# Waste Management 2014
# Hot Topics Panel

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**March 3, 2014**

# FY 2013 Tank Waste Accomplishments

## Innovative Technology Paves Way for New Retrieval Method at Hanford Tank Farms

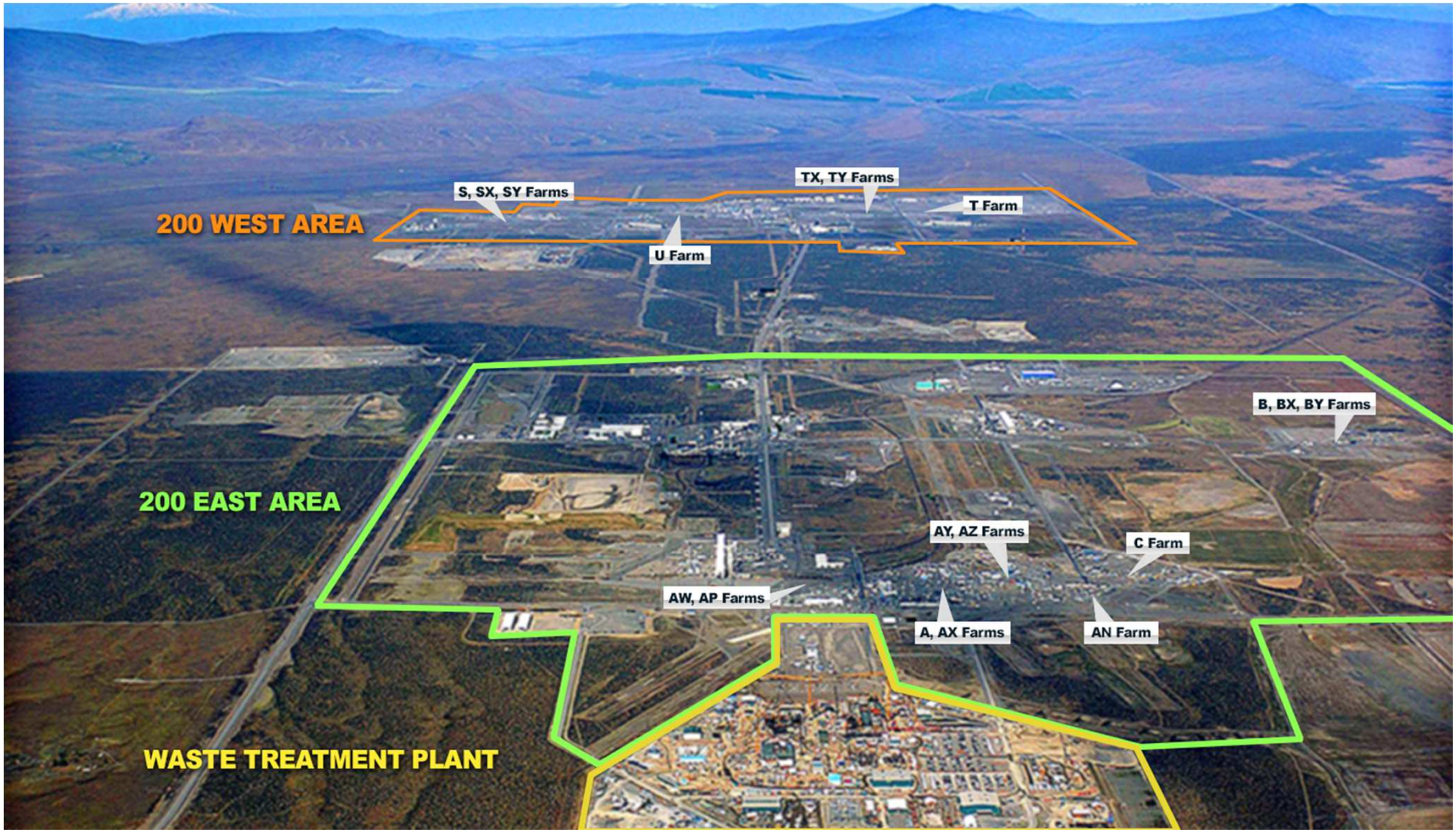
- Mobile Arm Retrieval System (MARS) Vacuum tested on single-shell tank C-105
- Completed retrievals in three single-shell tanks

## Two Additional 1.3 Million Gallon Radioactive Waste Tanks Closed at SRS

- Tanks 5 and 6 closed in December 2013

# FY 2013 - Hanford Tank Waste Framework

## Retrieve Waste from 177 Underground Tanks and Vitrify in the Waste Treatment Plant



# FY 2013 Demonstrated Record Rates

## At the Savannah River Site:

- Increased waste loading by 25% achieved by tailoring frit composition.
- In August 2013, DWPF set a monthly production rate record by vitrifying 40 canisters.
- For FY 2014, there have been over 106,000 gallons transferred to the Actinide Removal Process (ARP).
- For FY 2014, there has been over 6,000 gallons transferred from the Modular Caustic Side Solvent Extraction Unit (MCU) to the DWPF.

