Discussion Topics

- Overview of Waste Treatment and Immobilization Plant (WTP)
- Work Priorities
- Resolution of major technical issues
  - Mixing
  - Erosion/Corrosion
WTP is 65 Percent Complete
Low-Activity Waste (LAW) Vitrification Facility

Turns low-activity waste into glass

- 84 percent design complete
- 88 percent procurement complete
- 70 percent construction complete
Balance of Facilities
Vast infrastructure to support operations

- 73 percent design complete
- 48 percent procurement complete
- 64 percent construction complete

18 support buildings for the Balance of Facilities
Glass-former piping
Overhead pipe racks for steam and glass-forming materials
Glass-former silos
Analytical Laboratory
Ensures glass meets regulatory requirements

- 79 percent design complete
- 76 percent procurement complete
- 83 percent construction complete

*Analytical Laboratory exterior*

*Analytical Laboratory fume hoods*

*Analytical Laboratory air-handling systems*
High-Level Waste (HLW) Vitrification Facility

Turns high-level waste into glass

- 86 percent design complete
- 76 percent procurement complete
- 41 percent construction complete
Pretreatment Facility
World's largest radioactive chemical separations facility

- 79 percent design complete*
- 52 percent procurement complete*
- 42 percent construction complete*

*Percent complete data is being re-evaluated due to replanning and rebaselining efforts and resolution of technical issues
Pretreatment Facility Functions and Simplified Flow Diagram

- Receives waste feed from Hanford Tank Farm
- Separation and conditioning of waste feeds for High-Level Waste (HLW) and Low-Activity Waste (LAW)
  - Evaporation
  - Ultrafiltration
  - Leaching
  - Ion exchange
- Lag storage for HLW and LAW feed
Work Priorities

- Taking advantage of planned slow down of work at the Pretreatment and High-Level Waste Facilities to resolve technical issues

- Completing construction of the Low-Activity Waste Facility, Balance of Facilities, and Analytical Laboratory

- Directing any additional resources to advance construction work at the High-Level Waste Facility and then the Pretreatment Facility
Pulse Jet Mixing at the Waste Treatment and Immobilization Plant

Five unresolved technical concerns related to pulse jet mixing:

- Limitations of the small-scale testing program
- Modeling of the mixing performance
- Tank Waste characterization and feed certification
- Planned WTP process vessel modifications
- Limitations of pulse jet mixer controller and instrumentation testing
38 Pulse Jet Mixer Vessels

- 4 Newtonian vessels in the High-Level Waste Facility
- 34 vessels in the Pretreatment Facility
  - 29 vessels designated “Newtonian vessels”
    - 9 vessels are for liquids only
    - 3 vessels store spent resin
    - 16 vessels are limited to less than 5 wt% solids
    - 1 vessel is limited to less than 10 wt% solids
  - 5 vessels designated “non-Newtonian vessels”
Pretreatment Facility Black Cell Vessels
29 installed (green), 9 not installed (gray, red), 5 non-Newtonian, not installed (red)

*Five vessels are designated as “non-Newtonian vessels”: UFP-2A/B, HLP-27A/B, and HLP-28*
Large-Scale Integrated Testing

- Large-scale vessel testing defined to support:
  - Verifying vessel design
  - Establishing operating and control limits

- Three test platform sizes identified:
  - 4 ft, 8 ft, 14 ft diameter vessels

- Four pulse jet mixer (PJM) arrays to be tested:
  - RLD-00008, HLP-00022
  - UFP-00002A, HLP-00027A

- Single PJM tests to be completed verifying PJM control design
Erosion Wear of Pulse Jet Mixer Vessels

- Pulse jet mixer vessel erosion wear re-assessments have not been completed
  - Action: Erosion wear calculations to be revised based on comments, including updated vessel-specific waste characteristics

- Wear experiments conducted at Dominion Engineering Inc. (DEI) do not appear to validate the WTP erosive wear rate design basis
  - Action: Re-analysis of the DEI erosion wear experiments for erosion scar depth to accurately determine erosion wear

- Procedures for waste feed control and measurement of waste characteristics important to corrosion/erosion wear have not been developed
  - Action: Develop method for waste feed erosion potential and in-service inspection program
Localized Corrosion of Pulse Jet Mixer Vessels

- Temperature and chemistry controls for preventing localized corrosion of vessels (e.g., pitting, crevice corrosion, and stress corrosion cracking) have not been confirmed
  - Completion of a Vessel Material Localized Corrosion Limit Analysis report that will identify the acceptable margins, chemistry and temperature operating ranges for WTP vessel materials

- Uncertainties exist in localized corrosion data (from external technical papers) when applying the data to anticipated conditions in WTP process environments
  - Assess requirement for additional testing data
  - Assess requirement for vessel material changes
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