

INNOVATION • DEFENSE
NONPROLIFERATION • ENVIRONMENT



We make the world safer.

H Canyon and Accelerated Basin De-inventory (ABD) Update

Tara Armstead

Environmental Management Operations Mission Planning Manager

*Citizens Advisory Board – Aiken, SC
September 2025*



- **Purpose**
 - Update the CAB on the progress of H Canyon ABD Mission
- **Refresher on the ABD Mission**
- **Progress to date**



H Canyon – A National Asset



- Only remaining production-scale, radiochemical separations facility in the United States
 - Spent Nuclear Fuel processing
 - Actinide, mainly uranium, recovery



ACHIEVING A BETTER TOMORROW. TODAY.

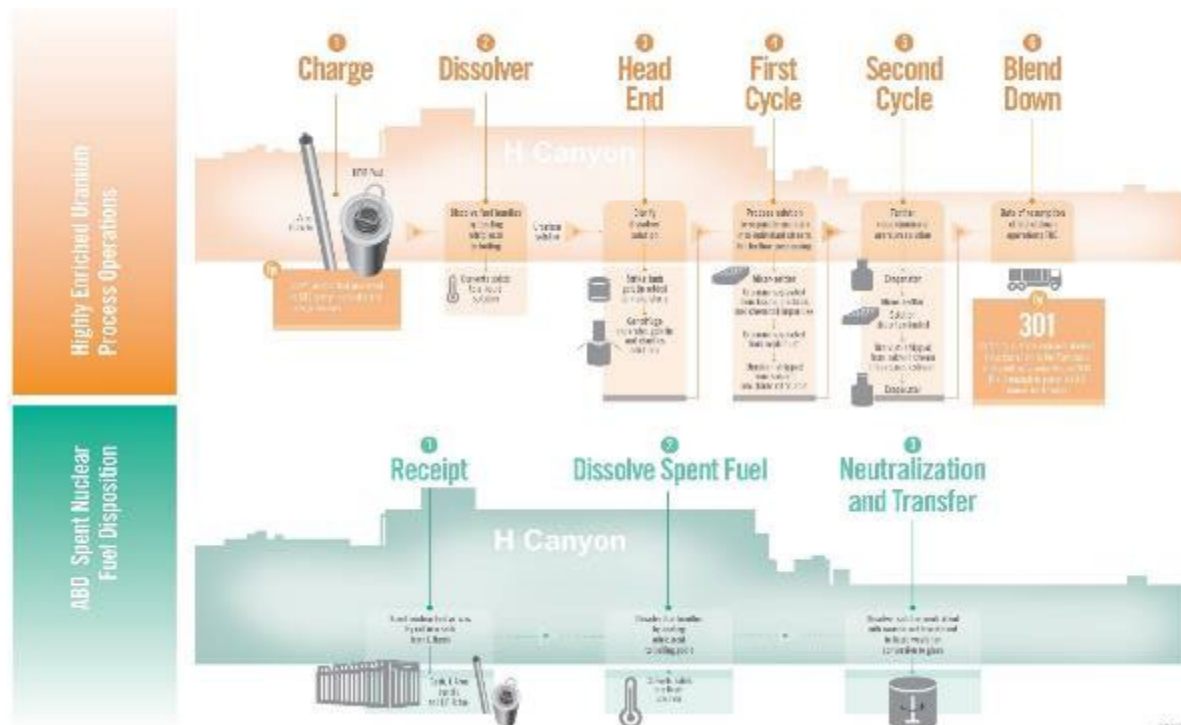


We make the world safer.

