

**Nuclear Waste Management: Key Attributes,
Challenges, and Costs for the Yucca Mountain
Repository and Two Potential Alternatives
GAO-10-48, 11/4/09**

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GAO

- The U.S. Government Accountability Office (GAO)
 - Works for the congress
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Background

- Issue: Accumulation of spent nuclear fuel (SNF) and high-level radioactive waste (HLW)
 - Industry- and government-generated
 - Waste currently stored at 80 sites in 35 states
 - By 2009 ~ 70,000 metric tons
 - By 2055 ~ 153,000 metric tons

Background

- Nuclear Waste Policy Act of 1982 (NWPA)
 - Identified geologic disposal as national policy
 - Directed DOE to evaluate multiple sites as candidates for national geologic repositories
 - Amended in 1987
 - Directed DOE to phase-out site specific activities at candidate sites other than Yucca Mountain
 - Placed cap of 70,000 metric tons for disposal of SNF and HLW at Yucca Mountain

Background

- NWPA (cont.)
 - Created the Nuclear Waste Fund (NWF)
 - Rate payers pay fee of one mill (1/10th of a cent)/kilowatt-hour of nuclear-generated electricity
 - ~ \$24 billion in nuclear waste fund at end of FY 2009
 - NARUC and NEI requested end to NWF collections – July 2009

Background

- NWPA (cont.)
 - In 2002, the President recommended and the Congress approved the Yucca Mountain site for a geologic repository
 - In June 2008, DOE submitted a license application to the Nuclear Regulatory Commission (NRC)
 - In October 2008, NRC began review of DOE's license application
 - Final approval or disapproval is due within 3 years; NRC can extend by 1 year
 - On March 3, 2010, DOE filed motion to withdraw its license application

Background

- Yucca Mountain expenses fiscal years 1983-2008
 - ~ \$14 billion (in constant FY 2009 dollars)
- Yucca Mountain Funding Sources
 - ~ 20 percent – DOE appropriations
 - ~ 80 percent – NWF

Background

- DOE's FY 2011 budget proposal eliminates funding for licensing activities for Yucca Mountain
- In January 2010, DOE established a Blue Ribbon Commission to study SNF and HLW management alternatives

Objectives

- Nuclear Waste Management: Key Attributes, Challenges, and Costs for the Yucca Mountain Repository and Two Potential Alternatives

GAO-10-48, November 4, 2009 (www.gao.gov)

- Objectives
 - Identify possible nuclear waste management alternatives to Yucca Mountain
 - Examine key attributes, challenges, and costs
 - the Yucca Mountain repository
 - 1st alternative: interim storage at two centralized sites
 - 2nd alternative: storage at current locations
- Provide information on what is known about sources of funding

Yucca Mountain Repository

- Designed as a permanent solution
- Minimizes future safety and security
- Government can take custody of commercial SNF

Challenges

- Planned termination of Yucca Mountain
- NRC construction and operations license
- Opposition by stakeholders

Identification of Alternatives

- Interviewed about 200 experts
- Identified two 100-year approaches
- Intended to end in geologic disposal
 - 1) Centralized interim storage
 - 2) On-site storage
- Developed cost models
- Experts provided input on data & assumptions for our models

Centralized Storage

- Implementation possible in 10 to 30 years
- More time to consider options
- Decommissioned reactor sites can be cleared
- Government can take custody of commercial SNF

Challenges

- No statutory authority
- Finding potential sites
- Storage is not disposal
- Transportation
- Funding

On-Site Storage

- Little change from status quo
- More time to consider options
- Predictability

Challenges

- Public resistance
- Custody
- Uncertainty

Cost Models

Scenarios (153,000 MT)	Cost Range (Billions of 2009 dollars)	Mean (Billions of 2009 dollars)
Yucca Mountain (disposal assumed)	\$41 - \$67	\$53
Centralized Storage (disposal assumed)	\$23 - \$81	\$47
On-Site Storage (disposal assumed)	\$20 - \$97	\$51
On-Site (500 years – no disposal assumed)	\$34 - \$225	\$89

Observations

- Developing a long-term national strategy for safely and securely managing the nation's high-level nuclear waste is a complex undertaking that must balance health, social, environmental, security, and financial factors.
- Federal agencies, industry, and policy makers may also want to consider a strategy of complementary and parallel interim and long-term disposal options—similar to those being pursued by some other nations.
- Lessons learned from the past and concerns for the future.

What Next?

- New requests
 - Why close Yucca Mountain?
 - What are ramifications regarding closure?
 - What are costs to taxpayer?
 - How to mitigate impacts of closure?
 - What to do with Yucca Mountain?