



U.S. DEPARTMENT OF
ENERGY

OFFICE OF
**ENVIRONMENTAL
MANAGEMENT**

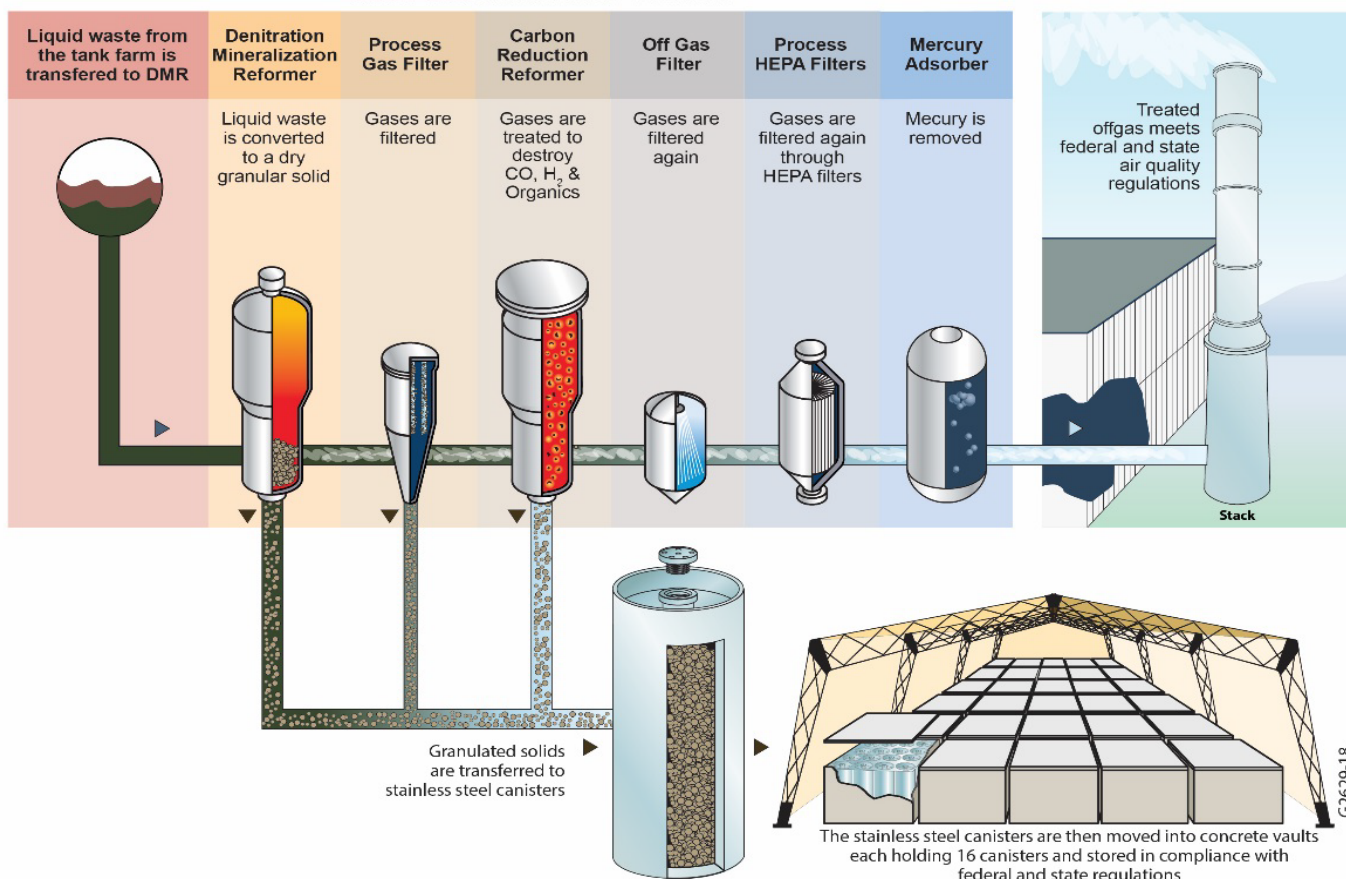
Integrated Waste Treatment Unit

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February 21, 2019

IWTU Background

- 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 Treatment Process Overview



