U.S. DEPARTMENT OF ENERGY | OFFICE OF ENVIRONMENTAL MANAGEMENT

Idaho Cleanup Project

Congressional Nuclear Cleanup Caucus

James R. Cooper

Manager for EM Idaho Operations Office

June 4, 2013

The Idaho Site Background

- 890 Square Miles
- Remote location in the southeast region of Idaho
- Established in 1949 as the Naval Gunnery Range
  - Currently referred to as the **Idaho National Laboratory**
- Provided an isolated location where prototype nuclear reactors could be designed, built and tested; home to 52 first-of-a-kind test reactors with one still in operation
- **Idaho Cleanup Project** conducts its business within the boundary of the Idaho National Laboratory
- **The Idaho Site mission is divided into three contracts:**
  - **Idaho Cleanup Project-** managed by the Office of Environmental Management
  - **Advanced Mixed Waste Treatment Project** – managed by the Office of Environmental Management
  - **Idaho National Laboratory** – managed by the Office of Nuclear Energy (Lead Program Secretarial Office)

EM Mission & Idaho's Priorities

- Maintain a safe, secure, and compliant posture in the EM complex
- Complete radioactive tank waste treatment and closure
- Disposition Idaho Settlement Agreement remote and contact handled transuranic waste
- Complete excess facility deactivation and decommissioning
- Continue soil and groundwater remediation
- Continue safe fuel storage and receive foreign and domestic research reactor fuel in support of nonproliferation goals

RH-TRU repackaging in CPP-659

Liquid Draining from AMWTP Drums

EM-Idaho Mission Work Scope

Cleanup is focused at six major geographic areas:

- Idaho Nuclear Technology and Engineering Center (INTEC)
- Radioactive Waste Management Complex (RWMC)
- Material and Fuels Complex (MFC)
- Advanced Test Reactor Complex (ATRC)
  - **cleanup completed**
- Test Area North (TAN)
  - **cleanup completed on soil remediation and decontamination and decommissioning**
- Power Burst Facility (PBF)
  - **cleanup completed**

Idaho Nuclear Technology & Engineering Center

- Complete the Resource Conservation and Recovery Act (RCRA) closure of the final four High Level Waste Tanks resulting in RCRA closure of all 15 tanks
- ✓ Deactivate & Demolish (D&D) all facilities and structures that have no future mission
- Complete treatment and disposition of remaining RH –TRU waste containers
- Transfer EBR II Spent Nuclear Fuel bottles to MFC

✓ Test Area North (Completed)

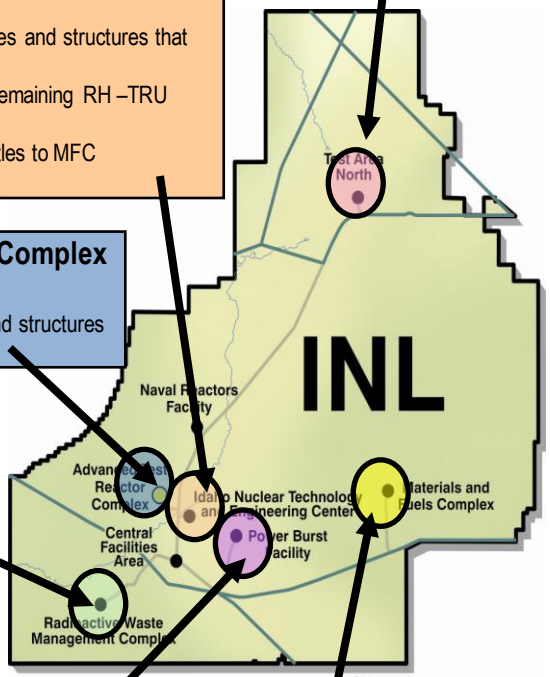
✓ Completed D&D of all EM facilities and structures

✓ Advanced Test Reactor Complex (Completed)

✓ Complete D&D of all EM facilities and structures

Radioactive Waste Management Complex (location of the Advanced Mixed Waste Treatment Project)

- Complete Disposition of 65,000 m^3 of stored TRU waste
- Complete exhumation of 5.69 acres of targeted buried waste
- Complete packaging and offsite shipping of 7,785 m3 of targeted TRU waste



✓ Power Burst Facility (Completed)

✓ Completed D&D of EM facilities

Materials and Fuels Complex

- ✓ Completed retrieval of RH – TRU waste for transfer to INTEC
- Complete transfer of EBR II Used Nuclear Fuel from wet to dry storage

Idaho Site Funding

Appropriation	FY 2012 Current	FY 2014 Cong. Request
Defense Environmental Cleanup	384,669	365,010
Non-Defense Environmental Cleanup	5,131	5,000
Total, Idaho	**389,800**	**370,010**

Dollars in thousands

FY 2014 Request

Transuranic and Mixed / Low-Level Waste Disposition $174,000

- Process and ship 4,500 cubic meters of contact-handled TRU Waste and 5 cubic meters of remote-handled TRU waste to the Waste Isolation Pilot Plant
- Continue disposition of mixed low-level and low-level waste

Soil and Groundwater Remediation $97,000

- Continue ground water remediation activities
- Continue exhumation of targeted buried waste

