



U.S. Department of Energy  
Office of Civilian Radioactive Waste Management



# Setting the Stage: Nuclear Energy and Yucca Mt.

Presented to:  
**U.S. Transport Council**  
*"Setting the Stage"*

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# Setting the Stage

## 8 years ago - *Last Act?*

- **Plant Life Extensions – Calvert Cliffs first in March 2000**
- **8 premature plant shutdowns, but increase in “operable” nuclear generating capacity – 97 GWe in 2004 to more than 98 GWe today.**
- **Industry Consolidation & Mergers – 45 operators in 1995 to 25 in 2007**
- **President Veto’s Nuclear Waste Policy Amendments Act of 2000 – On May 2, 2000, Senate falls 3 votes shy of overriding**
- **No plans for New Nuclear Plants**



# Setting the Stage

- **Yucca Mt. Site Selection – President signs Congressional Resolution in July 2002**
- **Energy Policy Act of 2005 – Nuclear Energy cornerstone of Energy Policy**
  - ◆ **Production Tax Credit**
  - ◆ **Standby Support**
  - ◆ **Federal Loan Guarantees**
  - ◆ **Price Anderson – 20 year extension**
  - ◆ **Support for advanced nuclear technology - NGNP**
- **First New Plant License Applications in 30 years**



# Setting the Stage – New Plants and Nuclear Infrastructure

- **NRC has received and docketed 7 COLs for 11 new reactors**
- **Projected: 20 utilities have announced intention to build 34 new reactors – 45 GWe**
- **Internationally:**
  - ◆ **439 nuclear reactors in 31 countries**
  - ◆ **33 new nuclear plants under construction – 28 GWe**
  - ◆ **Projected: 630 reactors operating in 55 countries by 2030**
- **Enrichment Plants: 2 Under Construction and 1 Announcement**
- **Conversion Plant: recent expansion and announcement of future increases in capacity**



# Setting the Stage

## Nuclear Energy - Climate Change Solution

- Patrick Moore – Green Peace founder
  - “Nuclear Energy is the only large-scale, cost-effective energy source that can reduce emissions while continuing to satisfy a growing demand for power...”
- Senator Barbara Boxer (D-CA) – Chair Senate EPW
  - “I am a pragmatist. The vast majority of the members of my committee support nuclear power, and so do the majority of the Senate. I don’t think there is any question that we are going to be seeing new plants.”
- Governor Martin O’Malley (D-MD)
  - “...moral Imperative...if we don't develop better and cleaner technology, including safer and cleaner nuclear ”



# Mission and Priorities

In 1983 the U.S. Department of Energy's (DOE) Office of Civilian Radioactive Waste Management (OCRWM) was created by the Nuclear Waste Policy Act (NWPA).

## Mission:

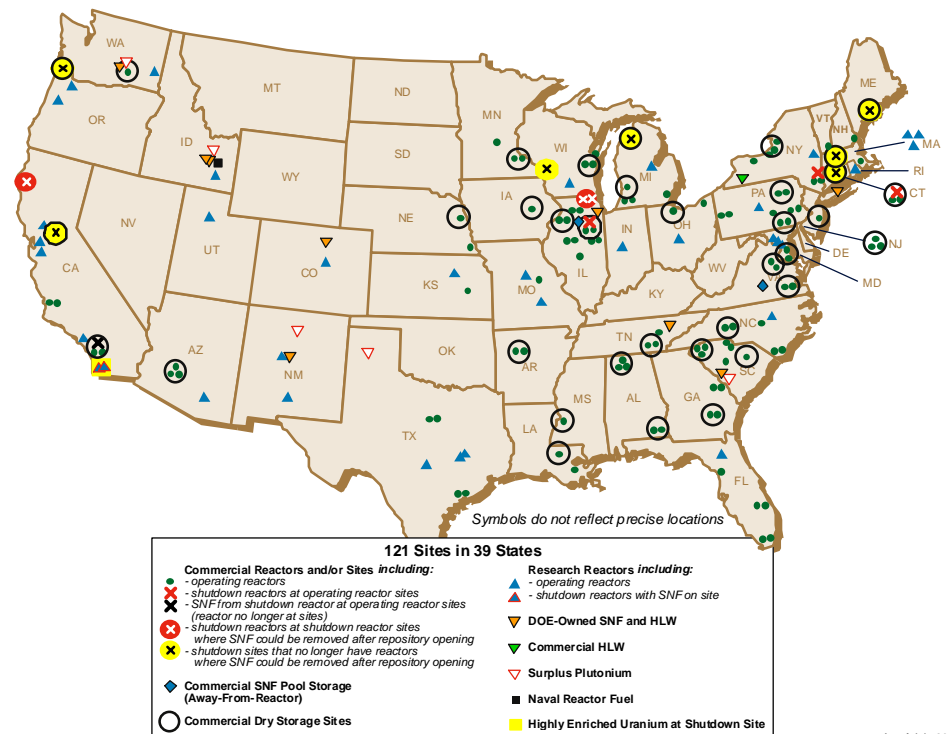
Manage and dispose of high-level radioactive waste (HLW) and spent nuclear fuel (SNF) in a manner that protects health, safety, and the environment; enhances national and energy security; and merits public confidence.

