



Integrated Waste Treatment Unit Update

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Idaho Cleanup Project Citizens Advisory Board

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IWTU Mission

- IWTU is a Hazard Category 2 nuclear facility designed and constructed to treat approximately 850,000 gallons of highly radioactive liquid tank waste (sodium bearing waste – SBW) using the fluidized bed steam reforming process
 - General waste description:
 - 850,000 gallons of acidic waste
 - Waste is contained in 3 stainless steel tanks within concrete vaults (WM-187, -188, -189)
 - Tank 187 includes the majority of solids (36-in heel)
- The process will convert liquid SBW into a solid, granular, carbonate product for on-site storage pending final disposition



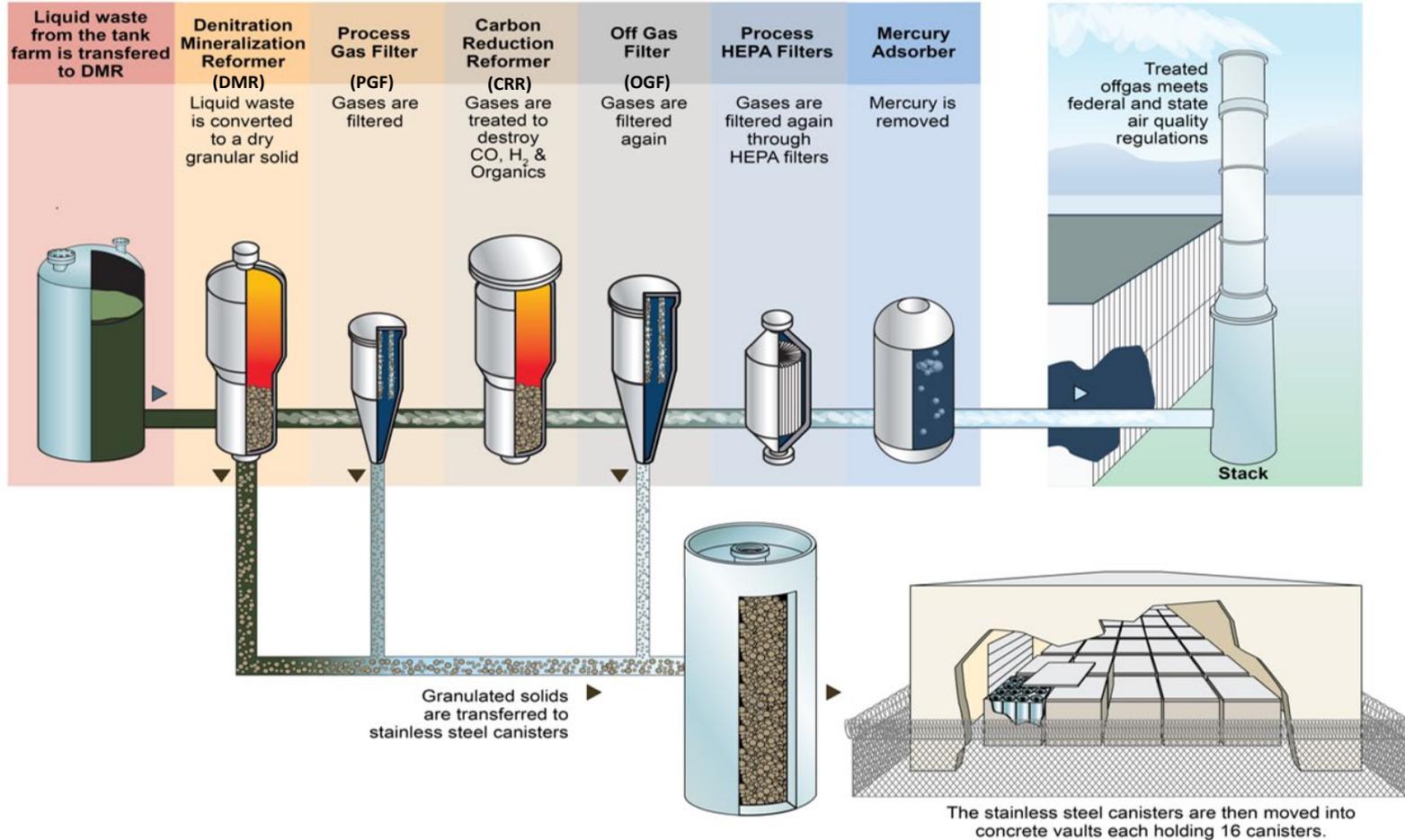
Treated SBW simulant product



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Integrated Waste Treatment Unit Process Flow



