U.S. DEPARTMENT OF ENERGY

# 2010 Congressional Nuclear Cleanup Caucus

**March 11, 2010**


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***Jeffrey D. Mousseau, Bechtel BWXT Idaho***

# EM is Embarked on a Journey to Excellence

## *Our Vision:*

***"EM completes quality work safely, on schedule and within cost and delivers demonstrated value to the American taxpayer."***

# EM Mission and Priorities

***"Complete the safe cleanup of the environmental legacy brought about from five decades of nuclear weapons development, production, and Government-sponsored nuclear energy research."***

- Activities to maintain a safe, secure, and compliant posture in the EM complex
- Radioactive tank waste stabilization, treatment, and disposal
- Spent nuclear fuel storage, receipt, and disposition
- Special nuclear material consolidation, processing, and disposition
- High-priority groundwater remediation
- Transuranic and mixed/low-level waste disposition
- Soil and groundwater remediation
- Excess facilities deactivation and decommissioning (D&D)

# EM Program Goals

- **Risk Reduction**
  - Ensure the safety and health of the public and the workers
  - Protect the environment
  - Reduce the EM footprint by 90% by 2015
- **Maintain Compliance**
  - 37 compliance agreements with state and federal regulatory agencies
  - Complete building the capability for dispositioning tank waste, nuclear materials, and spent nuclear fuel
- **EM American Recovery and Reinvestment Act Goals**
  - Thousands of jobs created or saved
  - Reduce the EM footprint by 40% by 2011
- **Improve Project Performance**
  - Improve construction project performance
  - Deliver all projects on time and within cost
  - Get EM projects removed from the GAO High-Risk List
- **Establish strategic options for Special Nuclear Materials, Spent Nuclear Fuel, Radioactive Tank Waste, Groundwater and Excess Facilities not currently in the EM portfolio**
  - Overall objective is to reduce life-cycle costs and shorten the period of program execution

# EM Strategic Goals

- Improve ***Safety Performance*** with the goal of zero accidents/incidents

- Improve ***Project Management***
  - Restructure the project portfolio
  - Adapt the Office of Science construction project model to EM
    - Construction Project Review, front end planning; appropriate pricing and contingency
  - Establish Performance Metrics for EM operating projects
  - Align project and contract management
  - Streamline the acquisition process

- Achieve ***Excellence in Management and Leadership*** with the objective of making EM an employer of choice in the federal government

- Align ***Headquarters and Field Operations*** in order to streamline decision making and improve efficiency

- Utilize ***Science and Technology*** to optimize the efficiency of tank waste, excess nuclear materials, spent nuclear fuel and groundwater treatment and disposition
  - Evaluate programmatic alternatives to smartly reduce the cost of the program and period of execution

# Components of DOE's Idaho Site

- 890 square miles
- Cleanup workforce of ~2,500
- Originally established in 1949 as a national reactor testing station; 52 "first-of-a-kind" reactors were constructed at the site
- Idaho Cleanup Project focuses on six major geographic areas
  - Idaho Nuclear Technology and Engineering Center (INTEC)
  - Radioactive Waste Management Complex (RWMC)
  - Materials and Fuels Complex (MFC)
  - ✓ Test Area North (TAN)- complete
  - Reactor Technology Complex (RTC)
  - ✓ Power Burst Facility (PBF)- complete

# Facility Missions

- Idaho Nuclear Technology and Engineering Center – established in 1950s to remove usable fuel (uranium) from used spent nuclear fuel to fuel government reactors and to store unusable spent nuclear fuel
- Radioactive Waste Management Complex – used since 1950s to manage, store, and dispose of waste contaminated with radioactive elements generated in national defense and energy programs, such as transuranic waste* from Rocky Flats, Colorado
- Advanced Test Reactor Technology Complex– established in the 1950s
  - Materials Test Reactor and Engineering Test Reactor (now closed) - studied neutron irradiation effects on materials, fuels and equipment
  - Advanced Test Reactor (operating) - neutron irradiation studies on fuels & materials
- Test Area North – established in the 1950s to support the nation's commercial nuclear industry research, from nuclear powered jet engines to operation of reactors that simulated accidents
- Power Burst Facility – established in the 1960s to conduct experiments that helped determine safe operating limits for the commercial nuclear industry
- Materials and Fuels Complex- established in the 1950s to focus on research and development of nuclear fuels. Location of the Experimental Breeder Reactor-II

* Transuranic Waste – waste contaminated with elements heavier than uranium.

