

In Well Vapor Stripping

(OST Ref. No. 6)

In-Well Vapor Stripping (IWVS) extracts volatile organic compounds (VOCs) dissolved in groundwater, and removes these contaminants as a vapor. The technology is based on a well within a well design (i.e., an airlift pump within a well). Groundwater is recirculated by air injected through the inner well. VOCs dissolved in groundwater are stripped and transferred in the off-gas stream. The outer well delivers the off-gas stream to the surface for treatment. The outer well delivers the off-gas stream to the surface for treatment. Effective deployment requires a rather highly permeable aquifer.

DESCRIPTION OF THE DEPLOYMENT

Location: Massachusetts Military Reservation, Cape Cod, MA

Project Name: Otis AFB

Date of Deployment: December, 1996-
(Ongoing) **Technology User:** Air Force Center for
Environmental
excellence (AFCEE)

Deployment Value/Impact: Deployment involves 6 wells tapping 2 distinct VOC plumes (TCE, PCE, DCE). The NoVOCs technology is compared with a circulating well setup marketed by SBP Technologies (a German vendor). Atmospheric emission of extracted VOCs has not been approved by regulators due to the proximity to a densely populated area, hence the off-gas is absorbed by carbon filters. Unlike the application of Pump-and-Treat, the application of IWVS here is particularly valuable by eliminating adverse impact on sensitive hydrologic environment (shallow surface ponds).

Point of Contact:

User Program POC:

Spence Smith (AFCEE), Tel. 508-968-4670,
ext. 5603

OST Program POC:

Jim Wright, Tel. 803-725-5608

TECHNOLOGY DEVELOPMENT INFORMATION

Major Developers:

EG&G Environmental, Inc., Stanford University Dept. of Geological & Environmental Sciences, Pacific Northwestern National Laboratories (PNNL), NoVOCs, Inc.

Funding Information: (\$ in Thousands):

Total Estimated Funding: \$8,031

Other Deployments:

- In FY 1990, at Savannah River Site (SRID site), Aiken, SC
- In FY 1996, at Edwards Air Force Base, Rosamond, CA
- In FY 1997, at Brookhaven National Laboratory, Upton, NY
- In FY 1997, at Savannah River Site, Aiken, SC

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DESCRIPTION OF THE DEPLOYMENT

Location: Savannah River Site, Aiken, SC

Project Name: SR-ER06, South A & M Area Ground Water Plume

Date of Deployment: January, 1997

Technology User: Westinghouse
Savannah River
Company (WSRC)

Deployment Value/Impact: IWVS is used to remediate a VOC (TCE and PCE) contaminated confined aquifer. A series of recirculation wells are providing plume control at the 500 ppb iso-concentration contour. A Treatability study in one of the two installed wells indicated a removal rate of 2 lb/day.

Point of Contact:

User Program POC:
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OST Program POC:
Jim Wright (SRS EM-50), Tel. 803-725-5608

TECHNOLOGY DEVELOPMENT INFORMATION

Major Developers:

EG&G Environmental, Inc., Stanford University Dept. of Geological & Environmental Sciences, PNNL, NOVOCs, Inc.

Funding Information: (\$ in Thousands):

Total Estimated Funding: \$8,031

Other Deployments:

- FY 1996 at Edwards Air Force Base, Rosamond, CA
- FY 1997 at Brookhaven National Laboratory, Upton, NY
- FY 1997 at Otis AFB, Cape Cod, MA

Dynamic Underground Stripping

(OST Ref. No. 7)

Dynamic Underground Stripping uses steam injection to sweep contaminants from permeable sediments, coupled with resistance (electrical) heating of interlayered clays to drive contaminants into the permeable sediments. Condensed steam and mobilized contaminants are then recovered through pumping extraction wells in the center of the plume.

DESCRIPTION OF THE DEPLOYMENT

Location: Commercial Site Visalia, Owner Southern California Edison

Project Name: Visalia, CA (non-DOE)

Date of Deployment: January 1997

Technology User: Steam Tech Inc.

Deployment Value/Impact: The successful deployment at Visalia demonstrated that the combination of DUS/HPO can effectively remediate DNAPL source contamination. DUS mobilizes the contaminants so they can be brought to the surface for treatment and disposal, and HPO insitu destroys contaminant by oxidation. The combination of the two processes at Visalia has cleaned up the site at a rate up to 2000 faster than pump and treat. The elevated temperatures resulting from these processes has also enhanced the rate of bioremediation.

Point of Contact:

User Program POC:

Mr. Kim V. Abbott (DOE-Oakland) - Tel. 510-637-1501

OST Program POC:

Mr. Jim A. Wright (DOE-SR) - Tel. 803-725-5608

TECHNOLOGY DEVELOPMENT INFORMATION

Major Developers:

Lawrence Livermore National Laboratory

Funding Information: (\$ in Thousands):

Total Estimated Funding: \$15,368

Other Deployments:

Deployed (type: DOE) in FY 1995 at Lawrence Livermore National Laboratory (Gasoline Spill Site; GSA Livermore) in Livermore, CA

Alternative Landfill Cover

(OST Ref. No. 10)

The Alternative Landfill Cover Demonstration (ALCD) is a large-scale field demonstration comparing innovative landfill covers specifically designed for dry environments with currently accepted EPA cover designs as baselines. These covers are installed and instrumented in a side-by-side arrangement. Each test plot is 300 feet long; peaked in the middle with 150 feet sloping at 5 percent toward the west, and the other 150 feet half sloping at 5 percent toward the east. The eastern half of each test plot will be evaluated under ambient conditions, with the western side evaluated under 'stressed' conditions, controlled by a rain simulation system. The covers will be evaluated and compared based on construction, cost, and performance criteria. Some of the alternative designs will emphasize such things such as unsaturated hydraulic conductivity, increased water storage potential to allow for eventual evaporation, and increased transpiration through engineered vegetative covers. The alternative covers were designed to take advantage of local materials to allow for easier construction of the covers at substantial savings. The key to gaining general acceptance of any new environmental technology is obtaining regulatory approval. The ALCD is addressing this issue by involving the EPA and environmental divisions from the western states in the project. This is aiding in gaining acceptance of the new technologies and is encouraging interstate cooperation. The Western Governors Association and Committee to Develop On-Site Innovative Technologies are working with Sandia National Laboratories (SNL) to promote interstate cooperation.

DESCRIPTION OF THE DEPLOYMENT

Location: Lee Acres, Bureau of Land Management, Deployed SNL Cover #1

Project Name: Non DOE-PBS number not applicable

Date of Deployment: September 1997 **Technology User:** Bureau of Land Management

Deployment Value/Impact: One landfill cover designed and patented by SNL was installed on the number one priority landfill site of BLM. The use of this cover compared to the cost of standard RCRA Subtitle C and Subtitle D covers, saved \$250,000 and dropped two years of the schedule for covering the landfill.

Point of Contact:

User Program POC:
Gerald L. Pease SNL Tel. 505-284-2472

OST Program POC:
Scott McMullin (DOE-SR) Tel. 803-725-9596

TECHNOLOGY DEVELOPMENT INFORMATION

Major Developers:

Sandia National Laboratory

Funding Information: (\$ in Thousands):

Total Estimated Funding: \$11,091

Other Deployments:

- Deployed (type: Unknown) in FY 1999 at SNL (Mixed Waste Landfill) in Albuquerque, NM
- Deployed (type: Non-DOE) in FY 1998 at Warren AFB in Sundance, WY
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Dig Face Characterization

(OST Ref. No. 12)

The Dig Face Characterization project demonstrates multiple sensors that can be used as part of a retrieval effort. The digface-characterization technology will allow continuous and continually improving monitoring and characterization of the site being remediated. The digface-characterization technique is integrated into the remediation process itself. As retrieval progresses, the capability to interpret sensor data improves by comparing interpreted data images with the retrieved targets. Geophysical, chemical, and radiological sensors are deployed on a remotely controlled and monitored platform system. The sensors scan over the surface being remediated. As waste retrieval proceeds, the sensors are continuously deployed to characterize the remaining waste. Remediation proceeds in a methodical manner in which the characterization data are interpreted in real-time to support the retrieval process. The primary objective is to develop and demonstrate a field-ready mobile platform that contains geophysical, chemical, and radiological sensors to provide constant surveillance and screening for all categories of hazards at the digface during excavation. The digface system will be used later in 1996 to assist in the excavation of contaminated soils at the SNL Tech Area II Radioactive and Classified Landfills. This demonstration of the digface technology will show its adaptability to various excavation strategies and its flexibility during a complicated, multiphased remediation, such as the one planned at SNL.

DESCRIPTION OF THE DEPLOYMENT

Location: Mound Site, Ohio

Project Name: Miamisburg/Erie Canal Remediation

Date of Deployment: August 1997

Technology User: EM-40 Ohio Operations Office

Deployment Value/Impact: This characterization technology eliminated the need for sampling and soil analysis, and produces a cost savings through the avoidance of excavation and cleaning of large amounts of soil.

Point of Contact:

User Program POC:

- Aran Armstrong (DOE-ID) - Tel. 208-526-5199
- Mike Carpenter (LMITCO) - Tel. 208-526-8467

OST Program POC:

Jim Wright (DOE-SRS) - Tel. 803-725-5608

TECHNOLOGY DEVELOPMENT INFORMATION

Major Developers:

EM-50 and EM-40 at INEEL

Funding Information: (\$ in Thousands):

Total Estimated Funding: \$5,504

Other Deployments:

Demonstrated in FY 1995 at Ohio (Mound Plant) in Miamisburg, OH

Electrical Resistance Tomography for Subsurface Imaging

(OST Ref. No. 17)

Electrical Resistance Tomography (ERT) is a technique based on the measurement of electrical resistance in the soil and rock, which has been developed for site characterization and monitoring of the remediation processes in the subsurface; and monitoring for water saturation changes in rock. ERT has been used for the past few years to help characterize Yucca Mountain, a possible site for high-level disposal. During 1997 ERT was instrumental in the Single Heater Test and Large Block Test characterizing the effect of heating a block of the mountain to simulate the effect of radioactive heat. ERT will be deployed in FY98 in a multiyear Drift Scale Test heating a larger volume of the rock. The nondestructive imaging over the heated region provided regulators with subsurface mapping of temperature and moisture movement plus an indication of water chemistry, complementary to the ground penetrating radar technique used.

DESCRIPTION OF THE DEPLOYMENT

Location: Yucca Mountain, adjacent to the Nevada Test Site near Mercury, NV

Project Name: Yucca Mountain Site Characterization Project

Date of Deployment: October 1996 - September 1997 **Technology User:** Woodward-Clyde/TRW

Deployment Value/Impact: ERT is an important geophysical tool that has been used at the Yucca Mountain Project, and continued to be used as an integral tool in ongoing tests. Because of its value in helping unravel complex, coupled thermal, hydrologic, and chemical processes, its use at the Yucca Mountain Project has grown with time. The data and knowledge obtained through ERT will be used in helping the DOE and regulators determine whether or not the proposed repository is suitable and licensable.

Point of Contact:

User Program POC:

William Boyle, DOE/RW-NV, 702-794-5506

OST Program POC:

Dirk Schmidhofer, DOE-NV, 702-295-0159

TECHNOLOGY DEVELOPMENT INFORMATION

Major Developers:

Lawrence Livermore National Laboratory

Funding Information: (\$ in Thousands):

Total Estimated Funding: \$410

Other Deployments:

- 1991 - Main Site, Lawrence Livermore National Laboratory, Livermore, CA
- 1997 - Site 300, Lawrence Livermore National Laboratory, Livermore, CA
- 1996-8 Commercial Sites

Electrical Resistance Tomography for Subsurface Imaging

(OST Ref. No. 17)

Electrical Resistance Tomography (ERT) is a technique based on the measurement of electrical resistance in the soil and rock, which has been developed for site characterization and monitoring of the remediation processes in the subsurface; monitoring for tank leaks and water saturation changes in the rock. ERT was deployed at Site 300 infiltration ponds to detect leaks in the pond liner. The actual electromagnetic technique used is called excitation of mass and is a separate patent from other ERT patents. This is the first known deployment of this technique at DOE sites.

DESCRIPTION OF THE DEPLOYMENT

Location: Site 300, Lawrence Livermore National Laboratory, Livermore, CA

Project Name: Site 300 Pond Liner Leak Mapping Project

Date of Deployment: July 1997

Technology User: Lawrence Livermore
National Laboratory

Deployment Value/Impact: Electrical Resistance Tomography (ERT) was deployed to provide real-time process control. No other technology existed that could have provided noninvasive 2/3-D imaging of leaks through a pond liner.

Point of Contact:

User Program POC:
Joe Wong, DOE-STCG, 510-637-3184

OST Program POC:
Dirk Schmidhofer, DOE-NV, 702-295-0159

TECHNOLOGY DEVELOPMENT INFORMATION

Major Developers:

Lawrence Livermore National Laboratory

Funding Information: (\$ in Thousands):

Total Estimated Funding: \$410

Other Deployments:

- 1991 - Main Site, Lawrence Livermore National Laboratory, Livermore, CA
- 1997 - Yucca Mountain Nevada Test Site, Mercury, NV
- 1997 - Commercial Sites - Edison

Electrical Resistance Tomography for Subsurface Imaging

(OST Ref. No. 17)

Electrical Resistance Tomography (ERT) is a technique based on the measurement of electrical resistance in the soil and rock, which has been developed for site characterization and monitoring of remediation processes in the subsurface. ERT has been used since 1993 to help image remediation processes such as soil heating, electrokinetics, pump and treat, Dynamic Stripping and Hydrous Pyrolysis Oxidation. A commercial Edison site was contaminated with hundreds of thousands of gallons of DNAPLs and had been using pump and treat method to cleanup. Instead of more than 30 years of pump and treat, HPO was applied and most of the DNAPLs in the subsurface were destroyed in the first year of application. Electrical Resistance Tomography provides real-time imaging of the movement of steam in the subsurface allowing operators to control in real time the continued injection of steam.

DESCRIPTION OF THE DEPLOYMENT

Location: Commercial Sites - Edison

Project Name: DNAPL Remediation Project using Hydrous Pyrolysis Oxidation and Electrical Resistance Tomography

Date of Deployment: July 1997

Technology User: Steam Tech Inc.

Deployment Value/Impact: Electrical Resistance Tomography was used for real-time process control of the Hydrous Pyrolysis Oxidation remediation process. No other technology can provide real-time data on steam flow to allow control of the steam injection process.

Point of Contact:

User Program POC:
Joe Wong, DOE-STCG, 510-637-3184

OST Program POC:
Dirk Schmidhofer, DOE-NV, 702-295-0159

TECHNOLOGY DEVELOPMENT INFORMATION

Major Developers:

Lawrence Livermore National Laboratory

Funding Information: (\$ in Thousands):

Total Estimated Funding: \$410

Other Deployments:

- 1991 - Main Site, Lawrence Livermore National Laboratory, Livermore, CA
- 1997 - Yucca Mountain Nevada Test Site, Mercury, NV
- 1997 - Site 300, Lawrence Livermore National Laboratory, Livermore, CA

In-Tank Grouting/Tank Closure

(OST Ref. No. 22)

In order for a radioactive waste storage tank to be closed, enough waste must be removed to meet regulatory requirements. After the waste is removed, a sludge-entraining reducing grout is poured into the tank. This grout traps and holds residual radionuclides, preventing them from leaching into the groundwater. Next, controlled low-strength material is added until it almost reaches the top of the tank's walls. A high-strength intrusion prevention pour is added next to fill the dome space. Finally, the risers are filled with higher strength concrete as a seal; and final activities such as capping the distribution pipes and finishing the surface are completed.

DESCRIPTION OF THE DEPLOYMENT

Location: DOE-SR, F-Tank Farm, Tank 20

Project Name: SR-HL02 F Tank Farm

Date of Deployment: May-September
1997

Technology User: Westinghouse
Savannah River Co.

Deployment Value/Impact: Using improved grouts and grouting techniques the Savannah River Site (SRS) was able to close Tank 20. The SRS has a regulatory agreement to remove from service by the year 2028 its 24 high level waste tanks that do not satisfy the full secondary containment criteria. To remove the tanks from service, the waste must be removed and the tanks must be closed. Closing the tanks involves trapping the residual waste and making the tank structurally sound. This approach defined a closure process and an acceptable end state such that the DOE can confidently proceed toward closing other high level waste tanks at SRS and in the DOE complex.

Point of Contact:

User Program POC:

Tom Gutmann, DOE-SR, Tel. 805-208-7408

OST Program POC:

Billie Mauss, DOE-RL, Tel: 509-372-4512

TECHNOLOGY DEVELOPMENT INFORMATION

Major Developers:

- Westinghouse Savannah River Company
- Los Alamos National Lab

Funding Information: (\$ in Thousands):

Total Estimated Funding: \$1,405

Other Deployments:

FY97 deployment at Savannah River Site (F-Tank Farm, Tank 17) in Aiken, SC

In-Tank Grouting/Tank Closure

(OST Ref. No. 22)

In order for a radioactive waste storage tank to be closed, enough waste must be removed to meet regulatory requirements. After the waste is removed, a sludge-entraining reducing grout is poured into the tank. This grout traps and holds residual radionuclides, preventing them from leaching into the groundwater. Next, controlled low-strength material is added until it almost reaches the top of the tank's walls. A high-strength intrusion prevention pour is added next to fill the dome space. Finally, the risers are filled with higher strength concrete as a seal; and final activities such as capping the distribution pipes and finishing the surface are completed.

DESCRIPTION OF THE DEPLOYMENT

Location: DOE Savannah River Site, F-Tank Farm, Tank 17

Project Name: SR-HL02 F Tank Farm

Date of Deployment: August 1997

Technology User: Westinghouse
Savannah River
Company

Deployment Value/Impact: Using improved grouts and grouting techniques the Savannah River Site (SRS) was able to close Tanks 17. In closing Tank 17, a 7-Point Grout Pour Methodology was used. The SRS has a regulatory agreement to remove from service by the year 2028 its 24 high level waste tanks that do not satisfy the full secondary containment criteria. To remove the tanks from service, the waste must be removed and the tanks must be closed. Closing the tanks involves trapping the residual waste and making the tank structurally sound. This approach defined a closure process and an acceptable end state such that the DOE can confidently proceed toward closing other high level waste tanks at SRS and in the DOE complex.

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Tom Gutmann, DOE-SR, Tel. 805-208-7408

OST Program POC:

Billie Mauss, DOE-RL, Tel: 509-372-4512

TECHNOLOGY DEVELOPMENT INFORMATION

Major Developers:

- Westinghouse Savannah River Company
- Los Alamos National Lab

Funding Information: (\$ in Thousands):

Total Estimated Funding: \$1,405

Other Deployments:

1997 Savannah River Site F-Tank Farm, Tank 20

Stabilized Contaminants using Envirocare Polymer Macroencapsulation

(OST Ref. No. 30)

Polymer Macroencapsulation is a process that encases debris containing mixed low-level waste in an inert, stable, polyethylene monolith suitable for permanent disposal in a hazardous waste landfill. The process involves extruding molten low density polyethylene into a specially designed container partially filled with pieces of a solid, contaminated waste such as lead or debris. The plastic flows around, over, and between pieces of waste, coating and bonding to all surfaces of the waste matrix.

DESCRIPTION OF THE DEPLOYMENT

Location: DOE - Oak Ridge - Contaminated lead and debris waste was shipped from a FUSRAP site in Colonie, New York to Envirocare of Utah, Inc. in Clive, Utah. This waste was treated and disposed of at Envirocare of Utah, Inc.

Project Name: WM-23 - Treatment of Heterogeneous Waste

Date of Deployment: May 1997

Technology User: Envirocare of Utah, Inc.

Deployment Value/Impact: Eliminated 11,520 lbs. of debris and lead waste from a FUSRAP site in Colonie, New York using the polymer macroencapsulation process at a commercial facility under a cooperative agreement with the Department of Energy. This is a relatively simple and cost-effective process to stabilize lead and debris waste in accordance with Resource Conservation and Recovery Act (RCRA) Land Disposal Restrictions (LDRs). This waste was treated and disposed of at Envirocare of Utah.

Point of Contact:

User Program POC:

Pat Trudell, DOE-ID, (208) 526-0169

OST Program POC:

- Bill Owca, DOE-ID, (208) 526-1983
- Greg Borden, FUSRAP - Colonie, New York, (423) 576-4314
- Vince C. Maio, INEEL, (208) 526-3696

TECHNOLOGY DEVELOPMENT INFORMATION

Major Developers:

- Department of Energy
- Brookhaven National Laboratory (BNL)
- Idaho National Engineering and Environmental Laboratory
- Envirocare of Utah, Inc.

Funding Information: (\$ in Thousands):

Total Estimated Funding: \$3,082

Other Deployments:

- Deployed (type: DOE) in FY 1997 at General Atomics (Oakland (four laboratories)) in Oakland, CA
- Deployed (type: DOE) in FY 1997 at Hanford in Richland, WA
- Deployed (type: DOE) in FY 1997 at INEEL (MARE Island and Charleston NSY (MARE Island and Charleston NSY) in Idaho Falls, ID
- Deployed (type: DOE) in FY 1997 at Los Alamos (Los Alamos National Laboratory) in Albuquerque, NM
- Deployed (type: Non-DOE) in FY 1997 at Naval Nuclear Program Sites (6 sites) (Pudget Sound, Pearl Harbor, Norfolk, Knolls Atomic, KAPL Kessring, and Bettis Atomic) in Clive, UT
- Deployed (type: DOE) in FY 1997 at Argonne East (Argonne National Laboratory) in Chicago, IL

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- Deployed (type: DOE) in FY 1997 at Fernald (Fernald site) in Fernald, OH
- Deployed (type: DOE) in FY 1997 at Nevada Test Site (Nevada Test Site) in Las Vegas, NV
- Deployed (type: DOE) in FY 1997 at Pinellas (Pinellas Plant) in St. Petersburg, FL
- Deployed (type: DOE) in FY 1997 at Brookhaven National Laboratory (Unknown) in New York City (Suffolk County,, NY
- Deployed (type: DOE) in FY 1997 at Battelle - Columbus (BMI's Battelle-Columbus Laboratories King Avenue Site) in Columbus, OH
- Deployed (type: DOE) in FY 1997 at Oak Ridge National Laboratory (Unknown) in Oak Ridge, TN
- Deployed (type: DOE) in FY 1997 at Paducah (lead and debris waste) in Paducah, KY

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(OST Ref. No. 30)

Polymer Macroencapsulation is a process that encases debris containing mixed low-level waste in an inert, stable, polyethylene monolith suitable for permanent disposal in a hazardous waste landfill. The process involves extruding molten low density polyethylene into a specially designed container partially filled with pieces of a solid, contaminated waste such as lead or debris. The plastic flows around, over, and between pieces of waste, coating and bonding to all surfaces of the waste matrix.

DESCRIPTION OF THE DEPLOYMENT

Location: DOE-Nevada, lead and debris waste was shipped from the Nevada Test Site to Envirocare of Utah, Inc. in Clive, Utah where the waste will be treated and disposed of in accordance with RCRA LDRs.

Project Name: NV16-9801-16 Macro-Encapsulation of Lead and other mixed waste

Date of Deployment: June 1997

Technology User: Envirocare of Utah, Inc.

Deployment Value/Impact: Eliminated 11,200 lbs. of contaminated lead and debris waste from the Nevada Test Site using polymer macroencapsulation process at a commercial facility under a cooperative agreement with the Department of Energy. This is a relatively simple and cost-effective process to stabilize lead and debris waste in accordance with Resource Conservation Act (RCRA) Land Disposal Restrictions (LDRs). This waste was treated and disposed at Envirocare of Utah, Inc.

