Advancing the Used Fuel Management Agenda

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What Will We Do with Nuclear Waste?

• Decisions to build new nuclear plants will turn on electricity generation fundamentals, not whether a particular used fuel facility is successful.

• We must, however, have a plausible, durable policy and plan to manage used fuel responsibly.
The Foreseeable Future
Used Nuclear Fuel in Storage in the U.S.

December 2012

- **Used fuel inventory**
  - Approximately 70,000 MTU
  - Increases 2 - 2.4k MTU annually

- **ISFSI* storage**
  - 71,754 assemblies
  - 20,000 MTU
  - 1,698 casks/modules loaded
  - 62 Operating ISFSIs
    - 1 pool ISFSI, 1 modular vault

- **Projections for 2020**
  - Estimating 88,000 MTU total
  - Estimating 31,000 MTU at ISFSI
  - 3,000 casks/modules loaded
  - At 76 ISFSIs
    - All plant sites + Morris & INEL
  - Fuel from 119 reactors

*ISFSI = Independent Spent Fuel Storage Installation*
Spent Fuel Pool
The Independent Spent Fuel Storage Installation (ISFSI) at Surry Power Station in Virginia
Rancho Seco
California
21 used fuel casks; 1 GTCC cask

LaCrosse
Wisconsin
5 used fuel casks

Humboldt Bay
California
5 used fuel casks; 1 GTCC cask

Trojan
Oregon
34 used fuel casks

Zion
Illinois
61 used fuel casks

Big Rock Point
Michigan
7 used fuel casks; 1 GTCC cask

Yankee Rowe
Massachusetts
15 used fuel casks; 1 GTCC cask

Maine Yankee
Maine
60 used fuel casks; 4 GTCC casks

Connecticut Yankee
Connecticut
40 used fuel casks; 3 GTCC casks

Decommissioned sites without an operating reactor
Yucca Mountain Timeline

1982 Nuclear Waste Policy Act (NWPA)

1987 NWPA amended – Site characterization narrowed to Yucca Mountain

1998 contractual deadline for DOE waste acceptance

2002 Yucca Mountain Development Act completes site characterization, begins licensing

2004, DOE misses commitment date for License Application (LA), initiates changes

June 2008 DOE submits LA

Feb. 2010 NRC staff questions on LA answered

Oct. 2010 Project Terminated
Key Used Fuel Events

• Yucca Mountain project terminated 2010  
  - Waiting on court decision
• Blue Ribbon Commission on America’s Nuclear Future recommendations January 2012
• DOE Strategy January 2013
• Waste Confidence Rule vacated 2012  
  - NRC addressing court issues – complete 2014
• Nuclear Waste Administration Act of 2013 introduced June 2013  
  - Drafted by Senators Wyden, Murkowski, Feinstein, and Alexander
Industry Strategy

- New management entity
- Access to the waste fund and fees
- Completion of the Yucca Mountain licensing process
- Consolidated storage for commercial used fuel and DOE high-level waste
- Research, development and demonstration on advanced fuel cycles
- Support waste confidence rulemaking and eventual legislative determination
Consolidated Storage Program

2014: Begin consent based siting process
2015: Restart NRC licensing and ASLB proceedings
2016: 2017: Siting complete and design begins
2017: NRC construction authorization received and construction begins
2019: NRC license application submitted
2020: 2021: 2022: NRC license issued and construction begins
2023: 2024: Construction complete and operations begin
2025: 2026: 2027: 2028:
(2027) Construction completed and operations begin (average annual funding $1.4 billion – peak funding $2 billion)
(b) 2037 Construction completed and operations begin (maximum of $750 million/year funding from waste fees only – historic max appropriation was $576 million)

Cost: Pre-operation $525 million Operation $115 million annually*

Funding Scenarios

Cost: Restart/relicensing $800 million Construction $13.7 billion Operation $1.5 billion annually**

Damage awards from taxpayer-funded Judgment Fund (billions)

2020: $20.8 2023: $22.3 2027: $24.3 2037: $29.3

July 2013

* Based on EPRI report 1018722 “Cost Estimate for an Away-From-Reactor Generic Interim Storage Facility (GSIF) for Spent Nuclear Fuel.” Costs escalated to 2012 dollars.
Who Pays?

• Rate payers
  - one mill/kWh - one tenth of a cent per kW/h
  - $750 million per year
  - Nuclear Waste Fund – more than $28 billion

• All taxpayers
  - Payments from taxpayer funded Judgment Fund from lawsuits
  - $21 billion by 2020
The Political Landscape

• Legislation will be considered in both Houses of Congress
• Senate – no deal that does not eliminate Yucca Mountain as an option
• House – no deal that does not include Yucca Mountain
Legislation Introduced

• 111th Congress
  - Voinovich and Upton on Fedcorp

• 112th Congress
  - Senator Murkowski – used fuel storage
  - Senators Feinstein, Alexander, Bingaman, and Murkowski – used fuel storage in approps
  - Senator Bingaman – Nuclear Waste Administration Act

• 113th Congress
  - Senators Wyden, Murkowski, Feinstein, and Alexander– Nuclear Waste Administration Act of 2013
Nuclear Waste Administration Act of 2013

- New Federal Agency
  - Administrator and deputy with advisory board – all appointed by President
  - Board and CEO structure preferred

- Working Capital Fund
  - Waste fees go directly to new agency
  - Direct access to waste fund must also be provided on defined schedule without appropriations

- Consent based siting for new facilities

- Target dates
  - Pilot consolidated storage facility for priority waste – 2021
  - Larger consolidated storage facility for non-priority waste – 2025
  - Repository - 2048
Informing the Discussion

• More than half of the members of Congress have been in office for 6 years or less

• Industry Efforts
  - Legislative principles
  - Response to Senate discussion draft
  - Ongoing interaction with Congress and the Administration

• Stakeholders for Nuclear Waste Reform
Blue Ribbon Commission Report

DOE and Administration Strategy

Congress must now establish a sustainable program
Blue Ribbon Commission Recommendations

• Consent-based approach to siting
• New organization to manage program
• Access to funds
• Prompt efforts on one or more repositories
• Prompt efforts on consolidated storage
• Prompt efforts to prepare to transport
• Support for innovation
• U.S. leadership (non-proliferation, security, etc.)
Fuel Assemblies

15x15 PWR Fuel Assembly

Relative size of PWR and BWR fuel assemblies

Number of Operating Reactors
PWR – 65, BWR – 35

~8.4 inches

~5.1 inches

PWR Fuel
BWR Fuel
Dry Cask Storage

Vertical Storage Cask

Horizontal Storage Module