THE HANFORD SITE

Tank Integrity Program and Technology Development

Erik Nelson
Tank Farms Program Division
Office of River Protection

Jason Gunter
Tank and Pipeline Integrity Program
Washington River Protection Solutions

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Briefing Purpose

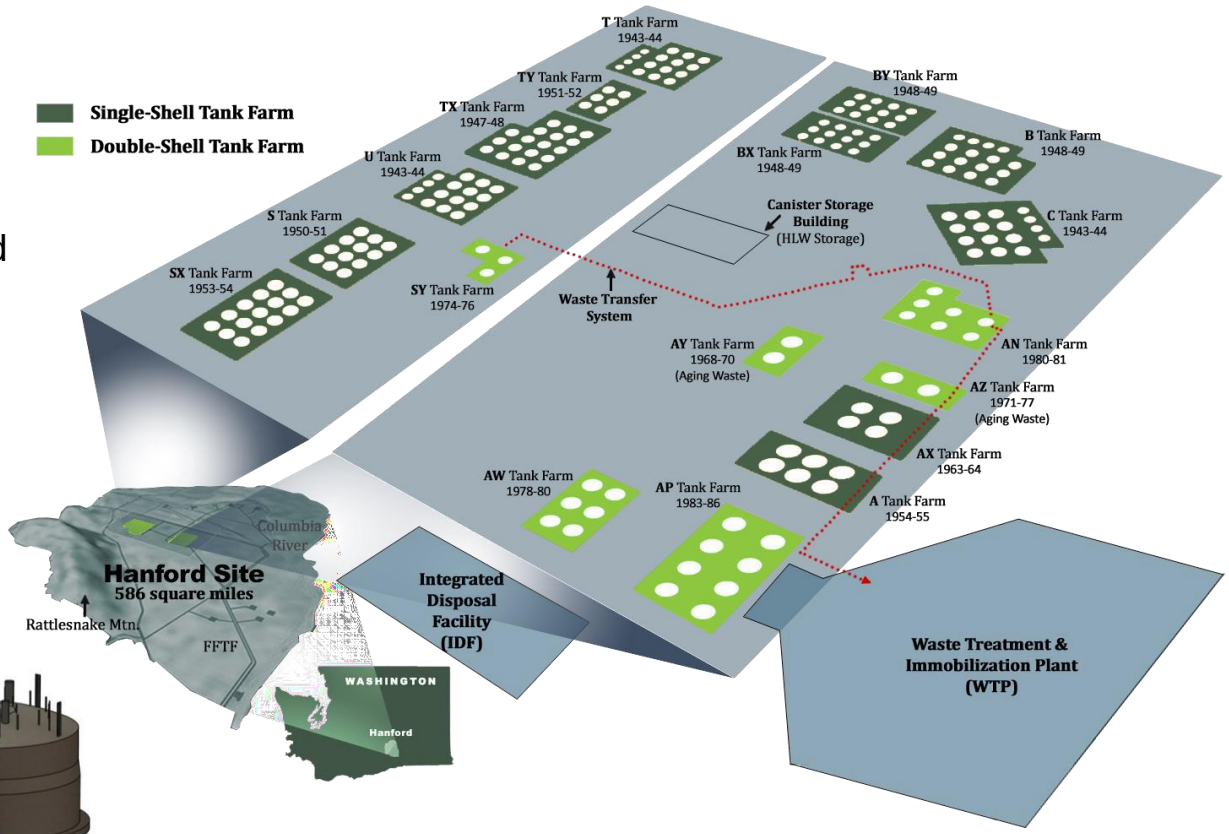
- **What is being briefed:**
  - Overview of the Direct-Feed Low-Activity Waste (DFLAW) Program from the Tank Farms to the Waste Treatment and Immobilization Plant

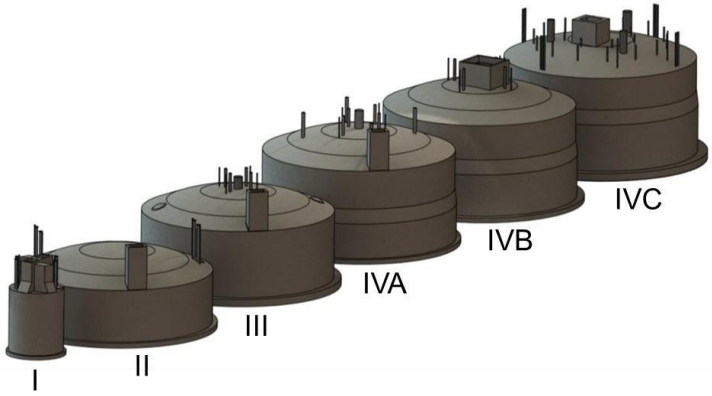
- **What do we want the OHCB to do with this information?**
  - Gain a better understanding of the DFLAW Program

