



U.S. DEPARTMENT OF
ENERGY

Nuclear Energy

Management of Spent Nuclear Fuel (SNF) and High Level Waste Form development at the Idaho National Laboratory

Information for the Nuclear Waste Technical Review Board Meeting
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Lance L. Lacroix

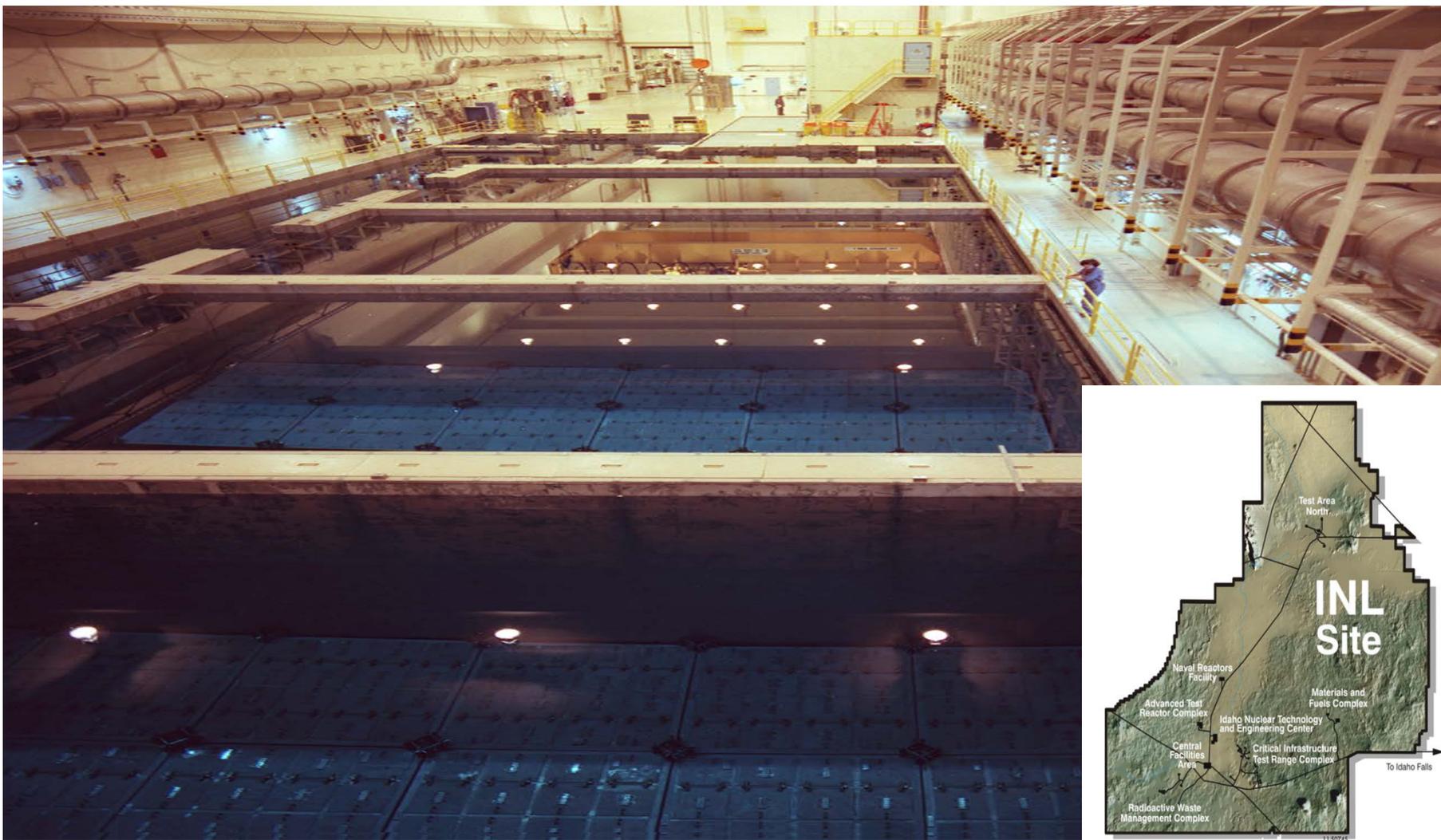
Director, Facility & Infrastructure Support Division,
Department of Energy
Idaho Operations Office



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Idaho National Laboratory SNF Wet to Dry Transfer





Idaho National Laboratory Wet Storage

- Transfer of SNF from wet to dry storage was initiated on 07/10/97.
- All wet storage facilities other than CPP-666 were emptied as of 09/15/03.*
- The remaining facility actively employed in wet storage is CPP-666.

