

Used Fuel Disposition Campaign

Deep Borehole Disposal (DBD) Session Summary

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UFD Working Group Meeting

Las Vegas, NV

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Deep Borehole Disposal (DBD) Breakout Sessions

SESSION 1 - WEDNESDAY, JUNE 8, 2016: 08:00 AM – 09:50 AM

Time	Presenter	Topic
08:00 – 08:10	Tim Gunter (DOE)	DBFT Overview and Status
08:20 – 08:30	Geoff Freeze (SNL)	DBD Safety Case Framework
08:30 – 08:45	Dave Sassani (SNL)	DBFT Site Evaluation and Site Selection
08:45 – 09:00	Frank Perry (LANL)	Geologic Framework Model
09:00 – 09:05	Glenn Russell (INL)	Regional Geology Web Map Application
09:05 – 09:20	Emily Stein (SNL)	DBD PA Model
09:20 – 09:30	Kris Kuhlman (SNL)	DBFT Borehole Characterization
09:30 – 09:35	Kurt Nihei (LBNL)	Monitoring and Characterization
09:35 – 09:50	Group Discussion	Siting and Characterization

SESSION 2 - WEDNESDAY, JUNE 8, 2016: 10:10 AM – 12:00 NOON

Time	Presenter	Topic
10:10 – 10:30	Ernie Hardin (SNL)	DBFT Engineering Overview
10:30 – 10:40	Fred Peretz (ORNL)	Surface Handling and Transfer Cask Concept
10:40 – 10:50	John Cochran (SNL)	Emplacement Zone Completion Options
10:50 – 11:10	Group Discussion	Engineering
11:10 – 11:20	Jonny Rutqvist (LBNL)	DRZ Modeling and Testing
11:20 – 11:30	Pat Dobson (LBNL)	Swedish Deep Borehole R&D
11:30 – 11:40	Florie Caporuscio (LANL)	Laboratory Testing of Sealing Materials
11:45 – 11:50	T.J. Ulrich (LANL)	DRZ and Fracture Detection
11:50 – 11:55	Andrew Delorey (LANL)	Stresses and Breakouts

DBD and DBFT Overview

■ UFD is conducting a Deep Borehole Field Test (DBFT)

- To demonstrate and evaluate technologies necessary for determining the safety and feasibility of the deep borehole disposal (DBD) concept
- Currently working with Spink County SD

■ DBD R&D is ongoing

- Borehole testing and characterization methods
 - *properties of low-k crystalline rock, DRZ, and deep, high-T brines*
- Geologic framework model
- Engineering design
 - *deep drilling*
 - *waste packages*
 - *surface handling and emplacement system*
- PA model

DBD Safety Case – Current Status for Cs/Sr Disposal

■ Pre-Closure Safety Case for Deep Borehole Disposal of Cs/Sr:

- **Drilling** and casing a large diameter borehole to 5,000 m depth in crystalline basement rock is achievable with existing drilling technology.
- **Surface handling and emplacement systems** can be engineered to provide a high level of assurance that waste packages can be safely emplaced at the desired depth with minimal probability of packages becoming stuck and/or breached.
- Additional hazard analyses needed for: transportation, worker exposure, surface handling, and external events (e.g., seismic, flooding, sabotage)

■ Post-Closure Safety Case for Deep Borehole Disposal of Cs/Sr:

- Waste emplacement is deep; in **low-permeability crystalline basement rock** with limited interaction with shallower groundwater.
- **Borehole seals** can be engineered to maintain their physical integrity, at least over the approximately 100-year time period of thermally-induced upward groundwater flow.
- Preliminary results from post-closure PA calculations suggest **minimal radionuclide releases** beyond the disposal zone and zero dose at biosphere.