Radioactive Tank Waste Stabilization and Disposition $78,600

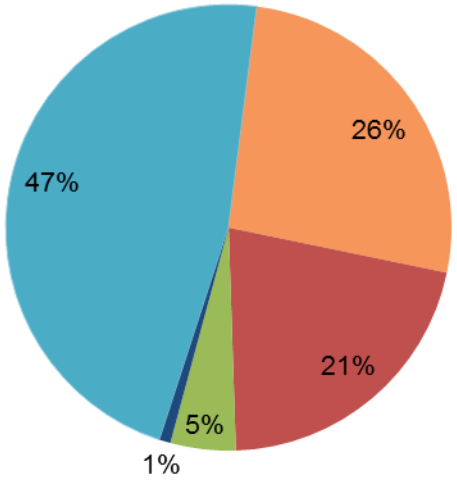
- Continue sodium-bearing waste operations toward December 2015 completion date

Spent Nuclear Fuel $17,500

- Continue retrieval of Domestic and Foreign Research Reactor Fuel and retrieval of Experimental Breeder Reactor II fuel from storage

Community and Regulatory support - $2,910

- Community and Regulatory Support Activities



Safety in Idaho

Idaho Cleanup Project

- Reduced recordable injuries by over 60 percent since contract inception (May 2005)
- Voluntary Protection Program (VPP) Star of Excellence
- VPP Legacy of Stars

Advanced Mixed Waste Treatment Project

- Zero Accidents or Lost Time Injuries since October 2011 (over 2 Million hours for ITG)
- Over 14.5 million hours worked without a lost time injury since December 2003
- VPP Star of Excellence

Accomplishments

- Exhumed 3.10 acres out of a total 5.69 acres
- Deactivated & Decommissioned 221 facilities
- Over 2 million square feet of EM facilities eliminated (including four test reactors, two hot shops and one spent nuclear fuel reprocessing plant)
- Transferred EM used nuclear fuel from wet to dry storage
- Dispositioned all EM Special Nuclear Material out of Idaho
- Completed construction on ARP-VIII (2 acre exhumation facility)
- AMWTP is the largest shipper of CH-TRU waste to WIPP
  - 50% of all CH-TRU waste shipped to WIPP is from Idaho
- CWI is the largest RH-TRU shipper to the Waste Isolation Pilot Plant (WIPP)
  - Averaging two shipments per week

Retrieval of stored TRU waste at AMWTP

ARP-VIII construction completed

In Support of the Cleanup Mission

- Submitted the Calcine Disposition Project RCRA Part B permit Modification to the Idaho Department of Environmental Quality
- Will remain the principal shipper of contact-handled and remote-handled transuranic waste to WIPP supporting the DOE TRU waste remediation and disposal mission
- Continue the retrieval, processing, and shipment of targeted buried waste from the Subsurface Disposal Area
- Complete remaining processing of remaining 900,000 gallons of tank waste by December 31, 2014
- Continue the transfer of spent/used nuclear fuel from INTEC to the Materials and Fuels Complex

Exhumation in ARP-VII

RH-TRU Shipment Headed for WIPP

Technical Challenges

- Complete the processing of the remaining 900,000 gallons of tank waste by December 31, 2014
- Resume and maintain exhumation work at the Subsurface Disposal Area
- Complete the Advanced Mixed Waste Treatment Project by FY15, no later than FY16
- Maintain performance against regulatory milestones in a challenging environment

Removal of the Auger/Grinder at the Sodium Bearing Waste Plant

Idaho is a Sound Investment

- We continue to maintain excellent rapport with our Regulators through successful completion of regulatory milestones and open communications.
- We receive outstanding support from Tribal Nations and local stakeholders through up front communications and involvement.
- Idaho's performance has proven that substantial cleanup progress can be achieved within cost and ahead of schedule.
- Idaho provides successful results with a priority on safety and a value to the taxpayer.
- Idaho's work is essential to the health of our local communities and in protection of the environment.

Idaho site employees working as a team

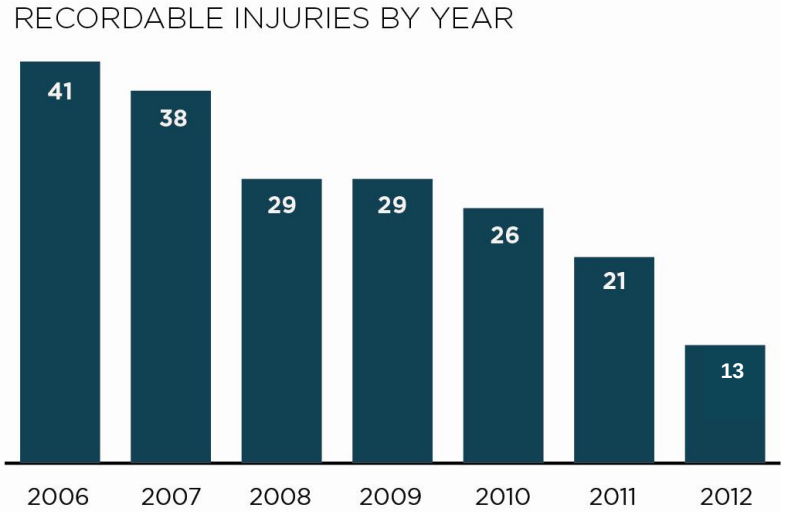
Idaho Cleanup Project
Congressional Nuclear Cleanup Caucus