IWTU Overview

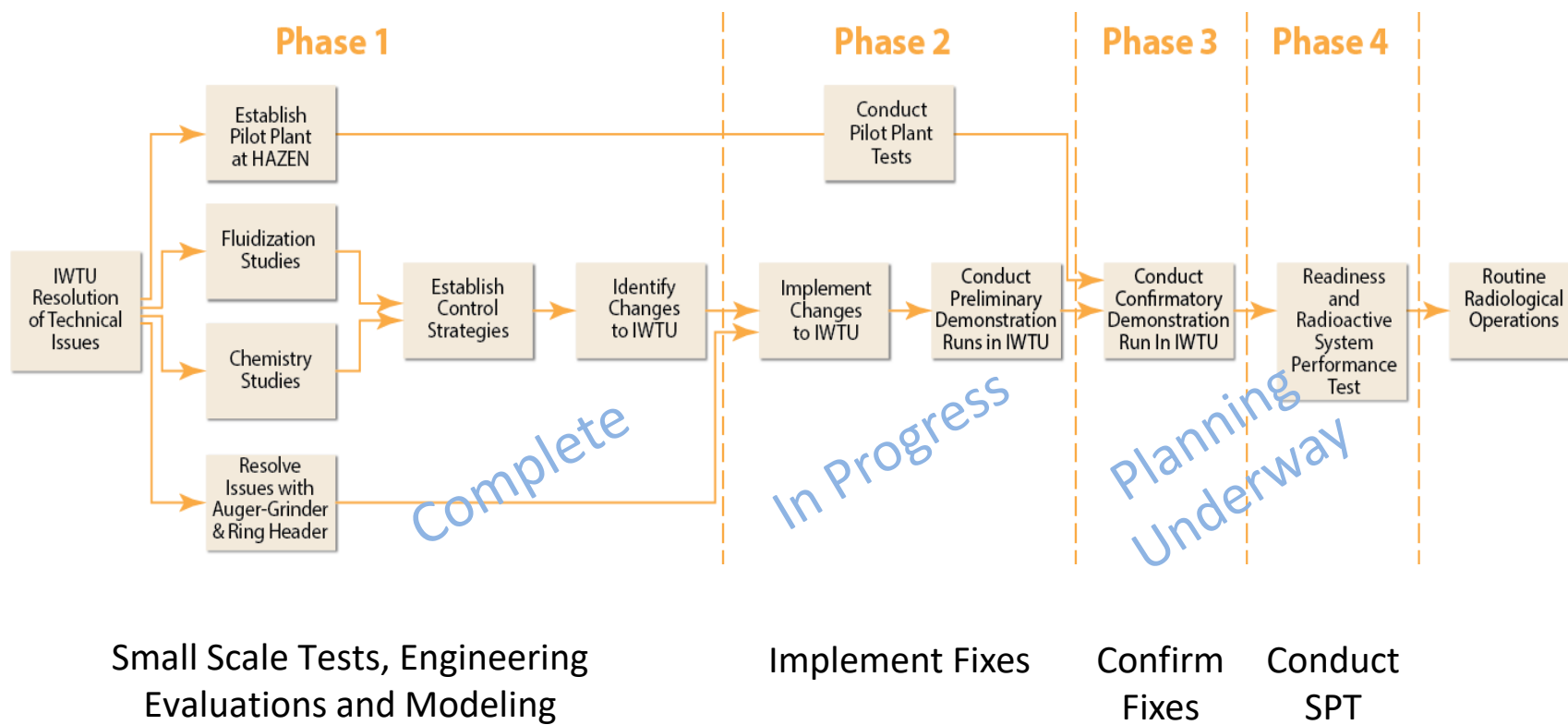
- The process will convert Sodium Bearing Waste (SBW) into a solid, granular, carbonate product for on-site storage pending final disposition.
- Construction was completed in late 2011, initial heat-up occurred in June 2012.
- Process instabilities and equipment problems identified during non-radiological testing have delayed the transition to radiological operations.
- Facility entered an outage to address Process Gas Filter (PGF) performance following a successful 30-day demonstration run in August 2018.
- Follow-on 50-day demonstration run – Simulant Run 3.



PGF Bundle following Simulant Run 2

Approach to Address Remaining Issues

- Fluor Idaho has established a systematic, mechanistic based approach involving 4 phases to address issues with the IWTU
- Phase 2 Demonstration Run - Simulant Run 2 - completed, preparing for Simulant Run 3



Process Gas Filter

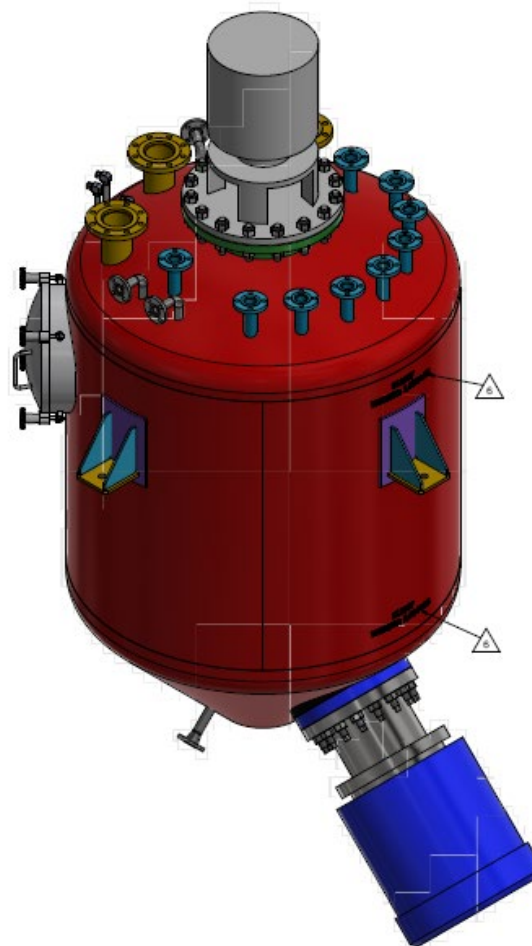
- High differential pressure (ΔP) led to PGF maintenance outage.
- Filters were removed, cleaned, inspected and tested.
- Corrosion contributed to filter plugging.
- Replacement filters were treated using a high temperature surface modification process and installed in PGF for current demonstration run.
- Pilot plant testing ongoing to better understand corrosion mechanism and to evaluate alternative filter media.
- Two-day PGF summit was held Jan. 30-31, which concluded coated filters were acceptable for simulant run.
- Evaluated and re-tuned filter blowback cleaning system.



Ongoing Testing and Improvements



Dry Decontamination



Wet Decontamination

Ongoing Testing and Improvements (cont.)



Canister Decontamination



Phosphoric Acid Addition

- Complete Simulant 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.
 - Assess PGF performance.
- Finalize Plan for Phases 3 and 4
 - Outage J – Additional plant modifications and equipment maintenance.
 - Confirmatory Run – “Shakedown” of Outage J Mods and establish carbonate bed using Simulant.
 - System Performance Test – EPA/DEQ oversight, establish Permit conditions using Tank Waste.