



Integrated Waste Treatment Unit

Kevin O'Neill

Idaho Cleanup Project

April 25, 2019



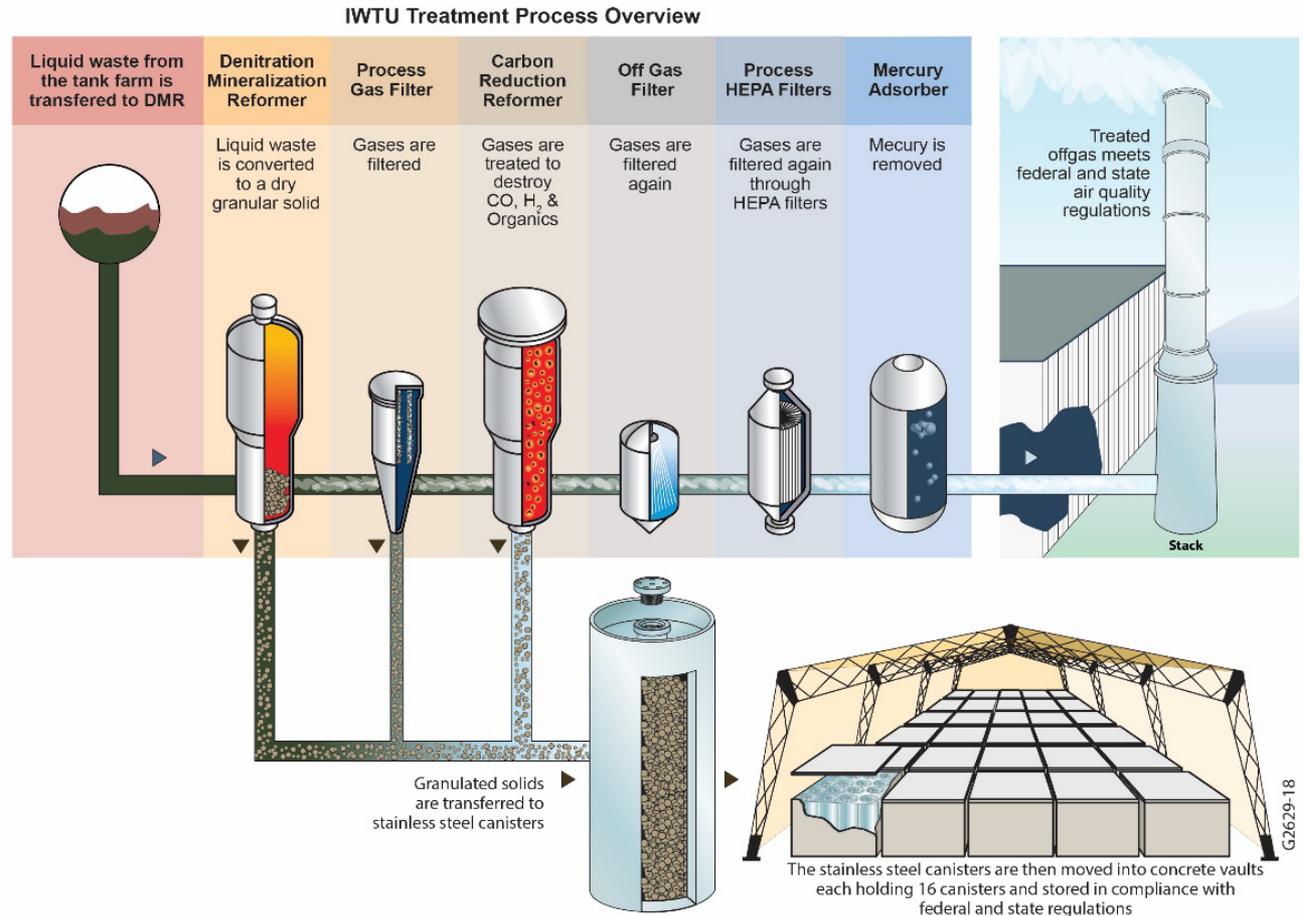
EM Environmental Management

safety ❖ performance ❖ cleanup ❖ closure

Idaho Cleanup Project

IWTU Mission

- There are about 900,000 gallons of liquid radioactive waste stored in three stainless steel underground tanks at the Idaho Nuclear Technology and Engineering Center.
- The Integrated Waste Treatment Unit (IWTU) was constructed to treat, package and store the waste.