Hanford Tank Farm Overview

- 149 single-shell tanks were built between 1944 and 1965
  - 55,000 to 1 million gallons
  - SSTs were removed from service in 1980 and subsequently pumped to remove liquids to the extent possible

- 28 double-shell tanks were built between 1968 and 1986
  - 1 to 1.25 million gallons



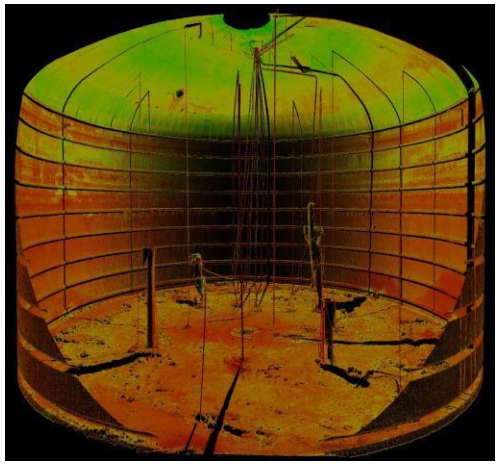


Relative sizes of single-shell tank designs

Single-Shell Tank Integrity

- Confirm safe storage of waste in support of retrievals
  - In-tank visual inspections
  - Waste monitoring
  - Structural analysis
  - Integrity assessment

Visual inspection

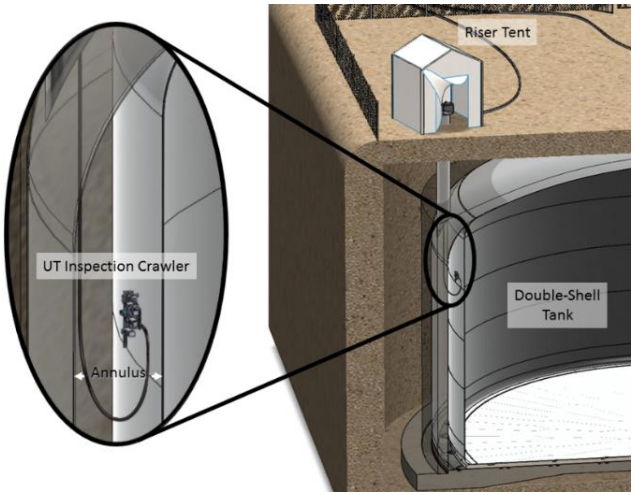


Laser scan

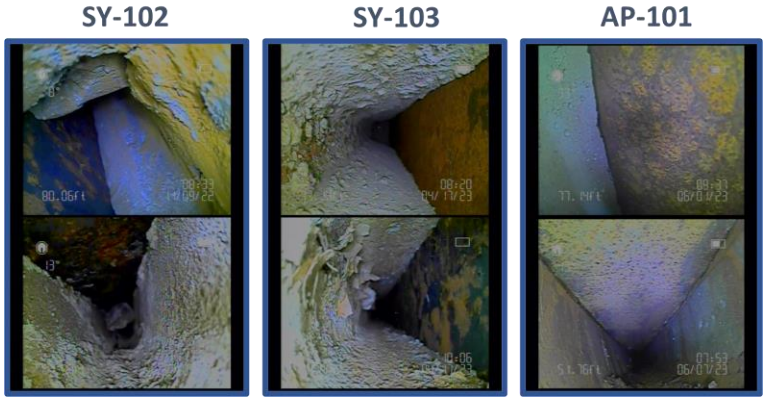
Liquid level measurement

Double-Shell Tank Integrity

- Maintains safe storage of waste in DSTs in support of waste processing operations
  - Annulus visual inspections
  - Ultrasonic testing
  - Waste monitoring
  - Waste chemistry control
  - Structural analysis
  - Integrity assessment



Primary tank exterior wall inspections using cameras and robotic ultrasonic testing crawlers