# Investments to Maximize Risk Reduction

## Solid Waste Disposition

- Continue meeting Idaho Settlement Agreement by shipping record amounts of transuranic waste to the Waste Isolation Pilot Plant
- Majority of EM-owned remote-handled transuranic (RH-TRU) waste dispositioned to WIPP (over 200 of the 213 shipments have been made to date)

Above: Another RH-TRU shipment leaving the Idaho Site. Below: Workers stand in front of a shipment of mixed-low-level waste leaving the Advanced Mixed Waste Treatment Project

# Investments to Maximize Risk Reduction

- The Idaho Site Cleanup program received additional facilities and waste from the Office of Nuclear Energy including:
  - 19 contaminated facilities for final disposition including:
    - Experimental Breeder Reactor II Facility located at the Materials and Fuels Complex
    - Advanced Test Reactor Complex (ATRC) Hot Cells Building
  - RH-TRU Waste
  - Voluntary Consent Order Lines under the ATRC Hot Cells

EBR-II Reactor

ATRC Hot Cells

RH-TRU canisters being unloaded from their interim storage container

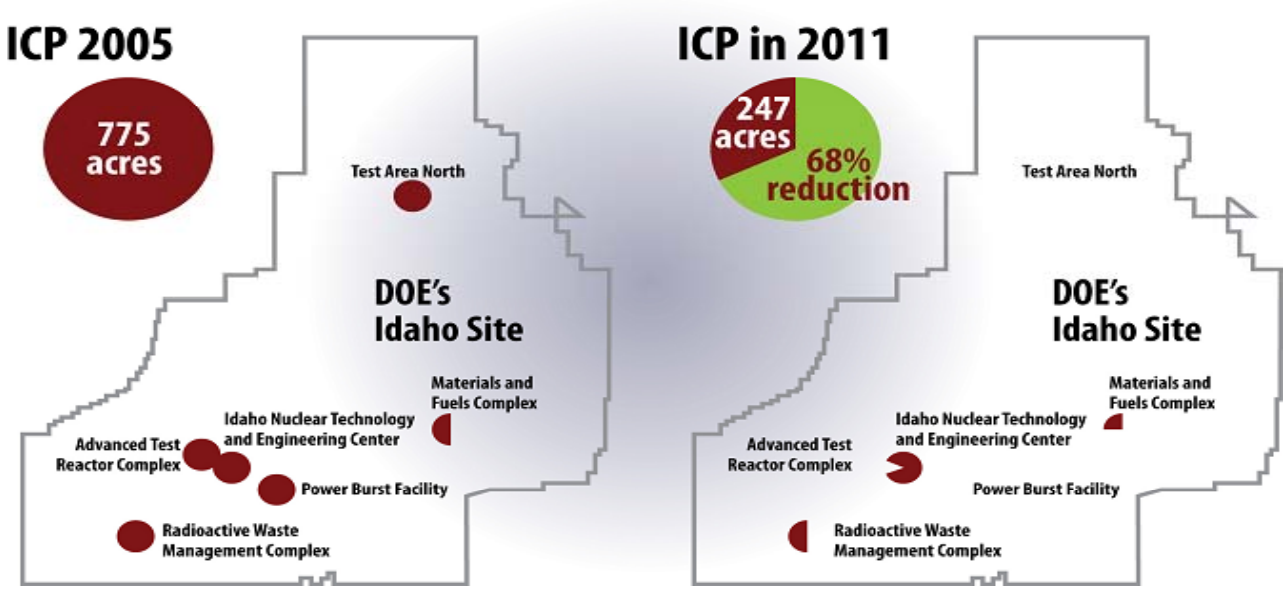
# Investments to Maximize Footprint Reduction

## Decontamination & Decommissioning (D&D)

- Idaho Site D&D crews continue to be among the top performers across the DOE Complex
- Reduced the Idaho Site Footprint by over 350,000 square feet in 2009
- Currently working to demolish two reactors and two spent nuclear fuel reprocessing facilities on schedule for completion in 2011
- Continue to make progress on moving all EM owned spent nuclear fuel from wet-to-dry storage by the end of 2010

Above: D&D of the Idaho Site's Glovebox Excavator Method Project ; Below: D&D of CPP-604 located at the Idaho Nuclear Technology and Engineering Complex

# State of the Cleanup (2005 vs. 2011)




| Year | 2005 (beginning of contract) | 2009 (Actual) | 2010 (goal) | 2011 (goal) |
|---|---|---|---|---|
| Acreage | 775 | 658 | 411 | 247 |
| Buildings and Structures square feet (ft2) | 3,635,948 | 2,299,319 (includes 100,067 ft2 of NE liability transfers) | 2,196,900 | 1,805,367 |
| Cumulative Square Foot Reduction | | 1,436,696 | 1,539,115 | 1,930,648 |

# Investments to Maximize Risk Reduction

## Soil and Water Remediation

- Implementing the Record of Decision for Waste Area Group 7 at the Radioactive Waste Management Complex
- Exhuming targeted waste from the Subsurface Disposal Area
  (over 1.3 acres of the total 5.69 acres have been exhumed to date)
- Started exhuming targeted buried waste from the fourth retrieval area in late January