IWTU Overview

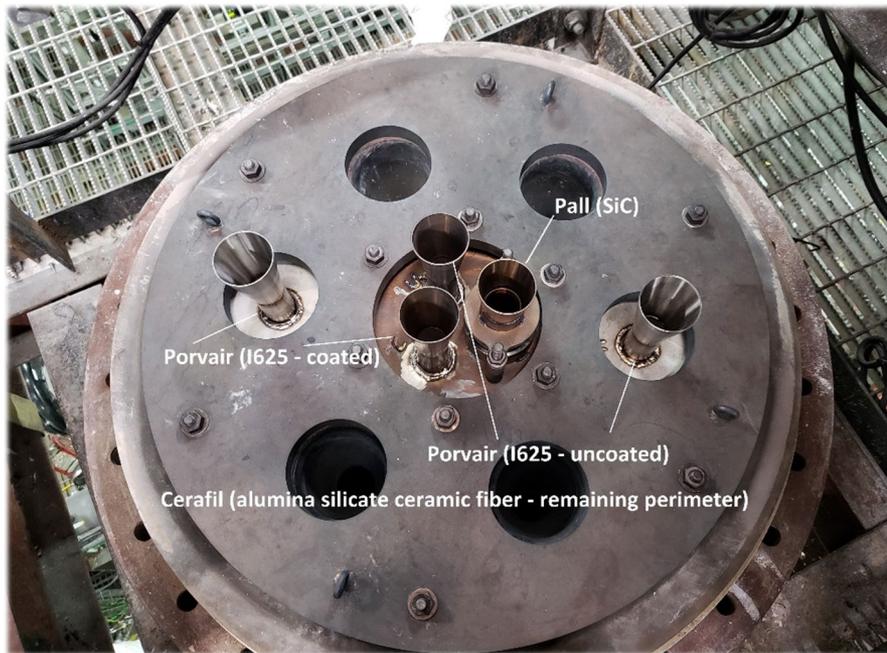
- The process will convert liquid Sodium Bearing Waste (SBW) into a solid, granular, carbonate product for on-site storage pending final disposition.
- Construction was completed in late 2011, initial heat-up occurred in June 2012.
- Process instabilities and equipment problems identified during non-radiological testing have delayed the transition to radiological operations.
- Simulant Run 2 – Completed August 2018 – Demonstrated effective operation of Denitration Mineralization Reformer (DMR) and auger-grinder, revealed Process Gas Filter deficiencies.
- February 6 – Heat up began for Simulant Run 3
 - February 20 - brief loss of power led to plant shutdown.
 - Indications of Off Gas Filter fines hold-up during shutdown – erosion found on transfer jet (eductor).
- Simulant Run 3 heat-up resumed on March 28.



Process Gas Filter Testing

Test Run at 550°C at Hazen Research

- Porvair coated Inconel-625 element (2)
- Porvair uncoated Inconel-625 element (2)
- Pall monolithic SiC ceramic element (1)
- Cerafil alumina silicate ceramic fiber element (4)