Point of Contact:

User Program POC:

Pat Trudell, DOE-ID, (208) 526-0169

OST Program POC:

- Bill Owca, DOE-ID, (208) 526-1983
- Collen O'Laughlin, NTS, (702) 295-0648
- Vince C. Maio, INEEL, (208) 526-3696

TECHNOLOGY DEVELOPMENT INFORMATION

Major Developers:

- Department of Energy
- Brookhaven National Laboratory
- Idaho National Engineering and Environmental Laboratory
- Envirocare of Utah, Inc.

Funding Information: (\$ in Thousands):

Total Estimated Funding: \$3,082

Other Deployments:

- Deployed in FY 1997 at General Atomics (four laboratories in southern California)
- Deployed in FY 1997 at Hanford in Richland, WA
- Deployed in FY 1997 at FUSRAP (Colonie Site) in Colonie, New York
- Deployed in FY 1997 at INEEL (MARE Island and Charleston NSY)
- Deployed in FY 1997 at Los Alamos National Laboratory in Albuquerque, NM
- Deployed in FY 1997 at Naval Nuclear Program Sites (6 sites)
- Deployed in FY 1997 at Argonne East (Argonne National Laboratory) in Chicago, IL
- Deployed in FY 1997 at Fernald in Fernald, OH
- Deployed in FY 1997 at Pinellas (Pinellas Plant) in Petersburg, FL
- Deployed in FY 1997 at Brookhaven National Laboratory (Unknown) in Long Island, NY
- Deployed in FY 1997 at Battelle - Columbus (BMI Battelle-Columbus Laboratories King Avenue Site) in Columbus, OH
- Deployed in FY 1997 at Oak Ridge National Laboratory in Oak Ridge, TN

Stabilized Contaminants using Envirocare Polymer Macroencapsulation

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- Deployed in FY 1997 at Paducah (lead and debris waste) in Paducah, KY

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DESCRIPTION OF THE DEPLOYMENT

Location: DOE-Albuquerque, contaminated lead and debris waste from Pinellas Plant in Petersburg, Florida was shipped to Envirocare of Utah, Inc. in Clive, Utah for treatment and disposal.

Project Name: AL-07-01-07-MW Treatment of Mixed Waste (Lockheed Martin Largo)

Date of Deployment: May 1997

Technology User: Envirocare of Utah, Inc.

Deployment Value/Impact: Eliminated 200 lbs of contaminated lead and debris waste from the Pinellas Plant using polymer macroencapsulation process at a commercial facility under a cooperative agreement with the Department of Energy. This is a relatively simple and cost-effective process to stabilize lead and debris waste in accordance with Resource Conservation and Recovery Act (RCRA) Land Disposal Restrictions (LDRs). This waste was treated and disposed at Envirocare of Utah, Inc. in Clive, Utah.

Point of Contact:

User Program POC:

Pat Trudell, DOE-ID, (208) 526-0169

OST Program POC:

- Bill Owca, DOE-ID, (208) 526-1983
- Richard Rossmeisal, Pinellas Plant, (813) 541-8812
- Vince C. Maio, INEEL, (208)526-3696

TECHNOLOGY DEVELOPMENT INFORMATION

Major Developers:

- Department of Energy
- Brookhaven National Laboratory
- Idaho National Engineering and Environmental Laboratory
- Envirocare of Utah, Inc.

Funding Information: (\$ in Thousands):

Total Estimated Funding: \$3,082

Other Deployments:

- Deployed in FY 1997 at General Atomics (four laboratories in southern California)
- Deployed in FY 1997 at Hanford in Richland, WA
- Deployed in FY 1997 at FUSRAP (Colonie Site) in Colonie, New York
- Deployed in FY 1997 at INEEL (MARE Island and Charleston NSY)
- Deployed in FY 1997 at Los Alamos National Laboratory in Albuquerque, NM
- Deployed in FY 1997 at Naval Nuclear Program Sites (6 sites)
- Deployed in FY 1997 at Argonne East (Argonne National Laboratory) in Chicago, IL
- Deployed in FY 1997 at Fernald site in Fernald, OH
- Deployed in FY 1997 at Nevada Test Site in Las Vegas, NV
- Deployed in FY 1997 at Brookhaven National Laboratory in Long Island, NY
- Deployed in FY 1997 at Battelle - Columbus (BMI Battelle-Columbus Laboratories King Avenue Site) in Columbus, OH

Stabilized Contaminants using Envirocare Polymer Macroencapsulation

(OST Ref. No. 30)

- Deployed in FY 1997 at Oak Ridge National Laboratory in Oak Ridge, TN
- Deployed in FY 1997 at Paducah (lead and debris waste) in Paducah, KY

Stabilized Contaminants using Envirocare Polymer Macroencapsulation

(OST Ref. No. 30)

Polymer Macroencapsulation is a process that encases debris containing mixed low-level waste in an inert, stable, polyethylene monolith suitable for permanent disposal in a hazardous waste landfill. The process involves extruding molten low density polyethylene into a specially designed container partially filled with pieces of a solid, contaminated waste such as lead or debris. The plastic flows around, over, and between pieces of waste, coating and bonding to all surfaces of the waste matrix.

DESCRIPTION OF THE DEPLOYMENT

Location: DOE-ID - Lead and debris waste shipped from MARE Island, Charleston NSY, and INEEL, to Envirocare of Utah, Inc., Clive, Utah for treatment and disposal.

Project Name: IN-S003 WROC Macroencapsulation

Date of Deployment: June 1997

Technology User: Envirocare of Utah, Inc.

Deployment Value/Impact: Eliminated 215,000 lbs. of debris and lead waste from 3 locations; INEEL, MARES Island and Charleston NSY using the polymer macroencapsulation process at a commercial facility under a cooperative agreement with the department of Energy. This is a relatively simple and cost effective process to stabilize lead and debris waste in accordance with Resource Conservation and Recovery Act (RCRA) Land Disposal Restrictions (LDRs). This waste was treated and disposed of at Envirocare of Utah, Inc. in Clive, Utah.

Point of Contact:

User Program POC:

Pat Trudell, DOE-ID, (208)526-0169

OST Program POC:

- Bill Owca, DOE-ID, (208) 526-1983
- Lynn Schwendiman, MARES Island and Charleston NSY Sites, (208) 526-8732
- Vince C. Maio, INEEL, (208) 526-3696

TECHNOLOGY DEVELOPMENT INFORMATION

Major Developers:

- Department of Energy
- Brookhaven National Laboratory
- Idaho National Engineering and Environmental Laboratory
- Envirocare of Utah, Inc.

Funding Information: (\$ in Thousands):

Total Estimated Funding: \$3,082

Other Deployments:

- Deployed in FY 1997 at General Atomics (four laboratories in southern California)
- Deployed in FY 1997 at Hanford in Richland , WA
- Deployed in FY 1997 at FUSRAP (Colonie Site) in Oak Ridge, TN
- Deployed in FY 1997 at Los Alamos (Los Alamos National Laboratory) in Albuquerque, NM
- Deployed in FY 1997 at Naval Nuclear Program Sites (6 sites) (Unknown) in Idaho Falls, ID
- Deployed in FY 1997 at Argonne East (Argonne National Laboratory) in Chicago, IL
- Deployed in FY 1997 at Fernald (Fernald site) in Fernald, OH
- Deployed in FY 1997 at Nevada Test Site (Nevada Test Site) in Las Vegas, NV
- Deployed in FY 1997 at Pinellas (Pinellas Plant) in Petersburg, FL
- Deployed in FY 1997 at Brookhaven National Laboratory in Long Island, NY
- Deployed in FY 1997 at Battelle - Columbus (BMI Battelle-Columbus Laboratories King Avenue Site) in Columbus, OH

Stabilized Contaminants using Envirocare Polymer Macroencapsulation

(OST Ref. No. 30)

- Deployed in FY 1997 at Oak Ridge National Laboratory in Oak Ridge, TN
- Deployed in FY 1997 at Paducah (lead and debris waste) in Paducah, KY

Stabilized Contaminants using Envirocare Polymer Macroencapsulation

(OST Ref. No. 30)

Polymer Macroencapsulation is a process that encases debris containing mixed low-level waste in an inert, stable, polyethylene monolith suitable for permanent disposal in a hazardous waste landfill. The process involves extruding molten low density polyethylene into a specially designed container partially filled with pieces of a solid, contaminated waste such as lead or debris. The plastic flows around, over, and between pieces of waste, coating and bonding to all surfaces of the waste matrix.

DESCRIPTION OF THE DEPLOYMENT

Location: DOE-Albuquerque - Lead and debris waste shipped from Los Alamos National Laboratory to Envirocare of Utah, Inc. in Clive Utah

Project Name: AL-07-01-07 Treatment of Mixed Waste

Date of Deployment: June 1997

Technology User: Envirocare of Utah, Inc.

Deployment Value/Impact: Eliminated 59,600 lbs of lead and debris waste from Los Alamos National Laboratory using the polymer macroencapsulation process at a commercial facility under a cooperative agreement with the Department of Energy. This is a relatively simple and cost-effective process to stabilize lead and debris waste in accordance with Resource Conservation and Recovery Act (RCRA) Land Disposal Restrictions (LDRs). This waste was treated and disposed of at Envirocare, Utah.

Point of Contact:

User Program POC:

Pat Trudell, DOE-ID, (208) 526-0169

OST Program POC:

- Bill Owca, DOE-ID, (208) 526-1983
- James Nunz, Los Alamos, (505) 667-5027
- Vince Maio, INEEL, (208) 526-3696

TECHNOLOGY DEVELOPMENT INFORMATION

Major Developers:

- Department of Energy
- Brookhaven National Laboratory
- Idaho National Engineering and Environmental Laboratory
- Envirocare of Utah, Inc.

Funding Information: (\$ in Thousands):

Total Estimated Funding: \$3,082

Other Deployments:

- Deployed in FY 1997 at General Atomics (four small laboratories in sothern, California)
- Deployed in FY 1997 at Hanford in Richland , WA
- Deployed in FY 1997 at FUSRAP (Colonie Site) in Colonie, New York
- Deployed in FY 1997 at INEEL (MARE Island and Charleston NSY (MARE Island and Charleston NSY) in Idaho Falls, ID
- Deployed in FY 1997 at Naval Nuclear Program Sites (6 sites)
- Deployed in FY 1997 at Argonne East (Argonne National Laboratory) in Chicago, IL
- Deployed in FY 1997 at Fernald in Fernald, OH
- Deployed in FY 1997 at Nevada Test Site (Nevada Test Site) in Las Vegas, NV
- Deployed in FY 1997 at Pinellas (Pinellas Plant) in Petersburg, FL
- Deployed in FY 1997 at Brookhaven National Laboratory in Long Island, NY
- Deployed in FY 1997 at Battelle - Columbus (BMI's Battelle-Columbus Laboratories King Avenue Site) in Columbus, OH
- Deployed in FY 1997 at Oak Ridge National Laboratory in Oak Ridge, TN

Stabilized Contaminants using Envirocare Polymer Macroencapsulation

(OST Ref. No. 30)

- Deployed in FY 1997 at Paducah (lead and debris waste) in Paducah, KY

Stabilized Contaminants using Envirocare Polymer Macroencapsulation

(OST Ref. No. 30)

Polymer Macroencapsulation is a process that encases debris containing mixed low-level waste in an inert, stable, polyethylene monolith suitable for permanent disposal in a hazardous waste landfill. The process involves extruding molten low density polyethylene into a specially designed container partially filled with pieces of a solid, contaminated waste such as lead or debris. The plastic flows around, over, and between pieces of waste, coating and bonding to all surfaces of the waste matrix.

DESCRIPTION OF THE DEPLOYMENT

Location: Remove lead and waste debris from six Naval Nuclear Propulsion Program sites (Pudget Sound, Pearl Harbor, Norfolk, Knolls Atomic, KAPL Kessring, and Bettis Atomic) for treatment and disposal at Envirocare of Utah, Inc. in Clive, Utah

Project Name: Polymer Macroencapsulation of lead and debris waste from Naval Nuclear Propulsion Program (Non-DOE)

Date of Deployment: March - May 1997 **Technology User:** Envirocare of Utah, Inc.

Deployment Value/Impact: Eliminated 22,600 lbs. of lead and waste debris from six naval nuclear propulsion sites (Pudget Sound, Pearl Harbor, Norfolk, Knoll Atomic, KAPL Kessring, and Bettis Atomic) using the polymer macroencapsulation process at a commercial facility under a cooperative agreement with the Department of Energy. This is a relatively simple and cost-effective process to stabilize lead and debris waste in accordance with Resource Conservation and Recovery Act (RCRA) Land Disposal Restrictions (LDRs). The waste from these six sites were treated and disposed of at Envirocare of Utah, Inc.

Point of Contact:

User Program POC:
Pat Trudell, DOE-ID, (208) 526-0169

OST Program POC:

- Bill Owca, DOE-ID, (208) 526-1983
- Elmer Naples, Naval Nuclear Propulsion Program Sites, (703) 602-8229
- Vince Maio, INEEL, (208) 526-3696

TECHNOLOGY DEVELOPMENT INFORMATION

Major Developers:

- Department of Energy
- Brookhaven National Laboratory (BNL)
- Idaho National Engineering and Environmental Laboratory
- Envirocare of Utah, Inc.

Funding Information: (\$ in Thousands):

Total Estimated Funding: \$3,082

Other Deployments:

- Deployed in FY 1997 at General Atomics (four laboratories in southern California)
- Deployed in FY 1997 at Hanford in Richland, WA
- Deployed in FY 1997 at FUSRAP (Colonie Site) in Oak Ridge, TN
- Deployed in FY 1997 at INEEL (MARE Island and Charleston NSY)
- Deployed in FY 1997 at Los Alamos National Laboratory in Albuquerque, NM
- Deployed in FY 1997 at Argonne East (Argonne National Laboratory) in Chicago, IL
- Deployed in FY 1997 at Fernald (Fernald site) in Fernald, OH
- Deployed in FY 1997 at Nevada Test Site (Nevada Test Site) in Las Vegas, NV
- Deployed in FY 1997 at Pinellas (Pinellas Plant) in Petersburg, FL

Stabilized Contaminants using Envirocare Polymer Macroencapsulation

(OST Ref. No. 30)

- Deployed in FY 1997 at Brookhaven National Laboratory in Long Island, NY
- Deployed in FY 1997 at Battelle - Columbus (BMI Battelle-Columbus Laboratories King Avenue Site) in Columbus, OH
- Deployed in FY 1997 at Oak Ridge National Laboratory in Oak Ridge, TN
- Deployed in FY 1997 at Paducah (lead and debris waste) in Paducah, KY

Stabilized Contaminants using Envirocare Polymer Macroencapsulation

(OST Ref. No. 30)

Polymer Macroencapsulation is a process that encases debris containing mixed low-level waste in an inert, stable, polyethylene monolith suitable for permanent disposal in a hazardous waste landfill. The process involves extruding molten low density polyethylene into a specially designed container partially filled with pieces of a solid, contaminated waste such as lead or debris. The plastic flows around, over, and between pieces of waste, coating and bonding to all surfaces of the waste matrix.

DESCRIPTION OF THE DEPLOYMENT

Location: DOE-Ohio - Shipment of lead and debris waste from Fernald site to Envirocare of Utah, Inc. for treatment and disposal at Clive, Utah facility.

Project Name: OH-F008 Mixed waste treatment

Date of Deployment: June 1997

Technology User: Envirocare of Utah, Inc.

Deployment Value/Impact: Eliminated 26,700 lbs. of lead and debris waste from Fernald site using the polymer macroencapsulation process a commercial facility under a cooperative agreement with the Department of Energy. This is a relatively simple and cost-effective process to stabilize lead and debris waste in accordance with Resource Conservation and Recovery Act (RCRA) Land Disposal Restrictions (LDRs). This waste was treated and disposed of at Envirocare of Utah, Inc.

Point of Contact:

User Program POC:

Pat Trudell, DOE-ID, (208) 526-0169

OST Program POC:

- Bill Owca, DOE-ID, (208) 526-1983
- Keith Sparks, Fernald, (513) 648-5731
- Vince C. Maio, INEEL, (208) 526-3696
- Rod Warner, DOE-Fernald, (513) 648-3076

TECHNOLOGY DEVELOPMENT INFORMATION

Major Developers:

- Department of Energy
- Brookhaven National Laboratory
- Idaho National Engineering and Environmental Laboratory
- Envirocare of Utah, Inc.

Funding Information: (\$ in Thousands):

Total Estimated Funding: \$3,082

Other Deployments:

- Deployed in FY 1997 at General Atomics (four laboratories in southern California)
- Deployed in FY 1997 at Hanford in Richland, WA
- Deployed in FY 1997 at FUSRAP (Colonie Site) in Oak Ridge, TN
- Deployed in FY 1997 at INEEL (MARE Island and Charleston NSY)
- Deployed in FY 1997 at Los Alamos National Laboratory in Albuquerque, NM
- Deployed (non-DOE) in FY 1997 at Naval Nuclear Program Sites (6 sites)
- Deployed in FY 1997 at Argonne East (Argonne National Laboratory) in Chicago, IL
- Deployed in FY 1997 at Nevada Test Site (Nevada Test Site) in Las Vegas, NV
- Deployed in FY 1997 at Pinellas (Pinellas Plant) in Petersburg, FL
- Deployed in FY 1997 at Brookhaven National Laboratory (Unknown) in Long Island, NY
- Deployed in FY 1997 at Battelle - Columbus (BMI Battelle-Columbus Laboratories King Avenue Site) in Columbus, OH

Stabilized Contaminants using Envirocare Polymer Macroencapsulation

(OST Ref. No. 30)

- Deployed in FY 1997 at Oak Ridge National Laboratory in Oak Ridge, TN
- Deployed in FY 1997 at Paducah (lead and debris waste) in Paducah, KY

Stabilized Contaminants using Envirocare Polymer Macroencapsulation

(OST Ref. No. 30)

Polymer Macroencapsulation is a process that encases debris containing mixed low-level waste in an inert, stable, polyethylene monolith suitable for permanent disposal in a hazardous waste landfill. The process involves extruding molten low density polyethylene into a specially designed container partially filled with pieces of a solid, contaminated waste such as lead or debris. The plastic flows around, over, and between pieces of waste, coating and bonding to all surfaces of the waste matrix.

DESCRIPTION OF THE DEPLOYMENT

Location: DOE-Oak Ridge, contaminated lead and debris waste was shipped from Paducah, Kentucky and treated and disposed of at Envirocare of Utah, Inc. in Clive, Utah.

Project Name: WM-23 Treatment of heterogeneous waste

Date of Deployment: June 1997

Technology User: Envirocare of Utah, Inc.

Deployment Value/Impact: Eliminated 16,200 lbs. of contaminated lead and debris waste at Paducah using polymer macroencapsulation process at a commercial facility under a cooperative agreement with the Department of Energy. This is a relatively simple and cost-effective process to stabilize lead and debris waste in accordance with Resource Conservation and Recovery Act (RCRA) Land Disposal Restrictions (LDRs). This waste was treated and disposal of at Envirocare of Utah, Inc. in Clive, Utah.

Point of Contact:

User Program POC:

Pat Trudell, DOE-ID, (208)526-0169

OST Program POC:

- Bill Owca, DOE-ID, (208) 526-1983
- Tom Shadowan, Paducah, (502) 441-5245
- Vince C. Maio, INEEL, (208) 526-3696

TECHNOLOGY DEVELOPMENT INFORMATION

Major Developers:

- Department of Energy
- Brookhaven National Laboratory
- Idaho National Engineering and Environmental Laboratory
- Envirocare of Utah, Inc.

Funding Information: (\$ in Thousands):

Total Estimated Funding: \$3,082

Other Deployments:

- Deployed in FY 1997 at General Atomics (four laboratories in southern California)
- Deployed in FY 1997 at Hanford in Richland, WA
- Deployed in FY 1997 at FUSRAP (Colonie Site) in Colonie, New York
- Deployed in FY 1997 at INEEL (MARE Island and Charleston NSY)
- Deployed in FY 1997 at Los Alamos National Laboratory in Albuquerque, NM
- Deployed in FY 1997 at Naval Nuclear Program Sites (6 sites)
- Deployed in FY 1997 at Argonne East (Argonne National Laboratory) in Chicago, IL
- Deployed in FY 1997 at Fernald in Fernald, OH
- Deployed in FY 1997 at Nevada Test Site in Las Vegas, NV
- Deployed in FY 1997 at Pinellas (Pinellas Plant) in Petersburg, FL
- Deployed in FY 1997 at Brookhaven National Laboratory in Long Island, NY
- Deployed in FY 1997 at Battelle - Columbus (BMI Battelle-Columbus Laboratories King Avenue Site) in Columbus, OH

Stabilized Contaminants using Envirocare Polymer Macroencapsulation

(OST Ref. No. 30)

- Deployed in FY 1997 at Oak Ridge National Laboratory in Oak Ridge, TN

Stabilized Contaminants using Envirocare Polymer Macroencapsulation

(OST Ref. No. 30)

Polymer Macroencapsulation is a process that encases debris containing mixed low-level waste in an inert, stable, polyethylene monolith suitable for permanent disposal in a hazardous waste landfill. The process involves extruding molten low density polyethylene into a specially designed container partially filled with pieces of a solid, contaminated waste such as lead or debris. The plastic flows around, over, and between pieces of waste, coating and bonding to all surfaces of the waste matrix.

DESCRIPTION OF THE DEPLOYMENT

Location: DOE-Oakland - Contaminated lead and debris waste was shipped from 4 DOE laboratories (DOE Santa Susana, Lab for Energy Related Health Research, GA Laboratory, and LLNL Lab) operated by General Atomics to Envirocare of Utah, Inc. in Clive, Utah.

Project Name: OK-012 Method to Decontaminate Lead and debris

Date of Deployment: May 14 - June 24, 1997 **Technology User:** Envirocare of Utah, Inc.

Deployment Value/Impact: Eliminated 60,644 lbs. of contaminated lead and debris waste from four laboratories operated by General Atomics for DOE using the polymer macroencapsulation process at a commercial facility under a cooperative agreement with the department of Energy. This is a relatively simple and cost-effective process to stabilize lead and debris waste in accordance with Resource Conservation and Recovery Act (RCRA) Land Disposal Restrictions (LDRs).

Point of Contact:

User Program POC:

Pat Trudell, DOE-ID, (208) 526-0169

OST Program POC:

- Bill Owca, DOE-ID, (208) 526-1983
- Dan Nakahara, Oakland Sites, (510) 637-1640
- Vince C. Maio, INEEL, (208) 526-3696

TECHNOLOGY DEVELOPMENT INFORMATION

Major Developers:

- Department of Energy
- Brookhaven National Laboratory
- Idaho National Engineering and Environmental Laboratory
- Envirocare of Utah, Inc.