Above: the interior of the Accelerated Retrieval Project's fourth retrieval enclosure ; below: targeted buried waste exhumation inside a retrieval enclosure at the Subsurface Disposal Area

# *Funding at the Idaho Site*

- The FY 2011 Budget Request of **$412 million** allows cleanup work at the Idaho Site to continue.
  - Provides for transition from Sodium Bearing Waste Treatment Project construction into operations
  - Supports
    - Spent Nuclear Fuel Stabilization and Disposition
    - Solid Waste Stabilization and Disposition
    - Radioactive Liquid Tank Waste Stabilization and Disposition
    - Soil and Water Remediation

Ongoing construction at the Idaho Site's Sodium Bearing Waste Treatment Project

# Idaho Site Cleanup Funding Summary

| Idaho Site Cleanup Funding | $ in millions | | | |
|---|---|---|---|---|
| | FY 2009 | ARRA | FY 2010 | FY 2011 |
| Spent Nuclear Fuel Stabilization and Disposition-Defense | 16.0 | 0.0 | 34.3 | 43.3 |
| Solid Waste Fuel Stabilization and Disposition (including AMWTP) | 175.0 | 130.0 | 143.5 | 172.6 |
| Sodium Bearing Waste Treatment Project | 96.3 | 0.0 | 113.6 | 40.6 |
| Radioactive Liquid Tank Waste Stabilization and Disposition | 60.3 | 0.0 | 71.9 | 77.7 |
| Soil and Water Remediation | 95.0 | 120.0 | 91.5 | 69.0 |
| Decontamination & Decommissioning | 29.3 | 217.8 | 5.4 | 0.0 |
| Spent Nuclear Fuel Stabilization and Disposition - Non Defense | 13.5 | 0.0 | 5.0 | 4.9 |
| Site Support | 3.8 | 0.0 | 3.9 | 3.9 |
| Total | 489.2 | 467.8 | 469.1 | 412.0 |

# The American Recovery and Reinvestment Act

- The Idaho Site received $468 million of ARRA funding
- Over $120M spent to date
- The funding is being used at the Idaho Site to:
  - Deactivate & Decommission 89 excess buildings and structures
  - Accelerate removal and disposal of remote-handled transuranic waste and mixed-low-level waste
  - Ship contact-handled low-level-waste offsite
  - Remove buried radioactive waste at the Subsurface Disposal Area
- Created/Saved over 650 jobs

# ARRA Accomplishments

- The Idaho Site met all 2009 ARRA milestones
  - Completed the D&D of over 300,000 square feet of facilities and structures
  - Retrieved and packaged 389 cubic meters of buried targeted waste and completed Accelerated Retrieval Project III
  - Began processing RH-TRU waste containers from the Idaho Site's Materials and Fuels Complex
  - Shipped over 1,300 cubic meters of Low-Level-Waste and Mixed-Low-Level Waste out of Idaho
  - Shipped over 90 cubic meters of organic MLLW sludge out of Idaho

The Idaho Site is on track to meet all 2010 ARRA milestones

# Summary

- ARRA funding has saved jobs, created new ones, created new work, and allowed us to utilize existing experienced work crews
  - Resulting in accelerated cleanup and site footprint reduction
  - Soliciting final contract for the Advanced Mixed Waste Treatment Project
  - Beginning acquisition work on the next Idaho Cleanup Project contract. The current contract expires in 2012

A process vessels being lifted into place at the Sodium Bearing Waste Treatment Project

