Nuclear

U.S. Transport Council

Panel: Waste Acceptance Readiness

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Spent Fuel Management at Exelon

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Need for a Geologic Repository

Exelon SM Nuclear

The Numbers

- Total Units: 17 operational, 4 retired.
  - (IL) Byron, Braidwood, Clinton, Dresden, LaSalle, Quad Cities, Zion
  - (PA) Limerick, Peach Bottom, TMI-1
  - (NJ) Oyster Creek
- Total fleet output: ~20% of commercial nuclear industry.
- Exelon spent fuel pools were never designed to accommodate all of the assemblies we will discharge over the life of the plants.

Exelon SM Nuclear

The Numbers (continued)

- Total fleet discharge projections (assuming all units receive license renewal):
  - ~115,000 assemblies
  - ~25,000 MTU
  - ~2,200 transport systems

Business Planning Guidelines

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- DOE will not begin operations at a federal repository before 2015.
- DOE will accept fuel at rates outlined by the 1998 Viability Assessment Study rate (seen elsewhere) of 400, 600, 1200, 2000, and 3000 MTU/yr during the first five years of operation, and 3,000 MTU/yr beyond the fifth year.
- Under this scenario, we will have to build on-site, independent spent fuel storage installation (ISFSI) at each of our sites to maintain full-core discharge reserve (FCDR).
- Exelon operating principles include maintaining FCDR at all sites.

Business Planning Guidelines

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- We have developed a number of management models to calculate our anticipated future costs for storing spent fuel on our sites until DOE accepts for disposal.
- **The cost impact of dry cask storage installations fall in two categories**:
  - Expenses incurred for dry cask storage during the operational lives of the units
  - Expenses incurred post-retirement to maintain the plant until DOE completes all removal of spent fuel
  - **Estimated costs (nominal dollars):**
    - Operational expenses - $25-30 million for ISFSI infrastructure, $5-6 million/yr dual-unit site for cask loading campaigns
    - Post retirement operations and maintenance expenses incurred beyond the normal decommissioning schedule – decommissioning delays of 5 to 25 years at $15 million/yr dual-unit site

Business Planning Guidelines

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- **Exelon's management strategy is to ship all spent fuel to the permanent repository by rail**
- **Exelon's policy is to minimize the handling of spent fuel**
  - Use dual-purpose (storage and transportation) dry cask storage systems at all sites
  - Use largest payload systems available, compatible with infrastructure

Experience To-date

Exelon Nuclear

Site	Loss of FCDR
Dresden	ISFSI in use (25 casks on pad)
Oyster Creek	ISFSI in use (16 casks on pad)
Peach Bottom	ISFSI in use (28 casks on pad)
Zion	Wet Storage in use
Quad Cities	2006 (dry run complete)
Limerick	2009 (prelim design started)
Byron	2011
LaSalle	2012
Braidwood	2013
Clinton	2014
Three Mile Island	2024

Cask System selection criteria:

- Safety during physical operations
- Technical evaluation
- Site compatibility
- Supplier support
- All-In costs
- Internal/External stakeholder impact
- License status
- Project schedule

Limerick Generating Station

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Experience To-date

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Public perception needs to be addressed

- How can you take the spent fuel out of the water? Is that safe?
- Why don't you shut the plant down now to avoid making more waste?
- What are the health risks? I hear the cancer rate will increase.
- How will my property value be affected?
- How do you protect the ISFSI from attack?
- How does the spent fuel get from Limerick to this Yucca Mountain?

Experience to-date

Public outreach must be active & continuous

- Cannot begin early enough
- Use of Community Advisory Panel
- Mailings to townships within Emergency Planning Zone
- Table-top models of ISFSI system
- Brochures to leave as "take-aways" at community gatherings

Educate, educate, educate.