

SPENT FUEL AND WASTE SCIENCE AND TECHNOLOGY R&D OVERVIEW

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SFWD

SPENT FUEL & WASTE DISPOSITION

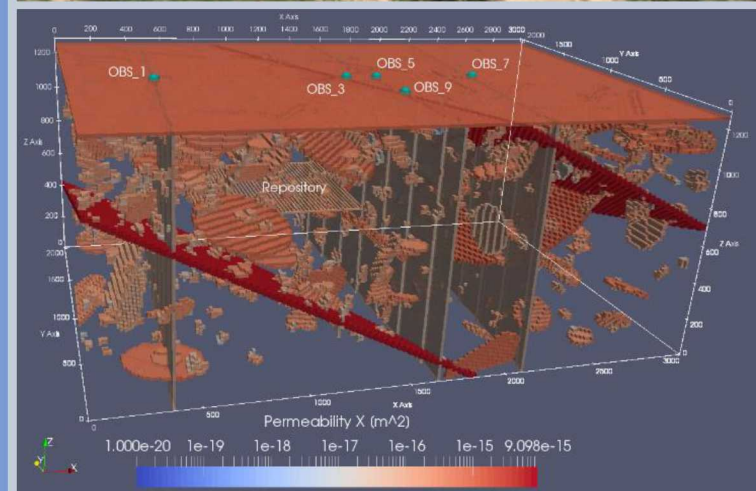
Annual Working Group Meeting

UNLV-SEB – Las Vegas, Nevada

May 21-23, 2019



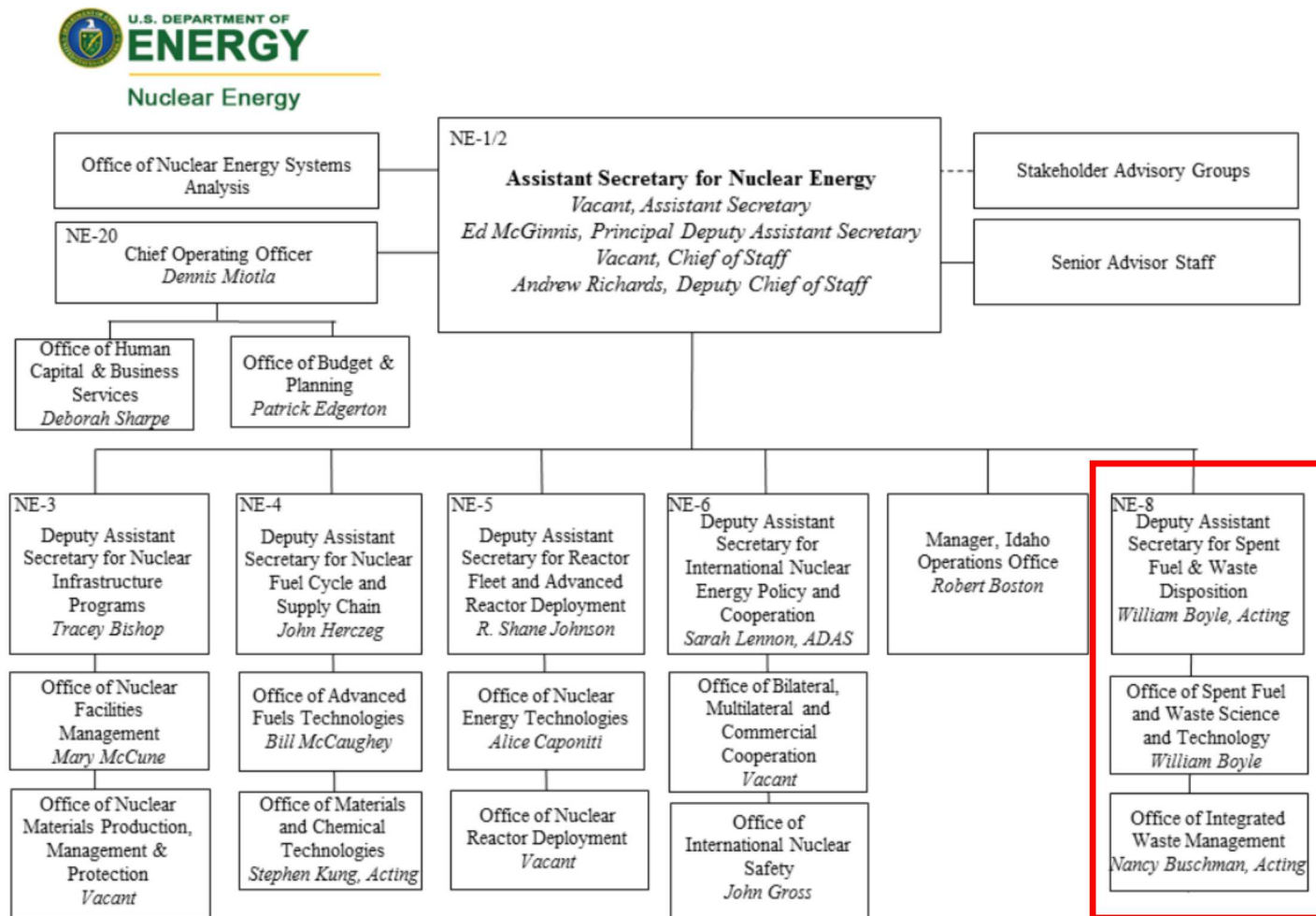
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WELCOME AND THANK YOU