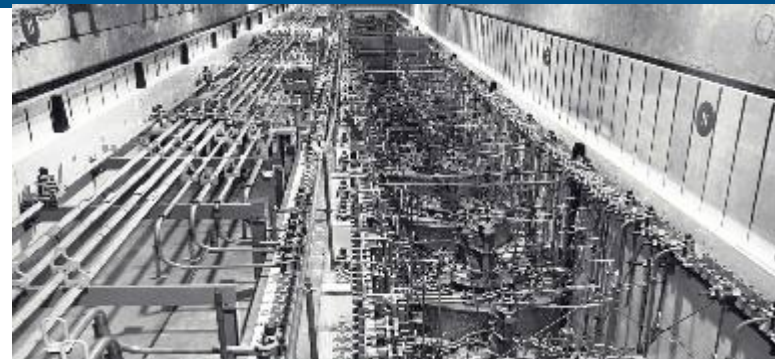
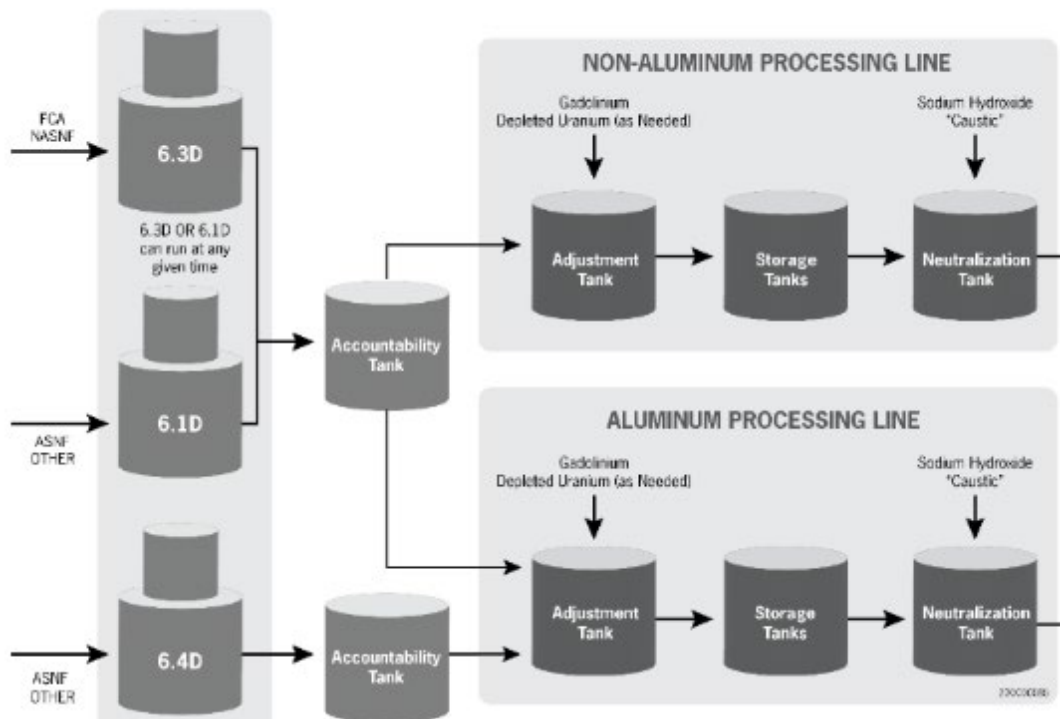
Mission Timeline



Change to the ABD Mission

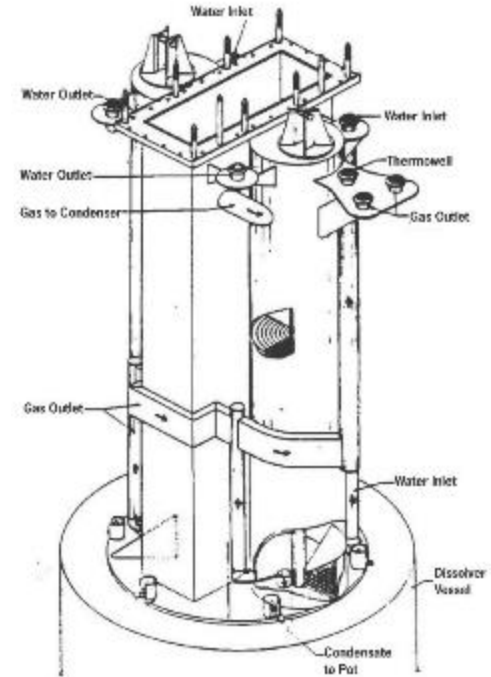
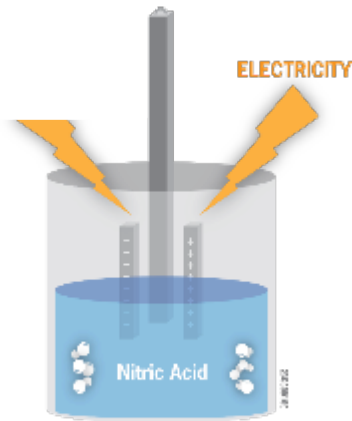