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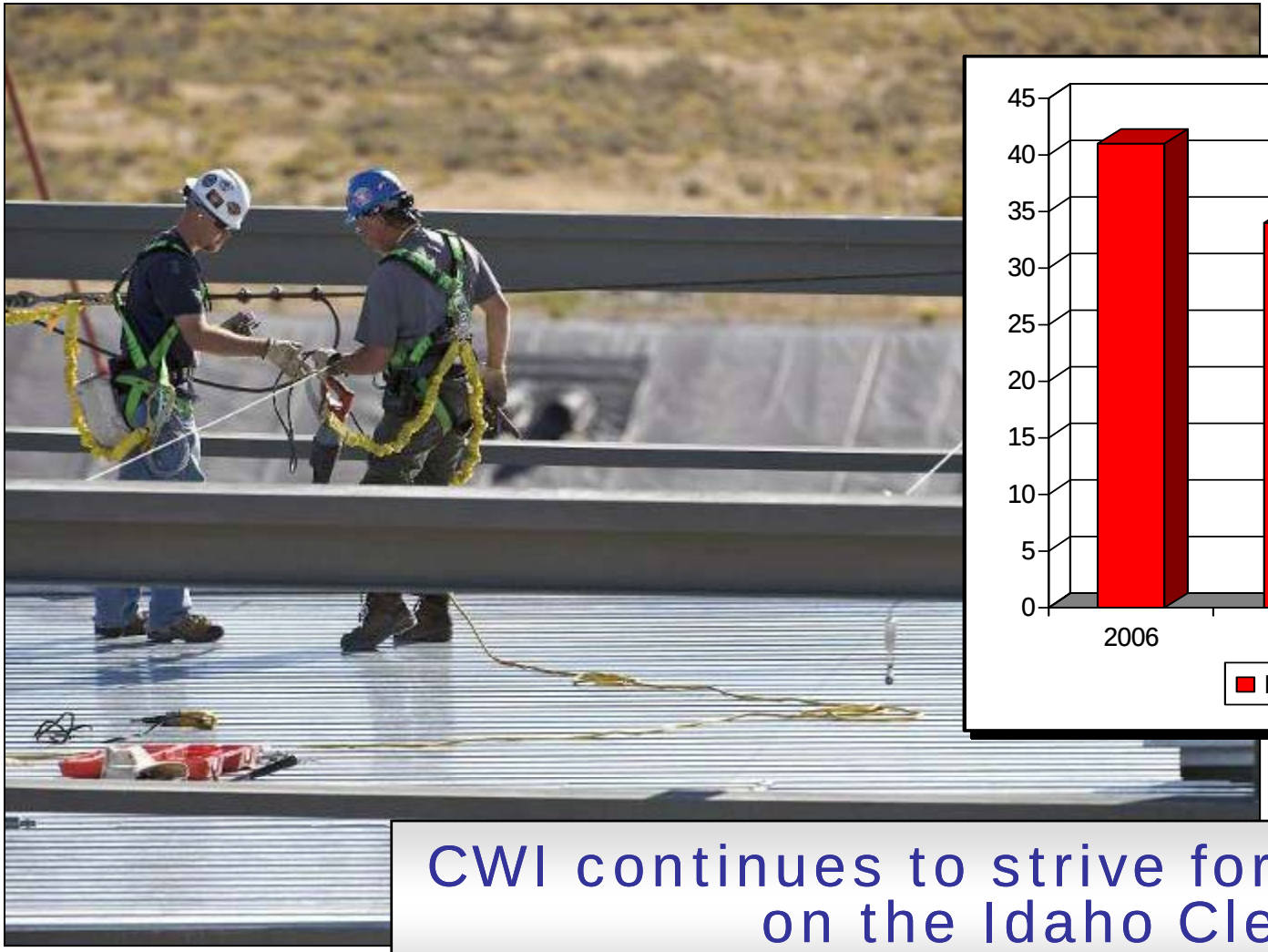
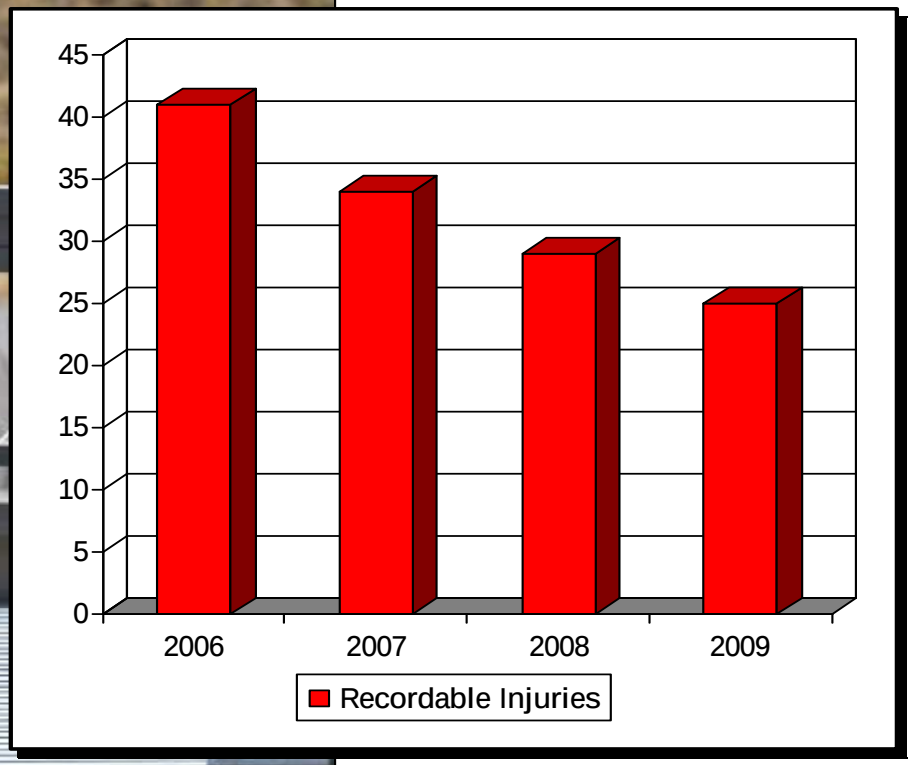
## Idaho Cleanup Project
## Department of Energy- Idaho Operations Office