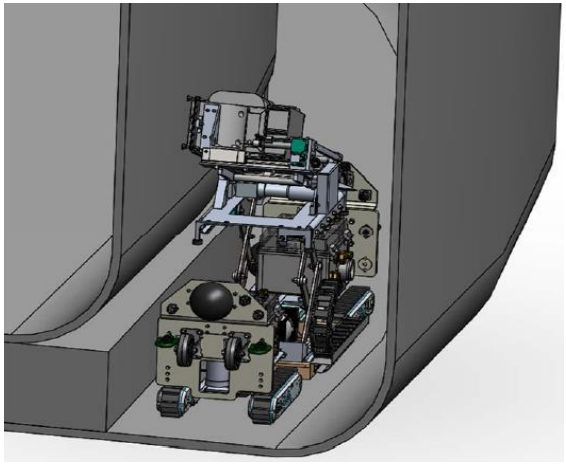


Under-tank air slot inspections

Waste core sampler

Developing New Technology

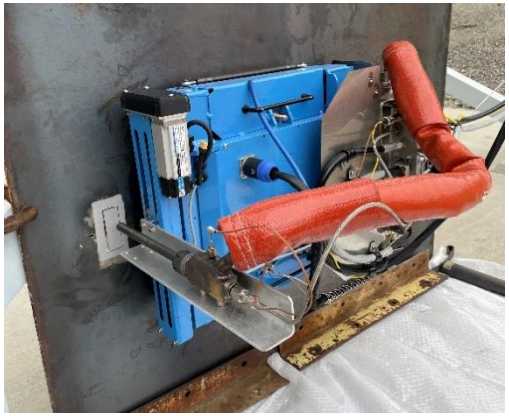
- Inspection tool development
  - Upgraded visual inspection cameras, affording higher resolution, better lighting, and digital recording and file transfer
  - Improving capability to deploy laser scanning tools within single-shell tanks
  - Developing and testing several DST primary bottom volumetric evaluation tools
- DST refurbishment technology development
  - Patching of localized wall areas with cold spray



Tank-bottom ultrasonic inspection tool design

New 3D laser scanning inspection system

New camera inspection systems

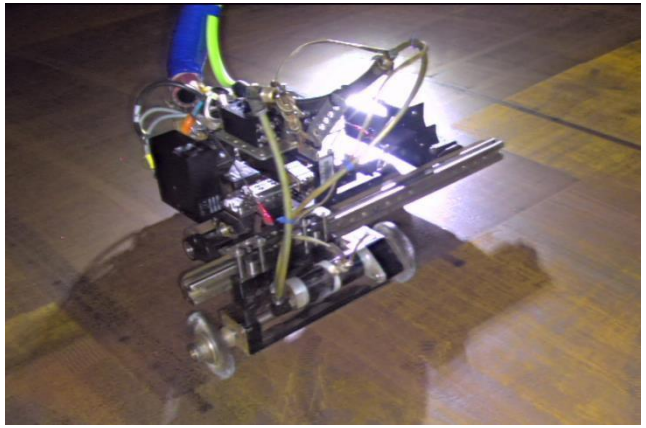


Cold-spray patch testing

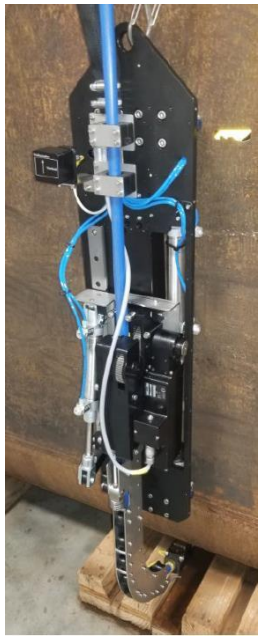
Inspection Tools

Visual inspection borescope

Magnetic wheeled ultrasonic testing crawler



Deployed magnetic crawler with brush attachment



Magnetic wheeled air slot visual inspection crawler

Air slot visual inspection camera

Visual inspection camera

Visual inspection crawler

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Tank-Side Cesium Removal Update

Bibek Tamang
Tank Farms Program Division
Office of River Protection

Tank-Side Cesium Removal

TSCR is on track to process and stage approximately 800,000 gallons of waste in preparation for DFLAW Program operations

Approximately 305,000 curies of cesium have been removed

Tank-Side Cesium Removal (cont.)