- What's new this year?
 - This is now the NE-8 Spent Fuel and Waste Disposition working group meeting, rather than just the NE-81 Spent Fuel and Waste Science and Technology R&D meeting
 - Welcome to the NE-82 team
 - Three separate tracks
 - Storage and Transportation R&D
 - Disposal R&D
 - Integrated Waste Management
- Welcome to collaborators from Nuclear Energy University Program and the Small Business Innovation Research/Small Business Technology Transfer program
- Welcome to observers from the Nuclear Waste Technical Review Board, Nuclear Regulatory Commission, and the Electric Power Research Institute
- Thank you to those who made the meeting happen

DOE NE ORGANIZATION

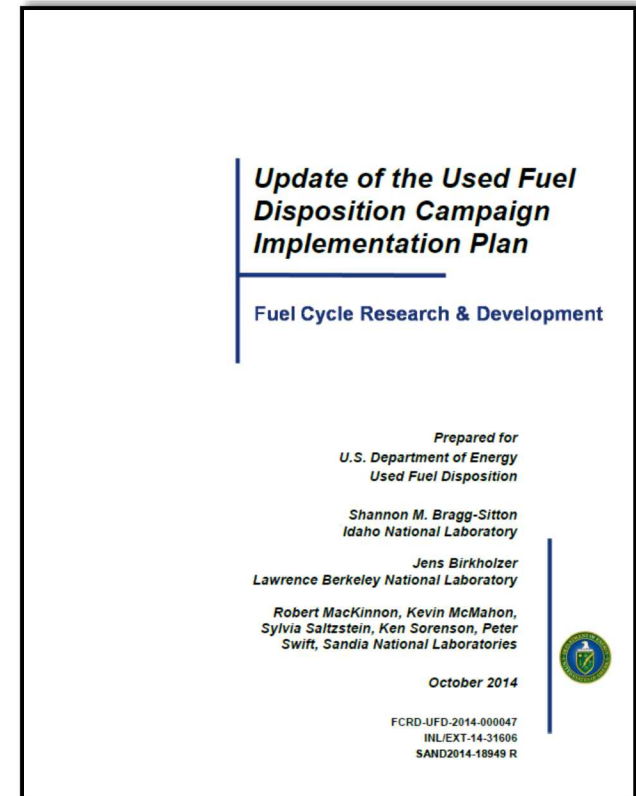


SFWST R&D MISSION

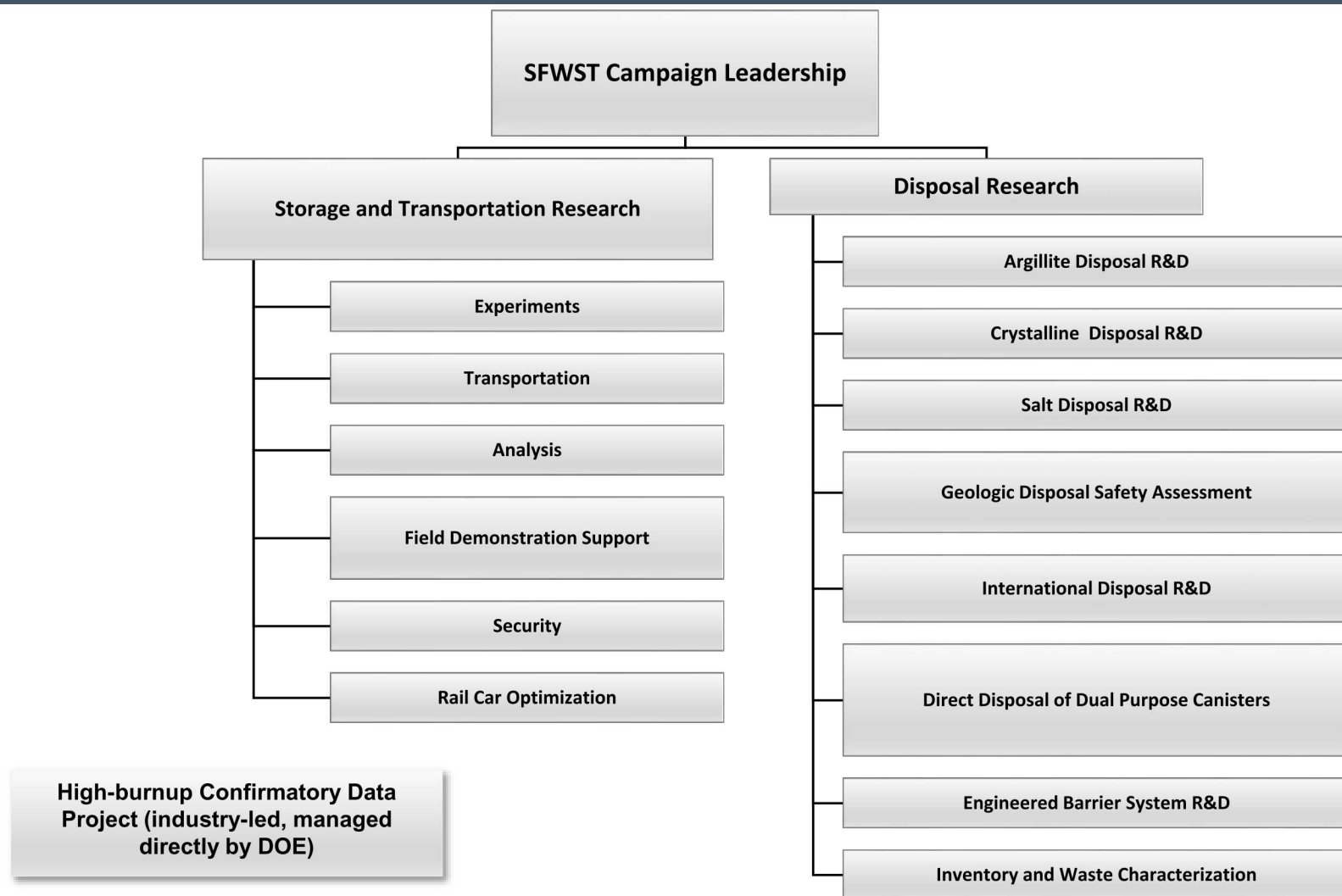
The mission of the Spent Fuel and Waste Science and Technology Disposition Campaign is to identify alternatives and conduct scientific research and technology development to enable storage, transportation and disposal of used nuclear fuel and wastes generated by existing and future nuclear fuel cycles.

Update of the Used Fuel Disposition Campaign Implementation Plan

FCRD-UFD-2014-000047, October 2014



FY 18 SFWST R&D CAMPAIGN STRUCTURE (FROM PICS NE 1.08.01)