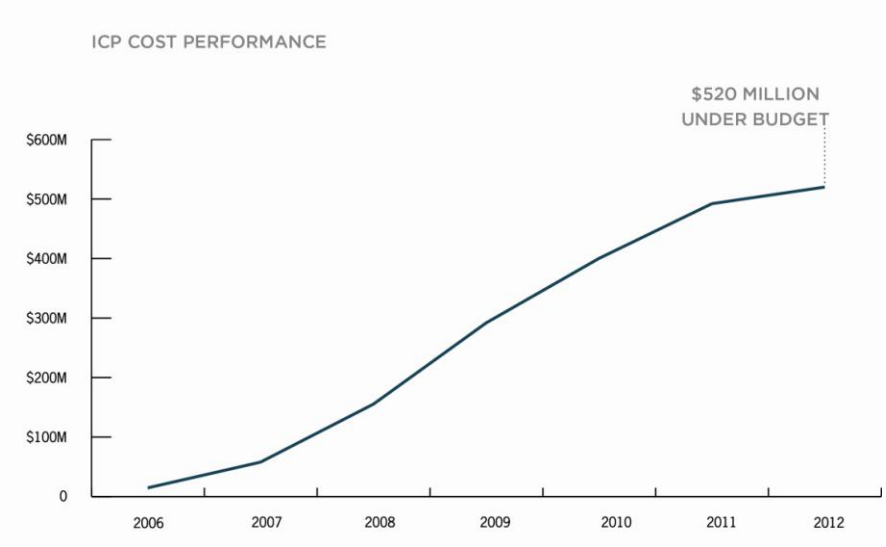
Tom Dieter
President and CEO
CH2M-WG Idaho (CWI)

June 4, 2013

ICP-I Completion

- Period of Performance
  - May 2005-September 2012
- Safety
  - Reduced recordable injuries by more than 70 percent since contract inception
- Accomplishments
  - Delivered seven-year project $520 million under budget





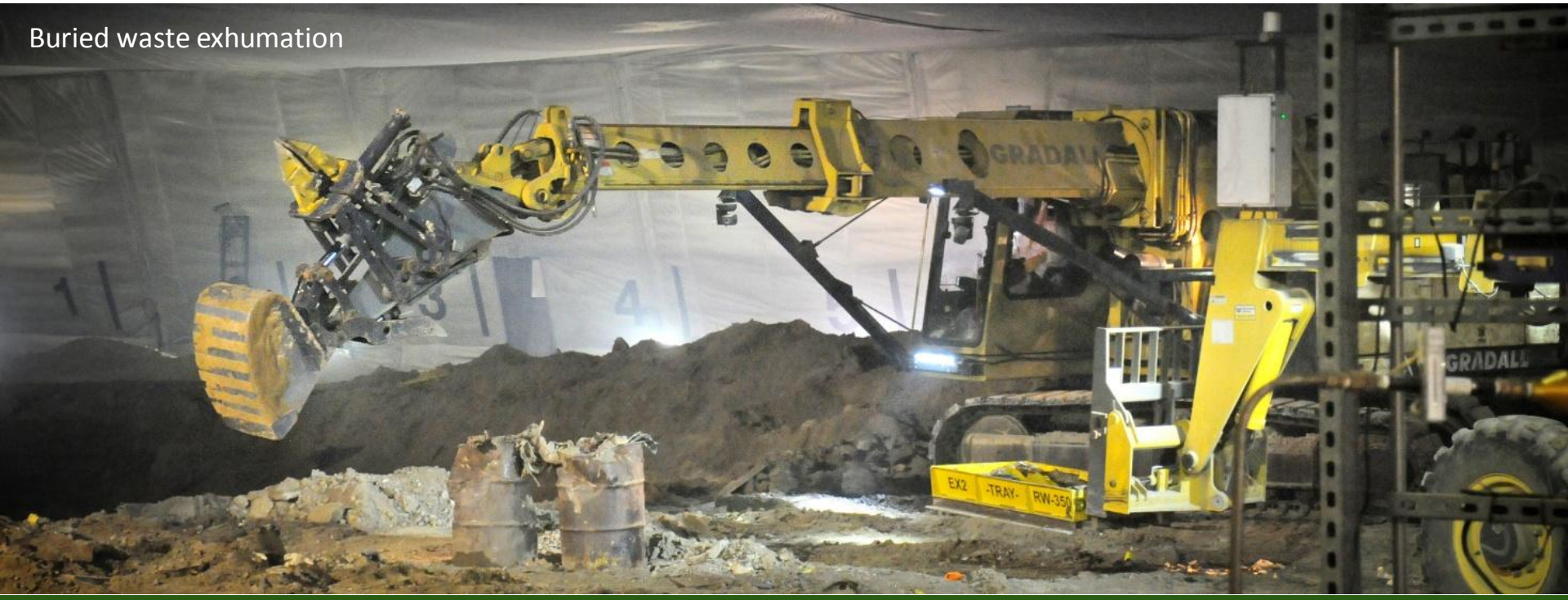
Deactivation and Decommissioning

- Demolished 221 facilities and structures
- Reduced EM's footprint by more than two million square feet while protecting the Snake River Plain Aquifer, sole drinking water source to 300,000 residents
- Completed
  - One year ahead of schedule
  - $312 million under budget