Funding Information: (\$ in Thousands):

Total Estimated Funding: \$3,082

Other Deployments:

- Deployed in FY 1997 at Hanford in Richland, WA
- Deployed in FY 1997 at FUSRAP (Colonie Site) in Colonie, New York
- Deployed in FY 1997 at INEEL (MARE Island and Charleston NSY)
- Deployed in FY 1997 at Los Alamos National Laboratory in Albuquerque, NM
- Deployed in FY 1997 at Naval Nuclear Program Sites (6 sites) (Pudget Sound, Pearl Harbor, Norfolk, Knolls Atomic, KAPL Kessring, and Bettis Atomic) in Clive, UT
- Deployed in FY 1997 at Argonne East (Argonne National Laboratory) in Chicago, IL
- Deployed in FY 1997 at Fernald in Fernald, OH
- Deployed in FY 1997 at Nevada Test Site in Las Vegas, NV
- Deployed in FY 1997 at Pinellas (Pinellas Plant) in Petersburg, FL

Stabilized Contaminants using Envirocare Polymer Macroencapsulation

(OST Ref. No. 30)

- Deployed in FY 1997 at Brookhaven National Laboratory in Long Island, NY
- Deployed in FY 1997 at Battelle - Columbus (BMI Battelle-Columbus Laboratories King Avenue Site) in Columbus, OH
- Deployed in FY 1997 at Oak Ridge National Laboratory in Oak Ridge, TN
- Deployed in FY 1997 at Paducah (lead and debris waste) in Paducah, KY

Stabilized Contaminants using Envirocare Polymer Macroencapsulation

(OST Ref. No. 30)

Polymer Macroencapsulation is a process that encases debris containing mixed low-level waste in an inert, stable, polyethylene monolith suitable for permanent disposal in a hazardous waste landfill. The process involves extruding molten low density polyethylene into a specially designed container partially filled with pieces of a solid, contaminated waste such as lead or debris. The plastic flows around, over, and between pieces of waste, coating and bonding to all surfaces of the waste matrix.

DESCRIPTION OF THE DEPLOYMENT

Location: DOE-Chicago - Contaminated lead and debris was shipped from the Battelle-Columbus to Envirocare of Utah, Inc. in Clive, Utah, where it was treated and disposed of in accordance with RCRA LDRs.

Project Name: CH-0011 Lead Removal, Segregation, and Disposal

Date of Deployment: June 1997

Technology User: Envirocare of Utah, Inc.

Deployment Value/Impact: Eliminated 19,800 lbs. of contaminated lead and debris waste from Battelle-Columbus facility using the polymer macroencapsulation process at a commercial facility (Envirocare of Utah, Inc.) under a cooperative agreement with the Department of Energy. This is a relatively simple and cost-effective process to stabilize lead and debris waste in accordance Resource Conservation and Recovery Act (RCRA) Land Disposal Restrictions (LDRs). This waste was treated and disposed of at Envirocare of Utah, Inc. in Clive, Utah.

Point of Contact:

User Program POC:

Pat Trudell, DOE-ID, (208) 526-0169

OST Program POC:

- Bill Owca, DOE-ID, (208)526-1983
- Dave Garbor, Battelle-Columbus, (614) 424-5821
- Vince C. Maio, INEEL, (208) 526-3696

TECHNOLOGY DEVELOPMENT INFORMATION

Major Developers:

- Department of Energy
- Brookhaven National Laboratory
- Idaho National Engineering and Environmental Laboratory
- Envirocare of Utah, Inc.

Funding Information: (\$ in Thousands):

Total Estimated Funding: \$3,082

Other Deployments:

- Deployed in FY 1997 at General Atomics (four laboratories in southern California)
- Deployed in FY 1997 at Hanford in Richland, WA
- Deployed in FY 1997 at FUSRAP (Colonie Site) in Colonie, New York
- Deployed in FY 1997 at INEEL (MARE Island and Charleston NSY)
- Deployed in FY 1997 at Los Alamos National Laboratory in Albuquerque, NM
- Deployed in FY 1997 at Naval Nuclear Program Sites (6 sites)
- Deployed in FY 1997 at Argonne East (Argonne National Laboratory) in Chicago, IL
- Deployed in FY 1997 at Fernald in Fernald, OH
- Deployed in FY 1997 at Nevada Test Site in Las Vegas, NV
- Deployed in FY 1997 at Pinellas (Pinellas Plant) in Petersburg, FL
- Deployed in FY 1997 at Brookhaven National Laboratory in Long Island, NY
- Deployed in FY 1997 at Oak Ridge National Laboratory in Oak Ridge, TN

Stabilized Contaminants using Envirocare Polymer Macroencapsulation

(OST Ref. No. 30)

- Deployed in FY 1997 at Paducah (lead and debris waste) in Paducah, KY

Stabilized Contaminants using Envirocare Polymer Macroencapsulation

(OST Ref. No. 30)

Polymer Macroencapsulation is a process that encases debris containing mixed low-level in an inert, stable, polyethylene monolith suitable for permanent disposal in a hazardous waste landfill. The process involves extruding molten low density polyethylene into a specially designed container partially filled with pieces of a solid, contaminated waste such as lead or debris. The plastic flows around, over, and between pieces of waste, coating and bonding to all surfaces of the waste matrix.

DESCRIPTION OF THE DEPLOYMENT

Location: DOE-Oak Ridge, shipped contaminated lead and debris waste from Oak Ridge National Laboratory to Envirocare of Utah, Inc. located in Clive, Utah for treatment and disposal.

Project Name: WM-05 Removal and disposal of radioactive contaminants

Date of Deployment: June 1997

Technology User: Envirocare of Utah, Inc.

Deployment Value/Impact: Eliminated 15,250 lbs of contaminated lead and debris waste from Oak Ridge National Laboratory using the polymer macroencapsulation process at a commercial facility under a cooperative agreement with the Department of Energy. This is a relatively simple and cost-effective process to stabilize lead and debris waste in accordance with Resource Conservation and Recovery Act (RCRA) Land Disposal Restrictions (LDRs). This waste was treated and disposed of at Envirocare of Utah, Inc. in Clive, Utah.

Point of Contact:

User Program POC:

Pat Trudell, DOE-ID, (208) 526-0169

OST Program POC:

- Bill Owca, DOE-ID, (208) 526-1983
- Mike Norris, Oak Ridge National Laboratory, (423) 574-0559
- Vince C. Maio, INEEL, (208) 526-3696

TECHNOLOGY DEVELOPMENT INFORMATION

Major Developers:

- Department of Energy
- Brookhaven National Laboratory
- Idaho National Engineering and Environmental Laboratory
- Envirocare of Utah, Inc.

Funding Information: (\$ in Thousands):

Total Estimated Funding: \$3,082

Other Deployments:

- Deployed in FY 1997 at General Atomics (four laboratories in the southern California area)
- Deployed in FY 1997 at Hanford in Richland, WA
- Deployed in FY 1997 at FUSRAP (Colonie Site) in Colonie, New York
- Deployed in FY 1997 at INEEL (MARE Island and Charleston NSY)
- Deployed in FY 1997 at Los Alamos National Laboratory in Albuquerque, NM
- Deployed in FY 1997 at Naval Nuclear Program Sites (6 sites)
- Deployed in FY 1997 at Argonne East (Argonne National Laboratory) in Chicago, IL
- Deployed in FY 1997 at Fernald in Fernald, OH
- Deployed in FY 1997 at Nevada Test Site in Las Vegas, NV
- Deployed in FY 1997 at Pinellas (Pinellas Plant) in Petersburg, FL
- Deployed in FY 1997 at Brookhaven National Laboratory in Long Island, NY
- Deployed in FY 1997 at Battelle - Columbus (BMI Battelle-Columbus Laboratories King

Stabilized Contaminants using Envirocare Polymer Macroencapsulation

(OST Ref. No. 30)

- Avenue Site) in Columbus, OH
- Deployed in FY 1997 at Paducah (lead and debris waste) in Paducah, KY

Stabilized Contaminants using Envirocare Polymer Macroencapsulation

(OST Ref. No. 30)

Polymer Macroencapsulation is a process that encases debris containing mixed low-level waste in an inert, stable, polyethylene monolith suitable for permanent disposal in a hazardous waste landfill. The process involves extruding molten low density polyethylene into a specially designed container partially filled with pieces of a solid, contaminated waste such as lead or debris. The plastic flows around, over, and between pieces of waste, coating and bonding to all surfaces of the waste matrix.

DESCRIPTION OF THE DEPLOYMENT

Location: DOE-Chicago, shipped contaminated lead and debris from Brookhaven National Laboratory in Long Island, New York to Envirocare of Utah, Inc. in Clive, Utah. The contaminated lead and debris waste was treated and disposed of at this commercial facility.

Project Name: CH-0011 Lead Removal, Segregation, and Disposal

Date of Deployment: June 1997

Technology User: Envirocare of Utah, Inc.

Deployment Value/Impact: Eliminated 19,900 lbs of contaminated lead and debris waste from Brookhaven National Laboratory using the polymer macroencapsulation process at a commercial facility under a cooperative agreement with the Department of Energy. This is a relatively simple and cost-effective process to stabilize lead and debris waste in accordance with Resource Conservation and Recovery Act (RCRA) Land Disposal Restrictions (LDRS). This waste was treated and disposed of at Envirocare of Utah, Inc. in Clive, Utah.

Point of Contact:

User Program POC:
Pat Trudell, DOE-ID, (208) 526-0169

OST Program POC:

- Bill Owca, DOE-ID, (208)526-1983
- Glen Todzia, BNL, (516) 282-7488
- Vince Maio, INEEL, (208) 526-3696

TECHNOLOGY DEVELOPMENT INFORMATION

Major Developers:

- Department of Energy
- Brookhaven National Laboratory
- Idaho National Engineering and Environmental Laboratory
- Envirocare of Utah, Inc.

Funding Information: (\$ in Thousands):

Total Estimated Funding: \$3,082

Other Deployments:

- Deployed in FY 1997 at General Atomics (Oakland, four laboratories)
- Deployed in FY 1997 at Hanford in Richland, WA
- Deployed in FY 1997 at FUSRAP (Colonie Site) in Colonie, New York
- Deployed in FY 1997 at INEEL (MARE Island and Charleston NSY)
- Deployed in FY 1997 at Los Alamos (Los Alamos National Laboratory) in Albuquerque, NM
- Deployed in FY 1997 at Naval Nuclear Program Sites (6 sites) (Pudget Sound, Pearl Harbor, Norfolk, Knolls Atomic, KAPL Kessring, and Bettis Atomic) in Clive, UT
- Deployed in FY 1997 at Argonne East (Argonne National Laboratory) in Chicago, IL
- Deployed in FY 1997 at Fernald (Fernald site) in Fernald, OH
- Deployed in FY 1997 at Nevada Test Site (Nevada Test Site) in Las Vegas, NV
- Deployed in FY 1997 at Pinellas (Pinellas Plant) in Petersburg, FL
- Deployed in FY 1997 at Battelle - Columbus (BMI Battelle-Columbus Laboratories King

Stabilized Contaminants using Envirocare Polymer Macroencapsulation

(OST Ref. No. 30)

- Avenue Site) in Columbus, OH
- Deployed in FY 1997 at Oak Ridge National Laboratory in Oak Ridge, TN
- Deployed in FY 1997 at Paducah (lead and debris waste) in Paducah, KY

Stabilized Contaminants using Envirocare Polymer Macroencapsulation

(OST Ref. No. 30)

Polymer Macroencapsulation is a process that encases debris containing mixed low-level waste in an inert, stable, polyethylene monolith suitable for permanent disposal in a hazardous waste landfill. The process involves extruding molten low density polyethylene into a specially designed container partially filled with pieces of a solid, contaminated waste such as lead or debris. The plastic flows around, over, and between pieces of waste, coating and bonding to all surfaces of the waste matrix.

DESCRIPTION OF THE DEPLOYMENT

Location: DOE - Chicago, Argonne East, Argonne National Laboratory

Project Name: CH-0011 Lead Removal, Segregation, and Disposal

Date of Deployment: May 1997

Technology User: Envirocare of Utah, Inc.

Deployment Value/Impact: Eliminated 26,700 lbs of lead and debris waste from Argonne National Laboratory using the polymer macroencapsulation process at a commercial facility under a cooperative agreement with the Department of Energy. This is a relatively simple and cost-effective process to stabilize lead and debris waste in accordance with Resource Conservation and Recovery Act (RCRA) Land Disposal Restrictions (LDRs). This waste was treated and disposed of at Envirocare of Utah.

Point of Contact:

User Program POC:

Pat Trudell, DOE-ID, (208) 526-0169

OST Program POC:

- Bill Owca, DOE-ID, (208) 526-1983
- Jim Wescott, Argonne East, (630) 252-9675
- Vince C. Maio, INEEL, (208) 526-3696

TECHNOLOGY DEVELOPMENT INFORMATION

Major Developers:

- Department of Energy
- Brookhaven National Laboratory (BNL)
- Idaho National Engineering and Environmental Laboratory (INEEL)
- Envirocare of Utah, Inc.

Funding Information: (\$ in Thousands):

Total Estimated Funding: \$3,082

Other Deployments:

- Deployed in FY 1997 at General Atomics (four laboratories in southern California)
- Deployed in FY 1997 at Hanford in Richland, WA
- Deployed in FY 1997 at FUSRAP (Colonie Site) in Colonie, New York
- Deployed in FY 1997 at INEEL (MARE Island and Charleston NSY)
- Deployed in FY 1997 at Los Alamos (Los Alamos National Laboratory) in Albuquerque, NM
- Deployed (non-DOE) in FY 1997 at Naval Nuclear Program Sites (6 sites)
- Deployed in FY 1997 at Fernald (Fernald site) in Fernald, OH
- Deployed in FY 1997 at Nevada Test Site (Nevada Test Site) in Las Vegas, NV
- Deployed in FY 1997 at Pinellas (Pinellas Plant) in Petersburg, FL
- Deployed in FY 1997 at Brookhaven National Laboratory in Long Island, NY
- Deployed in FY 1997 at Battelle - Columbus (Battelle-Columbus Laboratories King Avenue Site) in Columbus, OH
- Deployed in FY 1997 at Oak Ridge National Laboratory in Oak Ridge, TN
- Deployed in FY 1997 at Paducah (lead and debris waste) in Paducah, KY

Modified Light Duty Utility Arm (MLDUA)

(OST Ref. No. 40)

The Modified Light Duty Utility Arm (MLDUA) is a manipulator system used for deployment of storage tank characterization and waste retrieval tools. Characterized by a 45-ft. vertical extension, 15-ft. horizontal reach, and 200-lb. payload, it has the ability to be deployed through a 12-in. riser.

DESCRIPTION OF THE DEPLOYMENT

Location: Oak Ridge National Laboratory, Gunite & Associated Tanks, Tanks W-3, W-4, W-6 and W-7

Project Name: Gunite and Associated Tanks Treatability Study

Date of Deployment: Fiscal Year 1997
through Calendar
Year 2000

Technology User: ORNL EM-40 Gunite
and Associated Tanks
Remediation Project,
Lockheed Martin Energy
Research under contract
to M&I Bechtel Jacobs
Company

Deployment Value/Impact: Under the GAATTS, Oak Ridge demonstrated the ability to remove sufficient waste from tanks to allow the tanks to be closed and enable progress on the restoration of the Bethel Valley Watershed. The Modified Light Duty Utility Arm provides remote retrieval capability. Through the end of FY 1998 the arm and associated technologies had removed sludge and debris from two 85,000 gallon tanks and one 170,000 gallon tank.

Point of Contact:

User Program POC:

- Dr. Barry L. Burks (The Providence Group) - Tel. 423-927-5519
- Richard Glassell (Lockheed Martin Energy Research) - Tel. 423-576-2580
-

OST Program POC:

- John DeGregory (DOE-HQ) - Tel. 301-903-7949
- Dr. Linton W. Yarbrough (DOE-AL) - Tel. 505-845-6569
- Dr. Barry L. Burks (The Providence Group) - Tel. 423-927-5519

TECHNOLOGY DEVELOPMENT INFORMATION

Major Developers:

- SPAR Aerospace of Toronto, Canada was the major developer with technical direction and oversight from Oak Ridge National Laboratory, Westinghouse Hanford Company, and Pacific Northwest National Laboratory
-

Funding Information: (\$ in Thousands):

Total Estimated Funding: \$4,860

Other Deployments:

This unit is a modified version of the Light Duty Utility Arm deployed at the Hanford Site in 1996.

Residual Contamination Survey End Effector

(OST Ref. No. 41)

A manipulator end-effector capable of measuring residual contamination on tank floors and walls has been developed. This end-effector is deployed before, during, and after waste retrieval operations to locate and measure residual contamination sources.

DESCRIPTION OF THE DEPLOYMENT

Location: ORNL, Gunite and Associated Tanks

Project Name: Gunite and Associated Tanks Remediation Project

Date of Deployment: Fiscal Year 1997
through calendar
year 2000

Technology User: ORNL EM-40 Gunite
and Associated Tanks
Remediation Project,
Lockheed Martin Energy
Research under contract
to M&I Bechtel Jacobs
Company

Deployment Value/Impact: Under the GAAT Remediation Project, Oak Ridge is demonstrating the ability to remove sufficient waste from tanks to allow the tanks to be closed and enable progress on the restoration of the Bethel Valley Watershed. The Residual Contamination Survey End-Effector is deployed both prior to and upon completion of tank waste retrieval operations to provide an indication of how well a tank has been cleaned. Through the end of CY 1998, the Residual Contamination Survey End-Effector had been deployed in four of the gunite tanks.

Point of Contact:

User Program POC:

- Dr. Barry L. Burks (The Providence Group) - Tel. 423-927-5519
- Stephen Killough (Oak Ridge National Laboratory) - Tel. 423-574-4537

OST Program POC:

- Dr. Linton W. Yarbrough (DOE-AL) - Tel. 505-845-6569
- Dr. Barry L. Burks (The Providence Group) - Tel. 423-927-5519

TECHNOLOGY DEVELOPMENT INFORMATION

Major Developers:

The original Residual Contamination Survey End Effector was built by Sandia National Laboratories with the functions and requirements defined by the Oak Ridge National Laboratory. The original end-effector was delivered to ORNL early in 1997. During cold testing the system was modified by ORNL to prepare for deployment at the Gunite tanks.

Funding Information: (\$ in Thousands):

Total Estimated Funding: \$615

Other Deployments:

This technology has not been applied anywhere else.

Frozen Soil Barrier

(OST Ref. No. 51)

The Frozen Soil Barrier is a temporary in situ containment technology. Two types of freezing technologies have been tested by OST. A technology using NaCl brine circulated through underground piping, to remove heat from the soil, was tested at a clean site in 1994. In 1997, another technology that uses a series of two-phase thermosyphons to remove the heat from the soil -- spaced around the area to be contained -- was deployed at a radioactively contaminated site. This setting freezes the soil moisture and reduces permeability. A 4 to 24-foot thick barrier is formed and prevents movement of contaminants from inside the barrier.

DESCRIPTION OF THE DEPLOYMENT

Location: WAG9, Oak Ridge

Project Name: OR-43202, ORNL Homogeneous Reactor Experiment Pond (WAG9)

Date of Deployment: September 1997-
(ongoing) **Technology User:** LMES, Oak Ridge

Deployment Value/Impact: The Frozen Soil Barrier installed at WAG9 is an interim measure to contain Sr90 and Cs137 that reside at the bottom of disposal pond. The containment is designed to keep ground water from mobilizing the contaminants, until a permanent disposal resolution is taken. In general, Frozen Soil Barrier is an in situ containment technology that can be rapidly installed and removed. It minimizes secondary waste, excavation, dust generation, and worker health risk. Breaches in the barrier can be easily repaired by injecting water into the breached area. It uses a benign material (water) as the containment medium. For high-mobility contaminants such as tritium, it may provide the only practical containment measure.

Point of Contact:

User Program POC:

Elizabeth Phillips (DOE-OR), Tel. 423-241-6172

OST Program POC:

Jim Wright, Tel. 803-725-5608

TECHNOLOGY DEVELOPMENT INFORMATION

Major Developers:

RKK Freezwall, Arctic Foundations, Inc.

Funding Information: (\$ in Thousands):

Total Estimated Funding: \$5,178

Other Deployments:

None

Passive Soil Vapor Extraction (Barometric Pumping)

(OST Ref. No. 56)

Passive Soil Vapor Extraction (PSVE) technology takes advantage of natural pressure gradients to cause the flow of contaminant-laden subsurface air from the vadose zone to the surface. These gradients are caused by changes in atmospheric pressure which fluctuate diurnally and with the movement of large air masses. Application of PSVE involves the creation and utilization of pathways, such as wells and pipe collection networks, to produce a directed air-flow in response to natural pressure changes.

DESCRIPTION OF THE DEPLOYMENT

Location: Savannah River Site, A and M Area

Project Name: SR-ER06; Miscellaneous Chemical Basin

Date of Deployment: November, 1996-
(Ongoing)

Technology User:

- Westinghouse Hanford
- Savannah River Site
- Sandia National Lab, Albuquerque
- INEEL, Idaho Falls

Deployment Value/Impact: PSVE has targeted the vadose zone overlying the A&M Area VOCs plume. Extraction of VOCs by 25 wells is enhanced by injection of solar-heated, moist air into the subsurface. In general, PSVE has shown high performance as a polishing technology following conventional VOC extraction. The process is a low cost and low maintenance solution to shallow diffuse plume remediation. Because the driving force for flow is free, the technology is inherently inexpensive. The air from the vadose zone carries some contaminant vapor with it when moving to the atmosphere.

Point of Contact:

User Program POC:

Joseph Rossabi, (SRTC) - Tel. 803-725-5220

OST Program POC:

Jim Wright (SRS - EM-50), Tel. 803-725-5608

TECHNOLOGY DEVELOPMENT INFORMATION

Major Developers:

- CH2M Hill, Science and Engineering Associates, Inc., INEEL, LLNL, PNNL, WSRC, and EPA Region X.

-

Funding Information: (\$ in Thousands):

Total Estimated Funding: \$2,909

Other Deployments:

- Hanford (200 West Area carbon tetrachloride plume), Richland, WA, FY 1995
- INEL (WAG 7 - Pit 2 at SDA), Idaho Falls, ID, FY 1996 (PBS#: ID-ER-06)

Duramelter/Joule-Heated Melter

(OST Ref. No. 58)

The duramelter/joule-heated melter vitrifies or transforms a mixed low-level inorganic sludge waste into a highly stable and leach resistant glass that can be permanently disposed of in a hazardous waste landfill. It also significantly reduces the volume of waste to be disposed. The stabilization and disposal of mixed waste is a significant challenge because the waste contains both hazardous and radioactive material.

DESCRIPTION OF THE DEPLOYMENT

Location: Savannah River Site, 'M' Area

Project Name: SR-SW-03 Treatment of MW Soils to Immobilize Radionuclides and RCRA Constituents for Disposal

Date of Deployment: March 1997

Technology User: GTS Duratek,
Westinghouse
Savannah River
Company

Deployment Value/Impact: Eliminate over 550,000 gallons of mixed waste sludge at Savannah River Site's M Area once the project is completed. This deployment has shown that vitrification systems can perform at high feed rates and produce stable and durable final waste form. The sludge contained uranium as the primary radionuclide, nitrate, nickel, lead, and chromium are the hazardous species.

Point of Contact:

User Program POC:

Sherri V. Robinson, DOE-SR, (803) 725-5793

OST Program POC:

• Bill Owca, DOE- Idaho, (208)526-1983

• Mr. Jim Pope, WSRC, (803) 725-1004

TECHNOLOGY DEVELOPMENT INFORMATION

Major Developers:

- GTS Duratek
- Westinghouse Savannah River Company
- Department of Energy
- Fernald Environmental Management Project
- Vitreous State Laboratory of Catholic University
- Argonne National Laboratory.