## Priorities:

Develop the Yucca Mountain repository and related infrastructure to safely and permanently dispose of our Nation's HLW and SNF currently being stored at temporary sites around the country.

Current locations of SNF and HLW destined for geologic disposal:

121 sites in 39 States



As of July 2007



# Yucca Mountain

## Licensing Process is Next Step



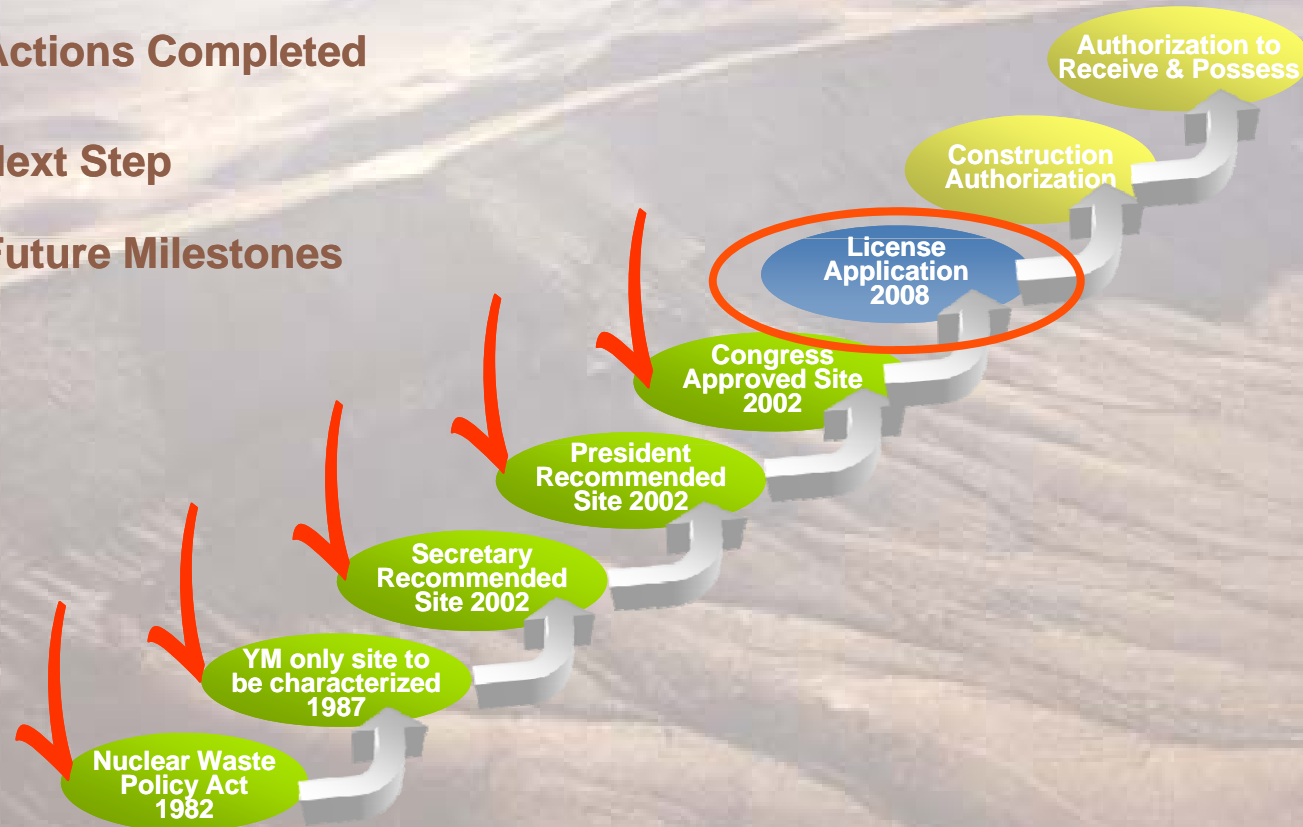
Actions Completed



Next Step



Future Milestones



# The United States is One of Many Countries Pursuing Geologic Repositories



## United States

Yucca Mt site approved 2002; site characterization complete; license application to NRC in June 2008; repository operation TBD – pending resolution of funding issues



## Belgium

URL at Mol (Boom clay); 2002 SAFIR-2 site feasibility report favorable; repository by 2035



