



Idaho Cleanup Project Integrated Waste Treatment Unit

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EM *Environmental Management*

safety ❖ performance ❖ cleanup ❖ closure

Idaho Cleanup Project

IWTU Mission

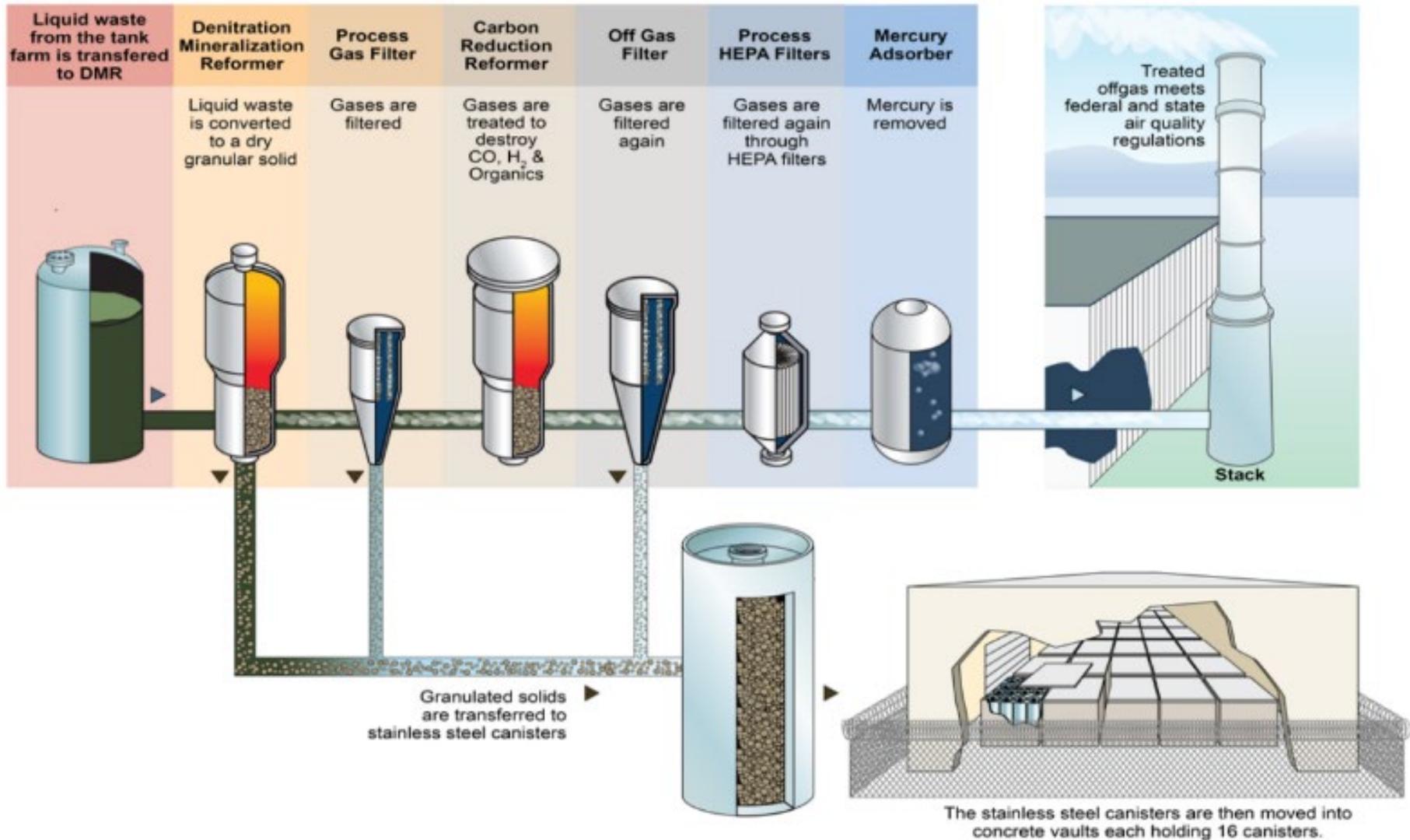
- IWTU is a Hazard Category 2 nuclear facility designed and constructed to treat approximately 850,000 gallons of highly radioactive liquid tank waste (sodium bearing waste – SBW) using the fluidized bed steam reforming process
 - General waste description:
 - Approximately 850,000-900,000 gallons of acidic waste
 - Waste is contained in 3 stainless steel tanks within concrete vaults (WM-187, -188, -189)
 - Tank 187 includes 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



IWTU Simplified Process Flow



IWTU Path to Radiological Operations

✓ Outage J

- implement necessary plant modifications to support sustained operations

✓ Contractor Readiness Assessment

- verification of readiness to safely resume simulant operations

✓ DOE Readiness Assessment

- independent federal verification of readiness to safely resume simulant operations
- Confirmatory Run (in progress but completion delayed)
 - verify modifications, plant, and process meet objective test criteria for sustained operations
- Radiological Readiness Assessments (during confirmatory run)
 - additional contractor and federal verification of readiness under simulated radiological plant conditions
- Process Gas Filter Outage (planning well underway)
 - short duration outage to perform inspections and address emergent equipment issues
- EM-HQ authorization
 - EM 3.1 approval required to commence radiological operations
- System Performance Test
 - simulant start-up with gradual introduction of SBW followed by regulatory required off-gas sampling
- Routine waste processing operations



