



U.S. DEPARTMENT OF
ENERGY

OFFICE OF
ENVIRONMENTAL
MANAGEMENT

EM's Management of Spent Nuclear Fuel at Idaho

June 23, 2016

Overview

- EM currently manages 265 MTHM (metric tons of heavy metal) of spent nuclear fuel (SNF) at INL.
- INL currently maintains about 220 specific fuel types, or 51% (by volume) of DOE fuel.
- EM also manages approx. 15 MTHM of SNF at the Ft. Saint Vrain site in Colorado.

INTEC SNF Facilities



Idaho Nuclear Technology and Engineering Center

Fort St. Vrain, Colorado

Three Fuel Types: ATR Plate, FSV Graphite Block, and TRIGA



SNF Program Goals

- Safe and efficient management of all materials within our custody.
- Continued protection of the Snake River Aquifer.
- Removal of all spent fuel, including naval spent fuel and Three Mile Island spent fuel, from Idaho by January 1, 2035 (per 1995 Idaho Settlement Agreement).

SNF Consolidation

- EM originally managed SNF at 11 facilities spread across the INL site, and one former commercial facility located off site (Ft. Saint Vrain).
- In 1997, work began to consolidate SNF at the Idaho Nuclear Technology Engineering Center (INTEC).
- As of 10/18/05, all SNF facilities throughout the INL site containing EM-managed legacy SNF have been consolidated at INTEC.
- Benefits of consolidation:
 - Moves SNF from wet to dry storage to meet 1995 Idaho Settlement Agreement milestone
 - Reduces safeguards and security requirements
 - Allows for some cost savings to be realized, such as through facility closure

SNF Consolidation

Former SNF Storage Locations

SNF Storage Facility	Date Emptied
TRA-660, ARMF/CFRMF Canal*	10/28/1997
TRA-603, MTR Canal & Plug Storage*	09/24/2002
TAN-607, Basin*	09/29/2002
PBF-620, Pool*	09/15/2003
CPP-603, FECF*	04/13/2004
TAN-791, Dry Storage Pad*	10/26/2004
TRA, various locations	10/18/2005

(* Closed)