Accelerated Retrieval Project VI Demolition

Soil and Groundwater Remediation (Buried Waste Exhumation)

- Completed target scope waste exhumation of 2.55 acres more than a year ahead of schedule and $31 million under budget (includes Pit 9)
- Completed exhumation of an additional 0.55 acres – achieving contract total of 3.10 acres



Buried waste exhumation

Waste Disposition

- Shipped 5,083 m3 of contact-handled waste to the Waste Isolation Pilot Plant (WIPP)
- Met remote-handled transuranic waste contractual agreement (216 shipments) nine months ahead of schedule and $4 million under budget

Immersion testing of sodium-bonded pieces and pins

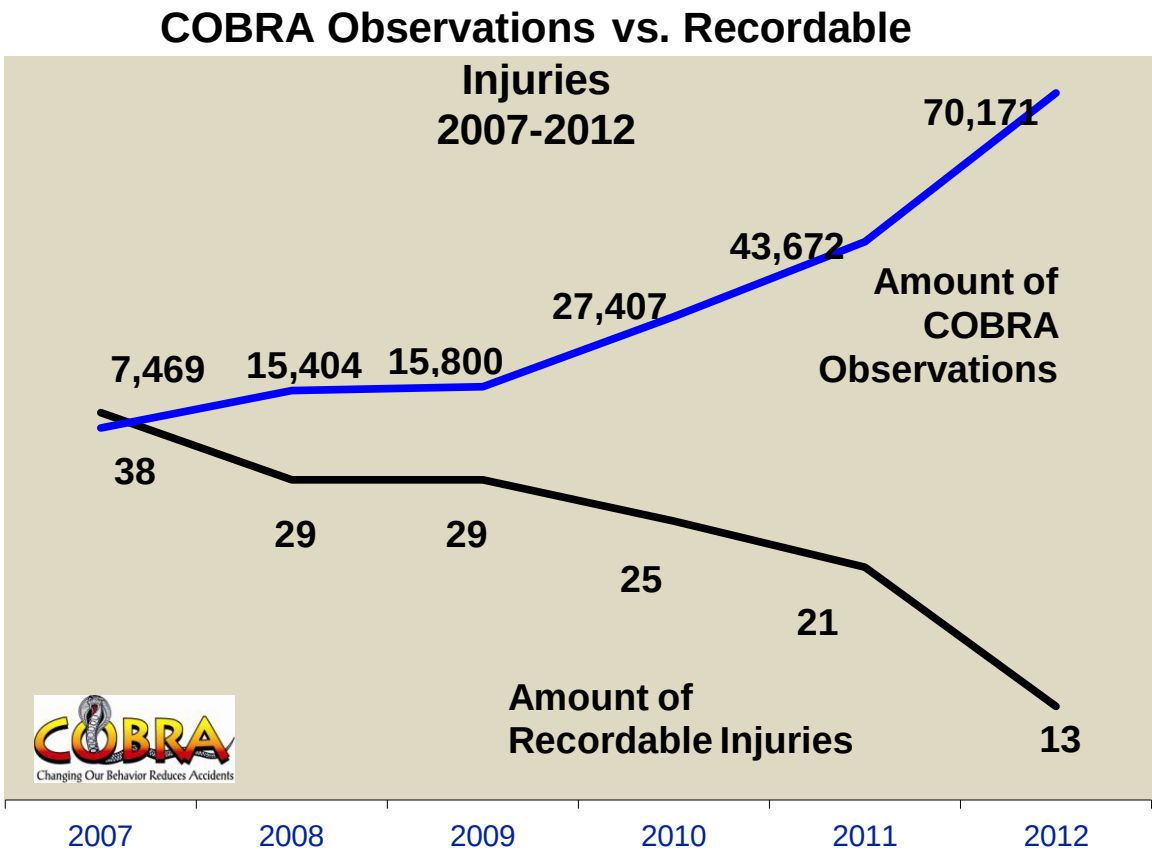
ICP-II (extension)

- Period of Performance
  - October 2012-September 2015
- Scope
  - Treat remaining 900,000 gallons of sodium-bearing waste
  - Receive 45 casks of Advanced Test Reactor fuel
  - Repackage 6,000 sludge drums for AMWTP
  - Ship 742 cubic meters of contact-handled transuranic waste; complete
    26 shipments of remote-handled transuranic waste to WIPP

