

Current Status of U.S. Nuclear Power: Operating Reactors

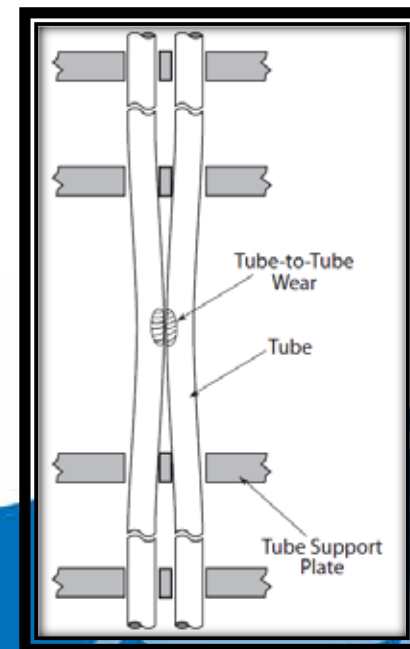
U.S. Operating Commercial Nuclear Power Reactors



Current Status of U.S. Nuclear Power: Operating Reactors

Material Issues

<u>Crystal River 3</u>	<u>San Onofre Units 2 and 3</u>
Containment Building Concrete Delamination	Steam Generator Tube Degradation
1 PWR, produced 860 MW	2 PWRs, produced 2,150 MW



Current Status of U.S. Nuclear Power: Operating Reactors

Market Conditions

<u>Kewaunee</u>	<u>Vermont Yankee</u>
(1) No Economies of Scale (2) Timing for Renewal of Power Purchase Agreements	(1) Low Natural Gas Prices (2) High Cost Structure (3) Wholesale Market Design Flaws
1 PWR reactor, produced 556 MW	1 BWR reactor, produces 605 MW