SNF Consolidation

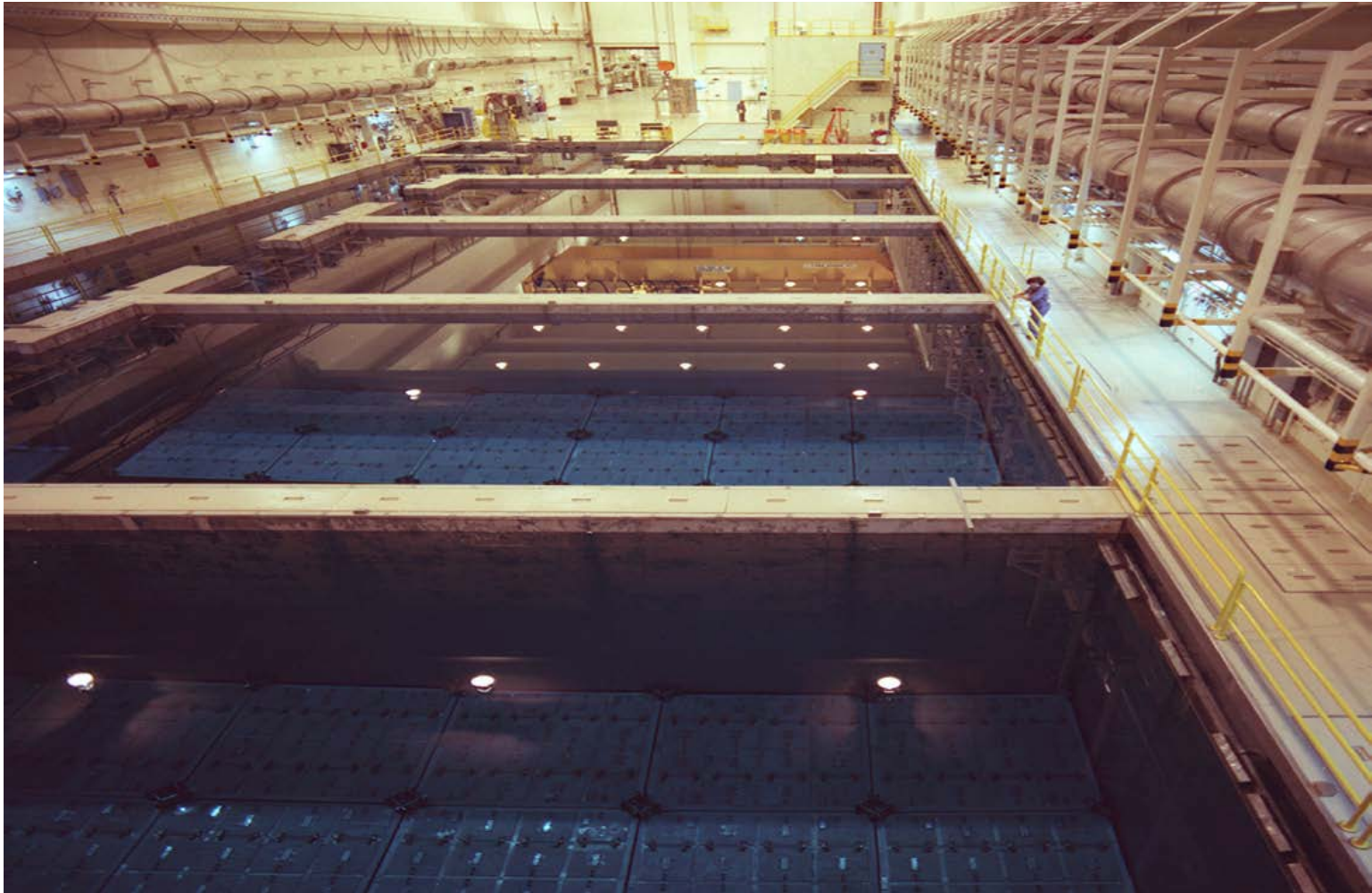
EM-Managed SNF Facilities at INTEC and Colorado

Area	Bldg No	Building Name	Function	Yr Built	Status
INTEC	CPP-603	1. Wet side - three basins: north, central, south, and Fuel Examination and Cutting Facility (FECF)	Underwater SNF storage and fuel examination and cutting capability	1953	Closed
		2. Dry side - Irradiated Fuel Storage Facility (IFSF)	Dry storage for SNF	1973	Operational
		3. Dry side - Fuel Canning Station	Heated drying system for drying and canning wet stored SNF	1997	Operational
	CPP-666	1. Fluorinel Dissolution Process (FDP)	Zr fuel reprocessing area	1983	Closed
		2. Fuel Storage Facility (FAST)	Underwater SNF storage	1983	Operational
	CPP-749	Peach Bottom Fuel Storage Facility	Underground SNF storage vaults	1972	Operational
	CPP-2707	Dry SF Cask Storage Pad	Dry storage for SNF	2003	Operational
	CPP-1774	TMI Independent Spent Fuel Storage Facility (ISFSI) NRC Licensed	Above ground SNF and TMI-2 core debris storage	1998	Operational
FSV	FSV-ISFSI	Fort Saint Vrain Independent Spent Fuel Storage Installation (ISFSI) NRC Licensed	Above ground SNF dry storage	1991	Operational

Wet to Dry Storage

- DOE is required under the Idaho Settlement Agreement to transfer all wet-stored SNF to interim dry storage by Dec. 31, 2023.
- As of 06/06/10, all EM SNF had been moved to dry storage, including emptying 5 of 6 wet storage pools.
- Benefits of transferring SNF to interim dry storage:
 - Reduces degradation of fuel and structural materials
 - Mitigates the effects of natural phenomena (e.g. earthquakes) that could result in a loss of cooling water from wet storage
 - Removes a moderator (water) from criticality considerations

