



U.S. Nuclear Waste Technical Review Board

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Summary of Technical Workshop on Impacts of Dry-Storage Canister Designs on Future Handling, Storage, Transportation, and Geologic Disposal of Spent Nuclear Fuel

Presented to:
NWTRB Public Meeting Attendees

Presented By:
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NWTRB Technical Workshop

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Washington, DC



Background on Workshop

- Monday afternoon presentations
 - Providing high-level information from diverse perspectives
 - Focused on commercial spent nuclear fuel
- Tuesday the Board focused on obtaining input from participants on two scenarios: repackaging and direct disposal
 - Used two facilitated breakout sessions on scenarios to identify issues
 - Reporting back from sessions with additional discussion from all participants
 - Final input from participants on what were their key observations



Session 1 Insights- Repackaging

- As evidenced by the flowchart, disposal with repackaging is a complicated process with many directions and options
- Because of the diversity of decisions already taken, not all spent fuel will necessarily follow the same path from the reactor to disposal
- The nature and characteristics of the final repository (geology, design, requirements) significantly impact the decisions made for the earlier steps
- Transportation issues for repackaging are complex, in terms of choice of canisters, containers, packages,



Session 1 Insights - Repackaging

- For stranded and shutdown sites, ability to repackage can be complex, depending on available facilities and infrastructure
- Condition and requirements related to high burnup fuel still to be understood and established
- Conflict of interest because party responsible for storage is different than party responsible for transportation and disposal
- Need to factor in safety over the life cycle of the fuel cycle when making decisions



Session 1 Insights - Repackaging

- Diversity of dry storage cask and canister designs makes all downstream operations more diverse, adding complexity and costs
- Inconsistencies between storage, transportation and repository criticality and thermal requirements
- Where and when to repackage (e.g. utility site, consolidated fuel storage facility) impacts on fuel storage facility design
- Pros and cons of dry vs. wet repackaging, hydriding
- How do decisions made in near term regarding storage and packaging impact fuel form performance in the repository



Session 2 Insights – Direct Disposal

- There are advantages to direct disposal without repackaging
- Lack of back end plan impacts everything
- Programmatic decision for direct disposal will help to “harmonize” DOE/NRC/Utilities/Stakeholders and allow discussion to move forward
- Might separate existing loaded and future canisters, and handle separately:
 - 1700 existing loaded canisters, many designs
 - Could optimize future canisters for direct disposal (including storage, transportation, disposal?)



Session 2 Insights – Direct Disposal

Technical Issues

- Weight effects
- Thermal effects
- Criticality effects
- Environmental stability effects





Some Key Points from Participants

- As time proceeds the issues are getting more complex (new designs, materials, and higher burnup)
- There is no clear path to harmonize interests (front to back)
- Policy/programmatic uncertainties are more important than technical uncertainties in moving forward
- DOE has more flexibility for its spent nuclear fuel
- Transportation of high burnup fuel is currently problematic- lack of certified casks and lack of data as a basis for certification
- Right time for workshop and an important topic for Board



Board Next Steps

- Seeking additional input
 - On workshop related issues through mid-January
 - Style of meeting : did the workshop format work?
- Board providing additional information to inform additional participant input on identifying the issues
 - Posting on Board website the “Participants Key Points” shortly
 - Posting transcript to Board’s website in mid-December
- Board report