Funding Information: (\$ in Thousands):

Total Estimated Funding: \$12,554

Other Deployments:

None

Material Handling and Waste Conveyance

(OST Ref. No. 62)

This task supports the development, testing, and technical oversight of technologies in direct support of remediation activities. These remedial activities may include the Glass Hole and Animal/Chemical Pits at the Brookhaven National Laboratory and removal actions at the Idaho National Engineering Laboratory.

DESCRIPTION OF THE DEPLOYMENT

Location: Hanford, WRAP facility

Project Name: No Project Name information has been defined

Date of Deployment: Fiscal Year 1997

Technology User: No Technology User information has been defined

Deployment Value/Impact: No Rationale information has been defined

Point of Contact:

User Program POC:

No User Program POC information has been defined

OST Program POC:

Jim Wright (DOE-SRS) - Tel. 803-725-5608

TECHNOLOGY DEVELOPMENT INFORMATION

Major Developers:

No Major Developers information has been defined

Funding Information: (\$ in Thousands):

Total Estimated Funding: \$4,305

Other Deployments:

Demonstrated (type: Small-Scale) in FY 1996 at INEL (Pit 9) in Idaho Falls, ID

Innovative Grout (In Situ Stabilization)

(OST Ref. No. 63)

The Innovative Subsurface Stabilization Project is a series of applied research tests involving stabilizing simulated buried waste sites with grouting agents using jet-grouting techniques. The purpose of this research is to prove that the technology is valid for application to hot buried waste sites. The basic jet-grouting technique is to make the waste into a solid monolith, which is the same effect as simultaneous horizontal and vertical barriers while also providing stabilization against subsidence. The monolith is created by jet grouting adjacent columns with the grouting material such that the soil-and-waste matrix forms a solid monolith, which should be an improved containment over a combination of vertical and horizontal barriers.

DESCRIPTION OF THE DEPLOYMENT

Location: INEEL

Project Name: No Project Name has been identified.

Date of Deployment: Fiscal Year 1997 **Technology User:** Lockheed Martin Idaho Technologies

Deployment Value/Impact: The jet-grouting technology provides stabilization against subsidence, unlike baseline horizontal and vertical barriers. Using Type-H cement, costs are \$413 per cubic yard.

Point of Contact:

User Program POC:
Guy Loomis (Lockheed Martin Idaho Technologies) - Tel. 208-526-9208

OST Program POC:
Jim Wright (DOE-SRS) - Tel. 803-725-5608

TECHNOLOGY DEVELOPMENT INFORMATION

Major Developers:
INEEL

Funding Information: (\$ in Thousands):
Total Estimated Funding: \$106

Other Deployments:
This technology has not been deployed at other sites.

Innovative Grout (In Situ Stabilization)

(OST Ref. No. 63)

The Innovative Subsurface Stabilization Project is a series of applied research tests involving stabilizing simulated buried waste sites with grouting agents using jet-grouting techniques. The purpose of this research is to prove that the technology is valid for application to hot buried waste sites. The basic jet-grouting technique is to make the waste into a solid monolith, which is the same effect as simultaneous horizontal and vertical barriers while also providing stabilization against subsidence. The monolith is created by jet grouting adjacent columns with the grouting material such that the soil-and-waste matrix forms a solid monolith, which should be an improved containment over a combination of vertical and horizontal barriers.

DESCRIPTION OF THE DEPLOYMENT

Location: Argonne National Lab, RS 397; East Vaults Drain

Project Name: ANL-East, RS 397; East Vaults Drain

Date of Deployment: Fiscal Year 1997 **Technology User:** Argonne National Laboratory - East

Deployment Value/Impact: The jet-grouting technology provides stabilization against subsidence, unlike baseline horizontal and vertical barriers. Using Type-H cement, costs are \$413 per cubic yard.

Point of Contact:

User Program POC:
Y. Collazo (DOE-ARG) Tel.630-252-2102

OST Program POC:
Jim Wright, DOE-SR, SCFA Manager - 803-725-5608

TECHNOLOGY DEVELOPMENT INFORMATION

Major Developers:
INEEL

Funding Information: (\$ in Thousands):
Total Estimated Funding: \$106

Other Deployments:

- Demonstrated in FY 1996 at Oak Ridge (ORNL, WAG-4) in Oak Ridge, TN
- Deployed in FY 1997 at INEEL in Idaho Falls, ID

Pipe Explorer (TM) System

(OST Ref. No. 74)

The Pipe Explorer system, developed by Science and Engineering Associates, Inc.(SEA), under contract with the U.S. Department of Energy (DOE) Federal Energy Technology Center, has been used to transport various characterizing sensors into piping systems that have been radiologically contaminated. DOE's nuclear facility decommissioning program must characterize radiological contamination inside piping systems before the pipe can be recycled, remediated, or disposed. The Pipe Explorer can be deployed through constrictions in the pipe, around 90° bends, vertically up and down, and in slippery conditions. Because the detector is transported inside the membrane, which is inexpensive and disposable, it is protected from contamination, which eliminates cross-contamination and false readings. Characterization sensors that have been demonstrated with the system thus far include: alpha, beta, and gamma detectors, video cameras, and pipe locators. Alpha measurement capability has been developed and will be demonstrated soon. The system is capable of deploying in pipes as small as 2-in. diameter and up to 250-ft long.

DESCRIPTION OF THE DEPLOYMENT

Location: DOE-CH, Argonne National Laboratory, IL

Project Name: CP-5 Reactor

Date of Deployment: October 1996

Technology User: Argonne National Laboratory

Deployment Value/Impact: The Pipe Explorer(TM) System was used at the CP-5 Reactor D&D Project to survey the internal area of three 5-inch pipe-lined holes in the CP-5 rod storage area for alpha-emitting radionuclides. Elevated levels of alpha activity were found at one location in one of the three holes.

Point of Contact:

User Program POC:

- Mr. Mike Ferrigan (DOE/CH) - Tel. 630-252-2570
- Mr Tom Yule (Argonne National Laboratory) - Tel. (630) 252-6740

OST Program POC:

Robert Bedick (DOE-FETC) - Tel. (304) 285-4505

TECHNOLOGY DEVELOPMENT INFORMATION

Major Developers:

- Science and Engineering Associates, Inc.
- OST Industry Program

Funding Information: (\$ in Thousands):

Total Estimated Funding: \$1,224

Other Deployments:

- FY 1995 FUSRAP General Motors Adrian Plant in Adrian, MI
- FY 1996 performed Beta surveys (Sr-90), Gamma surveys (Cs-137), and video surveys on buried drain lines at Inhalation Toxicology Research Institute (ITRI) in Albuquerque, NM
- FY 1996 at Grand Junction Site in Grand Junction, CO
- FY 1997 commercial contract to survey pipes at Mound Site, OH

Pipe Explorer (TM) System

(OST Ref. No. 74)

The Pipe Explorer system, developed by Science and Engineering Associates, Inc.(SEA), under contract with the U.S. Department of Energy (DOE) Federal Energy Technology Center, has been used to transport various characterizing sensors into piping systems that have been radiologically contaminated. DOE's nuclear facility decommissioning program must characterize radiological contamination inside piping systems before the pipe can be recycled, remediated, or disposed. The Pipe Explorer can be deployed through constrictions in the pipe, around 90° bends, vertically up and down, and in slippery conditions. Because the detector is transported inside the membrane, which is inexpensive and disposable, it is protected from contamination, which eliminates cross-contamination and false readings. Characterization sensors that have been demonstrated with the system thus far include: alpha, beta, and gamma detectors, video cameras, and pipe locators. Alpha measurement capability has been developed and will be demonstrated soon. The system is capable of deploying in pipes as small as 2-in. diameter and up to 250-ft long.

DESCRIPTION OF THE DEPLOYMENT

Location: DOE-OH, Mound Site

Project Name: Mound Environmental Management Project

Date of Deployment: Fiscal Year 1997 **Technology User:** Babcock and Wilcox - Ohio

Deployment Value/Impact: Under a commercial contract, the Pipe Explorer(TM) System was used to radiologically survey 1,100 ft of buried pipes at the Mound Site that otherwise would have had to be removed for characterization. The survey determined that the pipes were contaminated and also that many of the pipes were clogged or blocked.

Point of Contact:

User Program POC:

- Doug Maynor (DOE-OH) - Tel. (937) 865-3986
- Larry Lamsa (Mound) - Tel. (937) 865-4182

OST Program POC:

Robert Bedick (DOE-FETC) - Tel. (304) 285-4505

TECHNOLOGY DEVELOPMENT INFORMATION

Major Developers:

- Science and Engineering Associates, Inc.
- OST Industry Program

Funding Information: (\$ in Thousands):

Total Estimated Funding: \$1,224

Other Deployments:

- FY 1995 FUSRAP General Motors Adrian Plant in Adrian, MI
- FY 1996 performed Beta surveys (Sr-90), Gamma surveys (Cs-137), and video surveys on buried drain lines at Inhalation Toxicology Research Institute (ITRI) in Albuquerque, NM
- FY 1996 at Grand Junction Site in Grand Junction, CO
- FY 1997 CP-5 Reactor at Argonne National Laboratory in Argonne, IL

Expedited Site Characterization

(OST Ref. No. 77)

Expedited Site Characterization (ESC) is a rapid and cost effective methodology for conducting site characterization. ESC integrates site geology and hydrology information with contaminant analysis results from multiple techniques. Key characteristics include: a multidisciplinary team employing innovative technologies, where possible, on-site decision making, a dynamic work plan influenced by new data as it is acquired, and an emphasis on use of noninvasive and minimally invasive technologies to reduce investigation-derived wastes.

DESCRIPTION OF THE DEPLOYMENT

Location: Central Nevada Test Area, NV

Project Name: Central Nevada Test Area Surface

Date of Deployment: July - September 1997 **Technology User:** IT Corporation

Deployment Value/Impact: At the Central Nevada Test Area, located in northern NV, 22 corrective action sites were investigated for total petroleum hydrocarbon and chromium that was used in drilling mud at the sites. The use of on-site laboratory greatly reduced cost for analyses since ESC convinced regulators that the level of chromium was well below action levels that only a small number of analyses had to be done. Also no samples had to be sent to off-site laboratory for verification. The benefit to the site was that closure was achieved with analytical results from one mobilization of the field analytical lab. It was also deemed that a more thorough characterization was performed and that the site characterization contractor was trained ESC methodology.

Point of Contact:

User Program POC:
Sabine Curtis, DOE-NV, 702-295-0542

OST Program POC:
Dirk Schmidhofer, DOE-NV, 702-295-0159

TECHNOLOGY DEVELOPMENT INFORMATION

Major Developers:

Argonne National Laboratory, Ames Laboratory

Funding Information: (\$ in Thousands):

Total Estimated Funding: \$6,636

Other Deployments:

- 1995 - St. Louis Airport Site (a FUSRAP site)
- 1996 - Zone 12 Site Characterization at Pantex
- 1996 - Savannah River D-Area Oil Seepage Basin

Stainless Steel Beneficial Reuse

(OST Ref. No. 80)

This project uses developed technology to melt stainless steel radioactive scrap metal (RSM) and refabricate the metal into storage containers. The RSM to be recycled is type 304 stainless steel coming from several sources, such as heat exchangers, primary piping, damaged water containers, and contaminated transfer equipment. All RSM will qualify as 'low specific activity' items, as defined by the U.S. Department of Transportation regulations. The 304 stainless steel finished products will be 100-cubic feet boxes and 55 or 85 gallon drums. Up to 200 tons of RSM will first be processed and packaged at DOE sites. Next, the metal will be shipped to private industry for the melting and fabrication steps. The finished products will be shipped back to the DOE sites for use as containers for long-term, temporary, or above-ground storage of mixed waste, transuranics, or other appropriate materials.

DESCRIPTION OF THE DEPLOYMENT

Location: DOE-OR, Oak Ridge National Laboratory

Project Name: OR-44302, K-25 Process Equipment D&D

Date of Deployment: June 1997

Technology User: Lockheed Martin Energy System

Deployment Value/Impact: The beneficial reuse of contaminated metal illustrates DOE's ingenuity and commitment to recycle contaminated scrap metal and convert this DOE-liability material into valuable waste storage products. These containers were fabricated for transporting mixed waste for disposal.

Point of Contact:

User Program POC:

- Frank Vanryn (DOE OR) - Tel. 423-574-1907
- Johnny Moore (DOE-OR) - Tel. 423-576-3536

OST Program POC:

Steve Bossart (DOE/FETC) - Tel. 304-285-4643

TECHNOLOGY DEVELOPMENT INFORMATION

Major Developers:

Carolina Metals

Funding Information: (\$ in Thousands):

Total Estimated Funding: \$5,064

Other Deployments:

- Savannah River Site in Aiken, SC, FY 1995
- Fernald in Cincinnati, OH, FY 1997

Vitrification of Ion Exchange Materials

(OST Ref. No. 81)

Crystalline silicotitanate (CST) is an ion exchange material developed to remove radioactive cesium from tank waste. Vitrification of the cesium-loaded ion exchange material produces a waste form suitable for disposal. Formulations were developed for vitrifying Cs-loaded CST that allowed up to 60 weight percent CST in the glass. The Cs-loaded CST can also be coupled with HLW sludge and vitrified in a coupled flowsheet for both DWPF and Hanford. Glass formulations were developed which can incorporate both CST and sludge at required levels for HLW coupled operations. Durable glass was produced with minimal cesium volatilization at titanium levels significantly higher than previous HLW glass limit of 1% titanium dioxide.

DESCRIPTION OF THE DEPLOYMENT

Location: DOE-SR, Savannah River Technology Center, Vitrification of Oak Ridge Resin

Project Name: Melton Valley Storage Tanks, Oak Ridge National Laboratory

Date of Deployment: October - December 1996 **Technology User:** Lockheed Martin Energy Systems

Deployment Value/Impact: 25,000 gallons of waste from the Melton Valley Storage Tanks were treated using CSTs in 1996. The cesium loaded CSTs from this waste treatment operation were converted to a highly stable waste form for final disposal. Waste from the underground tanks at the SRS, ORR, INEEL, Hanford sites contain highly radioactive cesium which must be removed from the low activity fraction of the waste and vitrified with the high level waste. CST, a highly selective inorganic ion exchange material removes cesium from liquid tank wastes. CST is non-regenerable. One alternative for final disposal of the high activity fraction is to vitrify the cesium-loaded CST and dispose of it in high level waste glass.

Point of Contact:

User Program POC:

Tom Gutmann, DOE-SR, Tel. (803) 208-7408

OST Program POC:

Billie auss, DOE-RL, Tel: 509-372-4512

TECHNOLOGY DEVELOPMENT INFORMATION

Major Developers:

- Savannah River Technology Center
- Argonne National Lab

Funding Information: (\$ in Thousands):

Total Estimated Funding: \$2,102

Other Deployments:

This technology has not been applied anywhere else.

Light Duty Utility Arm

(OST Ref. No. 85)

The light duty utility arm (LDUA) and Modified LDUA (MLDUA) enable remote deployment and operation of in situ surveillance, confined sluicing, inspection, and waste analysis tools, called end-effectors, to multiple, in-tank positions using a robotic manipulator arm mounted on a telescoping mast. The arm can access radioactive waste storage tanks through existing 12-inch or larger diameter risers in tank domes.

DESCRIPTION OF THE DEPLOYMENT

Location: DOE-Oak Ridge, Oak Ridge National Laboratory Tank W-3

Project Name: OR-43203, Bethel Valley Remedial Action, Gunite and Associated Tanks Treatability Study (GAATTS)

Date of Deployment: July - September 1997 **Technology User:** Lockheed Martin Energy Systems

Deployment Value/Impact: Under the GAATTS, Oak Ridge is removing sufficient waste from tanks to allow the tanks to be closed and enable progress on the restoration of the Bethel Valley watershed. The modified light duty utility arm provides remote retrieval capability.

Point of Contact:

User Program POC:

Jacquie Noble-Dial (Site Rep) (DOE-OR) -
Tel. (423) 241-6184

OST Program POC:

Jeffrey A. Frey, DOE-RL, Tel: 509-372-4546
FAX: 509-372-4549

TECHNOLOGY DEVELOPMENT INFORMATION

Major Developers:

- Westinghouse Hanford Company
- SPAR Aerospace
- Pacific Northwest National Laboratory
- Sandia National Laboratory
- Idaho National Engineering and Environmental Laboratory
- Oak Ridge National Laboratory

Funding Information: (\$ in Thousands):

Total Estimated Funding: \$25,940

Other Deployments:

Hanford, Tank T-106 September, 1996

Houdini: Reconfigurable In Tank Mobile Robot

(OST Ref. No. 98)

The Houdini system will perform waste retrieval, waste mobilization, waste reduction, and other decommissioning tasks. Houdini is a tethered, hydraulically powered, track-driven worksystem with an expandable frame chassis. When fully deployed, Houdini measures 4 feet by 5 feet; but the system can be collapsed to fit through confined entries as small as 24 inches in diameter. Houdini's reliable actuation systems, low-voltage servo-valving, inherent spark-proof hydraulic operation, environmentally-safe hydraulic fluid, self-collapsing capability, hand-operable winch, and hard-wired suitcase control console make for a system that is safe and efficient to operate.

DESCRIPTION OF THE DEPLOYMENT

Location: Oak Ridge, Gunite tank W-3

Project Name: OR-43203 ORNL Bethel Valley Remedial Action

Date of Deployment: February - May 1997 **Technology User:** Lockheed Martin Energy Systems

Deployment Value/Impact: Houdini is able to be lowered into the Gunite/GAAT tanks through a tank riser. Inside the tank, it can be expanded to move the tank contents from around the walls to where it can be removed from the tank. Houdini has been used in the remediation of three of the Gunite/GAAT tanks.

Point of Contact:

User Program POC:

- Johnny Moore (DOE-OR) - Tel. (423) 576-3536
- Cavanaugh Mims (Oak Ridge Operations) - Tel. (423) 576-9481

OST Program POC:

Robert Bedick (DOE-FETC) - Tel. (304) 285-4505

TECHNOLOGY DEVELOPMENT INFORMATION

Major Developers:

- RedZone Robotics, Inc.
-

Funding Information: (\$ in Thousands):

Total Estimated Funding: \$3,621

Other Deployments:

Oak Ridge, Gunite tank W-4

Houdini: Reconfigurable In Tank Mobile Robot

(OST Ref. No. 98)

The Houdini system will perform waste retrieval, waste mobilization, waste reduction, and other decommissioning tasks. Houdini is a tethered, hydraulically powered, track-driven worksystem with an expandable frame chassis. When fully deployed, Houdini measures 4 feet by 5 feet; but the system can be collapsed to fit through confined entries as small as 24 inches in diameter. Houdini's reliable actuation systems, low-voltage servo-valving, inherent spark-proof hydraulic operation, environmentally-safe hydraulic fluid, self-collapsing capability, hand-operable winch, and hard-wired suitcase control console make for a system that is safe and efficient to operate.

DESCRIPTION OF THE DEPLOYMENT

Location: Oak Ridge, GAAT Tank W-4

Project Name: OR-43203 ORNL Bethel Valley Remedial Action

Date of Deployment: May - September 1997 **Technology User:** Lockheed Martin Energy Systems

Deployment Value/Impact: Houdini is able to be lowered into the Gunite/GAAT tanks through a tank riser. Inside the tank, it can be expanded to move the tank contents from around the walls to where it can be removed from the tank. Houdini has been used in the remediation of three of the Gunite/GAAT tanks.

Point of Contact:

User Program POC:

- Johnny Moore (DOE-OR) - Tel. (423) 576-3536
- Cavanaugh Mims (Oak Ridge Operations) - Tel. (423) 576-9481

OST Program POC:

Robert Bedick (DOE-FETC) - Tel. (304) 285-4505

TECHNOLOGY DEVELOPMENT INFORMATION

Major Developers:

- RedZone Robotics, Inc.
-

Funding Information: (\$ in Thousands):

Total Estimated Funding: \$3,621

Other Deployments:

Oak Ridge, Gunite Tank W-3

Topographical Mapping System (TMS)/Laser Range Finder (LRF)

(OST Ref. No. 130)

The Topographical Mapping System is based on structured light technology that uses laser light and a triangulation analysis method to generate a topographical map. The Topographical Mapping System camera sees the two-dimensional projected position of laser beam on the surface to be mapped. Trigonometric calculations are used to determine the position of the point in space. The Topographical Mapping System has been radiation-hardened to allow for longer in-tank time and, therefore, higher resolution. Software provides waste volume estimates based on input of tank size information and in-tank measurements.

DESCRIPTION OF THE DEPLOYMENT

Location: Oak Ridge National Laboratory

Project Name: OR-43203, Bethel Valley Remedial Action, Gunite and Associated Tanks Treatability Study, GAAT Tank W-3

Date of Deployment: March - May 1997 **Technology User:** Lockheed Martin Energy Systems

Deployment Value/Impact: Under the GAATTS, Oak Ridge is removing sufficient waste from tanks to allow the tanks to be closed and enable progress on the restoration of the Bethel Valley watershed. The Topographical Mapping System is an alternative to characterize and map the inside of waste storage tanks. This system is faster and more accurate than other methods currently being used to determine residual tank waste volume.

Point of Contact:

User Program POC:

Jacque Noble-Dial, DOE-OR, (423) 241-6184

OST Program POC:

Ted Pietrok, DOE-RL, (509) 372-4546

TECHNOLOGY DEVELOPMENT INFORMATION

Major Developers:

- Mechanical Technology, Inc.
- Oak Ridge National Laboratory
- Pacific Northwest National Laboratory
-

Funding Information: (\$ in Thousands):

Total Estimated Funding: \$3,733

Other Deployments:

Deployed (type: DOE) in FY 1992 at Fernald (K-65 Silo) in Cincinnati, OH

Topographical Mapping System (TMS)/Laser Range Finder (LRF)

(OST Ref. No. 130)

The Topographical Mapping System is based on structured light technology that uses laser light and a triangulation analysis method to generate a topographical map. The Topographical Mapping System camera sees the two-dimensional projected position of laser beam on the surface to be mapped. Trigonometric calculations are used to determine the position of the point in space. The Topographical Mapping System has been radiation-hardened to allow for longer in-tank time and, therefore, higher resolution. Software provides waste volume estimates based on input of tank size information and in-tank measurements.

DESCRIPTION OF THE DEPLOYMENT

Location: Oak Ridge National Laboratory

Project Name: OR-43203, Bethel Valley Remedial Action, Gunite and Associated Tanks Treatability Study, GAAT Tank W-6

Date of Deployment: March - May 1997 **Technology User:** Lockheed Martin Energy Systems

Deployment Value/Impact: Under the GAATTS, Oak Ridge is removing sufficient waste from tanks to allow the tanks to be closed and enable progress on the restoration of the Bethel Valley watershed. The Topographical Mapping System is an alternative to characterize and map the inside of waste storage tanks. This system is faster and more accurate than other methods currently being used to determine residual tank waste volume.

Point of Contact:

User Program POC: Jacquie Noble-Dial, DOE-OR, (423) 241-6184 **OST Program POC:** Ted Pietrok, DOE-RL, (509) 372-4546

TECHNOLOGY DEVELOPMENT INFORMATION

Major Developers:

- Mechanical Technology, Inc.
- Oak Ridge National Laboratory
- Pacific Northwest National Laboratory
-

Funding Information: (\$ in Thousands):

Total Estimated Funding: \$3,733

Other Deployments:

- Deployed (type: DOE) in FY 1992 at Fernald (K-65 Silo) in Cincinnati, OH
- Deployed (type: DOE) in FY 1997 at Oak Ridge (Gunite Tank W-3) in Oak Ridge, TN
- Deployed (type: DOE) in FY 1997 at Oak Ridge (GAAT Tank W-5) in Oak Ridge, TN

Topographical Mapping System (TMS)/Laser Range Finder (LRF)

(OST Ref. No. 130)

The Topographical Mapping System is based on structured light technology that uses laser light and a triangulation analysis method to generate a topographical map. The Topographical Mapping System camera sees the two-dimensional projected position of laser beam on the surface to be mapped. Trigonometric calculations are used to determine the position of the point in space. The Topographical Mapping System has been radiation-hardened to allow for longer in-tank time and, therefore, higher resolution. Software provides waste volume estimates based on input of tank size information and in-tank measurements.

