

# Integrating with Cleanup Needs

The Office of Science and Technology is involved in the planning stages of site cleanup plans

- ◆ **Accelerated Site Technology Deployment**, designed to spur widespread application of innovative technologies, has resulted in more than 125 deployments at 22 DOE sites
- ◆ Tanks Focus Area defined candidate processing paths for Idaho tank high level waste **Environmental Impact Statement**
- ◆ Subsurface Contaminants Focus Area **technical assistance teams** identified innovative technologies to remediate groundwater at Paducah and Pantex

**OST support helps sites address EM's toughest challenges**

- ◆ Supercritical Fluid Extraction Moisture Measurement reliably qualifies **nuclear materials** for transportation off-site and subsequent disposal
- ◆ Environmental Management Science Program contributed to solutions to **pour spout problems** at the Defense Waste Processing Facility
- ◆ Tanks Focus Area is managing the R&D portion of the **Salt Processing Project** at Savannah River

**Innovative technologies reduce technical risk and help sites meet compliance agreements**

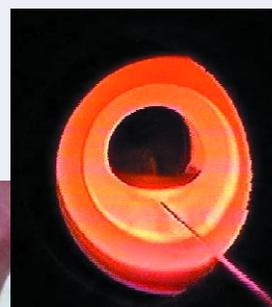
- ◆ Advanced robotics and waste sampling methods enabled a state-approved **closure plan** to be developed on schedule for Idaho high level waste tanks
- ◆ Deactivation and Decommissioning Focus Area technologies for **decontamination and size reduction** of gloveboxes will help Rocky Flats meet closure milestones



**Technical Assistance Teams** address urgent, high-visibility problems that require national scientific and technical support



**Supercritical Fluid Extraction** reliably measures moisture content of nuclear materials to meet shipping and disposal criteria



Science-based **Pour Spout Enhancements** reduced downtime at the Savannah River Defense Waste Processing Facility



**Accelerated Site Technology Deployment** promotes multisite deployment of technologies like the Segmented Gate System which sorts clean soil from contaminated soil



# Solutions

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## Accelerated Site Technology Deployment

OST established ASTD in 1998 to promote multisite deployment of new cleanup technologies. ASTD deployed 73 technologies at multiple sites in FY1998 and FY1999, 58 in FY2000. In FY2000, the program required participating sites to fund at least half of the deployment costs, complete projects within two years, and work with other deployments already planned. ASTD anticipates that multiple site deployments will rise dramatically in the near term.

## Idaho Tank Waste Environmental Impact Statement

At the request of DOE-Idaho, the Tanks Focus Area conducted an independent assessment of alternatives being considered for treatment of Sodium Bearing Waste (SBW) and calcine waste as part of the environmental impact statement process. The TFA review selected direct vitrification as the preferred alternative for treatment of SBW. This recommendation supports critical state agreement milestones for treatment and disposal of the liquid SBW.

## Technical Assistance Teams

Groups of the brightest scientists and engineers from universities, laboratories, and the private sector targeting specific high-priority EM needs are available to EM sites to provide technical assistance for urgent on-site consultation and problem solving.

At the Paducah Gaseous Diffusion Plant in Kentucky, a team from the Subsurface Contaminants Focus Area recommended ways to accelerate cleanup of on- and off-site groundwater. The team worked with staff of the Innovative Treatment Remediation Demonstration Program to identify about 30 technologies that could enhance remediation and reduce costs.

A technical assistance team staffed by the SCFA Lead Lab also went to the Pantex site to respond to the discovery of trichloroethylene in the Ogallala Aquifer beneath the plant. The team recommended several groundwater characterization improvements and identified and outlined innovative technologies to remediate and monitor potential contaminants.

## Supercritical Fluid Extraction Moisture Measurement [#3002]

Thousands of kilograms of plutonium materials at DOE sites must be stabilized and repackaged for shipment to long-term storage, but the inadequacies of current moisture measurement technology is jeopardizing site closure milestones and stakeholder agreements. New instrumentation has been developed and deployed to improve reliability and avoid unnecessary, time

consuming, and costly repackaging of previously canned nuclear materials. This technique for moisture measurement provides more accurate results and avoids the need for transporting samples to a laboratory. Deployed at Hanford and will be deployed at Rocky Flats and Savannah River.

## DWPF Melter Pouring Enhancements [#2092]

When the Defense Waste Processing Facility at the Savannah Rive Site experienced problems with the pour spout for molten glass containing high level waste, the Tanks Focus Area and scientists from Florida International University and Clemson University worked with plant engineers to solve the problem. The team developed a “sacrificial spout insert” to regulate the flow as a short-term solution and the lessons learned on the characteristics of the flow stream will have a major impact on the pour spout design on the next generation melter.

## Salt Processing Project [#21, #3088, and #3089]

In March 2000, DOE asked the Tanks Focus Area to manage the research and development portion of the Salt Processing Project at Savannah River for the selection, design, construction, and operation of pretreatment technologies and facilities to prepare salt waste feed material for subsequent treatment. TFA is reviewing and revising the existing technology development roadmaps, developing selection criteria, and preparing a comprehensive R&D program plan for three candidate cesium removal technologies, as well as alpha and strontium removal technologies.

## High Level Waste Tanks Closure Plan

Advanced robotics and waste sampling methods helped the Idaho National Engineering and Environmental Laboratory meet the state-approved compliance agreement for a closure plan for high-level waste tanks above the Snake River Plains Aquifer.

## Glove Box Decontamination

More than 900 plutonium-contaminated gloveboxes must be removed, cut up, and disposed of to meet the accelerated Rocky Flats site closure goal of FY 2006. The baseline method—workers in cumbersome protective gear using hand tools—couldn't have met schedule or budget requirements. The Deactivation and Decommissioning Focus Area has provided several innovative technologies that revolutionize the process including the **Decommissioning In-Situ Plutonium Inventory Monitor [#2241]**, the **Inner Tent Chamber [#3058]**, and the **Standard Waste Box Crate Counter [#2917]**.

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The Tech ID number [#] is used in the Technology Management System. For additional information, visit the Office of Science and Technology Website <http://ost.em.doe.gov>