Inside H Canyon - ABD Process Flow



Dissolving – The Heart of the ABD Mission

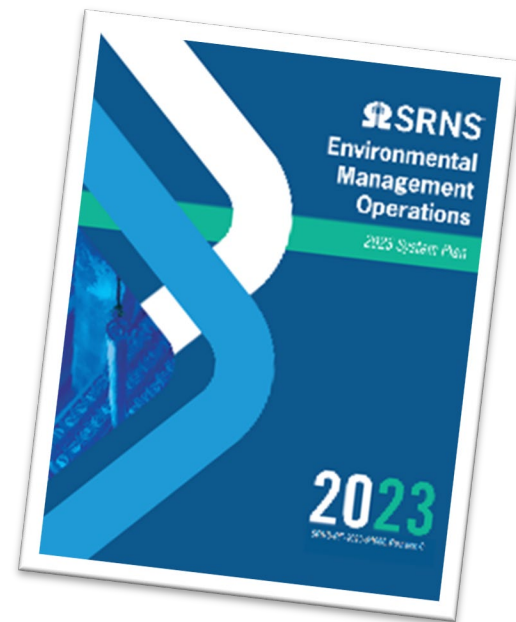
- Crane removed the lid from the dissolver
- Bundles are then lowered into dissolver by crane
- Chemistry converts solid Spent Nuclear Fuel to a liquid



Since Starting ABD – Established a ten-year Plan



- **Created a ten-year, executable processing plan that is integrated with Liquid Waste**
 - Used downstream limits to set processing priorities
 - Categorized the inventory by dissolution characteristics
 - Ranked inventory groups by readiness to process
 - Developed mathematical model to perform mass balances in L Area, H Canyon, and Liquid Waste
 - *Allows user to input annual, group specific dissolver batches*
 - *Outputs H Canyon availability requirements, key processing metrics, and projections against limits*
 - Generated scenarios by varying rankings of groups



In Three Years of ABD



- **Dissolved 1 MT uranium**
 - Over 300 SNF items
 - Approximately, 11% of the fissile able to be processed through H Canyon
- **Sent 0.5 MT of Spent Nuclear Fuel to Liquid Waste for conversion to a safe waste form**
 - Championed increased fissile loading in vitrified glass, improving efficiency and reducing the number of canisters produced
 - Championed crediting gadolinium, a more efficient neutron absorber than manganese, in Liquid Waste to reduce the number of canisters produced
- **Re-established the electrolytic dissolver**
 - Not Operated since 1980
- **Completed the FCA Mission ahead of schedule**
 - Actively preparing to transfer approximately 322 kg of Plutonium to Liquid Waste ahead of schedule
- **Performed \$22.6M worth of Infrastructure Improvements to ensure reliable, safe operations continue**
 - Roofs, ventilation equipment, crane upgrades
- **Prepared for the future**
 - Expanded the Aluminum flowsheet to be able to process more material
 - Developed seven new flowsheets
 - Stood up the Non-Aluminum Spent Nuclear Fuel program, which we will start after FCA
 - Developed a new aluminum canister for a-typical shaped fuels



The Future of the Mission



Fast Critical Assembly (FCA)

- Integrated H and K Area mission
- Pu/Stainless Steel
- Uses electrolytic dissolver
 - Last operated in 1980

Non-Aluminum Spent Nuclear Fuel (NASNF)

- Integrated H and L Area mission
- Fuel cladding other than aluminum
- May require re-bundling in L Area
- Will use the electrolytic dissolver

High-Assay Low Enriched Uranium (HALEU)

- H Area Outside Facilities
- Blend down of existing uranium
- Ships to an off-site vendor
- Last performed in 2011