**John Fulton**
**President and Chief Executive Officer**
**CH2M-WG Idaho, LLC (CWI)**

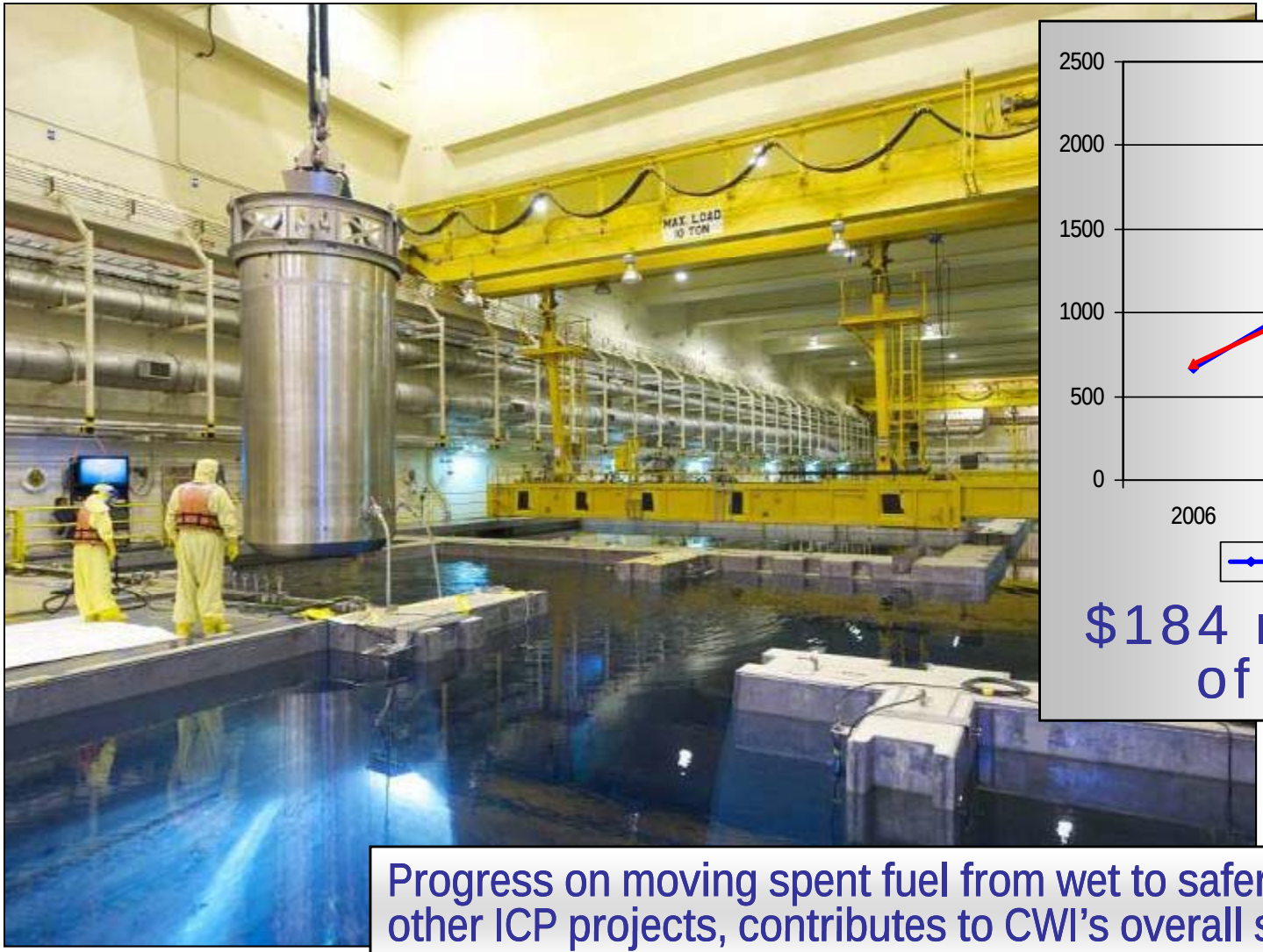
# CWI Overall Safety Performance

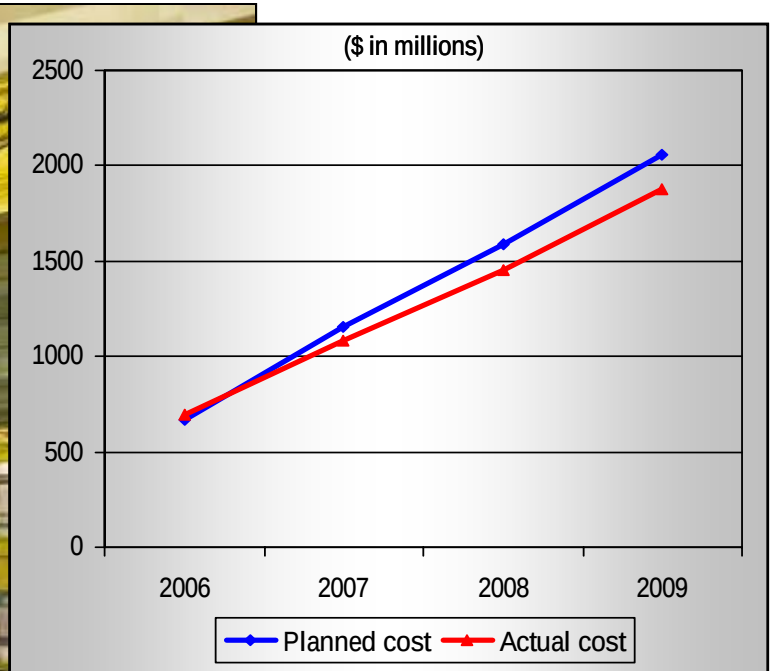





CWI continues to strive for zero injuries on the Idaho Cleanup Project

# CWI Overall Target Schedule Performance

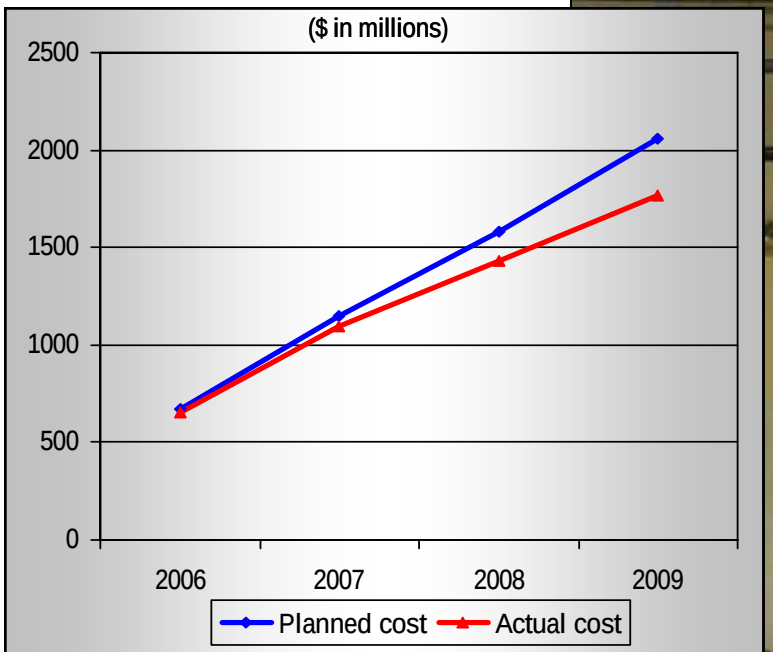



$184 million ahead of schedule

