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Assessment of Disposal Options for DOE-Managed HLW and SNF

LINE Commission II Update

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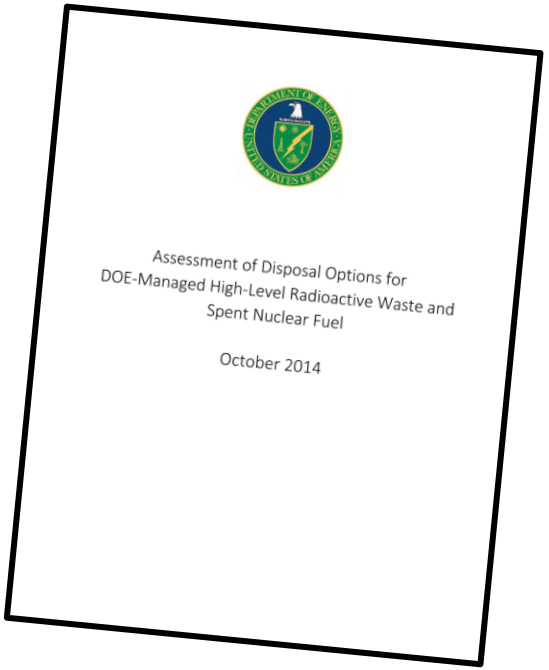
Changed Circumstances since 1985 Decision to "Commingle" Defense and Commercial Waste

- A number of circumstances have changed since the 1985 decision to "commingle" defense and commercial waste, including the following –
  - The Cold War is over and the U.S. is no longer producing nuclear weapons materials. Thus, the inventory of defense high level waste is finite and known.
  - Defense high level waste streams are heterogeneous, existing in many different waste forms, which creates opportunities for different disposal pathways.
  - The 1985 decision assumed a repository would be available in 1998 and did not envision the legal binding agreements with the States in place today to remove DOE HLW by dates certain.

Evaluation of Technical Options for Disposal of DOE-Managed High Level Radioactive Waste and Spent Nuclear Fuel

- Over the last year, the Department did a technical assessment, led by the Office of Nuclear Energy, of options for disposal of its inventory of DOE-managed high-level waste and spent nuclear fuel.
- This assessment considered whether DOE-managed HLW and SNF should be disposed of with commercial SNF and HLW in one geologic repository, or whether there are advantages to developing separate geologic disposal pathways for some DOE-managed HLW and SNF.
- **Disposal options analyzed --**
  - Dispose of all HLW and SNF waste, regardless of origin, in a common repository
  - Disposal of some DOE-managed HLW and SNF in a separate mined repository
  - Disposal of smaller waste forms in deep boreholes



Inventory of DOE-Managed High-Level Waste and Spent Nuclear Fuel

- The assessment estimated that DOE-managed HLW and SNF will account for about 15 percent of the total volume of material that would be disposed of in a repository.
- About 80 percent of that will be defense high-level waste.

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Recommendation to Pursue Separate Disposal Options for Some DOE-Managed High-Level Waste and Spent Nuclear Fuel

- Recommends that DOE pursue disposal options for some DOE-managed HLW and SNF separately from commercial HLW and SNF.
- Recommends that DOE pursue options that allow for flexibility in disposing of HLW and cooler DOE-managed SNF in one repository, while disposing of other DOE-managed wastes, including HLW and SNF of commercial origin and Naval SNF with higher heat output, in another repository.
- Concludes that a separate repository for DOE-managed HLW and cooler DOE-managed SNF could present fewer challenges and allow for a simpler repository design and licensing process.

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Some Smaller Waste Forms Could be Disposed of Using Deep Borehole Concept

- Deep borehole disposal concept could potentially accommodate smaller waste packages, such as the cesium and strontium capsules stored at Hanford. Theoretically, untreated calcine waste could also be placed in smaller waste packages and disposed of in boreholes.
- Under this concept, a deep borehole would be drilled at a depth of approximately 5 km (3.1 miles), with at least 3 km (1.9 miles) into crystalline rock formations. Waste packages would be disposed of in the lower 2 km of the hole.
- Low permeability of rock and the long pathway up to the surface make this disposal concept potentially desirable.

Key Conclusions and Recommendations

- Concludes that there are multiple options for disposal of DOE-managed HLW and SNF that are technically feasible and have the potential to provide long-term isolation of this waste.
- Concludes there are potential programmatic advantages to a phased strategy that allows for flexibility in disposal pathways for some DOE-managed HLW and SNF.
- Recommends the Department begin implementation of a phased, adaptive, and consent-based strategy with development of a separate repository for some DOE-managed HLW and SNF.
- Recommends the Department retain the flexibility to consider options for disposal of some smaller DOE-managed waste forms in deep boreholes rather than in a mined geologic repository.

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Next Steps….

- ….TBD