Sludge drum repackaging

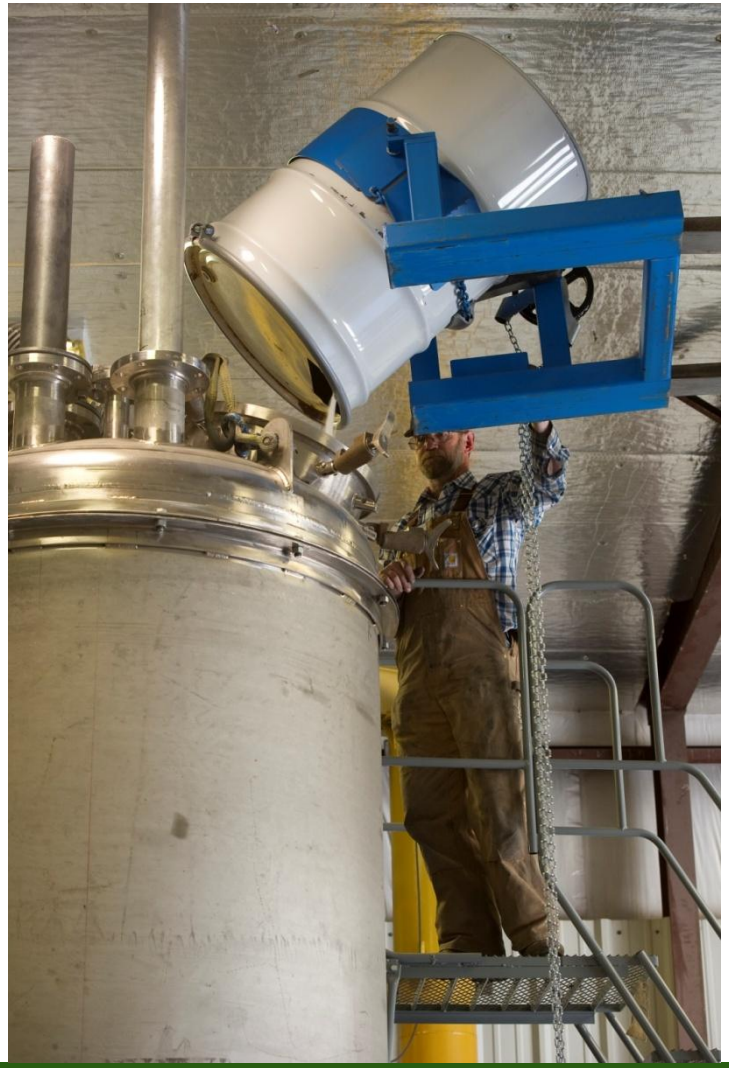
Safety

- Achieved safety excellence by worker ownership and involvement (e.g., Voluntary Protection Program, Changing Our Behavior Reduces Accidents, Employee Safety Teams, internal safety videos)
- 6,621 (ICP-II) radiological risk entries without an ORPS reportable radiological incident (ARP)
- Hours without reportable skin contamination event
  - 1.1 million hours (no events in ICP-II)
  - 15.7 million hours (includes ICP-I)



Sodium-bearing Waste Treatment

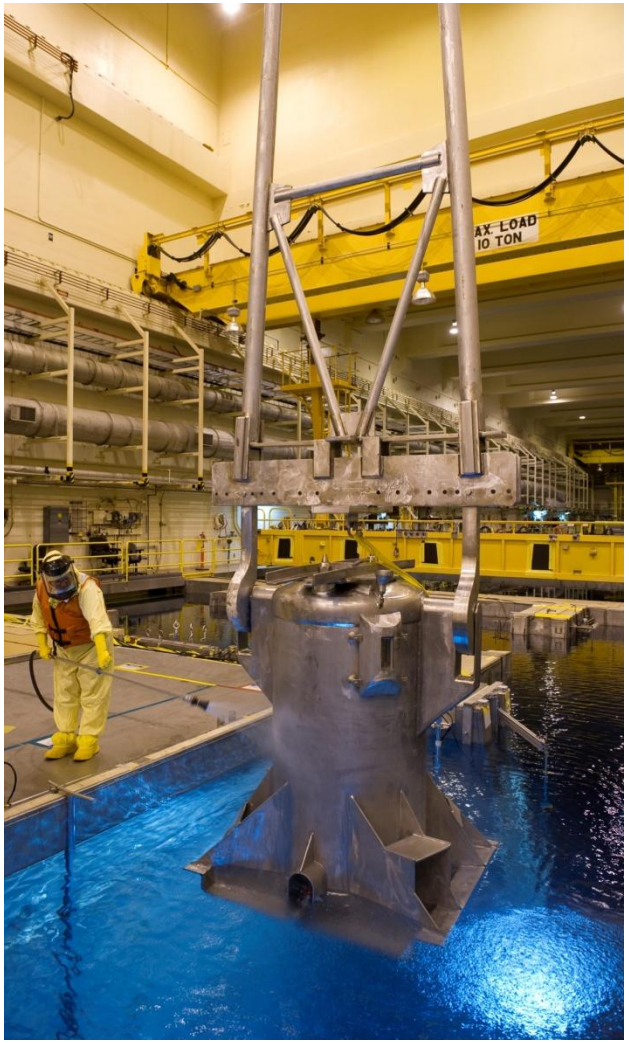
- Major plant modifications are complete (June 16, 2012 event)
- Additional modifications and investigations continue
  - CWI approach is extensive and conservative
  - Path to Start-up
    - Establishing optimum operational parameters for safe and reliable operations
- Planned completion date: December 31, 2014