Progress on moving spent fuel from wet to safer dry storage, and other ICP projects, contributes to CWI's overall schedule performance

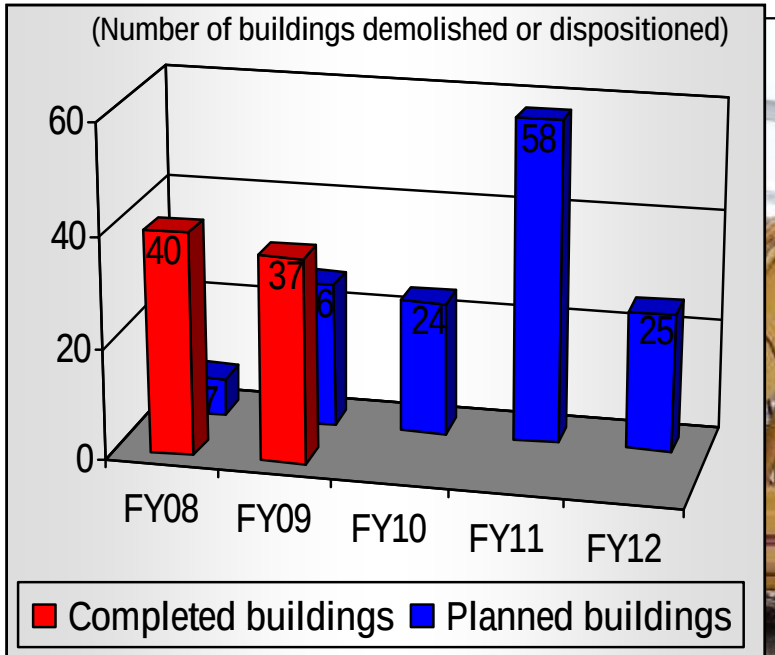
# CWI Overall Cost Performance




**$291 million under cost through 2009**

**An ICP worker processes remote-handled transuranic waste for final disposal at WIPP, contributing to CWI's cost performance**