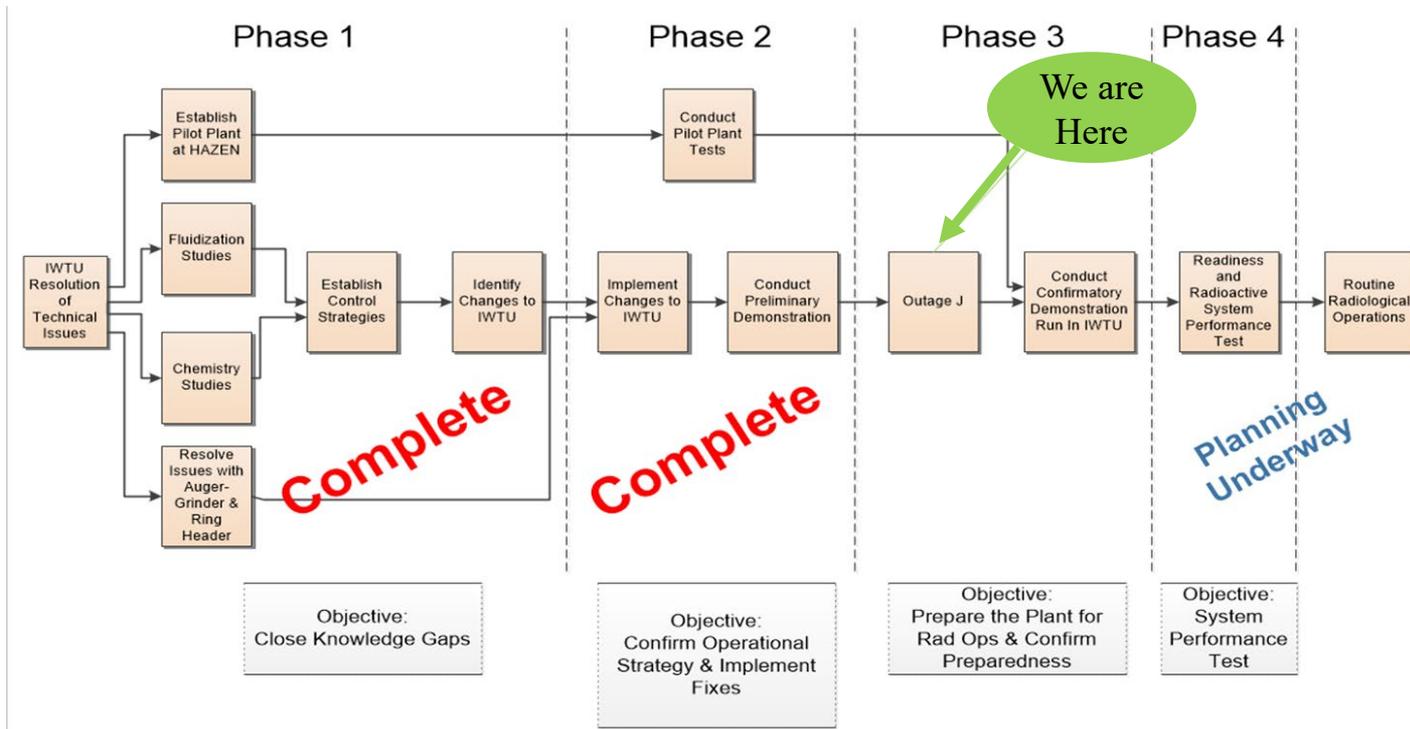
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IWTU Overview