Worker disconnecting ion exchange column in the TSCR System process enclosure

Workers connecting Ion Exchange columns for batch 4 start-up

Worker placing spent 27,000-pound ion exchange columns in the TSCR IXC Pad

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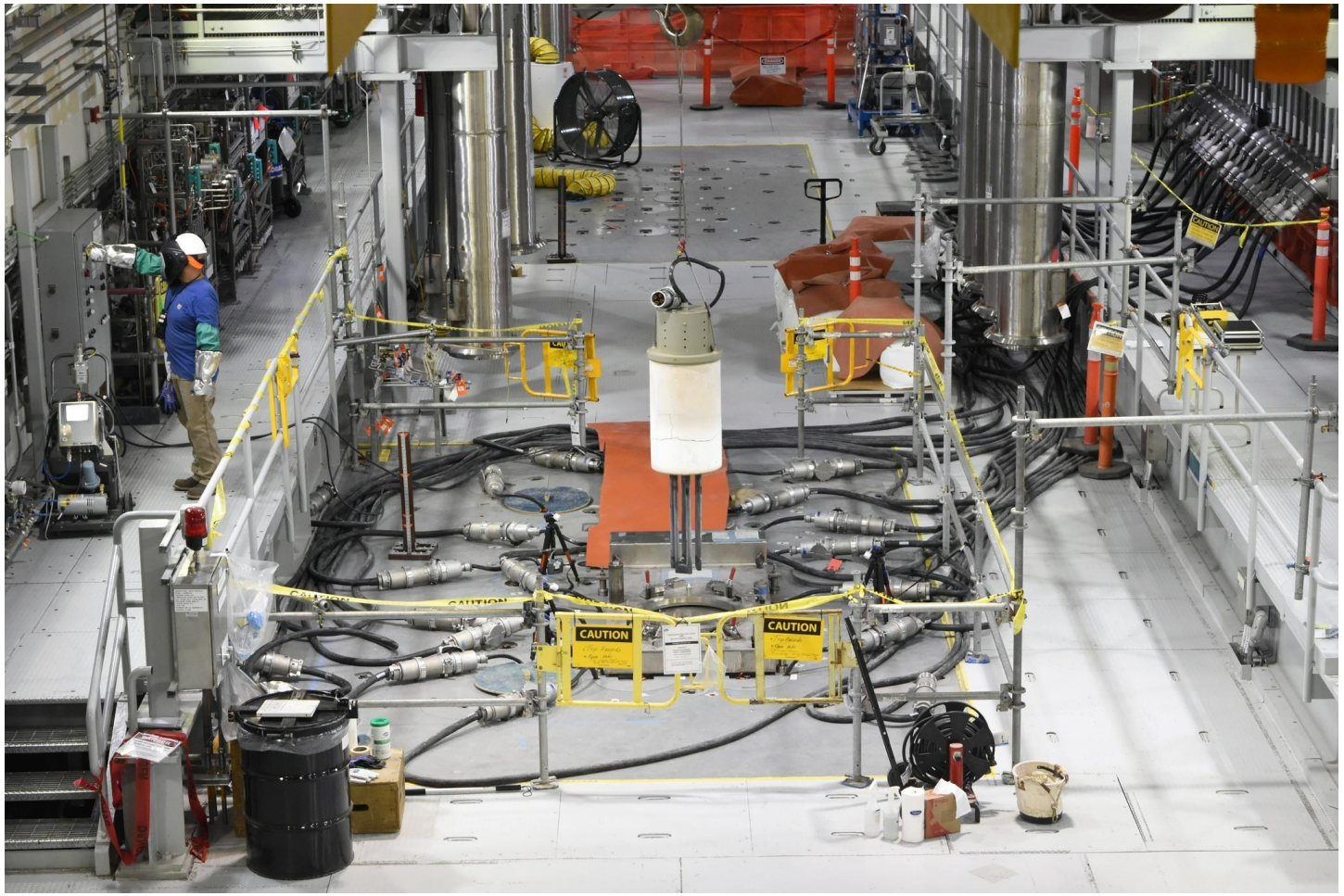
Direct-Feed Low-Activity Waste Program Update

Mat Irwin
Acting Assistant Manager
for Waste Treatment and Immobilization Plant Project
Office of River Protection

Direct-Feed Low-Activity Waste video

https://www.youtube.com/watch?v=8PChz6EB-Cs

Melter Heatup Video



https://youtu.be/NOcpthpN3g0

Summary

- DOE continues to make important progress toward achieving a cleanup commitment that has been decades in the making: vitrifying Hanford's tank waste through the DFLAW Program
- Tank integrity and monitoring are key components of the Hanford tank waste mission
- The Tank-Side Cesium Removal System is an integral part of the DFLAW Program that will vitrify Hanford's low-activity tank waste for safe, onsite storage


Questions?
The Hanford Reach
White Bluffs Overlooking the Columbia River