Future of U.S. Nuclear Power: Cost

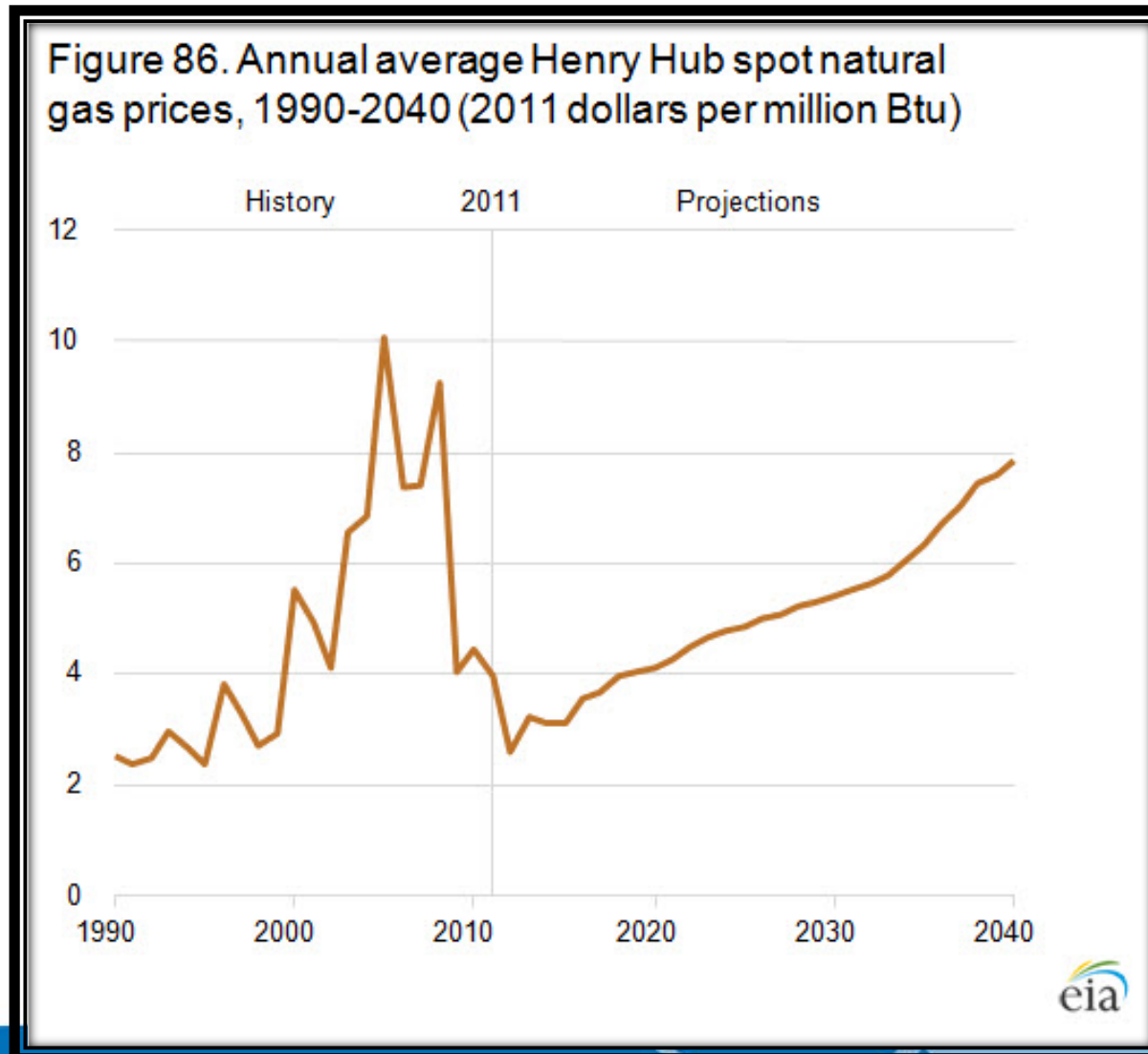


“Of all factors affecting prospects for the substantial growth of nuclear power in the 21st century, cost is the most fundamental.”

World Nuclear Association, *The New Economics of Nuclear Power*

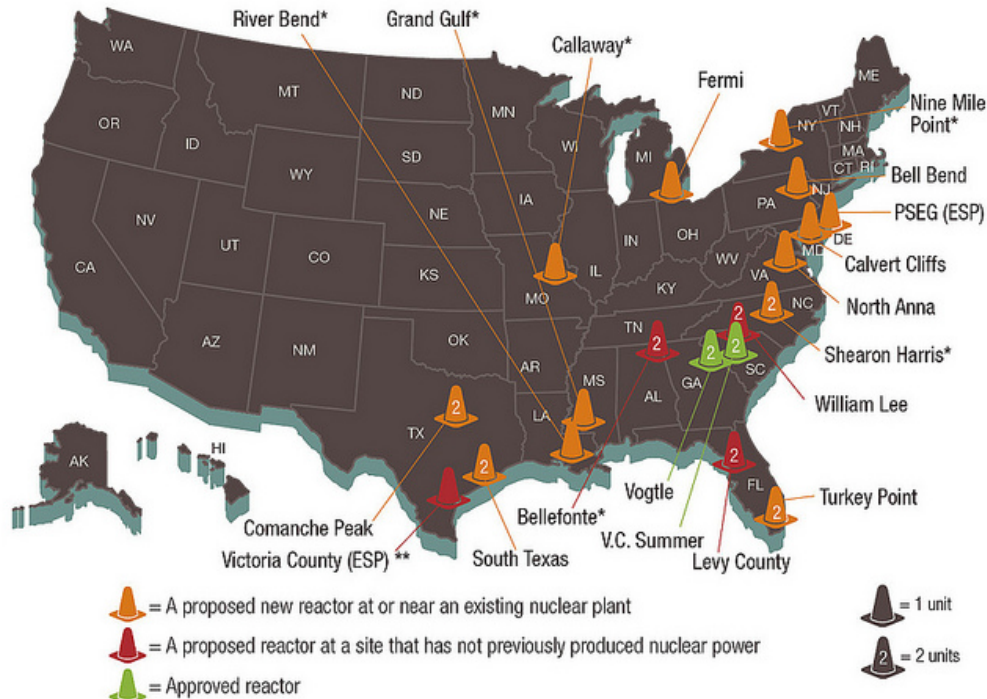
<http://www.world-nuclear.org/reference/pdf/economics.pdf>