- A four phased approach to achieve radiological operations
- Each phase scope of work negotiated separately due to the discrete nature of the work and builds upon previous phase results



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Outage J Activities

- Finalize Process Gas Filter (PGF) design
- Optimization for Sustained Radiological Operations
 - Dry/Wet Decontamination System modifications
 - Can Fill Canister Decontamination System modifications
- Operability Improvements



Full Scale wet de-con system mockup



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Process Gas Filter (PGF)

- Phase 2 Simulant Run 2 identified plugging/corrosion issues with PGF
- This impacted Simulant Run 3 and Phase 2 completion
- Completed testing at Hazen identified ceramic filter media (Refractron SF15)
- Currently evaluating PGF design changes



PGF Filter post Simulant Run 3



PGF Refractron ceramic filter bundle at Hazen

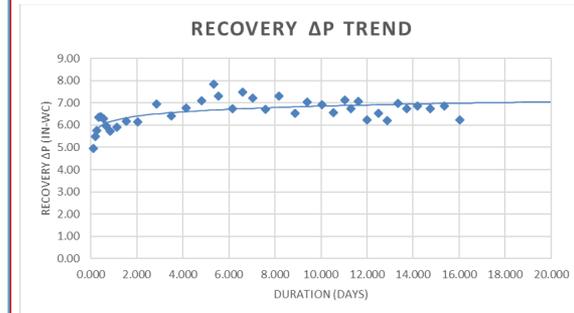
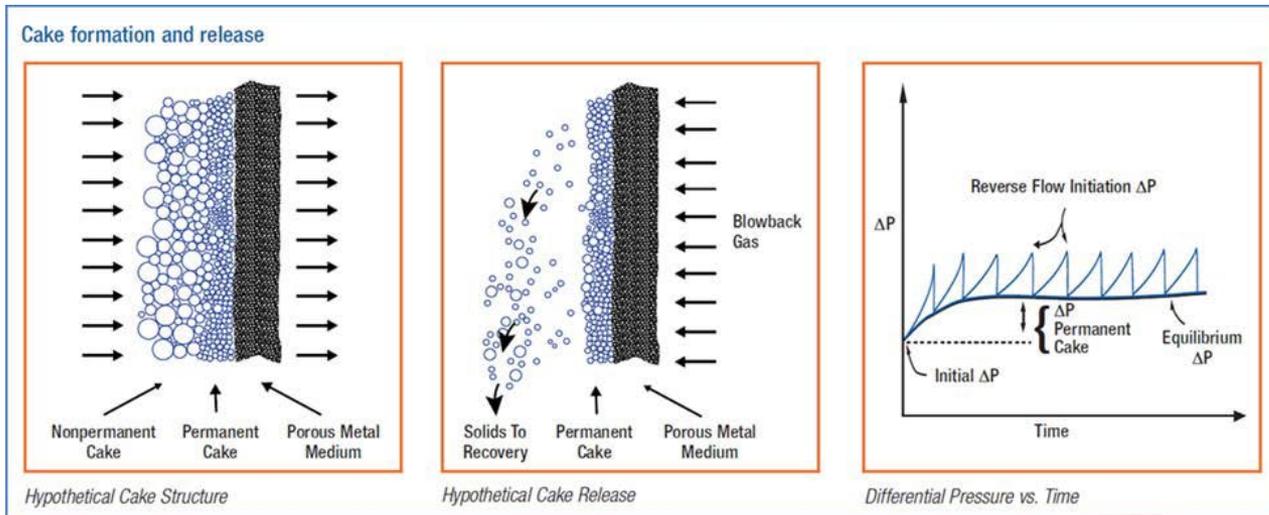


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PGF Status

- Completed Hazen Research PGF Long Term Test Run (running simulants specific to tanks WM-187, -188, -189)
 - Results:
 - No performance issues with the different tank mixes
 - Operational performance of the ceramic filter elements at all waste feed that mimic IWTU was excellent, with filter differential pressure generation as expected