DESCRIPTION OF THE DEPLOYMENT

Location: Oak Ridge National Laboratory

Project Name: OR-43203, Bethel Valley Remedial Action, Gunite and Associated Tanks Treatability Study, GAAT Tank W-5

Date of Deployment: March - May 1997 **Technology User:** Lockheed Martin Energy Systems

Deployment Value/Impact: Under the GAATTS, Oak Ridge is removing sufficient waste from tanks to allow the tanks to be closed and enable progress on the restoration of the Bethel Valley watershed. The Topographical Mapping System is an alternative to characterize and map the inside of waste storage tanks. This system is faster and more accurate than other methods currently being used to determine residual tank waste volume.

Point of Contact:

User Program POC: Jacquie Noble-Dial, DOE-OR, (423) 241-6184 **OST Program POC:** Ted Pietrok, DOE-RL, (509) 372-4546

TECHNOLOGY DEVELOPMENT INFORMATION

Major Developers:

- Mechanical Technology, Inc.
- Oak Ridge National Laboratory
- Pacific Northwest National Laboratory
-

Funding Information: (\$ in Thousands):

Total Estimated Funding: \$3,733

Other Deployments:

- Deployed (type: DOE) in FY 1992 at Fernald (K-65 Silo) in Cincinnati, OH
- Deployed (type: DOE) in FY 1997 at Oak Ridge (Gunite Tank W-3) in Oak Ridge, TN
- Deployed (type: DOE) in FY 1997 at Oak Ridge (GAAT Tank W-6) in Oak Ridge, TN

Membrane-Supported Particle-Bound Ligands for Cesium Removal

(OST Ref. No. 179)

Ion exchange material engineered into flow-through membranes have been developed to sample the cesium and technetium concentrations in rivers, lakes, ponds, oceans, and water tributaries. Ion exchange material attached to 3M Empore(TM) membranes have been used to sample water at the Savannah River Site. This technology provides a sampling method that is more cost effective, timely, and efficient than baseline methods that require the shipping of 55 gallon drums of the water being sampled.

DESCRIPTION OF THE DEPLOYMENT

Location: Savannah River Site, Aiken, SC

Project Name: Environmental sampling using 3M membrane technology.

Date of Deployment: Fiscal Year 1997 **Technology User:** Westinghouse Savannah River Company

Deployment Value/Impact: Improved sampling costs, efficiency, and timeliness. Before this technology the water being sampled was shipped in 55 gallon drums. The shipping was costly, the sampling method was expensive and time consuming, and the results were not reported in a timely manner. This technology improved all of these imperfections.

Point of Contact:

User Program POC:
Sharon Johnson, DOE-SR, (803) 725-5793

OST Program POC:
Jerry Harness, DOE-OR, (423)576-6008

TECHNOLOGY DEVELOPMENT INFORMATION

Major Developers:

- 3M Corporation, St. Paul MN
- OST Efficient Separations and Processing Crosscutting Program (ESP-CP0, and
- EM-40 at the Savannah River Site

Funding Information: (\$ in Thousands):

Total Estimated Funding: \$5,544

(Outside Funding: \$25)

Other Deployments:

- Applied in FY 1996 at INEEL (Test Area North (TAN)) in Idaho Falls, ID
- Applied in FY 1996 at Hanford (N-Springs, N-Basin) in Richland, WA
- Applied in FY 1998 at Savannah River Site (R-Basin) in Aiken, SC

Transportable Vitrification System (TVS)

(OST Ref. No. 222)

Vitrification involves converting wastes, which are primarily inorganic in nature, into glass using a joule-heated melter. This is accomplished by using carefully chosen additives to react chemically with glass-formers within the waste. The transportable system fully integrates material handling, glass melting, process control, and offgas treatment subsystems.

DESCRIPTION OF THE DEPLOYMENT

Location: DOE- Oak Ridge, Oak Ridge National Laboratory, ETPP (formerly K-25), B&C Pond Sludge

Project Name: WM-05 Removal of radioactive contaminant from sludge

Date of Deployment: August 1997

Technology User:

- Oak Ridge National Laboratory (ORNL)
- Lockheed Martin Energy Systems
- Westinghouse Savannah River Company

Deployment Value/Impact: This technology has eliminated 7328 kg of B&C pond sludge and CNF sludge from the Oak Ridge K-25 site, demonstrating a waste reduction around 60%.

Point of Contact:

User Program POC:

- Mr. Johnny Moore, DOE - Oak Ridge, (423) 576-3536
- Mr. Dave Hutchins, DOE - Oak Ridge, (423) 241-6420
- Mr. Irving Williams, Envitco, Inc. of Toledo, (419) 539-7297

OST Program POC:

- Mr. Bill Owca, DOE - Idaho, (208) 526-1983
- Mr. Vince Maio, LMITCO - MWFA, (208) 526-3696

TECHNOLOGY DEVELOPMENT INFORMATION

Major Developers:

- Envitco, Inc. of Toledo
- Lockheed-Martin Energy Systems
- Westinghouse Savannah River

Funding Information: (\$ in Thousands):

Total Estimated Funding: \$27,259

Other Deployments:

None

Waste Inspection Tomography (WIT)

(OST Ref. No. 259)

The Waste Inspection Tomography (WIT) project consists of a trailer-based (mobile), nondestructive evaluation and assay system for inspection of waste drums based on radiographic, tomographic, and spectroscopic principles.

DESCRIPTION OF THE DEPLOYMENT

Location: DOE-ID, Idaho National Environmental Engineering Laboratory (INEEL)

Project Name: Radioactive Waste Management Complex (RWMC) Stored Waste Examination Pilot Plant (SWEPP) (NDE/NDA TRU Drums)

Date of Deployment: January - February 1997 **Technology User:** INEEL

Deployment Value/Impact: WIT performed NDE/NDA on more than 50 drums, including 8 drums for performance verification under the Rapid Commercialization Initiative. WIT uncovered significant differences between the actual drum contents, and the stated inventory contents.

Point of Contact:

User Program POC:

- George Schneider (DOE-ID) - Tel. (208) 526-6789
- Joel Case (Idaho) - Tel. (208) 526-6795

OST Program POC:

Robert Bedick (DOE-FETC) - Tel. (304) 285-4505

TECHNOLOGY DEVELOPMENT INFORMATION

Major Developers:

- Bio-Imaging Research, Inc.
- OST Industry Program

Funding Information: (\$ in Thousands):

Total Estimated Funding: \$6,209

(Outside Funding: \$130)

Other Deployments:

FY 1996 commercial nuclear waste remediation contract (site detail is Commercial Business Information)

Catalytic Extraction Processing

(OST Ref. No. 269)

The Catalytic Extraction Process (CEP) uses a molten metal bath that acts as a catalyst and solvent in the breakdown of waste feed constituents into their constituent elements. Addition of co-reactants enables reformation and controlled partitioning of desired products.

DESCRIPTION OF THE DEPLOYMENT

Location: Molten Metal Technology Facility at Oak Ridge, TN

Project Name: Commercial Application

Date of Deployment: Fiscal Year 1997 **Technology User:** Molten Metal Technology, Inc.

Deployment Value/Impact: Molten Metal Technology, Inc. used the Quantum CEP to process radioactively contaminated ion-exchange resins from commercial nuclear power plants.

Point of Contact:

User Program POC:
Brian Payea (Molten Metal) - Tel. (617) 487-7681

OST Program POC:
Robert Bedick (DOE-FETC) - Tel. (304) 285-4505

TECHNOLOGY DEVELOPMENT INFORMATION

Major Developers:

- Molten Metals Technology, Inc.
- OST Industry Program

Funding Information: (\$ in Thousands):

Total Estimated Funding: \$48,515 (Outside Funding: \$15,287)

Other Deployments:

- This technology has not been applied anywhere else.
- Additional commercial facilities are pending resolution of financial issues.

Road Transportable Analytical Laboratory (RTAL)

(OST Ref. No. 292)

The Road Transportable Analytical Laboratory (RTAL) was developed to meet the unique needs of the Department of Energy (DOE) for rapid, on-site, low cost, and accurate analysis of environmental samples (soil, groundwater, and surface waters) for all samples of concern, including radionuclides. The RTAL design makes maximal use of laboratory automation and robotics technologies to dramatically shorten turnaround time and lower analytical costs while maintaining the highest levels of quality assurance and control. The RTAL is designed to be able to fully analyze samples within 16 hours, providing critical analytical data several days, weeks, or months faster than is currently achievable. Cost analyses show potential savings from analytical costs alone of \$12 million per year for each RTAL system deployed compared to current central laboratory costs.

DESCRIPTION OF THE DEPLOYMENT

Location: DOE-OH, Fernald, OH

Project Name: OU5 Advanced Wastewater Treatment (AWWT) Facility, OH-FN-04 Aquifer Restoration

Date of Deployment: Fiscal Year 1997 **Technology User:** Fluor Daniel - Fernald

Deployment Value/Impact: The RTAL is designed to be able to fully analyze samples within 16 hours, providing critical analytical data several days, weeks, or months faster than is currently achievable.

Point of Contact:

User Program POC:

- Rod Warner (DOE-OH) - Tel. (513) 648-3156
- Larry Stebbins (Fluor Daniel, Inc.) - Tel. (513) 648-4785

OST Program POC:

Robert Bedick (DOE-FETC) - Tel. (304) 285-4505

TECHNOLOGY DEVELOPMENT INFORMATION

Major Developers:

- Engineering Computer Optecnomics
- OST Industry Program

Funding Information: (\$ in Thousands):

Total Estimated Funding: \$6,205

Other Deployments:

Deployed at Nevada Test Site, FY1999

Fiber Optic/Cone Penetrometer System for Subsurface Heavy Metals Detection

(OST Ref. No. 319)

This technology is an integrated fiber optic sensor/cone penetrometer system to analyze the heavy-metals content of the subsurface. This site characterization tool uses the penetrometer to deploy an optical fiber chemical sensor which is based on laser induced breakdown spectroscopy (LIBS). In LIBS, a pulse from a high-energy laser, typically a Nd:YAG operating at 1.06 m, is delivered to the soil sample via an optical fiber. The soil sample absorbs the laser pulse, heat rapidly, reduce to elemental form, and become electronically excited. When the input pulse is removed, the excited electrons drop to lower energy levels with the emission of characteristic photons. The plasma emission is returned from the sample via a second fiber. Elemental analysis is conducted by observation of the wavelength and intensities of the emission lines, which will depend upon the type and amount of material present within the plasma. This technique has shown to be an effective method for the quantitative analysis of contaminants in soils.

DESCRIPTION OF THE DEPLOYMENT

Location: DOE-OR, FUSRAP Site

Project Name: FUSRAP - Luckey, OH

Date of Deployment: September - October 1997 **Technology User:** Science & Engineering Associates, Inc. (EM-40 FUSRAP Program)

Deployment Value/Impact: Beryllium concentrations in contaminated soil at the 40-acre site were measured in situ and in real-time with the goal of identifying hot spots that would require remediation. The site was used during the early 1950s by a private sector company to operate a beryllium manufacturing plant for the AEC. Deployment of the technology during a 6-week field project led to the successful identification of beryllium hot spots.

Point of Contact:

User Program POC:

- Johnny Moore (DOE-OR) - Tel. (423) 576-3536
- Bob Atkin (DOE-OR) - Tel. (423) 576-1826

OST Program POC:

Robert Bedick (DOE-FETC) - Tel. (304) 285-4505

TECHNOLOGY DEVELOPMENT INFORMATION

Major Developers:

- Science and Engineering Associates, Inc.
- OST Industry Program

Funding Information: (\$ in Thousands):

Total Estimated Funding: \$978

Other Deployments:

This technology has not been applied anywhere else.

Structured Light

(OST Ref. No. 367)

In 1994-95, the Topographical Mapping System (TMS) design originally developed by ORNL and SNL for use at the Fernald K-65 silos was modified for deployment at Hanford and ORNL. This modified system still used the structured light technique to determine range from sensor modules to illuminated surfaces, but was upgraded to handle higher radiation, higher pH and explosive atmospheres. This improved system was developed by ORNL and Mechanical Technology Incorporated (MTI) following CRADAs between MTI and both ORNL and SNL.

DESCRIPTION OF THE DEPLOYMENT

Location: Oak Ridge National Laboratory, Tanks W-5 and W-6, Gunite & Associated Tanks

Project Name: Gunite and Associated Tanks Remediation Project

Date of Deployment: Fiscal Year 1997 **Technology User:** ORNL EM-40 Gunite and Associated Tanks Remediation Project, Lockheed Martin Energy Research

Deployment Value/Impact: Under the Gunite and Associated Tanks Remediation Project, Oak Ridge is demonstrating the ability to remove sufficient waste from tanks to allow the tanks to be closed. The walls of some of the tanks were thought to have deteriorated to the point where remote remediation and wall washing techniques could have an adverse effect. The TMS was deployed into two such tanks and used to inspect and map the tank walls. The results from the surveys were then used to plan a suitable remediation strategy for the tanks with the damaged walls.

Point of Contact:

User Program POC:

- Gary A. Armstrong (Oak Ridge National Laboratory) - Tel. 423-574-5683
- Dr. Barry L. Burks (The Providence Group) - Tel. 423-927-5519
-

OST Program POC:

- John DeGregory (DOE-HQ) - Tel. 301-903-7949
- Dr. Linton W. Yarbrough (DOE-AL) - Tel. 505-845-6569
- Dr. Barry L. Burks (The Providence Group) - Tel. 423-927-5519
-

TECHNOLOGY DEVELOPMENT INFORMATION

Major Developers:

- ORNL and SNL developed the original Topographical Mapping System that used the structured light technique. This design was later modified to withstand the higher radiation and pH and explosive atmospheres at Hanford. That modified system, which was later deployed at ORNL, was developed by Mechanical Technology Incorporated (MTI) following CRADAs with ORNL and SNL.
-

Funding Information: (\$ in Thousands):

Total Estimated Funding: \$1,175

Other Deployments:

- The original structured light system was deployed in the K-65 silos at the Fernald site in 1991. A second system was later built and optimized for deployment at the Hanford site. Although this unit was demonstrated at the Hanford Fuel Materials Examination Facility it was never formally deployed at Hanford. This same system was, however, later deployed in Tanks W-5 and W-6 at ORNL as part of the Gunite and Associated Tanks Remediation

Structured Light

(OST Ref. No. 367)

Project.

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Cross-Well Seismic Imaging

(OST Ref. No. 588)

Seismic techniques are the established method for mapping the structural geology of sites deep within the earth and identifying fluid-saturated regions. Seismic methods are capable of penetrating up to tens of feet with resolutions of less than three feet, compared to standard geophysical approaches using electrical or electromagnetic approaches which can not resolve targets less than 10 feet or depths greater than 15 feet. This advanced technology, appropriately applied, is very suitable for identifying, locating, and characterizing hazardous waste sources, waste plumes, and local geologic structure and hydrology.

DESCRIPTION OF THE DEPLOYMENT

Location: LLNL, Livermore Site

Project Name: Vertical Seismic Profiling

Date of Deployment: February, 1997

Technology User: LLNL/ORNL

Deployment Value/Impact: Technology used for site characterization, to identify subsurface fluid migration pathways. Plume contains a variety of contaminants - VOCs and radioactive metals. Major advantage - easy to set up and deploy, employing an existing well.

Point of Contact:

User Program POC:

Mike Brown (DOE-Oakland), Tel. 925-423-7061

OST Program POC:

Kim Abbott, (DOE-Oakland), Tel. 510-637-1501

TECHNOLOGY DEVELOPMENT INFORMATION

Major Developers:

- Lawrence Berkeley National Lab, Berkeley, CA
- Southwest Research Institute, San Antonio, TX

Funding Information: (\$ in Thousands):

Total Estimated Funding: \$416

Other Deployments:

- FY 1992, Lawrence Livermore National Laboratory (Main Site), Livermore, CA
- FY 1996, Savannah River Site (A/M Area), Aiken, SC

Directional Drilling

(OST Ref. No. 650)

This technology provides methods to install directional wells that meet data quality objectives, minimize secondary waste generation, and reduce costs for drilling by minimizing operational and contamination exposure hazards to personnel. Furthermore, during drilling and following the completion of a boring or well, it supports the deployment of instruments, sensors, and other devices to the subsurface for characterization, remediation (including barrier placement), and monitoring purposes, and to accurately place boreholes.

DESCRIPTION OF THE DEPLOYMENT

Location: DOE-Chicago; Brookhaven National Laboratory, HFBR Tritium Project

Project Name: High Flux Beam Reactor (HFBR) Spent Fuel Pool

Date of Deployment: March 1997

Technology User: Associated Universities, Inc.

Deployment Value/Impact: Placed two directional boreholes to sample Tritium-contaminated groundwater underneath the facility's spent fuel pool. The directional drilling was used successfully to place the boreholes. Results of the groundwater testing activities were inconclusive.

Point of Contact:

User Program POC:

Gail Penny (DOE-Chicago), Tel. 516-344-3429

OST Program POC:

James Wright (DOE-SR) 803-725-5608

TECHNOLOGY DEVELOPMENT INFORMATION

Major Developers:

Originally developed by New Mexico Institute of Mining and Technology and commercialized by Texas Eastern Developments/Eastman Cherrington Environmental

Funding Information: (\$ in Thousands):

Total Estimated Funding: \$10,309

Other Deployments:

- Lawrence Berkeley National Laboratory in Berkeley, CA: 1989, 1996
- Sandia National Laboratories, NM, 1993
- FEMP (SILOS), OH, 1994
- Savannah River Site (F Basin), SC, 1996

LDUA - Supervisory Data Acquisition and Supervisory Control System

(OST Ref. No. 810)

The Light Duty Utility Arm (LDUA) Supervisory Data Acquisition and Supervisory Control System provides integrated data acquisition and remote control capability for LDUA operations. The system is operated from three stations: the Operations Workstation, the LDUA Console, and the Data Acquisition Workstation. The system is designed for two operators to control in-tank operations from a remotely located control trailer. One operator controls the LDUA operations, and a second operator controls end effectors and data manipulation. This technology is considered unique and separate from the LDUA because it is a significant step forward on robotic arm control systems.

DESCRIPTION OF THE DEPLOYMENT

Location: DOE-Oak Ridge, Oak Ridge National Laboratory, Tank W-3

Project Name: OR-43203, Bethel Valley Remedial Action, Gunitite and Associated Tanks Treatability Study (GAATTS)

Date of Deployment: July-September 1997 **Technology User:** Lockheed Martin Energy Systems

Deployment Value/Impact: Under the GAATTS, Oak Ridge is removing sufficient waste from tanks to allow the tanks to be closed and enable progress on the restoration of the Bethel Valley watershed. The Operations Workstation allows operators to preview motion of the LDUA in simulation, avoiding potential collisions. The Data Acquisition Workstation provides the primary user interface for operating end effectors, collecting data, and for monitoring and controlling the Tank Riser Interface and Containment (TRIC) environment subsystems.

Point of Contact:

User Program POC:

Jacquie Noble-Dial, DOE-OR, Tel. (423) 241-6184

OST Program POC:

Billie Mauss, DOE-RL, Tel: 509-372-4512

TECHNOLOGY DEVELOPMENT INFORMATION

Major Developers:

Sandia National Laboratories

Funding Information: (\$ in Thousands):

Total Estimated Funding: \$4,239

Other Deployments:

FY1996, Hanford, Tank T-106

LDUA Stereo Viewing System

(OST Ref. No. 890)

The Light Duty Utility Arm (LDUA) Stereo Viewing System uses a pair of cameras in conjunction with special hardware to allow the perception of depth. The hardware is modified from state-of-the-art technology for use in radioactive environments. The camera signals are processed by the stereo viewing system and displayed on a conventional monitor. Special liquid crystal display shutter glasses are synchronized with the processed image on the monitor, creating the perception of depth. This technology has been applied in development of both overview video systems to observe LDUA operations from a remote perspective and has been included in end effectors for close-up views of tool operations.

DESCRIPTION OF THE DEPLOYMENT

Location: DOE-Oak Ridge, Oak Ridge National Laboratory, Tank W-3

Project Name: OR-43203, Bethel Valley Remedial Action, Gunite and Associated Tanks Treatability Study (GAATTS)

Date of Deployment: July-September
1997

Technology User: Lockheed Martin Energy
Systems

Deployment Value/Impact: Under the GAATTS, Oak Ridge is removing sufficient waste from tanks to allow the tanks to be closed and enable progress on the restoration of the Bethel Valley watershed. The Stereo Viewing System provides stereoscopic viewing of LDUA activities improving the control of the LDUA in DOE's underground radioactive waste storage tanks.

Point of Contact:

User Program POC:

Jacquie Noble-Dial, DOE-OR, Tel. (423) 241-6184

OST Program POC:

Billie Mauss, DOE-RL, Tel: 509-372-4512

TECHNOLOGY DEVELOPMENT INFORMATION

Major Developers:

- Westinghouse Hanford Company
- Bristlecone Environmental Technologies

Funding Information: (\$ in Thousands):

Total Estimated Funding: \$965

Other Deployments:

1996, Hanford, Tank T-106

Base Hydrolysis

(OST Ref. No. 1420)

Base Hydrolysis is considered as one of the better technical alternatives to open flame, for the treatment of 1,3,5-Triamino-2,4,6-Trinitrobenzene (TATB). This process uses a solution to reduce the ignitability of the waste, followed by a secondary reduction process using a mixture of zinc and hydrochloric acid mix to degrade trinitrophenol, an explosive by-product resulting from the primary process.

DESCRIPTION OF THE DEPLOYMENT

Location: DOE - Albuquerque, Pantex (Amarillo, Texas) explosive waste stream

Project Name: PX-W026 Reactive Organic Waste

Date of Deployment: March 1997

Technology User: Pantex Plant

Deployment Value/Impact: The weapon systems in the stockpile program are designed and assembled using 1,3,5-Triamino-2,4,6-Trinitrobenzene (TATB) high explosive. Pantex Plants ongoing mission to maintain, evaluate, and dismantle the weapons systems will result in the generation of TATB waste. This project will demonstrate a base hydrolysis process for destruction of high explosive contaminated materials. This process, when successfully demonstrated, will replace the current process of open pit burning of these wastes.

Point of Contact:

User Program POC:

Mr. Dennis Olona, DOE-AL, (505) 845-4296

OST Program POC:

• Mr. Bill Owca, DOE-ID, (208) 526-1983

• Mr. Jay Roach, Lockheed Martin Idaho Technologies Company, (208) 526-4974

TECHNOLOGY DEVELOPMENT INFORMATION

Major Developers:

Los Alamos National Laboratory (LANL)

Funding Information: (\$ in Thousands):

Total Estimated Funding: \$302

Other Deployments:

None

Laser Cutting and Size Reduction

(OST Ref. No. 1477)

The Remote Laser Cutting utilizes a Neodymium Yttrium Aluminum Garnet (Nd:YAG) laser to cut and size reduce equipment in the 324 Laboratory B Hot Cell Air Lock located at Pacific Northwest National Laboratory. This project demonstrated the ability of the Nd:Yag laser to remotely and safely dismantle equipment faster, cheaper, and more efficiently than baseline cutting methods, such as the plasma torch and the water knife, in a highly radioactive area using fiber optics.