*Defense Waste Processing Facility – Savannah River Site*

*Defense Waste Processing Facility HLW Glass Canisters*

# SDU 3 & 5 Nominated for Project of the Year and Federal Project Director of the Year

Old Concept: 72 disposal Cells - $5/gallon

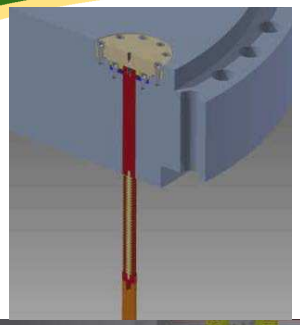

New Concept: 7 'Mega' Cells - $3/gallon

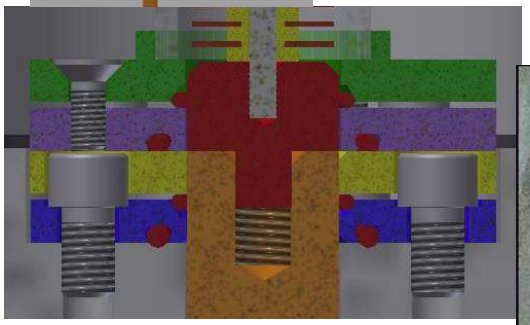
- Low level radioactive waste is grouted (saltstone) and placed in a disposal cell.
- Cylindrical cell design improves performance of saltstone disposal units.
- Construction of SDU 2,3 & 5 (6 cells) completed - each cell can hold 2.3Mgal grout.
- New concept – the mega SDU – has 30 Mgal grout capacity and potential to save over $300M
- The first mega-cell is expected to be available in November 2018.

# FY 2013 Accomplishments

## Demonstrated Cask Materials Monitoring System to Inspect Inaccessible SNF and Storage Components

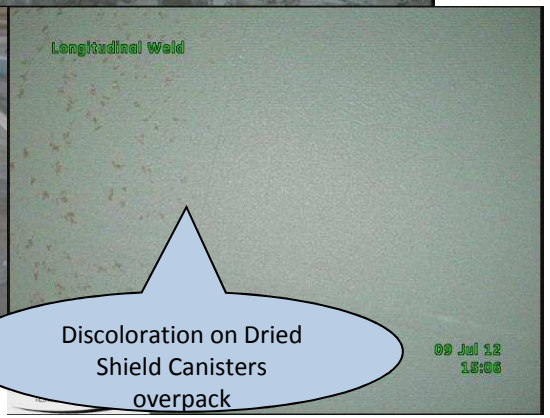
- Technology with remote visual inspection meets inspection requirements in NUREG-1927 for NRC license renewal






- Tool enabled assessment of aging conditions in Horizontal Storage Module

Crack in Horizontal Storage Module wall




Discoloration on Dried Shield Canisters overpack

# Continued Focus on Non-Proliferation


- Celebrated 50th Anniversary of First Return of Irradiated Fuel in Atoms for Peace Program on July 21, 2013
- This international co-operation has been unmatched by any peaceful program and is scheduled to continue until May 2019
- In FY13, DOE received two shipments of foreign research reactor fuel, five shipments of domestic research fuel and earlier in FY14, one shipment of plutonium

# Tackling Technical Issues in FY 2014

## Technical Issues Associated with Pulse Jet Mixed Vessels Remain

- Characterization of tank waste in recent years indicates Pulse Jet Mixers may not be adequate to mix high solids waste
- Inability to mix may lead to potential flammable gas and criticality issues
- Full Scale Vessel Testing removes uncertainty related to scaling and improves the process to resolve technical issues.

# FY14 Outlook

- Safely start-up the IWTU and process 900,000 gallons of sodium bearing waste
- Produce 100 canisters of vitrified HLW at the DWPF.
- Process aluminum clad fuel through H-canyon
- Begin preparation for receipt of HEU liquids from Canada
- Resume 242-F Evaporator in Hanford Tank Farms
- Continue C-Farm single-shell retrievals

H Canyon

Sodium Bearing Waste Facility

# Continued Emphasis on Projects is Key to Completion of EM Tank Waste Mission

## Hanford: Waste Treatment Plant

- Commission Low Activity Waste Vit Facility
- Resume Construction of High Level Waste Vit Facility
- Address technical issues at Pretreatment Facility
  - Re-evaluating designs of problematic PJM vessels
- Advancing new glass formulation
- Actively exploring technology solutions in
  - Sensors and instrumentation
  - Computational fluid dynamic models
  - Robotics
- Forging new collaborations with academia and other Federal labs

- Focus on Operational Start-up
- High degree of technical confidence
- Integrate technical improvements to enhance facility throughput
- Optimize facility operability
- Maintain integration with Liquid Waste (LW) Program
- Minimize LW lifecycle costs

**Savannah River Site: Salt Waste Processing Facility**