SF15 Filter Performance

ΔP trend resembles the theoretical



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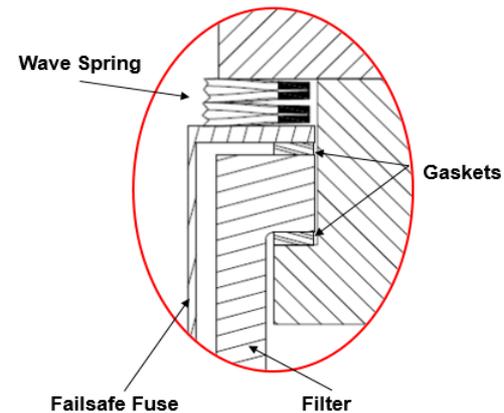
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PGF Status (continued)

- Results (continued)
 - Some Refractron SF15 ceramic filter elements broke during the November run with handling/assembly issues likely the cause; no additional filter elements broke during the December run
 - Post-run inspection validated the real time indications that the newly designed PGF seals (and manway seals) being tested performed as designed



PGF seals



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PGF Status (continued)

- Three part PGF Test beginning January 31:
 1. Determine element breakage rate – utilizes used filters, new elements, existing vertical distributor
 2. New distributor performance data – new distributor, utilizes new fuses, new elements
 3. Resiliency of fuses/elements after in-situ de-con
- Design efforts continue on a potential replacement PGF gas distributor. This option will only be exercised if Hazen testing shows bridging (or other detrimental effects) on the filter elements
- Finalize the design for the ceramic PGF filter bundles
- Optimize filter installation procedures to mitigate filter breakage



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Radiological Control Modifications

- Enhancing in-cell canister de-con capabilities
 - Canister surveying and cleaning will utilize robot suction, and wiping
- Designing wet and dry de-con systems
 - Reduces source term prior to maintenance of process vessels and piping
 - Wet decontamination system collects nitric “wash” from process vessels
 - To be returned to Waste Feed Tank or temporary storage to New Waste Calcining Facility
- Dry decontamination system removes product material from process vessels
 - To be returned to solids handling system
 - House vacuum for decontamination



Product canister in fill cell



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Canister Decontamination System Status

- Received the structural components, both robots, and canister de-con panel
- Mechanical, structural, and electrical layout and installation continue in the field



Robots, structural support, power and control panels



Robots ready for shipment



In cell canister cart modifications



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Wet and Dry De-Con Status

- Installation of the wet & dry de-con systems continues
- New wet de-con conditioning tank installed and hard piping for tie-in to modified vessels continues
- Significant progress has been made installing bulk piping and tubing through pipe chases and into the process cells



Wet De-con Conditioning Tank



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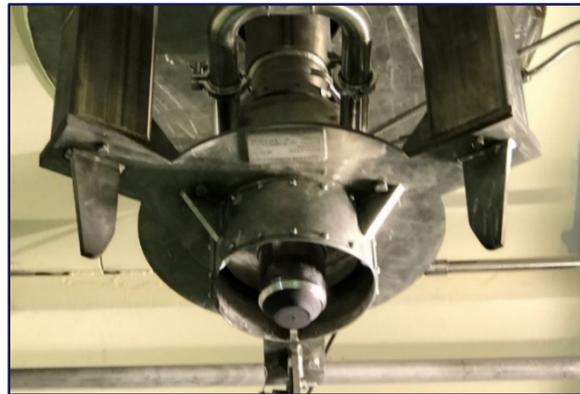
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Contamination Control

- Engineering/Operational Enhancements Being Executed
 - Inside Can Fill Cells 0 and 1
 - Transfer line improvements
 - Improve airflow in Fill Cell
 - Product Fill tube improvements
 - Outside of Can Fill Cells
 - Canister preparation
 - Improve air flow in Vault Loading Cell
 - Vault Loading Station modifications



Canister “pixie dust” test



Can fill tube



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Summary

- Continue with Outage J activities
- Conduct Confirmatory Run
 - Verify Outage J modifications and conduct a contractor readiness assessment in preparation for radioactive waste operations
- Conduct System Performance Test
 - DEQ oversight – establish final permit conditions using tank waste
 - High level of confidence that the plant will meet the mission need



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