



U.S. DEPARTMENT OF  
**ENERGY**

OFFICE OF  
**ENVIRONMENTAL  
MANAGEMENT**

# Overview of Office of Environmental Management Aluminum-clad Spent Nuclear Fuel Technology Development

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- The EM Office of Technology Development (TD), EM-3.2, provides leadership and guidance for technology development to support EM's mission.
- The current annual EM TD budget is a very modest \$25 million.
  - Most of the TD funds (75%-80%) are congressionally directed.
  - The remaining discretionary funds are allocated by the TD Director based on technical needs at the field sites.
- TD research programs and goals are driven by EM mission needs.
- EM funded Aluminum-clad Spent Nuclear Fuel (ASNf) TD activities are a result of congressional action, and are focused primarily on ASNf at Idaho. But results apply to multi-site ASNf dry storage.
- The Office of Nuclear Materials (EM-4.23) is the technical monitor for the annual, congressionally directed, ASNf TD scope of work.

1. What are the plans and goals of the DOE program to support research on ASNF?
  - INL works with DOE-EM Office of Nuclear Materials and EM TD Office to define scope each year.
  - About \$24 million has been spent on SNF TD work (\$12.9 million on ASNF) from FY17 to FY21.
  - ASNF TD addresses issues noted in a Spent Nuclear Fuel Working Group (SNFWG) report: “Aluminum Clad Spent Nuclear Fuel: Technical Considerations and Challenges for Extended (>50 Years) Dry Storage, DOE-ID/RPT-1575, June 2017” and is informed by the NWTRB’s December 2017 Report on Management and Disposal of US DOE SNF.

1. What are the plans and goals of the DOE program to support research on ASNF? (cont'd)
  - Results to date - A good news story, details by Dr. Jarrell from Idaho National Laboratory (INL):
    - Preliminary results indicate that the ASNF presently in vented interim dry storage (i.e., CPP-603) is safe for continued, extended dry storage (> 50 years) without corrosion degradation challenges.
    - ASNF from L-Basin (Savannah River) can be safely placed in a sealed canister storage without corrosion degradation, canister pressurization, and canister flammability challenges pending ultimate disposition.
    - Additional TD work will address “operational” concerns.
      - INL site’s ability to access, remove, dry, and store real ASNF.
      - Some confirmatory testing to further solidify the technical basis for extended dry storage of ASNF is expected.
    - Most planned ASNF TD “research” activities are completed or near completion.

2. On what schedule does DOE plan to move ASNF to dry storage at Idaho and the Savannah River Site?
  - Idaho
    - Almost all ASNF at INL is currently in dry storage, and the current wet basin (CPP-666) will be emptied by the end of 2023.
    - Future Advanced Test Reactor (ATR) SNF will be managed in accordance with the most recent agreement with the State of Idaho.
      - February 2020 ATR SNF Agreement to remove ATR fuel from the ATR canal within 6 years of being declared spent.
    - Additional sealed, dry storage (e.g., in DOE Standard canisters) of ASNF is being considered as part of broader DOE effort to package and store all INL-site SNF in a road-ready storage configuration.
      - The Mission Need Statement for the Idaho Nuclear Fuel Storage Capability was approved in May 2021.
      - The development of this capability is dependent on completion of the DOE O 413.1 process as well as congressional direction and budget authority.

2. On what schedule does DOE plan to move ASNF to dry storage at Idaho and the Savannah River Site? (cont'd)
  - Savannah River
    - Current baseline is to dry and store ASNF on site on an interim basis.
    - Requires construction of a new capital project to dry, drum and store.
    - Accelerated Basin Deinventory (ABD) proposal, currently being evaluated, seeks to process ALL SNF (ASNF and non-Aluminum-clad (NSNF)) through H-canyon, not separate out Uranium, and send the waste to the Defense Waste Processing Facility (DWPF) for vitrification and eventual disposal as High Level Waste (HLW).

3. What is the anticipated funding level for this research for fiscal year 2022 and beyond?
  - EM SNF TD funding is anticipated in the \$5 million range per year.
  - The portion of those funds focused on ASNF are evaluated and prioritized each year.