Future of U.S. Nuclear Power: Cost



Current Status of U.S. Nuclear Power: New Construction

Locations of New Nuclear Power Reactors Applications



* Review suspended ** COL application amended by applicant to ESP on March 25, 2010.
 Note: Data is as of June 2013.

Current Status of U.S. Nuclear Power: New Construction



Current Status of U.S. Nuclear Power: New Construction



May 22, 2013 – SCE&G placed 900 ton Containment Vessel Bottom Head for V.C. Summer Unit 2

Future of U.S. Nuclear Power: Small Modular Reactors

mPower

- Integral pressurized-water reactor (iPWR)
- Coolant – Light-water
- Reactor Power – 530 MWt
- Electrical Output – 180 MWe



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Status of High-Level Waste Disposal: Yucca Mountain



Aerial View
of Yucca
Mountain
(Nov. 2007)



Inside Yucca Mountain
(June 2007)

NRC Receives
DOE Yucca
Mountain License
Application
(June 2008)



Status of High-Level Waste Disposal: Yucca Mountain

- **NRC Adjudication**

- 2010 DOE Motion to Withdraw & Board decision
- 2011 Commission decision

- **Federal Adjudication**

In re: Aiken County (Petition for Writ of Mandamus) (D.C. Circuit)

- August 13, 2013 – decision
- August 30, 2013 – Order
- September 30, 2013 – responses due

Conclusions

- Operation and construction of nuclear power plants continues in the U.S.
- Several comingled factors, including principally economics, will impact the future of nuclear power.
- Waste issues must be addressed.



Thank You



Questions?

Comments?

Discussion?