IWTU DMR Distributor mockup testing

Spent Nuclear Fuel Programs

- Completed receipt and unloading of 12 of 15 Advanced Test Reactor casks
- Completed receipt and unloading of 78 TRIGA fuel elements from Austria
- Continue to transfer Navy fuel from wet to dry storage



Unloading of an Advanced Test Reactor cask in CPP-666 basin pool

Soil and Groundwater Remediation

- Buried Waste Exhumation
  - Completed construction of the ARP VIII waste exhumation facility
  - Began preparations for resumption of buried waste exhumation; exhumation planned for early Fall
- Sludge Drum Repack
  - Repurposed Accelerated Retrieval Project V/Pit 9 facility from CERCLA to RCRA permit for processing of AMWTP sludge drums
  - Opened and treated 1,562 of 6,000 sludge drums at ARP V

Sludge drum repack operations

Waste Management

- Completed 41 shipments of remote-handled transuranic waste to WIPP
- Received all (171) Uranium-233 drums from AMWTP to prepare for disposition
- Completed component fabrication and initiated system assembly for distillation treatment for sodium-contaminated waste

Mockup of sodium distillation process

Deactivation and Decommissioning

- Activities in Materials and Fuels Complex (MFC)-799
  - Removed sodium-contaminated piping and tanks
  - Removed and dispositioned non-sodium tanks
  - Submitted partial RCRA permit closure modification
  - Installed sodium treatment system

Workers prepare for sodium treatment in MFC-799

Summary

- Continuing momentum and partnerships created in ICP-I
  - Working safely
  - Reducing EM's footprint
  - Providing value to the American taxpayer
- Protecting the Snake River Plain Aquifer

Advanced Mixed Waste Treatment Project

Danny Nichols
President and Project Manager
Idaho Treatment Group

June 4, 2013

AMWTP Overview

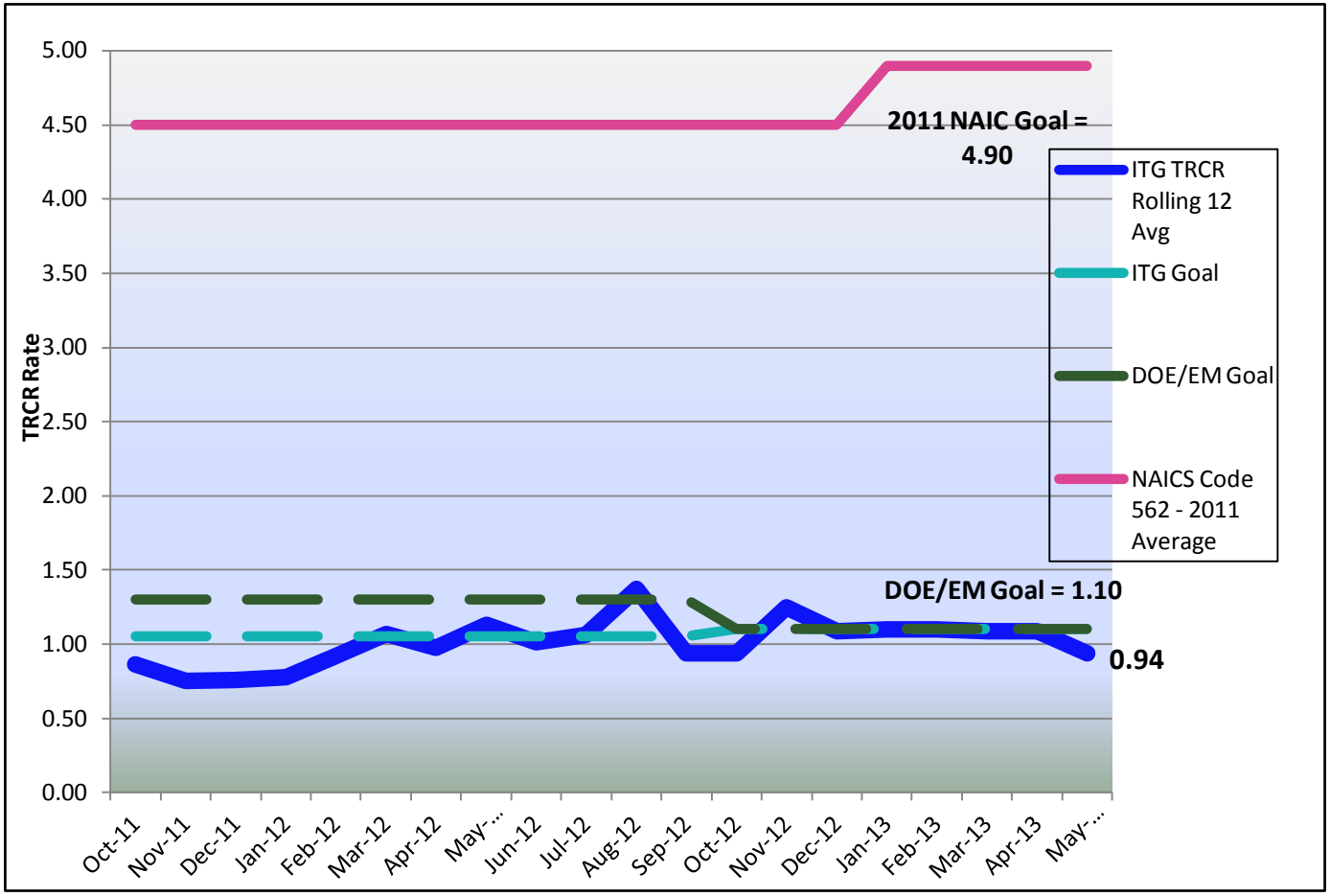
- DOE's premier facility for treating contact-handled transuranic waste and mixed low-level wastes
- DOE VPP STAR site with more than 2 million hours worked under ITG – more than 14.5 million hours worked on the project – without a lost time injury
- Waste processed at AMWTP has come from 15 DOE sites
- DOE's only large-scale Supercompactor providing significant size reduction of debris waste
- To date, ~40,000 m^3 of transuranic waste have been shipped from Idaho making AMWTP the largest shipper to WIPP; another 10,000 m^3 of mixed low-level waste shipped to federal and private disposal sites
- On track to meet regulatory compliance date in the Idaho Settlement Agreement for completing shipment of transuranic waste out of Idaho