CPP-666 Storage basins



Wet to Dry Storage

SNF Wet Storage Facility	Date Emptied
TRA-660, ARMF/CFRMF Canal*	10/28/1997
CPP-603, Basins*	04/28/2000
TRA-603, MTR Canal & Plug Storage*	09/24/2002
TAN-607, Basin*	09/29/2002
PBF-620, Pool*	09/15/2003
CPP-666, Basins (EM-managed SNF)	06/06/2010

(* Closed)

CPP-749 Inside the Fence



Wet to Dry Storage

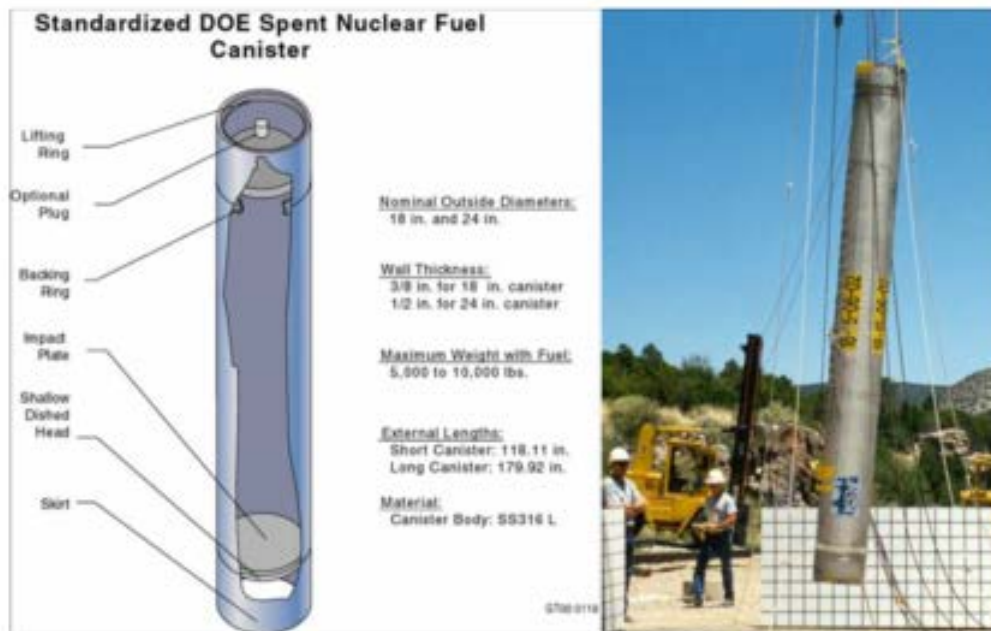
- Remaining SNF in wet storage consists of Navy fuel and DOE Office of Nuclear Energy fuel (EBR-II fuel and ATR fuel).
- The Navy plans to remove its SNF from wet storage by 2018.
- EM is working with the Office of Nuclear Energy to complete the removal of the EBR-II SNF by the end of 2020.
- EM will move approximately 1,000 ATR SNF elements into dry storage under the current Fluor contract.

Making SNF ‘Road Ready’

- Under the Idaho Settlement Agreement, DOE is required to remove all legacy SNF from Idaho by Jan. 1, 2035.
- DOE is working to make the SNF stored at INL ‘road ready’ to meet the Settlement Agreement milestone.
- SNF will be packaged in DOE Standard Canisters for eventual shipment to off-site repository.

Making SNF 'Road Ready'

Standardized DOE SNF Canister



Conclusion

- EM is safely and effectively managing the legacy SNF stored at the INL and the Ft. Saint Vrain site.
- EM has realized significant benefits by consolidating SNF storage from multiple sites across INL to INTEC.
- EM has made significant progress in transferring the SNF from wet to dry storage, thereby enhancing the safe interim storage of the material.
- EM's management of the SNF at INL is helping to protect the Snake River Aquifer.