DESCRIPTION OF THE DEPLOYMENT

Location: Hanford; Richland, WA (B-Cell Air Lock)

Project Name: RL-TP01; B-Plant Sub Project

Date of Deployment: May 1997

Technology User: Babcox & Wilcox

Deployment Value/Impact: The technology was successfully used in the cleanup of the Hanford B-cell in a cold environment. Subsequently the technology was used to partially cut a crane in the air lock. B&W purchased the laser system for future use (e.g., glovebox dismantlement in building 231Z).

Point of Contact:

User Program POC:

Shannon N. Saget (DOE-RL) - 509-372-4029

OST Program POC:

John Duda (DOE-FETC) - 304-285-4217

TECHNOLOGY DEVELOPMENT INFORMATION

Major Developers:

Lumonics, Livonia, MI.

Funding Information: (\$ in Thousands):

Total Estimated Funding: \$909

Other Deployments:

- FY 1997 Energy Technology Engineering Center, Santa Susana, CA
- Manufacturing Sciences Corporation (Oak Ridge, TN) is investigating deployment opportunities for size reducing converter shells from the K-25 Plant

Laser Cutting and Size Reduction

(OST Ref. No. 1477)

The Energy Technology Engineering Center (ETEC) applied remote laser cutting and size reduction techniques to the dismantlement and waste management of radioactive components at the ETEC site. This project used an off-the-shelf laser and fiber optics system to deliver the laser beam to a controlled cutting site for the remote size-reduction of contaminated fuel storage tubes. The size-reduced components were inspected and the radiologically clean (or decontaminated) sections released as scrap instead of requiring radioactive disposal.

DESCRIPTION OF THE DEPLOYMENT

Location: Energy Technology Engineering Center (Contaminated Fuel storage Tubes)

Project Name: OAK-007; ETEC Remediation

Date of Deployment: July 1997

Technology User: Energy Technology Engineering Center (Boeing)

Deployment Value/Impact: Fuel Storage Tubes were size reduced longitudinally and circumferentially for subsequent inspection and possible decontamination. The laser is faster, safer, and generates less secondary waste and airborne contamination. Remote applications allow minimal worker exposure.

Point of Contact:

User Program POC:

- Kim Abbott (DOE-Oakland) - 510-637-1501
- Mr. Satish Shah (ETEC D/022) - Tel. 818-586-5007

OST Program POC:

John Duda (DOE-FETC) - 304-285-4217

TECHNOLOGY DEVELOPMENT INFORMATION

Major Developers:

Lumonics, Livonia, MI

Funding Information: (\$ in Thousands):

Total Estimated Funding: \$909

Other Deployments:

- Deployed in FY 1997 at Hanford (B-cell); Richland, WA
- Manufacturing Sciences Corporation (Oak Ridge, TN) is investigating deployment opportunities for size reducing converter shells from the K-25 Plant

Rapid Sampling Using 3M Membrane Technology

(OST Ref. No. 1514)

This technology incorporates specialized flow-through membranes in a field-deployable water sampling system for radionuclides and heavy metals in natural and process waters. It packages surface-reactive particles in porous membranes to provide a high degree of selectivity for rapid water sampling. Examples include disks for technetium, strontium, cesium, radium, and plutonium. Current work is directed toward developing self-indicating disks for field determination of these radionuclides and in water.

DESCRIPTION OF THE DEPLOYMENT

Location: DOE-Savannah River, Savannah River Site, River Mile 120 & 160, Four Mile Creek, F/H areas

Project Name: PBS#: SR-IR02, SR-IR06, SR-IN10. Annual Environmental Monitoring Program and Process Control Station at F/H Groundwater Remediation Facilities

Date of Deployment: August 1997

Technology User: Westinghouse
Savannah River
Company

Deployment Value/Impact: The technology provides high selectivity and low detection levels for target analytes. Benefits include reduction in analytical waste by eliminating the need to collect ~20 liter water samples and cost savings from water sample collection, packaging, transportation, analytical preparation, and storage. The cost savings are: 1) For strontium 99 - \$400K per 756 samples per year, 2) For cesium 137 - \$270 per sample (material only), 3) For technetium 99 - \$475 per sample (material only).

Point of Contact:

User Program POC:
Sharon Robinson, DOE-SR, 803-725-5793

OST Program POC:
Dirk Schmidhofer, DOE-NV, 702-295-0159

TECHNOLOGY DEVELOPMENT INFORMATION

Major Developers:

3M; Argonne National Laboratory

Funding Information: (\$ in Thousands):

Total Estimated Funding: \$562

Other Deployments:

None

Specialized Separation Utilizing 3M Membrane Technology

(OST Ref. No. 1543)

This technology incorporates specialized flow-through membranes in a field-deployable water sampling system for radionuclides and heavy metals in natural and process waters. It packages surface-reactive particles in porous membranes to provide a high degree of selectivity for rapid water sampling. Examples include disks for technetium, strontium, cesium, radium, and plutonium. Current work is directed toward developing self-indicating disks for field determination of these radionuclides and in water.

DESCRIPTION OF THE DEPLOYMENT

Location: Savannah River Site, River Mile 120 and 160: Four mile creek; F/H areas

Project Name: PBS#: SR-IR02, SR-IR06, SR-IN10. Annual Environmental Monitoring Program and Process Control Station at F/H Groundwater Remediation Facilities

Date of Deployment: August, 1997

Technology User: Westinghouse
Savannah River
Corporation

Deployment Value/Impact: The technology provides high selectivity and low detection levels for target analytes. Benefits include reduction in analytical waste by eliminating the need to collect ~20 liter water samples and cost savings from water sample collection, packaging, transportation, analytical preparation, and storage. The cost savings are: 1) For strontium 99 - \$400K per 756 samples per year, 2) For cesium 137 - \$270 per sample (material only), 3) For technetium 99 - \$475 per sample (material only).

Point of Contact:

User Program POC:
Sharon Robinson (

OST Program POC:
Robert C. Bedick, (304) 285-4505

TECHNOLOGY DEVELOPMENT INFORMATION

Major Developers:

- 3M Corporation
- OST Industry Programs

Funding Information: (\$ in Thousands):

Total Estimated Funding: \$2,639

Other Deployments:

Deployed (type: DOE) in FY 1997 at Argonne National Laboratory (CP-5 LSDP) in Argonne, IL

Specialized Separation Utilizing 3M Membrane Technology

(OST Ref. No. 1543)

At Department of Energy (DOE) sites where radioactive materials were processed for weapons development and production there is waste which needs to be remediated. Much of the waste occurs in the form of aqueous solutions. Water in spent nuclear fuel storage basins and contaminated groundwater are two examples. Separating radionuclides and other contaminants from these solutions is necessary before they can be discharged to the environment. Often, contaminants must be removed to below EPA drinking water standards, and radionuclides and contaminants that have been separated from the solutions must be put in a form that can be either stored or processed further. Ion exchange and adsorption, two well-established techniques for remediation of aqueous waste streams, are often used for this purpose. Ion exchange and adsorbent particles suitable for use in columns have diameters greater than about 200 micrometers because smaller particles are difficult to support and offer very high flow resistance. Particle-loaded membranes have been developed that contain ten to thirty micron-sized particles. There is great flexibility in particle selection and it is possible to fabricate membranes from just about any particle provided it is properly sized. These membranes have been fabricated into cartridges which can be installed in the same vessels used for filters. In practice they function just like columns albeit ones with very large diameter compared to height. Technology development has been evolutionary starting with the EMPORE™ membrane that was made from tiny fibrils of poly-tetrafluoroethylene (PTFE) and small particles. Because PTFE is embrittled by radiation, a different fibrous matrix was introduced which resists radiation. Since the process for fabricating each of these membranes is quite different, considerable effort was expended in developing WWL, the term used for the radiation-resistant web. Converting WWL into cartridges involved additional development that is still ongoing. In parallel, systems for carrying out separations have also been developed along with a pilot-scale device. It includes filters for removing particulates that would otherwise clog absorber cartridges, vessels that house the absorbers, and controls with everything mounted on a portable drip tray/support.

DESCRIPTION OF THE DEPLOYMENT

Location: Argonne National Laboratory, CP-5 LSDP

Project Name: Argonne National Laboratory, CP-5 LSDP

Date of Deployment: Fiscal Year 1997 **Technology User:** Argonne National Laboratory

Deployment Value/Impact: Effluent from cartridge-based separation systems has lower concentrations of wastes than effluent from columns (i.e. a superior level of decontamination can be achieved). Volume of secondary wastes including material that must be stored is reduced. Flow rate at which waste streams can be processed is much higher for cartridge-based systems because the kinetics of exchange is much more rapid due to the small particle size. Captured radionuclides are immobilized on cartridges which can be easily handled and packaged for storage or further processing. The footprint of a cartridge-based system is small compared to columns making it easier to protect workers from radiation. Through selection of the proper particle, wastes can be captured selectively avoiding generation of mixed wastes that are hard to dispose of.

Point of Contact:

User Program POC:

- Mr. Mike Ferrigan (DOE/CH) - Tel. 630-252-2570
- Mr. Tom Yule (ANL) - Tel. 630-252-6740

OST Program POC:

Robert Bedick (DOE-FETC) - Tel. (304) 285-4505

TECHNOLOGY DEVELOPMENT INFORMATION

Major Developers:

- 3M Corporation, St. Paul MN

1997

Industry and University Programs

Specialized Separation Utilizing 3M Membrane Technology

(OST Ref. No. 1543)

- OST Industry Programs

Funding Information: (\$ in Thousands):

Total Estimated Funding: \$2,639

Other Deployments:

Demonstrated in FY 1997 at Paducah Gaseous Diffusion Plant (PDGP) in Paducah, KY

Treatment Using Wet Oxidation

(OST Ref. No. 1606)

This technology uses waste sodium hydroxide solutions and an added oxidizer to destroy organics in an aqueous environment. Hydrogen peroxide is the oxidizing agent. The process prepares certain organically contaminated mixed waste streams for final treatment via vitrification.

DESCRIPTION OF THE DEPLOYMENT

Location: DOE Oak Ridge, ORNL and Y-12 plant waste streams

Project Name: HG-2 Pretreatment of organically contaminated waste

Date of Deployment: May - September
1997

Technology User: Lockheed Martin Energy
Systems

Deployment Value/Impact: This technology was a part of the MWFA Quick Wins Program, funded in FY 1997. Its impact would be to allow the vitrification of otherwise untreatable organically contaminated tank waste using the Transportable Vitrification System, upon its implementation at Oak Ridge.

Point of Contact:

User Program POC:
Johnny Moore, DOE-OR, (423)576-3536

OST Program POC:

- Bill Owca, DOE-ID, (208) 526-1983
- Frank Van Ryn, (423) 574-1907

TECHNOLOGY DEVELOPMENT INFORMATION

Major Developers:
Oak Ridge National Laboratory

Funding Information: (\$ in Thousands):
Total Estimated Funding: \$529

Other Deployments:
None

Capillary Barrier

(OST Ref. No. 1717)

Surface covers are an important component in the isolation strategy of waste management methods. Landfills, surface impoundments, waste piles, and some mine tailings are required to be covered with an engineered cover or cap upon closure. Conventional covers can be expensive, difficult to construct, and of questionable long-term performance especially in arid environments. Conventional barriers rely on moist, compacted clays to restrict infiltration. In arid lands the clays dry out, crack and lose their effectiveness as a barrier. Capillary barriers, consisting of fine-over-coarse soil layers, have been suggested as an alternative component for surface covers. Although a relatively simple configuration, a capillary barrier should result in a long-lived, easily constructed, and low-cost barrier in comparison with many conventional cover systems. Capillary barriers are resistant to the desiccation that may compromise the effectiveness of conventional clay barriers in arid lands.

DESCRIPTION OF THE DEPLOYMENT

Location: Farmington, New Mexico

Project Name: Lee Acres Landfill

Date of Deployment: May, 1997- (ongoing) **Technology User:** Bureau of Land Management; San Juan County

Deployment Value/Impact: Capillary barrier was installed to contain a 3/4 acre liquid waste lagoon at a NPL site, a former municipal landfill. Concentrations of organic leachates and Mn in the underlying plume exceed NM State health standards. Cap consists of a three layer sequence (from bottom upwards): pea gravel, fine soil layer, and vegetation layer gravel/soil mix, all of local derivation. Soil moisture, suction and temperature are being monitored at four locations since 8/97, and the data is being applied towards the verification of unsaturated flow at the site. Testing is scheduled to proceed till 1999. The performance goal is 'no percolation in a 100-year period'. In general, the simple configuration of the capillary barrier should result in a lower cost, effective, and more desiccation-resistant cover system. The use of capillary barriers is also expected to significantly lower risks associated with failure of conventional barriers.

Point of Contact:

User Program POC:

- George Allen (SNL), Tel. 505-844-9769
- Stephanie Odell (BLM), Tel. 970-385-1353

OST Program POC:

Jim Wright, Tel. 803-725-5608

TECHNOLOGY DEVELOPMENT INFORMATION

Major Developers:

Sandia National Laboratories

Funding Information: (\$ in Thousands):

Total Estimated Funding: \$375

Other Deployments:

Warren AFB (Air Force Base site), Cheyenne, WY, FY97

In Situ Stabilization and Retrieval System

(OST Ref. No. 1744)

This technology addresses the challenges presented by abandoned buried mixed-waste containment structures (which includes tanks, sumps, and vaults). It applies innovative grout and contamination control for in situ stabilization of contaminated buried wastes to mitigate contaminant release to the environment. Hot spot containment and then retrieval of hot spots in buried waste pits or trenches provide either a long-term or an interim solution.

DESCRIPTION OF THE DEPLOYMENT

Location: Idaho, Acid Pit Tank V-9

Project Name: PBSs #, Acid Pit Tank V-9, Idaho

Date of Deployment: Fiscal Year 1997 **Technology User:** DOE-Idaho

Deployment Value/Impact: The in situ stabilization system uses innovative processes for injecting grout or other stabilizing materials into the waste form thereby stabilizing the contamination and mitigating environmental impacts due to leaching and contaminant migration. Depending on specific characteristics of the project, the waste can either remain as stabilized in place or exhumed with much less risk of exposure to the workers.

Point of Contact:

User Program POC:

George Schneider (DOE-ID) - Tel. (208) 526-6789

OST Program POC:

James Wright (DOE-SR) - Tel. (803) 725-5608

TECHNOLOGY DEVELOPMENT INFORMATION

Major Developers:

- Lockheed martin Idaho Technologies
- Geo-Con
- MSE-TA, Inc.

Funding Information: (\$ in Thousands):

Total Estimated Funding: \$5,683

Other Deployments:

This is the first deployment of this technology.

Micropurging of Wells

(OST Ref. No. 1762)

For water well monitoring purposes, it is essential that sampling have a minimum interference with natural aquifer conditions. Water within the screened section of a monitor well flows through the casing at its normal ground water flow velocity. Therefore, a sample collected from within the screened section represents the aquifer formation water. The baseline sampling approach involves purging three well volumes at a low rate (< 0.5 liters/minute) such that only limited draw-down occurs and, consequently, mixing of the stagnant water above the screened interval with the formation water may take place. The Low Volume micropurging method involves only purging (at a rate of < 1 gpm) the volume of water contained within the discharge lines and pump prior to measurement of field chemical parameters and sample collection.

DESCRIPTION OF THE DEPLOYMENT

Location: Lawrence Livermore National Laboratory (LLNL), Site 300 and Livermore Site

Project Name: Low Volume Sampling

Date of Deployment: September, 1997
(Site 300) **Technology User:** LLNL

Deployment Value/Impact: Benefits include: (1) a dramatic reduction in the amount of Investigation Derived Wastes (IDWs) - contaminated purge water that has to be treated or shipped out for disposal; (2) the amount of sampling time is greatly decreased which leads to lower sampling costs; (3) the Low Volume micropurging methodology can be used with any purging/sampling device, whereas baseline purging can only be done with a handful of devices and can still be time consuming due to the very low purging rates; and (4) there are no draw-down or colloidal effects.

Point of Contact:

User Program POC:

Mike Brown (DOE-Oakland), Tel. 925-423-7061

OST Program POC:

Jim Wright, Tel. 803-725-5608

TECHNOLOGY DEVELOPMENT INFORMATION

Major Developers:

LLNL Environmental Restoration Division

Funding Information: (\$ in Thousands):

Total Estimated Funding: \$219

Other Deployments:

- In FY 1993, at FEMP (OU5), Fernald, OH
- In FY 1995, at Princeton (PPPL10-11), Princeton, NJ

Steam Vacuum Cleaning

(OST Ref. No. 1780)

The Kelly Steam Vacuum Cleaning Decontamination System is a steam/vacuum cleaning system owned by Container Products Corporation of Wilmington, North Carolina. The system uses the kinetic energy of superheated pressurized water to dislodge surface contaminants from debris. The superheated water is directed through a hand-held spray wand, or any of a series of steam/vacuum cleaning heads that integrate spray nozzles within a hooded vacuum recovery sub-system. The superheated liquid flashes to steam upon contact with the debris. The hood is attached to a powerful vacuum cleaner which effectively picks up the steam and contaminants dislodged by the steam jet. The vacuum is most effective on flat surfaces but hoods with different contours can be used to conform to many surfaces. The waste stream passes through a liquid separator, a demister, and a high efficiency particulate air filter that removes contaminants and discharges clean air to the atmosphere. A detergent may be added to the pressurized water stream to improve washing effectiveness.

DESCRIPTION OF THE DEPLOYMENT

Location: Savannah River, 105-K reactor

Project Name: SR-FA20; Reactor Monitoring Project

Date of Deployment: Fiscal Year 1997 **Technology User:** Facility
Decommissioning
Division

Deployment Value/Impact: The Kelly Decontamination System is one of many decontamination tools used by the SRS Decon Facility, housed in the 105-C reactor facility, to decontaminate equipment from other SRS facilities. Most of the equipment is portable and can be taken to other SRS facilities for application. Using a shrouded head, the system was used to remove transferable and some fixed contamination from both the concrete floors and walls in the contaminated area (CA) rollback. Thirteen thousand sq. ft. of concrete floor in the CA rollback have been decontaminated to free release. The system was also used with a spray wand to remove gross transferable contamination from metal surfaces (stainless steel rods) in the disassembly basin. Contaminated area rollbacks reduce PPE requirements and lower S&M costs of shutdown SRS facilities.

Point of Contact:

User Program POC:

- Mr. Martin Salazar (DOE/SR) - Tel. 803-577-3617
- Ms. Heatherly Dukes (Westinghouse Savannah River Company) - Tel. 803-557-9205

OST Program POC:

Mr. Steve Bossart (DOE/FETC) - Tel. 304-285-4643

TECHNOLOGY DEVELOPMENT INFORMATION

Major Developers:

Container Products Corp.

Funding Information: (\$ in Thousands):

Total Estimated Funding: \$160

Other Deployments:

- Deployed (type: DOE) in FY 1997 at Savannah River Site (105-C reactor) in Aiken, SC
- Deployed (type: DOE) in FY 1996 at Savannah River Site (105-L Reactor) in Aiken, SC

Steam Vacuum Cleaning

(OST Ref. No. 1780)

The Kelly Steam Vacuum Cleaning Decontamination System is a steam/vacuum cleaning system owned by Container Products Corporation of Wilmington, North Carolina. The system uses the kinetic energy of superheated pressurized water to dislodge surface contaminants from debris. The superheated water is directed through a hand-held spray wand, or any of a series of steam/vacuum cleaning heads that integrate spray nozzles within a hooded vacuum recovery sub-system. The superheated liquid flashes to steam upon contact with the debris. The hood is attached to a powerful vacuum cleaner which effectively picks up the steam and contaminants dislodged by the steam jet. The vacuum is most effective on flat surfaces but hoods with different contours can be used to conform to many surfaces. The waste stream passes through a liquid separator, a demister, and a high efficiency particulate air filter that that removes contaminants and discharges clean air to the atmosphere. A detergent may be added to the pressurized water stream to improve washing effectiveness.

DESCRIPTION OF THE DEPLOYMENT

Location: Savannah River Site, 105-C Reactor (Decon Facility)

Project Name: SR-FA20; Reactor Monitoring Project

Date of Deployment: FY 1997

Technology User: Facility
Decommissioning
Division

Deployment Value/Impact: The Kelly Decontamination System is one of many decontamination tools used by the SRS Decon Facility, housed in the 105-C reactor facility, to decontaminate equipment from other SRS facilities. Most of the equipment is portable and can be taken to other SRS facilities for application. Using a shrouded head, the system was used to remove transferable and some fixed contamination from both the concrete floors and walls in the contaminated area (CA) rollback. Thirteen thousand sq. ft. of concrete floor in the CA rollback have been decontaminated to free release. The system was also used with a spray wand to remove gross transferable contamination from metal surfaces (stainless steel rods) in the disassembly basin. Contaminated area rollbacks reduce PPE requirements and lower S&M costs of shutdown SRS facilities.

Point of Contact:

User Program POC:

- Mr. Martin Salazar (DOE-SR) - Tel. 803-557-3617
- Ms. Heatherly Dukes (Westinghouse Savannah River Company) - Tel. 803-557-9205

OST Program POC:

Mr. Steve Bossart (DOE/FETC) - Tel. 304-285-4643

TECHNOLOGY DEVELOPMENT INFORMATION

Major Developers:

Container Products Corporation

Funding Information: (\$ in Thousands):

Total Estimated Funding: \$160

Other Deployments:

- Deployed (type: DOE) in FY 1996 at Savannah River (105-L Reactor) in Aiken, SC
- Deployed (type: DOE) in FY 1997 at Savannah River (105-K reactor) in Aiken, SC

Dual Arm Work Platform Teleoperated Robotics System

(OST Ref. No. 1787)

The Dual Arm Work Platform (DAWP) consists of two 6-degree-of-freedom (DOF) Schilling hydraulic manipulator arms mounted on a 5-DOF hydraulic positioning base. DAWP is designed for use in teleoperation, telerobotic, and robotic modes. The DAWP was used for a variety of D&D tasks at the CP-5 facility including reactor control rod cutting and sizing, reactor vessel dismantlement, removal of contaminated lead panels, and dismantlement and removal of graphite bricks from the control rod penetrations. Equipped with a circular saw, DAWP cut up large sections of the reactor and then passed them out to Rosie-C for size reduction and waste packaging.

DESCRIPTION OF THE DEPLOYMENT

Location: Argonne National Laboratory-East; Argonne, IL (CP-5 Test Reactor)

Project Name: CH-ANLEDD, ANL-E D&D Actions

Date of Deployment: June-September, 1997 **Technology User:** Argonne National Laboratory (ANL)

Deployment Value/Impact: The DAWP was used for a variety of D&D tasks at the CP-5 facility including reactor control rod cutting and sizing, reactor vessel dismantlement, removal of contaminated lead panels, and dismantlement and removal of graphite bricks from the control rod penetrations. Equipped with a circular saw, DAWP cut up large sections of the reactor and then passed them out to Rosie-C for size reduction and waste packaging.