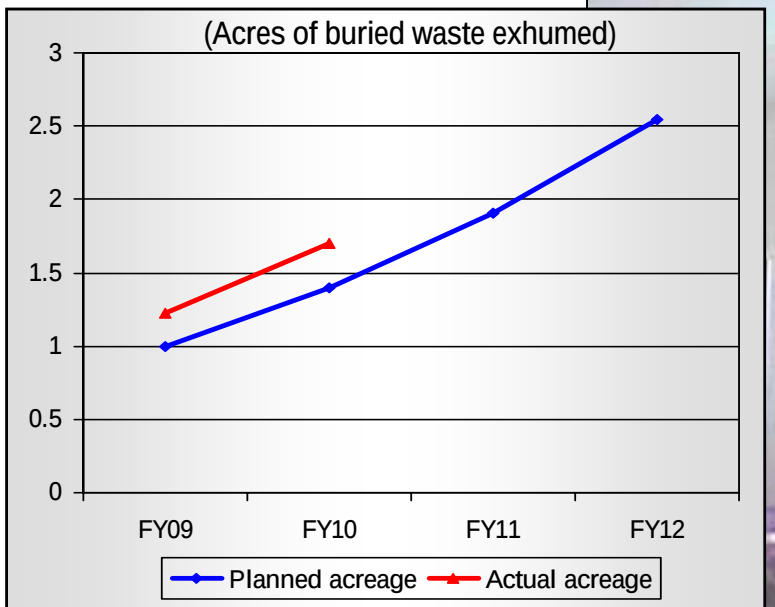
# CWI D&D Performance




Ahead of schedule on building D&D

Saved or created over 600 jobs and accelerated cleanup with American Recovery & Reinvestment Act funds

# Buried Waste Exhumation Performance




Ahead of schedule on buried waste exhumation

Keeping our commitments to the citizens of Idaho

# Sodium-Bearing Waste Treatment Plant Progress

## Protecting the Snake River Plain Aquifer for current and future generations

# Summary

- Employee-owned safety culture (24/7)
- Cost and schedule performance excellence
- Risk reduction/protection of the Snake River Plain Aquifer
- Delivering what we promised (and more)
- Partnership with stakeholders and regulators

*All of these things enable our success in completing our mission, protecting our workers, Idaho residents, and the environment*

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## Advanced Mixed Waste Treatment Project

## Department of Energy-Idaho Operations Office


***Jeffrey D. Mousseau, P.E.***
***President and General Manager***
***Bechtel BWXT Idaho, LLC***

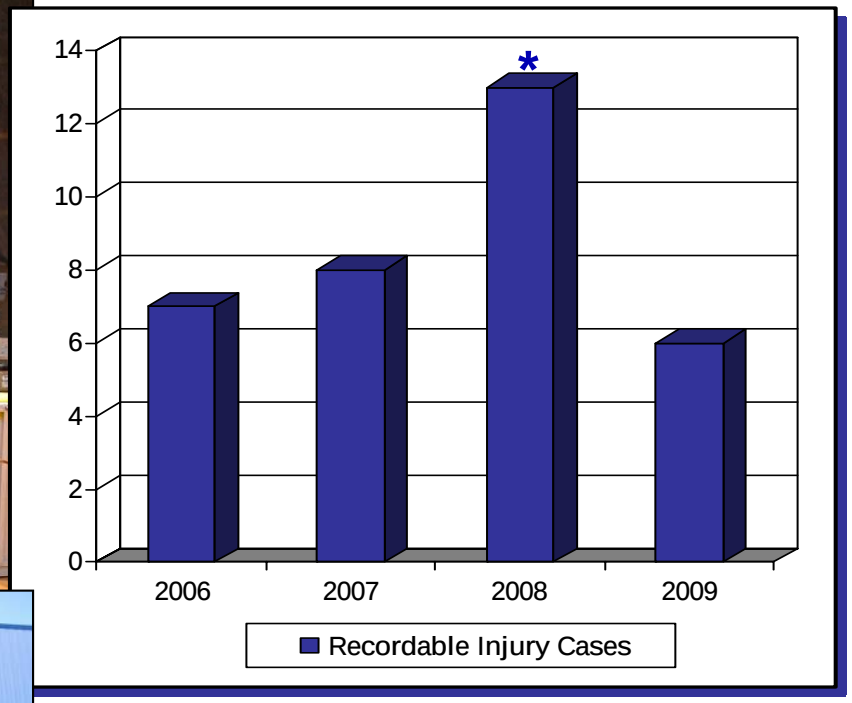
# AMWTP Scope Of Work

***Bechtel BWXT Idaho manages and operates the Advanced Mixed Waste Treatment Project for the U.S. Department of Energy at the Department's Idaho Operations site.***

Workers at AMWTP focus on the safe and compliant retrieval, characterization, treatment and shipment of 65,000 cubic meters of historically managed stored transuranic nuclear waste for permanent disposal at sites outside of Idaho and to support the receipt and treatment of transuranic waste from other DOE sites for shipment to the Department's Waste Isolation Pilot Plant.