Top photo shows AMWTP retrieval operators removing drums of contact-handled transuranic waste that have been stored at the Department's Idaho site for more than four decades. Using the project's Supercompactor, 55-gallon drums and their contents are volume reduced into a "puck." At the bottom, TRUPACT II shipping containers are lined up ready for their one-way trip from AMWTP to WIPP, filled with size reduced contact-handled waste.

Safety Performance

ITG Hours Without a Lost Time Injury:
Over 2 Million

AMWTP Cumulative Hours Without a Lost Time Injury:
14.5 Million



New Improvement Initiatives

- ITG implemented Operational Excellence Program where workforce driven improvements are implemented
- Macro-encapsulation system using zippered bags provides safe, low-cost alternative to current systems
- New soft-sided box design proves safe, economical alternative to traditional metal cakebox
- Drum Import/Export Glovebox to treat sludge waste, reduce cell entries
- Implementing major regulatory changes allowing supercompaction of liquids and aerosol cans, and eliminated unnecessary waste sampling

Employees show mock-up of new soft-sided box used to overpack deteriorating wooden boxes.

Members of the Six Drum Overpack Treatment Process Productivity Rapid Improvement Event Team show DOE's representatives an idea the team came up with to enhance productivity, an equipment status board.

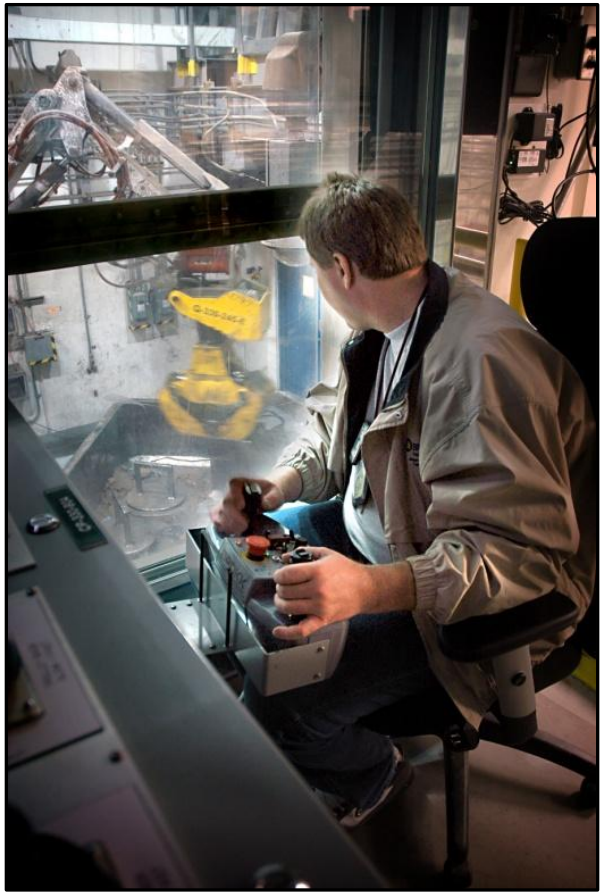
An employee describes to another a technique he used to maneuver a drum inside the Drum Export/Import Glovebox. The drum in the glovebox is being lowered into an 83-gallon overpack drum.

Treatment Capabilities

Soils, solidified, and debris waste:

- Prohibited item removal
- Liquid absorption
- Repackaging
- Venting
- Supercompaction

Business end of Supercompactor = > 4 million pounds of pressure



Operator sorting waste in Treatment Facility boxline.