Point of Contact:

User Program POC:

- Mr. Mike Ferrigan (DOE/CH) - Tel. 630-252-2570
- Mr. Tom Yule (ANL) - Tel. 630-252-6740

OST Program POC:

Steve Bossart (DOE-FETC) - 304-285-4643

TECHNOLOGY DEVELOPMENT INFORMATION

Major Developers:

Schilling Robotics Systems, Red Zone Robotics, Oak Ridge National Laboratory, Idaho National Energy Engineering Laboratory, ANL, OR-CH.

Funding Information: (\$ in Thousands):

Total Estimated Funding: \$1,655

Other Deployments:

No other deployments identified in FY1997

Mobile Integrated Temporary Utility System

(OST Ref. No. 1795)

The Mobile Integrated Temporary Utility System (MITUS) completely replaces site power for D&D projects in conjunction with other needed services. MITUS routes power to various parts of a facility via international-orange-colored armored cables. These orange feeds terminate at up to 20 specially designed Kiosks. The Kiosks supply a variety of power voltages (110, 220, and 480 volts), 3-way communication capabilities and paging, emergency egress lighting, and a multi-level alarm system. The three alarm conditions are medical (blue), alert (yellow), and evacuation (red). Any alarm can be triggered from any Kiosk; every alarm signal also notifies the central alarm station. The modular design of MITUS allows for quick setup and teardown, and movement to another facility.

DESCRIPTION OF THE DEPLOYMENT

Location: Hanford; Richland, WA (105-C Reactor)

Project Name: RL-ER06, Decontamination & Decommissioning (D&D)

Date of Deployment: February-March, 1997 **Technology User:** Bechtel Hanford, Inc.

Deployment Value/Impact: MITUS was used to provide increased safety and productivity during D&D activities by providing electrical power to match field needs, and clear quick communication and response to emergencies during site work. MITUS is mounted on a trailer and has a controller located at each zone where the workers are performing D&D activities. In case a safety hazard or problem occurs, the worker has a much faster response time to control electrical power and call for emergency personnel. MITUS can accommodate up to twenty portable Kiosks per unit. Nine Kiosks were connected for the demonstration at the 105-C Reactor at Hanford.

Point of Contact:

User Program POC:
Jeff Bruggeman (DOE-RL) - 509-376-7121

OST Program POC:
John Duda (DOE-FETC) - 304-285-4217

TECHNOLOGY DEVELOPMENT INFORMATION

Major Developers:
Rumsey Electric

Funding Information: (\$ in Thousands):
Total Estimated Funding: \$1,221

Other Deployments:

- No additional deployments in FY1998
- MITUS was mobilized in FY 1998 for deployment in FY 1999 at Hanford's F and DR Reactors; Richland, WA

Mobile Robot Worksystem (ROSIE)

(OST Ref. No. 1799)

'Rosie', was designed and implemented to deploy tooling for selective equipment removal and other D&D tasks. In addition, a semi-automatic robotic perception system, called 'Artisan', was developed to analyze and generate a geometric model of the worksystem's surroundings. Rosie provides the capability to do remote work in a variety of D&D applications while Artisan provides capabilities that help Rosie operators perform tasks faster and safer.

DESCRIPTION OF THE DEPLOYMENT

Location: Argonne National Laboratory-East; Argonne, IL (CP-5 Reactor Facility)

Project Name: CH-ANLEDD; ANL-E D&D Actions

Date of Deployment: June - September 1997 **Technology User:** Argonne National Laboratory

Deployment Value/Impact: Rosie removed approximately 3,000 lbs of contaminated graphite blocks and safely off-loaded 5,000 lbs of radioactive materials from the top of the CP-5 reactor without risking exposure to radiation by personnel. Rosie was used in conjunction with the DAWP and the Swing-Reduced Crane to conduct a number of dismantlement and waste disposition activities as part of the CP-5 D&D project.

Point of Contact:

User Program POC:

- Mr. Mike Ferrigan (DOE/CH) - Tel. 630-252-2570
- Mr. Tom Yule (ANL) - Tel. 630-252-6740

OST Program POC:

Robert Bedick (DOE-FETC) - Tel. (304) 285-4505

TECHNOLOGY DEVELOPMENT INFORMATION

Major Developers:

- RedZone Robotics, Inc.
- OST Industry Program

Funding Information: (\$ in Thousands):

Total Estimated Funding: \$6,307

Other Deployments:

This technology has not been applied anywhere else.

Pipe Crawler Internal Piping Characterization System

(OST Ref. No. 1810)

Pipe Crawler was developed by Radiological Services, Inc., for use as part of a turn-key pipe inspection, decontamination and survey service. The technology consists of a wheeled robot, or mule, on which is mounted an array of thin G-M detectors. The crawler is manually transported through pipes using flexible fiberglass rods. If piping systems are accessible from both ends, up to 200 feet of pipe, including multiple bends, can be surveyed. Crawlers have been build for pipes as small as 2 inch to as large as 18 inch internal diameter.

DESCRIPTION OF THE DEPLOYMENT

Location: Park Township, PA (NRC Site)

Project Name: NA - Non-DOE Deployment

Date of Deployment: Fiscal Year 1997 **Technology User:** B&W Services

Deployment Value/Impact: Video surveying and sampling of approximately 300 feet of 8 to 18-inch diameter outdoor sewer lines for the Parks Decommissioning Project. This technology unnecessary excavation, surveying and disposition of suspect-contaminated pipes.

Point of Contact:

User Program POC:

- Mr. David Fogel (PA Nuclear Service Operations) - Tel. 724-842-1477
- Mr. Don Krause (B&W Services) - Tel. 937-865-4501

OST Program POC:

Steve Bossart (DOE/FETC) - Tel. 304-285-4643

TECHNOLOGY DEVELOPMENT INFORMATION

Major Developers:

Radiological Services, Inc.

Funding Information: (\$ in Thousands):

Total Estimated Funding: \$169

(Outside Funding: \$8)

Other Deployments:

Deployed (type: DOE) in FY 1997 at Argonne National Laboratory (CP-5 Research Reactor Facility) in Argonne, IL

Pipe Crawler Internal Piping Characterization System

(OST Ref. No. 1810)

Pipe Crawler was developed by Radiological Services, Inc., for use as part of a turn-key pipe inspection, decontamination and survey service. The technology consists of a wheeled robot, or mule, on which is mounted an array of thin G-M detectors. The crawler is manually transported through pipes using flexible fiberglass rods. If piping systems are accessible from both ends, up to 200 feet of pipe, including multiple bends, can be surveyed. Crawlers have been built for pipes as small as 2 inch to as large as 18 inch internal diameter.

DESCRIPTION OF THE DEPLOYMENT

Location: Argonne National Laboratory-East: Argonne, IL (CP-5 Research Reactor Facility)

Project Name: CH-ANLEDD; ANL-E D&D Actions

Date of Deployment: January 1997 **Technology User:** Argonne National Lab

Deployment Value/Impact: ANL used the Pipe Crawler to inspect pipe interiors for contamination without the time, expense, and risk of pipe extraction. Surveys were conducted primarily in the rod storage holes, along with portions of a pair of 12-inch vent lines servicing the reactor area at CP-5. Several rod storage holes each of 5-, 6- and 12-inch diameter and 10- to 17-foot depth were surveyed, along with about 40 feet of the combined vent lines.

Point of Contact:

User Program POC:

- Mr. Mike Ferrigan (DOE/CH) - Tel. 630-252-2570
- Mr. Tom Yule (ANL) - Tel. 630-252-6740

OST Program POC:

Steve Bossart (DOE-FETC) - 304-285-4643

TECHNOLOGY DEVELOPMENT INFORMATION

Major Developers:

Radiological Services, Inc.

Funding Information: (\$ in Thousands):

Total Estimated Funding: \$169

(Outside Funding: \$8)

Other Deployments:

Deployed (type: Non-DOE) in FY 1997 at Park Township (NRC Site) in Park Township, PA

Swing-Reduced Crane Control

(OST Ref. No. 1815)

The polar crane at the Argonne National Laboratory CP-5 facility was modified with a No-Sway™ crane control system. The swing-reduced control system adjusts the bridge and trolley motion of the crane to limit the induced sway in the load. The system uses AC vector motors and drives in place of the original bridge and trolley AC motors. Additional features added to the crane include the following commercially-available upgrades: a radio control system for remote operation of the crane, a motorized rotating block, an on-board remotely-operated video camera, and load cells with remote load displays.

DESCRIPTION OF THE DEPLOYMENT

Location: Argonne National Laboratory-East; Argonne, IL (CP-5 Research Reactor)

Project Name: CH-ANLEDD; ANL-E D&D Action

Date of Deployment: September 1997 **Technology User:** Argonne National Lab

Deployment Value/Impact: ANL modified an existing overhead crane system by reducing the naturally induced crane swing. This allows for more precision operations during D&D operations, such as deploying remotely operated equipment for dismantlement and size reduction tasks. The crane was used during lifts of critical loads, and during the placement of robotic dismantlement system in the CP-5 reactor structure. This crane system was used in conjunction with Rosie and DAWP to remove reactor shield plugs, graphite block shielding, and other reactor components. This system provides more radiation protection to the worker than previously used manual operated long handled tools.

Point of Contact:

User Program POC:

- Mr. Mike Ferrigan (DOE/CH) - Tel. 630-252-2570
- Mr. Tom Yule (ANL) - Tel. 630-252-6740

OST Program POC:

Steve Bossart (DOE-FETC) - 304-285-4643

TECHNOLOGY DEVELOPMENT INFORMATION

Major Developers:

Savannah River, Los Alamos and MIT. System was licensed to Convolve and DAMAS Corp

Funding Information: (\$ in Thousands):

Total Estimated Funding: \$1,665

Other Deployments:

Gulfport, MS, FY1996

Reactor Surface Contamination Stabilization

(OST Ref. No. 1839)

The Master Lee coating 'Instacote' can be used contain airborne contaminants, as well as to fix loose surface contaminants. Master-Lee's Instacote TM coating consists of a polyurea film cover. the coating applicator consists of a modified Gusmer Model H-2000 high pressure proportioner that controls the mixture of coating compounds and a Gusmer Model No. GX-7 spray gun for spraying the coating onto the surfaces. Coatings were prepared by mixing two different compounds before the application. The proportion of the compounds are controlled at the high pressure proportioner and delivered to the spray gun via two different hoses.

DESCRIPTION OF THE DEPLOYMENT

Location: Savannah River Site, 105-C Decon Facility

Project Name: SR-FA20; Reactors Monitoring Project

Date of Deployment: August 1997

Technology User: Facility
Decommissioning
Division

Deployment Value/Impact: Master-Lee's Instacoate is being used as one of many D&D tools at the SRS Decon Facility. It is used for contamination rollback to fix contaminants in place on outdoor structures site wide, mainly on reactors and tank farms. Instacoate was chosen for its long term weather durability, and has reduced the necessity of wearing PPEs near these structures/facilities, thus helping reduce costs.

Point of Contact:

User Program POC:

- Ms. Heatherly Dukes (Westinghouse Savannah River Company) - Tel. 803-557-9205
- Mr. Martin Salazar (DOE Savannah River) - Tel. 803-557-3617

OST Program POC:

Mr. John Duda (DOE/FETC) - Tel. 304-285-4217

TECHNOLOGY DEVELOPMENT INFORMATION

Major Developers:

Master Lee

Funding Information: (\$ in Thousands):

Total Estimated Funding: \$168

Other Deployments:

No additional deployments identified in FY1997

Gamma Cam (TM) Radiation Imaging System

(OST Ref. No. 1840)

The GammaCamTM System displays the relative strength and location of gamma radiation as a two-dimensional image superimposed on the corresponding visual image. GammaCamTM consists of a portable sensor head that contains a gamma-ray imaging system and a TV camera. The superimposed radiation and visual images are displayed on a standard portable PC computer screen located several hundred feet from the radiation area. The PC controls the data acquisition time, the field of view, and the image display.

DESCRIPTION OF THE DEPLOYMENT

Location: Arkansas Nuclear One, Reactor Building

Project Name: NA - Non-DOE deployment

Date of Deployment: June 1997

Technology User: Innovative Industry Solutions

Deployment Value/Impact: Arkansas Nuclear One deployed the ability to perform remote, real-time, radiological surveys in highly radioactive D&D environments to avoid worker exposure and the need and expense of shielding.

Point of Contact:

User Program POC:

Mr. Stan Robinson (Innovative Industry Solutions) - Tel. 501-890-8503

OST Program POC:

Steve Bossart (DOE-FETC) - 304-285-4643

TECHNOLOGY DEVELOPMENT INFORMATION

Major Developers:

AIL Systems

Funding Information: (\$ in Thousands):

Total Estimated Funding: \$71

(Outside Funding: \$6)

Other Deployments:

- FY 1996 Los Alamos National Laboratory; Los Alamos, NM
- FY 1997 CP-5 Research Reactor Facility; Argonne, IL
- FY 1997 INEEL Advanced Test Reactor (ATR) Valve Cubicle 2B in Idaho Falls, ID

Gamma Cam (TM) Radiation Imaging System

(OST Ref. No. 1840)

The GammaCamTM System displays the relative strength and location of gamma radiation as a two-dimensional image superimposed on the corresponding visual image. GammaCam consists of a portable sensor head that contains a gamma-ray imaging system and a TV camera. The superimposed radiation and visual images are displayed on a standard portable PC computer screen located several hundred feet from the radiation area. The PC controls the data acquisition time, the field of view, and the image display.

DESCRIPTION OF THE DEPLOYMENT

Location: Argonne National Laboratory-East; Argonne, IL (CP-5 Test Reactor)

Project Name: CH-ANLEDD; ANL-E D&D Actions

Date of Deployment: December 1996 **Technology User:** Argonne National Lab

Deployment Value/Impact: The GammaCam was used at CP-5 for imaging radiological spills, for isolating radiation sources located inside a concrete vault, and for detecting and eliminating areas of radiation leakage in temporary shielding. GammaCam has shown the ability to perform remote, real-time, radiological surveys in highly radioactive D&D environments to avoid worker exposure and the need and expense of shielding.

Point of Contact:

User Program POC:

- Mr. Mike Ferrigan (DOE/CH) - Tel. 630-252-2570
- Mr. Tom Yule (ANL) - Tel. 630-252-6740

OST Program POC:

Steve Bossart (DOE-FETC) - 304-285-4643

TECHNOLOGY DEVELOPMENT INFORMATION

Major Developers:

AIL Systems

Funding Information: (\$ in Thousands):

Total Estimated Funding: \$71 (Outside Funding: \$6)

Other Deployments:

- FY 1996 Los Alamos National Laboratory; Los Alamos, NM
- FY 1997 (Non-DOE) Arkansas Nuclear One (Reactor Building); Russellville, AR
- FY 1997 (DOE) at INEEL Advanced Test Reactor (ATR) Valve Cubicle 2B in Idaho Falls, ID

Gamma Cam (TM) Radiation Imaging System

(OST Ref. No. 1840)

The GammaCamTM System displays the relative strength and location of gamma radiation as a two-dimensional image superimposed on the corresponding visual image. GammaCam consists of a portable sensor head that contains a gamma-ray imaging system and a TV camera. The superimposed radiation and visual images are displayed on a standard portable PC computer screen located several hundred feet from the radiation area. The PC controls the data acquisition

DESCRIPTION OF THE DEPLOYMENT

Location: INEEL, Advanced Test Reactor (ATR) Valve Cubicle 2B

Project Name: ID-ER-110; Decontamination & Dismantlement

Date of Deployment: October 1996

Technology User: LMITCO

Deployment Value/Impact: The Gamma Cam provided thorough and documented remote radiation surveys. Its ability to quickly identify 'hot spots' coupled with its remote application significantly reduced radiation exposure to the workers. Cost savings are also attributed to this technology through reduced PPE requirements.

Point of Contact:

User Program POC:

Mr. Garald Smith (DOE/ID) - Tel. 208-526-5200

OST Program POC:

Mr. Steve Bossart (DOE/FETC) - Tel. 304-285-4643

TECHNOLOGY DEVELOPMENT INFORMATION

Major Developers:

AIL Systems

Funding Information: (\$ in Thousands):

Total Estimated Funding: \$71

(Outside Funding: \$6)

Other Deployments:

- Deployed (type: DOE) in FY 1997 at Argonne National Lab (CP-5 Test Reactor) in Argonne, IL
- Deployed (type: DOE) in FY 1996 at Los Alamos National Laboratory (Unknown) in Los Alamos, NM
- Deployed (type: Non-DOE) in FY 1997 at Arkansas Nuclear One (Reactor Building) in Russellville, AR

Oxy-Gasoline Torch

(OST Ref. No. 1847)

The Oxy-Gasoline Safety Torch was developed by Petrogen International Ltd., Richmond, Calif. The Oxy-Gasoline cutting technique has been around for many years but was not considered a safe method because earlier technology charged a gasoline tank with oxygen and piped this volatile vapor to the cutting torch. A backflash often resulted in explosion. The system is a safe, reliable design which makes backflash impossible. An additional advantage of the Oxy-Gasoline Torch is the evaporation of gasoline which acts as a refrigeration process making the torch run cooler than conventional torches thereby, greatly extending tip life. The Oxy-Gasoline Torch burns at a temperature of over 5,000 degrees F and the force of the expanding gasoline flame allows for cutting under adverse conditions (dirty, rusty, cement coatings or backing, stacks of deformed plate, 5 percent chrome steel, 9 percent nickel steel, etc.). The torch deployed is a hand-held torch with a 2.5-gallon gasoline tank and a manifold tank system for the liquid oxygen. The Petrogen Oxy-Gasoline Torch is also available as a machine torch which can be mounted on track machines, pipe cutters, and rail cutters.

DESCRIPTION OF THE DEPLOYMENT

Location: Kazakhstan

Project Name: NA - Non-DOE deployment

Date of Deployment: 1997

Technology User: Kazakhstan

Deployment Value/Impact: Kazakhstan deployed the ability to cut through very thick metal (0.5 in. to 4.5 in.) faster, cleaner, and with less emissions than the commonly used thermal segmenting techniques.

Point of Contact:

User Program POC:

Mrs. Susan Benik (Defense Special Weapons Agency) - Tel. 703-325-6962

OST Program POC:

Steve Bossart (DOE-FETC) - 304-285-4643

TECHNOLOGY DEVELOPMENT INFORMATION

Major Developers:

Petrogen International, Ltd.

Funding Information: (\$ in Thousands):

Total Estimated Funding: \$95

Other Deployments:

- Deployed (type: DOE) in FY 1997 at Fernald (Plant 4) in Cincinnati, OH
- Deployed (type: DOE) in FY 1997 at Oak Ridge, TN
- Deployed (type: Non-DOE) in FY 1997 in Russia
- Deployed (type: DOE) in FY 1997 at Pantex Plant (N/A) in Amarillo, TX
- Deployed (type: Non-DOE) in FY 1997 at East River Drive in Manhattan, NY

Oxy-Gasoline Torch

(OST Ref. No. 1847)

The Oxy-Gasoline Safety Torch was developed by Petrogen International Ltd., Richmond, Calif. The Oxy-Gasoline cutting technique has been around for many years but was not considered a safe method because earlier technology charged a gasoline tank with oxygen and piped this volatile vapor to the cutting torch. A backflash often resulted in explosion. The system is a safe, reliable design which makes backflash impossible. An additional advantage of the Oxy-Gasoline Torch is the evaporation of gasoline which acts as a refrigeration process making the torch run cooler than conventional torches thereby, greatly extending tip life. The Oxy-Gasoline Torch burns at a temperature of over 5,000 degrees F and the force of the expanding gasoline flame allows for cutting under adverse conditions (dirty, rusty, cement coatings or backing, stacks of deformed plate, 5 percent chrome steel, 9 percent nickel steel, etc.). The torch deployed is a hand-held torch with a 2.5-gallon gasoline tank and a manifold tank system for the liquid oxygen. The Petrogen Oxy-Gasoline Torch is also available as a machine torch which can be mounted on track machines, pipe cutters, and rail cutters.

DESCRIPTION OF THE DEPLOYMENT

Location: DOE-AL, Pantex Plant

Project Name: AL014; Pantex Plant Site Remediation Project (D&D)

Date of Deployment: July 1997

Technology User: Mason & Hanger

Deployment Value/Impact: Mason & Hanger purchased two oxygasoline torches for size reduction applications at the Pantex Plant. The oxygasoline torch was used to cut through various metal thicknesses (0.5 in. to 4.5 in.) faster, cheaper, and with less emissions than the commonly used acetylene torch.

Point of Contact:

User Program POC:

- Mr. John Cormier (DOE/AL) - Tel. 505-845-5956
- Mr. Ken Williams (Mason & Hanger Corporation) - Tel. 1-806-477-3392

OST Program POC:

Steve Bossart (DOE-FETC) - 304-285-4643

TECHNOLOGY DEVELOPMENT INFORMATION

Major Developers:

Petrogen International, Ltd.

Funding Information: (\$ in Thousands):

Total Estimated Funding: \$95

Other Deployments:

- Deployed (type: DOE) in FY 1997 at Fernald (Plant 4) in Cincinnati, OH
- Deployed (type: DOE) in FY 1997 at Oak Ridge, TN
- Deployed (type: Non-DOE) in FY 1997 in Russia
- Deployed (type: Non-DOE) in FY 1997 in Kazakhstan
- Deployed (type: Non-DOE) in FY 1997 at East River Drive in Manhattan, NY

Oxy-Gasoline Torch

(OST Ref. No. 1847)

The Oxy-Gasoline Safety Torch was developed by Petrogen International Ltd., Richmond, Calif. The Oxy-Gasoline cutting technique has been around for many years but was not considered a safe method because earlier technology charged a gasoline tank with oxygen and piped this volatile vapor to the cutting torch. A backflash often resulted in explosion. The system is a safe, reliable design which makes backflash impossible. An additional advantage of the Oxy-Gasoline Torch is the evaporation of gasoline which acts as a refrigeration process making the torch run cooler than conventional torches thereby, greatly extending tip life. The Oxy-Gasoline Torch burns at a temperature of over 5,000 degrees F and the force of the expanding gasoline flame allows for cutting under adverse conditions (dirty, rusty, cement coatings or backing, stacks of deformed plate, 5 percent chrome steel, 9 percent nickel steel, etc.). The torch deployed is a hand-held torch with a 2.5-gallon gasoline tank and a manifold tank system for the liquid oxygen. The Petrogen Oxy-Gasoline Torch is also available as a machine torch which can be mounted on track machines, pipe cutters, and rail cutters.

DESCRIPTION OF THE DEPLOYMENT

Location: Fernald; Cincinnati, OH (Plant 4)

Project Name: OH-FN-02; Facility D&D

Date of Deployment: March 1997

Technology User: B&W Services

Deployment Value/Impact: B&W Services used the oxygasoline torch to cut thick-walled equipment, vessels, and shield walls during the decommissioning of the Fernald Plant 4 facility. The oxygasoline torch was used to cut through various metal thicknesses (0.5 in. to 4.5 in.) faster, cheaper, and with less emissions than the commonly used acetylene torch.

Point of Contact:

User Program POC:

- Mr. Bob Danner (DOE-FN) - Tel. 513-648-3167
- Mr. Don Krause (B&W Services, Inc.) - Tel. 804-522-6848

OST Program POC:

Steve Bossart (DOE-FETC) - 304-285-4643

TECHNOLOGY DEVELOPMENT INFORMATION

Major Developers:

Petrogen International, Ltd.