CAMPAIGN STRATEGIC FOCUS: STORAGE AND TRANSPORTATION R&D

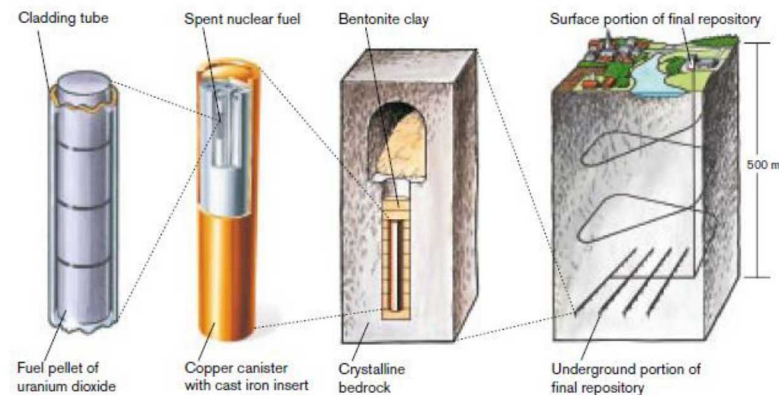
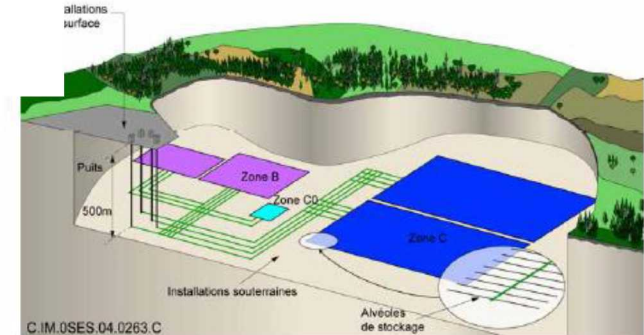
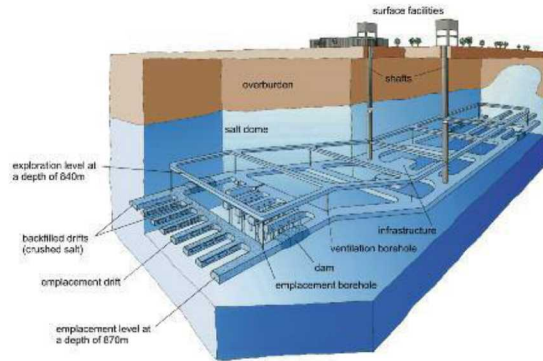
Prepare for extended storage and eventual large-scale transport of spent nuclear fuel and high-level waste

- Support the technical basis for evaluating:
 - Extended storage of spent nuclear fuel
 - Fuel retrievability and transportation after extended storage
 - Transportation of high-burnup spent nuclear fuel



CAMPAIGN STRATEGIC FOCUS: DISPOSAL R&D

- Provide a sound technical basis for multiple viable disposal options in the US
- Increase confidence in the robustness of generic disposal concepts
- Develop the science and engineering tools needed to support disposal concept implementation
- Conduct R&D on the direct disposal of existing dual purpose (storage and transportation) canisters
- Leverage international collaboration



MAJOR ACTIVITIES IN THE LAST YEAR

STORAGE AND TRANSPORTATION R&D

- High burnup fuel testing to support storage demonstration project
 - Non-destructive testing is complete
 - ORNL and PNNL are starting destructive testing
 - ANL has received samples and will test soon
- Corrosion
 - Improved understanding of salt deposition and decomposition rates, incubation times, pitting progression, and crack initiation and growth rates
 - Crack consequence experimental work and modeling has begun
 - Initiated repair and mitigation studies
- Transportation Handling Tests
 - Completion of 30 cm drop test; analyses of stress on fuel in progress
 - Designing a 9 m drop to get data on viability of pinch loads
- Residual Water After Drying
 - Analyzed gas samples from storage demonstration test and working to get more gas samples
 - Planning for experimental set up
 - Initiated consequence analysis
- Thermal Work
 - Vertical BWR experiments complete and horizontal test set up has begun
 - Blind round-robin modeling will continue

MAJOR ACTIVITIES IN THE LAST YEAR

DISPOSAL R&D

- Argillite, Crystalline, and Salt Research
 - Experimental data and modeling of bentonite performance at elevated temperatures
 - Improved techniques for modeling fracture flow and transport
 - Borehole heater test in progress at WIPP
- Geologic Disposal Safety Assessment
 - PFLOTRAN modeling capability expands
 - Uncertainty and sensitivity analysis capability expands
 - Re-assessment of 2012 Disposal R&D Roadmap priorities in progress
- International Disposal R&D
 - Collaborations continue on multiple fronts
 - Leadership role in DECOVALEX
 - Planning role in HotBENT test
 - Support for Nuclear Waste Technical Review Board
- Direct Disposal of Dual Purpose Canisters
 - Work continues on analyses of the potential for postclosure criticality events
 - Work initiated on fillers for criticality control
 - Cost analyses and multi-year planning in progress

OBSERVATIONS ON FY20 PLANNING

- We don't know what FY20 will bring
 - Congressional appropriation bills are in draft form, and it's premature to speculate
- Focus on completing the FY19 work that we have committed to in PICS-NE
 - Limit carryover to approximately 2 months of funding to cover transition (~16%)
 - If you won't be able to get the work done, let your control account manager know ASAP and we'll try to redirect FY19 funding to other areas
- Planning for FY20 will begin when we have clear direction

QUESTIONS?

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