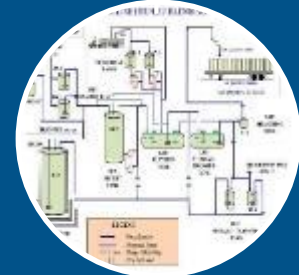
2024



2026



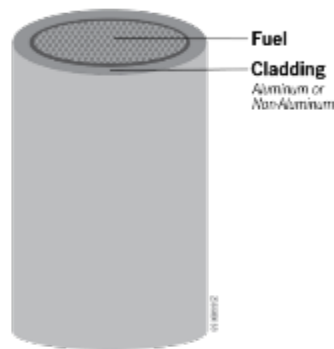
2028



Non-Aluminum Spent Nuclear Fuel

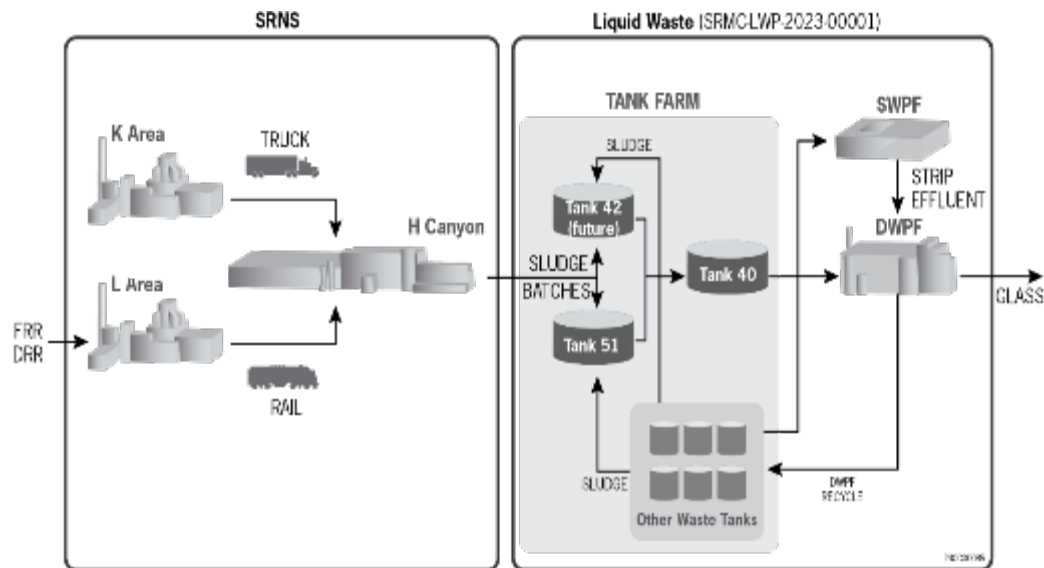
- **Non-Aluminum Spent Nuclear Fuel** represents roughly 10% (by item) of the ABD mission scope but is a high risk due to disposition challenges.
 - Consists of a variety of shapes, sizes, cladding, fuel composition, and integrity conditions
- **Start-up processing Campaign 1**
 - Lowest risk to H Canyon and L Basin
 - 20.5 dissolutions
 - 3 MT ^{238}U ; 100 kg ^{235}U
 - ~20 months of processing

Fuel Cladding



Conclusion

- **Accelerated Basin De-inventory** ✓
 - H/L Mission integrated with Liquid Waste (LW)
 - Spent Nuclear Fuel (uranium)
 - Duration: FY34
 - 1 MT uranium Dissolved to date
 - 0.5 MT discharged to liquid waste
- **Fast Critical Assembly** ✓
 - NNSA Funded
 - Plutonium stainless steel
 - H/K Mission integrated with LW
 - Duration: FY25 (early finish)
 - 17 Batch of 17 complete
 - Plans to discharge to LW in Fall (early disposition)



INNOVATION • DEFENSE

NONPROLIFERATION • ENVIRONMENT

SRNS

Savannah River Nuclear Solutions

We make the world **safer.**



C&B
CONSTRUCTION & BUILDING