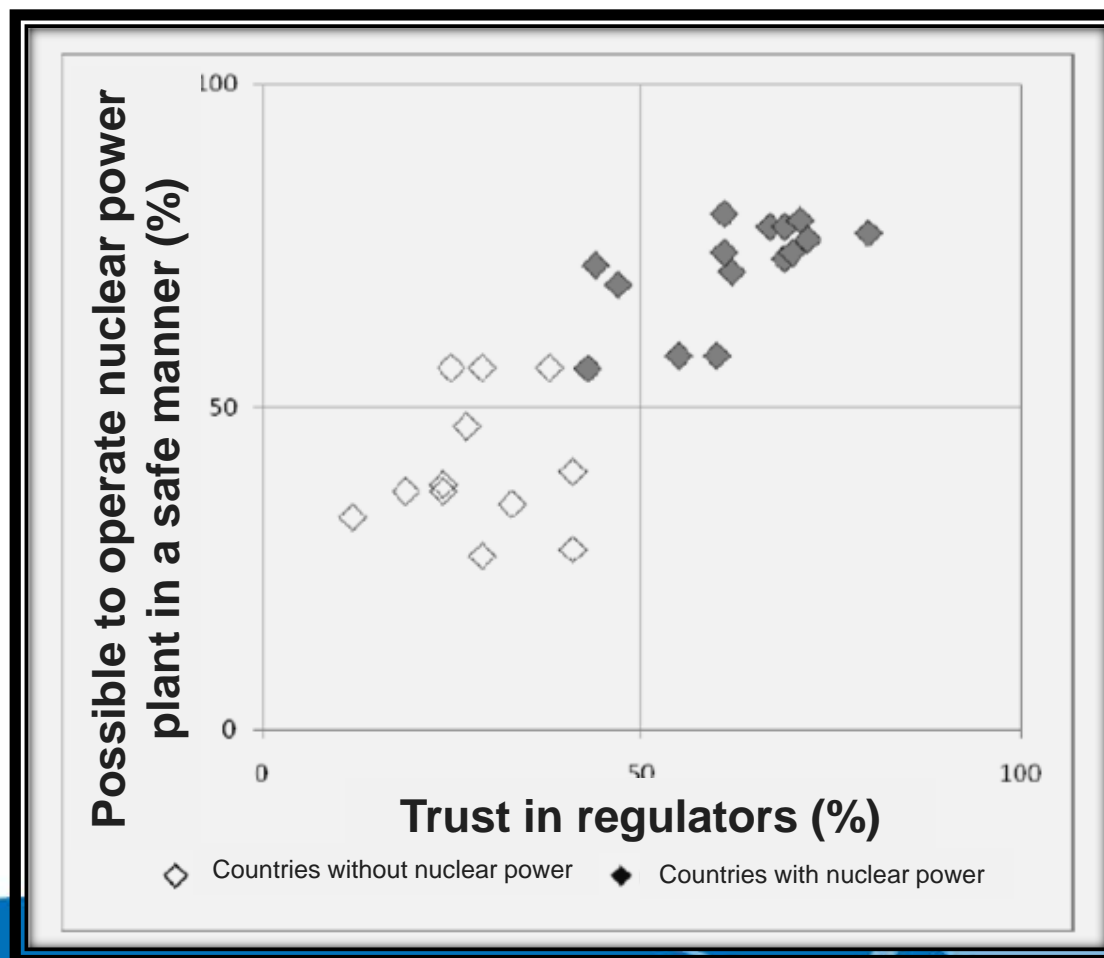


Backup Slides



Future of U.S. Nuclear Power: Public Opinion

Correlation between trust in regulators and belief that nuclear power plants can be operated safely



Status of “Waste Confidence” Decision and Rule

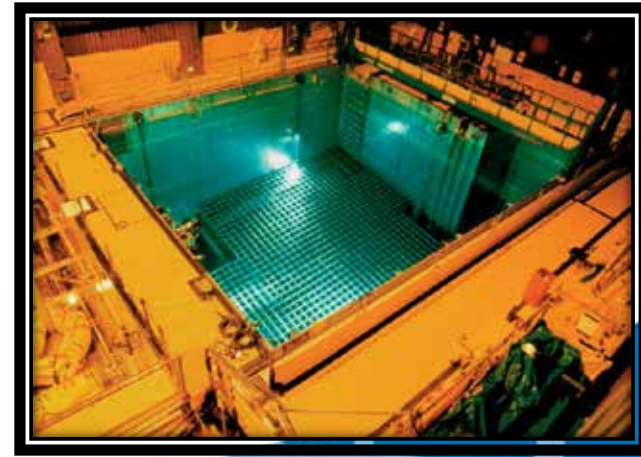
- Originated from a **1979** D.C. Circuit Court of Appeals decision
- Revised or updated periodically, most recently in **2010**



**Dry Cask
Storage**



Geologic Repository (2007)



Spent Fuel Pool

Status of “Waste Confidence” Decision and Rule



- **July 8, 2012** – U.S. Circuit Court remand
 - Three Deficiencies: (1) did not examine a no repository scenario and (2 & 3) failed to properly examine risks of spent fuel pool fires and leaks
- **August 7, 2012** – Commission decision
 - Link to reactor licensing
 - No final licenses until remand resolved
 - Licensing reviews and adjudications continue

Status of “Waste Confidence” Decision and Rule



- **July 7, 2013** – I approved the proposed rule, affirming my confidence in both:
 - the feasibility of safe storage of spent nuclear fuel following the licensed operational life of a reactor
 - the feasibility of a repository being developed to dispose of the nation’s spent fuel
- **Key Question in Waste Confidence:**
 - Not *when* a repository will be available, but whether spent fuel can be safely stored & without significant environmental impacts until a repository becomes available

Post-Fukushima Safety Enhancements