Post Outage J Readiness Assessments Summary

- Required to verify readiness to safely resume simulant operations due to extended shutdown and major modifications
- Management Self-Assessment – complete 8/9/21
 - No findings
- Contractor Readiness Assessment – complete 8/26/21
 - No findings
- DOE Readiness Assessment – complete 9/23/21
- DOE authorized facility re-start for simulant operations on October 24th



New Process Gas Filter bundle



Confirmatory Run Status

- Plant heat-up initiated October 29th
- IWTU general start-up sequence
 - Plant support system lineups
 - Denitration Mineralization Reformer (DMR) heat-up
 - Carbon Reduction Reformer (CRR) heat-up
 - Granular Activated Carbon (GAC) heat-up
 - Transition fluidizing gas (nitrogen to steam)
 - Initiate simulant/SBW feed flow
- Numerous challenges have impacted completion of confirmatory run
 - Vibratory feeder performance
 - Mercury adsorber bed commissioning
 - Transients and rapid system shutdowns
 - Process off-gas blower seals
 - Excessive total feed flow to DMR
 - Liquid nitrogen delivery shortages
- Initiated simulant feed at 1.4 gpm on December 27th
- Commenced plant shutdown on January 6th (lack of nitrogen)



Vibratory feeder assembly



IWTU mercury adsorber vessels

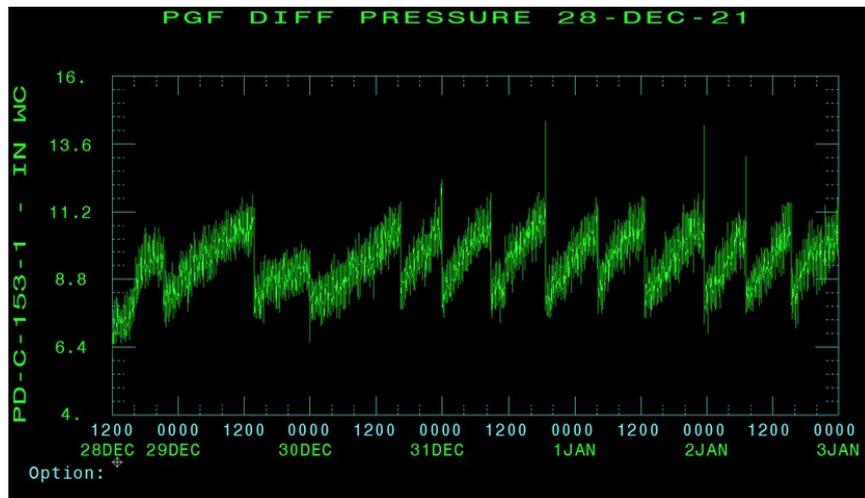


Confirmatory Run Key Takeaways

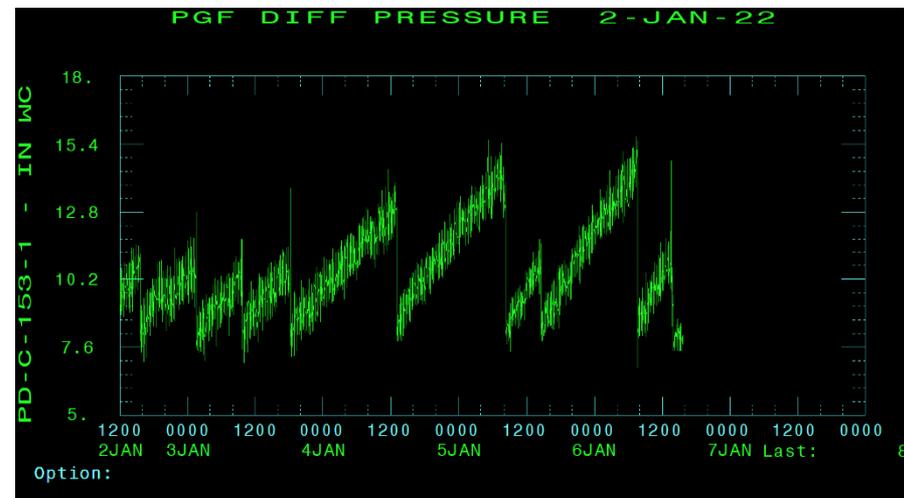
- No major process or plant stability issues encountered to date
- Stable post-pulse PGF differential pressure observed
- ~19,000 gals processed which filled ~18 canisters over ~10 days



IWTU liquid nitrogen storage system



IWTU PGF dP from 28 Dec – 3 Jan



IWTU PGF dP from 3 Jan – 6 Jan



Next Steps

- Complete confirmatory run
- Perform Rad Ops Readiness Assessments
- Conduct integrated testing of dry decontamination system
- Conduct PGF Outage
 - Perform PGF, DMR, and other component inspections
 - Correct outstanding or emergent issues
- Obtain EM-HQ approval to transition to Rad Ops
- Conduct System Performance Test
 - Simulant start up, bed turnover & sample off-gas collection dry-run
 - Initiate test with blended (simulant & SBW) feed to verify rad conditions
 - Establish permit conditions using 100% SBW feed & collect required samples
- Transition to steady-state SBW treatment operations



Q&A

Questions?



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