55-gallon drum post Supercompactor = a puck

AMWTP Waste Transportation

AMWTP Sends Waste To:

- WIPP for all TRU waste
- Nevada National Security Site (NNSS) for LLW/MLLW up to 100 nCi/gram of alpha activity bearing waste
- Clive, UT Bulk Waste Facility for LLW/MLLW less than 10 nCi/gram

Above, another TRU waste shipment from AMWTP arrives at WIPP

Crews loading a MLLW shipment destined for Clive, UT

ITG's first MLLW shipment leaving in a flurry for Nevada National Security Site

DOE's Primary Contact Handled-TRU Waste Processing Asset

- To date AMWTP has received, validated, treated and shipped ~600m³ from 15 sites
- DOE Record of Decision allows "up to an additional 8,700m³" to be shipped to AMWTP from other complex sites

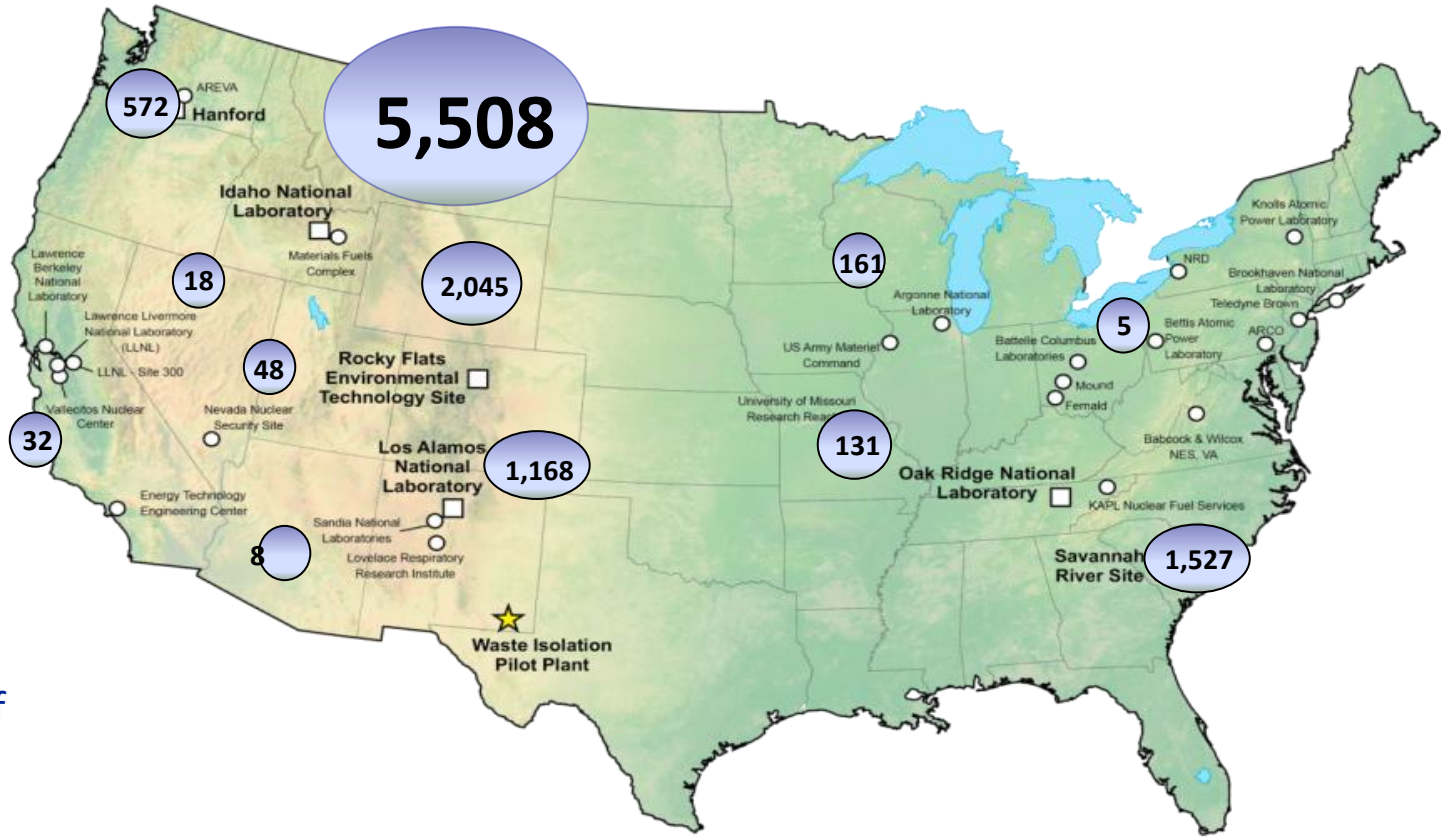
Inspecting shipment received from G.E. Vallecitos Nuclear Center, CA

Lawrence Livermore National Laboratory waste

Processing Hanford waste in AMWTP Treatment Facility

Fulfilling DOE's Mission and the Public Interest

- AMWTP is the largest shipper of TRU waste to WIPP; an essential asset for processing transuranic contact-handled waste; Mixed low-level waste from AMWTP permanently disposed of at Nevada National Security Site and the Clive, UT site
- Delivering value to taxpayers by completing disposal of final oldest, most difficult ~26,600 cubic meters of waste more efficiently than the first ~38,400 cubic meters of waste



- Transuranic waste shipments from DOE sites to WIPP as of April 22, 2013. Total number of shipments to WIPP is 11,223.