Facilities (Wet and Dry Storage) Emptied of SNF

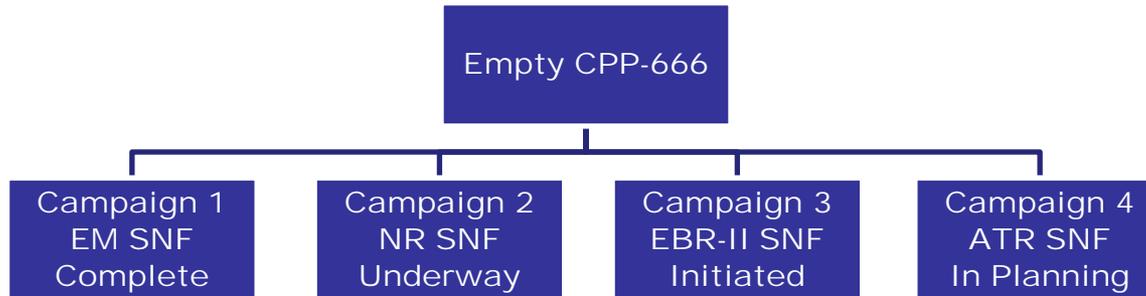
<u>Facility</u>	<u>Completed</u>
1. TRA-660, ARMF/CFRMF	10/28/97
2. CPP-603, Basins	04/28/00
3. TAN-607, Basin Campaign I/TMI	04/18/01
4. TRA-603, MTR Canal and Plug Storage	09/24/02
5. TAN-607, Basin Campaign II/LOFT & Comm	09/29/02
6. PBF-620, Pool	09/15/03
7. CPP-603/FECF	04/13/04
8. TAN-791, Dry Storage Pad	10/26/04
9. <u>CPP-666, Basins Campaign I/EM SNF</u>	<u>06/06/10</u>

* The ATR canal is not designated for storage, but functions rather in a fuel cooling capacity.

- Removal of SNF from CPP-666 wet storage was initiated in December of 2004.
- With the exception of three fuel types, all other fuel types were removed from CPP-666 as of 06/06/10.
- The remaining SNF types are:
 - Naval SNF
 - EBR-II SNF
 - ATR SNF



SNF Campaign Strategy - CPP-666 Fuel Storage Basin



Campaign 3 - Experimental Breeder Reactor-II SNF



Experimental Breeder Reactor-II Driver SNF

- Materials and Fuels Complex (MFC) examines fuel and provides treatment.
- The first shipment of EBR-II SNF from Idaho Nuclear Engineering and Technology Center to MFC was completed in 2011.
- Six shipments are planned for FY2014.
- Completion is planned by 2023, with continued MFC treatment and possible interim dry storage.
- Considerations:
 - Suitability for treatment
 - Shipping schedule
 - Suitable receipt and storage capability
 - Processing rates at MFC
 - Funding

Waste Forms from Electrochemical Processing

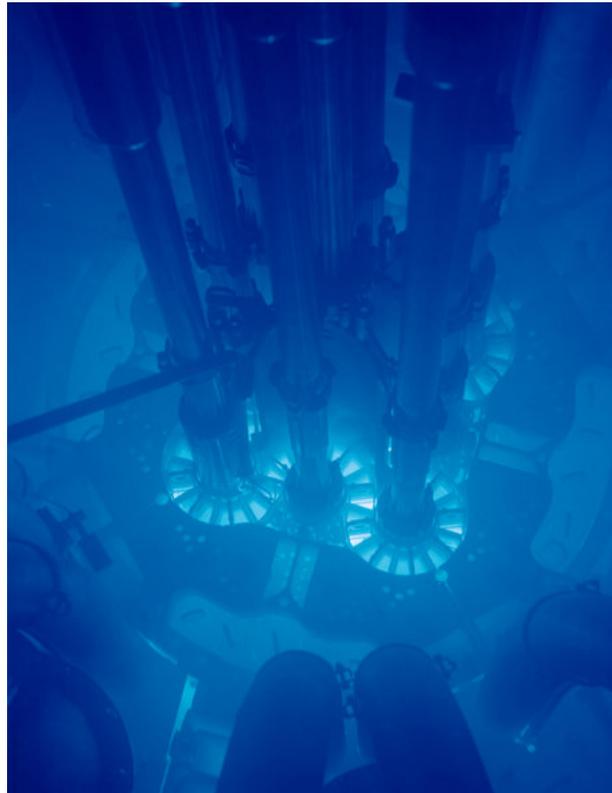
- Fuel Cycle Research & Development focused on two baseline high level waste forms that could be produced from electrochemical processing.
 - A zeolite-based ceramic waste stabilizes fission products that partition to the electrorefiner salt
 - A stainless-steel-15% zirconium metal waste that stabilizes the activated cladding hulls and more noble fission products

Path Forward on Waste Form Approach from Electrochemical Processing

- Current Plans

- Future Plans

Campaign 4 – Advanced Test Reactor SNF



Advanced Test Reactor (ATR) SNF

- ATR is part of the continuing INL mission, with plans to continue operations beyond 2023.
 - ATR SNF, upon removal from the reactor core, must first be cooled in the ATR canal
 - ATR SNF currently transferred to CPP-666 for additional cooling pending future decision
 - Study underway to assess disposition options

- Factors being considered.
 - Reduced cooling requirements for dry storage
 - Dry storage need and existing capabilities
 - Funding profiles
 - Potential continued need for wet cooling operations post-2023
- Team in place and working to identify options and coordinate DOE decisions on most effective strategy to meet milestone.