*Transuranic waste shipments from the Department's Idaho Site arriving at the DOE's Waste Isolation Pilot Plant.*

# Safety Is An AMWTP Core Value




AMWTP Employees attained VPP Star Status, July 2009

*More than **6 years** and **9.7 million hours** without a lost-time accident, and a lost-workday rate of zero*

**Winter 2008-09 experienced slips and falls. Developed Winter Safety Plan with significant reduction in slips and falls during winter 2009-10*

# Technology Improvements

***Improvements have increased operation time in the Treatment Facility to over 90 percent and treated hundreds of problematic waste drums and boxes.***

- Vibratory mixing of sludge successfully developed, demonstrated, and put into production
- Sonic mixing of liquid entrained sludge successfully demonstrated
- Plant improvements have included:
  - Improved robotic tools
  - Assay software upgrades
  - Back-up waste shipping crane
  - Six drum overpack waste processing
  - Waste processing tent construction and startup
  - Replacement box cutting robotic saw

**Six drum overpack waste processing**

**Shaker table**

**Box cutting robotic saw upgrade**

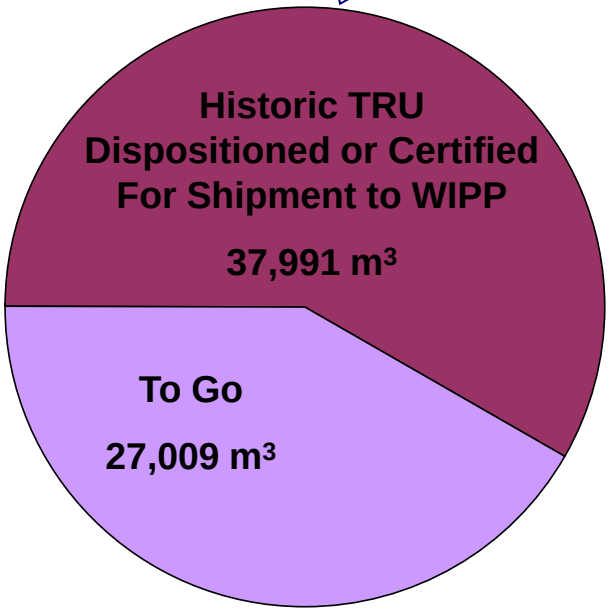
**Robotic shearing tool**

# AMWTP Unsurpassed In Production

*Low-level waste shipment*

*Idaho State Police inspect every shipment of waste leaving AMWTP*

**3,101 m³ BBWI (2000-2002)**
**34,890 m³ AMWTP**




*As of Feb. 10, 2010*

**NOTE**: From other sources, 2,278 cubic meters have been dispositioned or certified for shipment and 15,877 cubic meters to go. When combined with figures above, these total the lifecycle of 83,155 cubic meters cited in the FY 2011 budget.

*Mixed low-level waste shipment*

**Completed 59 percent of stored Inventory**

*A shipment of transuranic waste on the road to WIPP*

# AMWTP Cost and Schedule Achievements

- **Schedule Achievement**
  - AMWTP success has DOE on track to meet the 1995 Idaho Settlement Agreement
  - Installed an ANSI 748 compliant Earned Value Management System in 2009
- **Maintain Compliance**
  - Three successive years of passing Waste Isolation Pilot Plant and Nevada Test Site audits with no findings
  - More than 3,000 safe and compliant transuranic waste shipments without incident
  - Receipt, characterization and shipment of off-site waste
- **EM American Recovery and Reinvestment Act Goals**
  - Created jobs for 52 new employees
  - Completed all FY09 ARRA work including waste shipments, problem waste treatment, and accelerated retrieval
  - On track to complete all FY10 ARRA work
- **Improved Operations**
  - Six Sigma savings of nearly $11 million in 2009
  - Waste compaction reduces storage space and transportation costs

# AMWTP: Meeting The Public's Interest

- On schedule to meet the 1995 Idaho Settlement Agreement completion date by shipping over 38,000 cubic meters of the 65,000 cubic meters out of Idaho
- Meeting safety and compliance requirements
- Providing value to taxpayers with lowest waste processing costs
- Fulfilling expectations of the American Recovery & Reinvestment Act
- Providing DOE with a regional resource for transuranic waste treatment