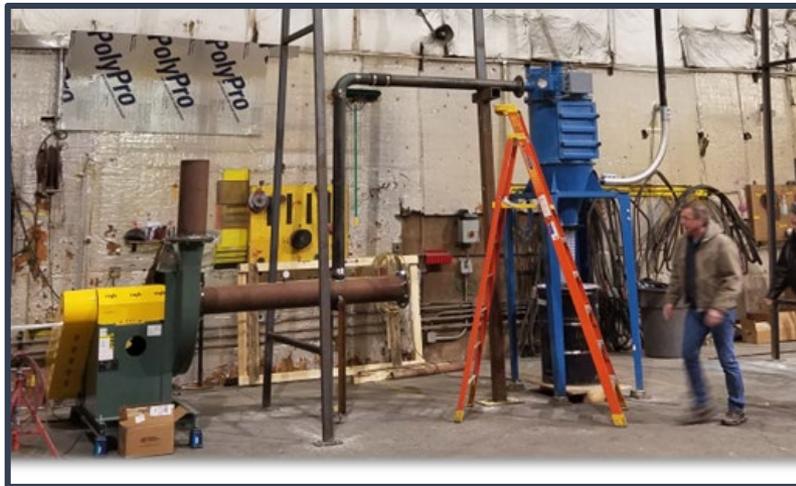
Preparing for full bundle testing

- Pall SiC
- Porvair Fecralloy
- Refractron SiC
- Refractron AlO



Preparations for Radioactive Operations

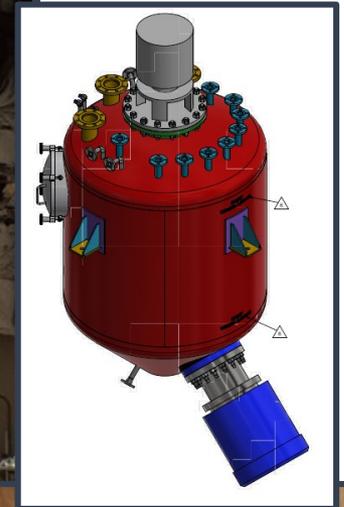
- Constructing mockups of wet and dry vessel and cell decontamination systems designed to remove high radiation source terms prior to cell entry and equipment maintenance.
- Dry decontamination system will provide secondary transport of process vessel solids to the Canister Filling system.