## Canada

“Adaptive Phased Management” approach agreed Nov. 2005; siting to use public input; repository operations by 2035



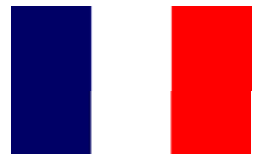
## China

Beishan granitic site near Gansu in Gobi Desert under study since 2001; site characterization thru 2010 URL and disposal demos thru 2025



## Finland

Olkiluoto granite site ratified 2001; “Onkalo” URL confirmatory tests since 2004; repository construction permit by 2012, operations by 2020



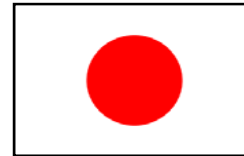
## France

Bure clay site feasibility published 2005; June 2006 Act calls for 2025 repository



## Germany

Moratorium on Gorleben site; 2002 siting criteria being debated; could lead to two new sites by 2010 – possibly Konrad iron mine



## Japan

URLs at Horonobe & Mizunami; NUMO voluntary siting shortlist by 2007; site selection by 2025



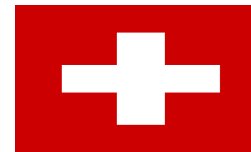
## Spain

Central SNF storage by 2010; generic repository design; no siting work before 2010



## Sweden

Osthammar & Oskarshamn crystalline site studies since 2002; LA by 2008; SNF canister facility permit application LA submitted Nov. 2006; operations test at Aspo URL



## Switzerland

URLs at Grimsel (granite) & Mt. Terri (clay); Opalinus clay site feasibility approved June 2006; siting procedures soon



## United Kingdom

CoRWM's final recommendation for repository disposal accepted October 2006; interim storage for now; siting process under development



Under any Fuel Cycle Scenario – A Repository is Needed



# Program Strategic Objectives

## License Application

**Submit a high-quality and docketable License Application to the Nuclear Regulatory Commission (NRC) no later than June 30, 2008.**

## Staffing

**Design, staff and train the OCRWM organization such that it has the skills and culture needed to design, license, and manage the construction and operation of the Yucca Mountain Project with safety, quality, and cost effectiveness.**

## Liability

**Address the Federal Government's mounting liability associated with unmet contractual obligations to move SNF from nuclear plant sites.**

## Transportation

**Design and begin implementation of a comprehensive national spent fuel transportation plan that accommodates State, local, and Tribal concerns to the greatest extent practicable.**



# Planned FY 2008 Deliverables

- **Certify DOE's Licensing Support Network collection in accordance with NRC requirements and regulations by December 21, 2007 (actual completion date – October 19, 2007);**
- **Submit a License Application for a Construction Authorization for a geologic repository for disposal of spent nuclear fuel and high-level radioactive waste at Yucca Mountain to the NRC by June 30, 2008;**
- **Complete the Final Repository Supplemental Environmental Impact Statement (EIS) for a Geologic Repository for the Disposal of Spent Nuclear Fuel and High-Level Radioactive Waste at Yucca Mountain;**
- **Complete the Final Nevada Rail Corridor Supplemental EIS and the Rail Alignment EIS for the Construction and Operation of a Railroad in Nevada to a Geologic Repository at Yucca Mountain; and**
- **Report to Congress on the need for a second repository, as required by the NWPA.**



# Impacts of FY 2008 Budget Shortfall

- **\$386.4 million FY 2008 appropriation was \$108.1 million below request:**
  - Occurred well into fiscal year
  - Followed approximately \$100 million shortfall in FY 2007
- **Combined effects led to:**
  - A reduction in force of approximately 900 personnel from the Program
  - Inability to maintain the best achievable opening date of March 2017
- **Significant improvements in management practices and processes will result in submittal of all promised deliverables for FY2008 on or near schedule, including the submittal of the License Application to the NRC this June.**



# Access to Program Funds is Major Challenge

- **Congress established the Nuclear Waste Fund to provide assured funding for repository development and operations**
- **Utilities pay 1 mil per kilowatt-hour fee on electricity generated and sold from nuclear power plants, in exchange for Federal contractual commitment to accept waste**
  - Revenues average \$750 million per year
  - Approximately \$15.7 billion in fees paid as of December 31, 2007
  - Excess funds invested in Treasury securities (approximately \$11.6 billion in interest earned as of December 31, 2007)
- **Market value of the Fund is approximately \$21.0 billion as of December 31, 2007**
- **BUT - Nuclear Waste Fund outlays are counted against the DOE appropriation**
  - Funds have not been made available for their intended purpose



# Challenges - Public Policy Solutions?

- **Regulatory Certainty – Ensure that NRC has the Resources to do the job**
- **Financing – Loan guarantee the key**
- **Human Capital & Infrastructure**
- **Managing Nuclear Waste**