Full scale mockup of Dry De-con system



Wet De-con collection and conditioning mockup



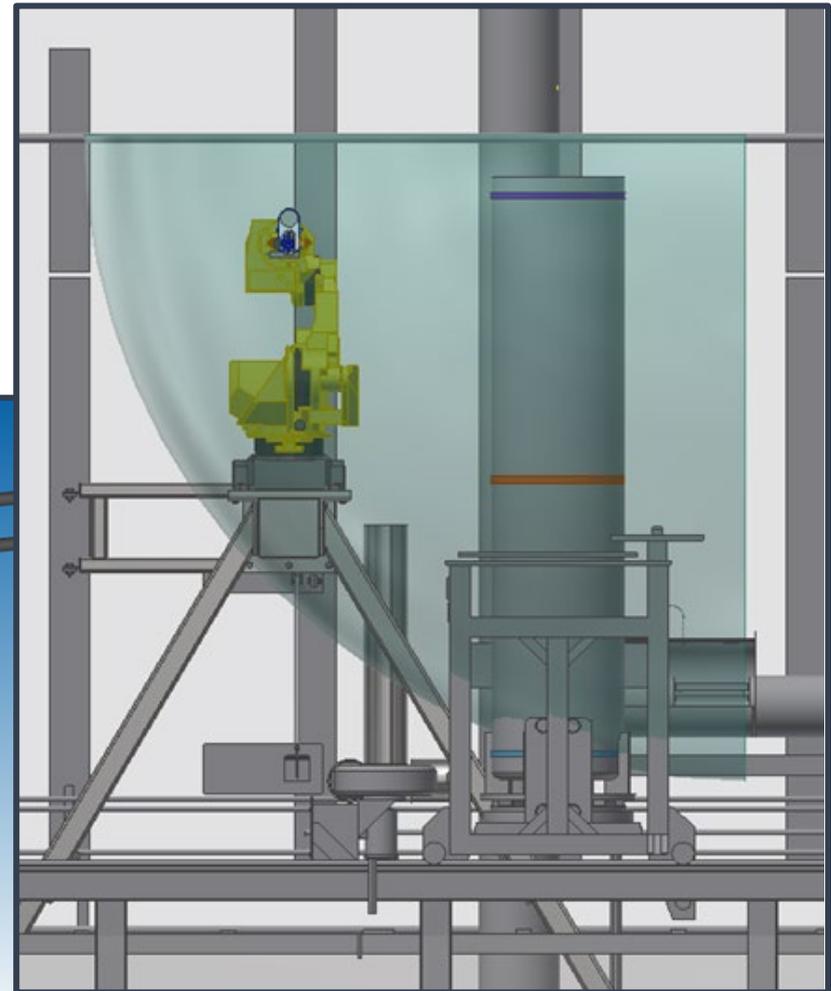
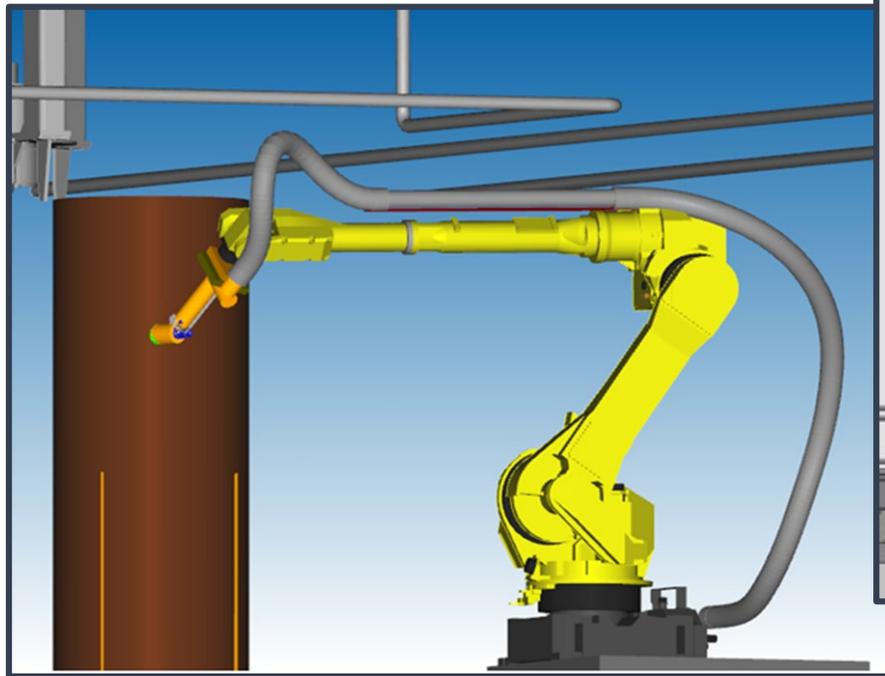
Colloid Mill



Preparations for Radioactive Operations

Design and testing of Canister Decontamination System continues

- Improved radiological surveys
- Canister surface vacuuming
- Improved surface wiping/cleaning



Canister Decontamination Robot Arm



Upcoming Activities

- Complete Demonstration Run 3
 - Anticipate 50 day period of simulated waste feed on
 - Verify satisfactory plant operations during long term operations at baseline conditions, and at/or near boundary conditions

- Complete Follow-on Outage
 - Outage J – Additional plant modifications and equipment maintenance
 - Upgrade Cell, Vessel, and Canister De-con capability
 - Resolve Process Gas Filter performance issues

- Conduct Confirmatory Run
 - Verify of Outage J Mods and conduct a Contractor Readiness Assessment in preparation for radioactive waste operations

- Conduct System Performance Test
 - EPA/DEQ oversight – establish final permit conditions using tank waste