Funding Information: (\$ in Thousands):

Total Estimated Funding: \$95

Other Deployments:

- Deployed (type: DOE) in FY 1997 at Oak Ridge, TN
- Deployed (type: Non-DOE) in FY 1997 in Russia
- Deployed (type: DOE) in FY 1997 at Pantex Plant (N/A) in Amarillo, TX
- Deployed (type: Non-DOE) in FY 1997 in Kazakhstan
- Deployed (type: Non-DOE) in FY 1997 at East River Drive in Manhattan, NY

Oxy-Gasoline Torch

(OST Ref. No. 1847)

The Oxy-Gasoline Safety Torch was developed by Petrogen International Ltd., Richmond, Calif. The Oxy-Gasoline cutting technique has been around for many years but was not considered a safe method because earlier technology charged a gasoline tank with oxygen and piped this volatile vapor to the cutting torch. A backflash often resulted in explosion. The system is a safe, reliable design which makes backflash impossible. An additional advantage of the Oxy-Gasoline Torch is the evaporation of gasoline which acts as a refrigeration process making the torch run cooler than conventional torches thereby, greatly extending tip life. The Oxy-Gasoline Torch burns at a temperature of over 5,000 degrees F and the force of the expanding gasoline flame allows for cutting under adverse conditions (dirty, rusty, cement coatings or backing, stacks of deformed plate, 5 percent chrome steel, 9 percent nickel steel, etc.). The torch deployed is a hand-held torch with a 2.5-gallon gasoline tank and a manifold tank system for the liquid oxygen. The Petrogen Oxy-Gasoline Torch is also available as a machine torch which can be mounted on track machines, pipe cutters, and rail cutters.

DESCRIPTION OF THE DEPLOYMENT

Location: DOE-OR, Oak Ridge National Laboratory

Project Name: OR-44302; K-25 Process Equipment D&D

Date of Deployment: June 1997

Technology User: Lockheed Martin Energy System

Deployment Value/Impact: Lockheed Martin Energy System purchased two oxygasoline torches for remote cutting applications at ORNL. The oxygasoline torch was used to cut through various metal thicknesses (0.5 in. to 4.5 in.) faster, cheaper, and with less emissions than the commonly used acetylene torch.

Point of Contact:

User Program POC:

- Mr. Johnny Moore (DOE/OR) - Tel. 615-576-3536
- Mr. Roger Bradley (LMER) - Tel. 423-574-7160

OST Program POC:

Steve Bossart (DOE-FETC) - 304-285-4643

TECHNOLOGY DEVELOPMENT INFORMATION

Major Developers:

Petrogen International, Ltd.

Funding Information: (\$ in Thousands):

Total Estimated Funding: \$95

Other Deployments:

- Deployed (type: DOE) in FY 1997 at Fernald (Plant 4) in Cincinnati, Ohio
- Deployed (type: Non-DOE) in FY 1997 in Russia
- Deployed (type: DOE) in FY 1997 at Pantex Plant (N/A) in Amarillo, TX
- Deployed (type: Non-DOE) in FY 1997 in Kazakhstan
- Deployed (type: Non-DOE) in FY 1997 at East River Drive in Manhattan, NY

Oxy-Gasoline Torch

(OST Ref. No. 1847)

The Oxy-Gasoline Safety Torch was developed by Petrogen International Ltd., Richmond, Calif. The Oxy-Gasoline cutting technique has been around for many years but was not considered a safe method because earlier technology charged a gasoline tank with oxygen and piped this volatile vapor to the cutting torch. A backflash often resulted in explosion. The system is a safe, reliable design which makes backflash impossible. An additional advantage of the Oxy-Gasoline Torch is the evaporation of gasoline which acts as a refrigeration process making the torch run cooler than conventional torches thereby, greatly extending tip life. The Oxy-Gasoline Torch burns at a temperature of over 5,000 degrees F and the force of the expanding gasoline flame allows for cutting under adverse conditions (dirty, rusty, cement coatings or backing, stacks of deformed plate, 5 percent chrome steel, 9 percent nickel steel, etc.). The torch deployed is a hand-held torch with a 2.5-gallon gasoline tank and a manifold tank system for the liquid oxygen. The Petrogen Oxy-Gasoline Torch is also available as a machine torch which can be mounted on track machines, pipe cutters, and rail cutters.

DESCRIPTION OF THE DEPLOYMENT

Location: Russia

Project Name: NA - Non-DOE deployment

Date of Deployment: 1997

Technology User: Russia

Deployment Value/Impact: Russia deployed the ability to cut through very thick metal (0.5 in. to 4.5 in.) faster, cleaner, and with less emissions than the commonly used thermal segmenting techniques.

Point of Contact:

User Program POC:

Mrs. Susan Benik (Defense Special Weapons Agency) - Tel. 703-325-6962

OST Program POC:

Steve Bossart (DOE-FETC) - 304-285-4643

TECHNOLOGY DEVELOPMENT INFORMATION

Major Developers:

Petrogen International, Ltd.

Funding Information: (\$ in Thousands):

Total Estimated Funding: \$95

Other Deployments:

- Deployed (type: DOE) in FY 1997 at Fernald (Plant 4) in Cincinnati, OH
- Deployed (type: DOE) in FY 1997 at Oak Ridge, TN
- Deployed (type: DOE) in FY 1997 at Pantex Plant (N/A) in Amarillo, TX
- Deployed (type: Non-DOE) in FY 1997 in Kazakhstan
- Deployed (type: Non-DOE) in FY 1997 at East River Drive in Manhattan, NY

Oxy-Gasoline Torch

(OST Ref. No. 1847)

The Oxy-Gasoline Safety Torch was developed by Petrogen International Ltd., Richmond, Calif. The Oxy-Gasoline cutting technique has been around for many years but was not considered a safe method because earlier technology charged a gasoline tank with oxygen and piped this volatile vapor to the cutting torch. A backflash often resulted in explosion. The system is a safe, reliable design which makes backflash impossible. An additional advantage of the Oxy-Gasoline Torch is the evaporation of gasoline which acts as a refrigeration process making the torch run cooler than conventional torches thereby, greatly extending tip life. The Oxy-Gasoline Torch burns at a temperature of over 5,000 degrees F and the force of the expanding gasoline flame allows for cutting under adverse conditions (dirty, rusty, cement coatings or backing, stacks of deformed plate, 5 percent chrome steel, 9 percent nickel steel, etc.). The torch deployed is a hand-held torch with a 2.5-gallon gasoline tank and a manifold tank system for the liquid oxygen. The Petrogen Oxy-Gasoline Torch is also available as a machine torch which can be mounted on track machines, pipe cutters, and rail cutters.

DESCRIPTION OF THE DEPLOYMENT

Location: East River Drive; Manhattan, NY

Project Name: NA - Non-DOE deployment

Date of Deployment: 1997

Technology User: Laquila Construction Co.

Deployment Value/Impact: Deployed the ability to cut through very thick metal (0.5 in. to 4.5 in.) faster, cleaner, and with less emissions than the commonly used thermal segmenting techniques.

Point of Contact:

User Program POC:

Mr. Angelo Sisca (Laquila Construction Company) - Tel. 718-252-0126

OST Program POC:

Steve Bossart (DOE-FETC) - 304-285-4643

TECHNOLOGY DEVELOPMENT INFORMATION

Major Developers:

Petrogen International, Ltd.

Funding Information: (\$ in Thousands):

Total Estimated Funding: \$95

Other Deployments:

- Deployed (type: DOE) in FY 1997 at Fernald (Plant 4) in Cincinnati, OH
- Deployed (type: DOE) in FY 1997 at Oak Ridge, TN
- Deployed (type: Non-DOE) in FY 1997 in Russia
- Deployed (type: DOE) in FY 1997 at Pantex Plant (N/A) in Amarillo, TX
- Deployed (type: Non-DOE) in FY 1997 in Kazakhstan
- Deployed (type: Non-DOE) in FY 1998 at Envirocare in Salt Lake City, UT
- Deployed (type: DOE) in FY 1998 at Hanford (C Reactor Gas & Water Tunnels) in Richland, WA
- Deployed (type: DOE) in FY 1998 at Ashtabula (RF-3 Burning Building) in Ashtabula, OH
- Deployed (type: DOE) in FY 1998 at INEEL (CFA-691) in Idaho Falls, ID
- Deployed (type: DOE) in FY 1998 at Fernald (Buildings 38A, 38B, 3F and 3G) in Fernald, OH

Centrifugal Shot Blast System

(OST Ref. No. 1851)

The Centrifugal Shot Blast technology developed by Concrete Cleaning, Inc., is an electrically operated self-propelled abrasive blast machine that travels across concrete surfaces. Hardened steel shot is propelled at a high rate of speed and abrades the concrete surface on contact. The steel shot and debris generated is vacuumed, the steel shot is reused, and the debris is collected by a large HEPA filtration system. The unit was demonstrated for its ability to remove coatings from large concrete floor areas.

DESCRIPTION OF THE DEPLOYMENT

Location: Parks Township, PA (NRC site)

Project Name: NA - Non-DOE deployment

Date of Deployment: 1997

Technology User: Surface Remediation Specialists
(subcontracted by B&W Services, Inc.)

Deployment Value/Impact: B&W Services used the shot blast system to decontaminate concrete surfaces to meet regulatory requirements and to reduce potential personnel and environmental exposure. The system was at an NRC plutonium/uranium facility located at Parks Township, PA.

Point of Contact:

User Program POC:

- Mr. David Fogel (PA Nuclear Service Operations) - Tel. 724-842-1477
- Mr. Don Krause (B&W Services) - Tel. 937-865-4501

OST Program POC:

Steve Bossart (DOE-FETC) - 304-285-4643

TECHNOLOGY DEVELOPMENT INFORMATION

Major Developers:

Surface Remediation Specialists (formerly, Concrete Cleaning, Inc.)

Funding Information: (\$ in Thousands):

Total Estimated Funding: \$255

(Outside Funding: \$27)

Other Deployments:

No other deployments in FY1998

Portable Selective Hot Spot Removal System

(OST Ref. No. 1863)

The ground penetrating holographic system technology (low frequency electromagnetic array with both a 2.5 Ghz and 5 Ghz linear array for imaging waste) will be used to determine the location, depth, and size of buried materials. The identification of buried waste without disturbing or disrupting the environment is a difficult task in soils of high conductivity or low resistivity (less than ~50 ohm meters). High speed surveillance and moderately high resolution low frequency electromagnetic imaging/mapping systems are needed in the waste retrieval arsenal to facilitate the cleanup of DOE sites. It is anticipated that both rapid inspection and reasonably good image resolution can be accomplished with this system.

DESCRIPTION OF THE DEPLOYMENT

Location: Savannah River Site, Savannah River, SC

Project Name: Ford Building Waste Unit Project

Date of Deployment: April-May 1997

Technology User: WSRC

Deployment Value/Impact: This technology eliminated the need for sampling and soil analysis, and produces a cost savings through the avoidance of excavation and cleaning of large amounts of soil.

Point of Contact:

User Program POC:

Scott McMullin (DOE-SRS) - Tel. 803-725-9596

OST Program POC:

Jim Wright (DOE-SRS) - Tel. 803-725-5608

TECHNOLOGY DEVELOPMENT INFORMATION

Major Developers:

Pacific Northwest Laboratory

Funding Information: (\$ in Thousands):

Total Estimated Funding: \$2,247

Other Deployments:

Demonstrated in FY 1997 at Hanford (300 Area; 618-4 Burial Ground) in Richland, WA

Surface Contamination Monitor and Survey Information Management System (SCM/SIMS)

(OST Ref. No. 1942)

The SCM/SIMS is a motorized characterization and data analysis system for surveying contaminated floor and wall surfaces. Utilizing a position-sensitive gas-proportional counter (PSPC), 400 radiation measurements are taken in an area of 1 sq. meter. Survey data and sample location are logged electronically as well as displayed on an LCD screen for the operator. The data from each survey is analyzed by the SIMS to obtain visual representations of the surfaces surveyed, to generate a data report detailing the actual numerical results, and to overlay the data into a CAD drawing. The SCM/SIMS was demonstrated for beta/gamma at CP-5 in December 1996. In March 1997 at C-Reactor, the system was shown to be a versatile platform for a contamination measurement including the application of the PSPC for alpha contamination.

DESCRIPTION OF THE DEPLOYMENT

Location: BONUS Research Reactor, Puerto Rico

Project Name: NA - Non-DOE deployment

Date of Deployment: July 1997

Technology User: Jacobs Engineering

Deployment Value/Impact: Jacobs Engineering used the monitor as an automated surveying system that record and display real-time data for surfaces contaminated with alpha and beta radiation. The system was used for the characterization release survey of 42,000 sq. ft. of floors and walls at the BONUS Reactor in Puerto Rico.

Point of Contact:

User Program POC:
Jeff Bruggeman (DOE-RL) - 509-376-7121

OST Program POC:
Steve Bossart (DOE-FETC) - 304-285-4643

TECHNOLOGY DEVELOPMENT INFORMATION

Major Developers:

Shonka Research Associates

Funding Information: (\$ in Thousands):

Total Estimated Funding: \$101

Other Deployments:

- (DOE) in FY 1997 at Hanford (105 C-reactor) in Richland, WA
- (DOE) in FY 1997 at Idaho National Engineering and Environmental Laboratory (Air Support Building) in Idaho Falls, ID
- (DOE) in FY 1997 at Oak Ridge Institute of Science and Education (N/A) in Oak Ridge, TN
-

Surface Contamination Monitor and Survey Information Management System (SCM/SIMS)

(OST Ref. No. 1942)

The SCM/SIMS is a motorized characterization and data analysis system for surveying contaminated floor and wall surfaces. Utilizing a position-sensitive gas-proportional counter (PSPC), 400 radiation measurements are taken in an area of 1 sq. meter. Survey data and sample location are logged electronically as well as displayed on an LCD screen for the operator. The data from each survey is analyzed by the SIMS to obtain visual representations of the surfaces surveyed, to generate a data report detailing the actual numerical results, and to overlay the data into a CAD drawing. The SCM/SIMS was demonstrated for beta/gamma at CP-5 in December 1996. In March 1997 at C-Reactor, the system was shown to be a versatile platform for a contamination measurement including the application of the PSPC for alpha contamination.

DESCRIPTION OF THE DEPLOYMENT

Location: Idaho National Engineering and Environmental Laboratory; Idaho Falls, ID (Air Support Building)

Project Name: ID-ER-110; Decontamination and Dismantlement

Date of Deployment: March 1997 **Technology User:** INEEL/LMITCO

Deployment Value/Impact: INEEL used the monitoring system as an automated surveying system that record and display real-time data for surfaces contaminated with alpha and beta radiation. The system surveyed over 127,000 sq. ft. at the INEEL Air Support Building in two weeks onsite.

Point of Contact:

User Program POC:
George Schneider (DOE-ID) - 208-526-6789

OST Program POC:
Steve Bossart (DOE-FETC) - 304-285-4643

TECHNOLOGY DEVELOPMENT INFORMATION

Major Developers:

Shonka Research Associates

Funding Information: (\$ in Thousands):

Total Estimated Funding: \$101

Other Deployments:

- (DOE) in FY 1997 at Hanford (105-C Reactor) in Richland, WA
- (Non-DOE) in FY 1997 at BONUS Research Reactor in Rincon, PR
- (DOE) in FY 1997 at Oak Ridge Institute of Science and Education (N/A) in Oak Ridge, TN
-

Surface Contamination Monitor and Survey Information Management System (SCM/SIMS)

(OST Ref. No. 1942)

The SCM/SIMS is a motorized characterization and data analysis system for surveying contaminated floor and wall surfaces. Utilizing a position-sensitive gas-proportional counter (PSPC), 400 radiation measurements are taken in an area of 1 sq. meter. Survey data and sample location are logged electronically as well as displayed on an LCD screen for the operator. The data from each survey is analyzed by the SIMS to obtain visual representations of the surfaces surveyed, to generate a data report detailing the actual numerical results, and to overlay the data into a CAD drawing. The SCM/SIMS was demonstrated for beta/gamma at CP-5 in December 1996. In March 1997 at C-Reactor, the system was shown to be a versatile platform for a contamination measurement including the application of the PSPC for alpha contamination.

DESCRIPTION OF THE DEPLOYMENT

Location: Oak Ridge Institute of Science and Education (ORISE)

Project Name: Interagency (DOE and NRC)

Date of Deployment: May-July 1997 **Technology User:** ORISE

Deployment Value/Impact: ORISE used the monitoring system as an automated surveying system that record and display real-time data for surfaces contaminated with alpha and beta/gamma radiation. The monitor was used to perform independent verification measurements of equipment and facilities for both the DOE (including the K-25 site) and the Nuclear Regulatory Commission.

Point of Contact:

User Program POC:
Johnny Moore (DOE-OR) - 423-576-3536

OST Program POC:
Steve Bossart (DOE-FETC) - 304-285-4643

TECHNOLOGY DEVELOPMENT INFORMATION

Major Developers:

Shonka Research Associates

Funding Information: (\$ in Thousands):

Total Estimated Funding: \$101

Other Deployments:

- (DOE) in FY 1997 at Hanford (105 C-reactor) in Richland, WA
- (Non-DOE) in FY 1997 at BONUS Research Reactor in Rincon, PR
- (DOE) in FY 1997 at Idaho National Engineering and Environmental Laboratory (Air Support Building) in Idaho Falls, ID
-

Surface Contamination Monitor and Survey Information Management System (SCM/SIMS)

(OST Ref. No. 1942)

The SCM/SIMS is a motorized characterization and data analysis system for surveying contaminated floor and wall surfaces. Utilizing a position-sensitive gas-proportional counter (PSPC), 400 radiation measurements are taken in an area of 1 sq. meter. Survey data and sample location are logged electronically as well as displayed on an LCD screen for the operator. The data from each survey is analyzed by the SIMS to obtain visual representations of the surfaces surveyed, to generate a data report detailing the actual numerical results, and to overlay the data into a CAD drawing. The SCM/SIMS was demonstrated for beta/gamma at CP-5 in December 1996. In March 1997 at C-Reactor, the system was shown to be a versatile platform for a contamination measurement including the application of the PSPC for alpha contamination.

DESCRIPTION OF THE DEPLOYMENT

Location: Hanford; Richland, WA (105-C Reactor)

Project Name: RL-ER06; Decontamination & Decommissioning

Date of Deployment: January 1997

Technology User: Bechtel Hanford, Inc.

Deployment Value/Impact: Bechtel Hanford used the system as an automated surveying system that record and display real-time data for surfaces contaminated with alpha and beta radiation. The monitor was successfully used to release several contaminated areas of the 105-C Reactor structure.

Point of Contact:

User Program POC:
Jeff Bruggeman (DOE-RL) - 509-376-7121

OST Program POC:
John Duda (DOE-FETC) - 304-285-4217

TECHNOLOGY DEVELOPMENT INFORMATION

Major Developers:

Shonka Research Associates

Funding Information: (\$ in Thousands):

Total Estimated Funding: \$101

Other Deployments:

- (Non-DOE) in FY 1997 at BONUS Research Reactor in Rincon, PR
- (DOE) in FY 1997 at Idaho National Engineering and Environmental Laboratory (Air Support Building) in Idaho Falls, ID
- (DOE) in FY 1997 at Oak Ridge Institute of Science and Education (N/A) in Oak Ridge, TN

ROTO PEEN Scaler and VAC PAC System

(OST Ref. No. 1943)

The RotoPEEN Scaler is an aggressive decontamination method for small areas. The Savannah River Site uses this hand-held system along with other shrouded tools to decontaminate concrete and metal surfaces. These tools, in conjunction with large-area decontamination methods, are used extensively at the SRS Decon Facility, housed in the former 105-C Reactor. The RotoPEEN Scaler is equipped with a vacuum system and HEPA filtration to minimize airborne hazards. The system does not require a large compressor and can be easily carried to any location for immediate application. The system used by SRS was purchased by Desco Manufacturing Company, one of many companies who provide RotoPEEN scalers and other decontamination tools.

DESCRIPTION OF THE DEPLOYMENT

Location: Savannah River Site, 105-C Reactor Decon Facility

Project Name: SR-FA20; Reactor Monitoring Project

Date of Deployment: August 1997 **Technology User:** Facility
Decommissioning
Division

Deployment Value/Impact: The ROTO PEEN Scaler was used to decontaminate both a trailer and van in the Decontamination Facility that contained significant amounts of radiation. The trailer, which had hotspots in excess of 1,000,000 dpm/sq cm of beta/gamma, and the van, which had hotspots of 80,000 dpm/sq cm beta/gamma, were both decontaminated to free release.

Point of Contact:

User Program POC:

- Mr. Martin Salazar (DOE Savannah River)
- Tel. 803-557-3617
- Ms. Heatherly Dukes (Westinghouse
Savannah River Company) - Tel. 803-
557-9205

OST Program POC:

Mr. Steve Bossart (DOE/FETC) - Tel. 304-285-
4643

TECHNOLOGY DEVELOPMENT INFORMATION

Major Developers:

Desco Manufacturing Company

Funding Information: (\$ in Thousands):

Total Estimated Funding: \$84

(Outside Funding: \$12)

Other Deployments:

No other deployments identified in FY1997

Indoor Radiation Mapping Using Laser Assisted Ranging and Data System

(OST Ref. No. 1946)

LARADS is based on the integration of an auto-tracking laser system used to conduct civil surveys with a radiological detection system. Position data and radiological survey information is taken, sent from detector to receiving station, and then combined into electronic files to provide clear, detailed, and accurate surveys. Reports can be graphical, with color-coded radiological levels overlaid on CAD drawings or on photographs.

DESCRIPTION OF THE DEPLOYMENT

Location: Hanford; Richland, WA (105-C Reactor)

Project Name: RL-ER06, Decontamination & Decommissioning

Date of Deployment: February 1997 **Technology User:** Bechtel Hanford, Inc.

Deployment Value/Impact: Hanford used the LARADS to electronically record beta and gamma contamination data on surfaces. As a result 8,000 sq. ft. of floors and walls were free-released at the 105-C Reactor Large Scale D&D project. LARADS was also successful in reducing the exposure rates to workers during this effort. LARADS is a real-time surveying system that is cheaper than the baseline methods and provides reliable and accurate mapping data acceptable for regulatory review. The LARADS technology is available for use at the remaining production reactors at Hanford and other DOE sites.

Point of Contact:

User Program POC:
Jeff Bruggeman (DOE-RL) - 509-376-7121

OST Program POC:
John Duda (DOE/FETC) - 304-285-4217

TECHNOLOGY DEVELOPMENT INFORMATION

Major Developers:
Thermo Hanford, Inc.

Funding Information: (\$ in Thousands):
Total Estimated Funding: \$24

Other Deployments:
No other deployments in FY1997

System for Tracking Remediation, Exposure, Activities and Materials (STREAM)

(OST Ref. No. 1947)

The System for Tracking Remediation, Exposure, Activities and Materials (STREAM) developed by Delphinus Engineering, is a computer application management tool for planning and tracking D&D related projects. STREAM is a tool for managers and staff to enhance productivity, safety, and ALARA principles, help ensure compliance, improve communications and training, and assist the engineering, planning, operations and waste handling organizations throughout the life cycle of a project.

DESCRIPTION OF THE DEPLOYMENT

Location: Savannah River Site; Aiken, SC (Heavy Water Component Test Reactor)

Project Name: SR-ER09; HWCTR Projects

Date of Deployment: June-July 1997

Technology User: Westinghouse
Savannah River
Company

Deployment Value/Impact: SRS deployed STREAM to manage and track D&D of the HWCTR facility. STREAM provides for more organized, efficient, and effective project management while ensuring worker safety, understanding, and satisfaction during field work. This computer software is used to both plan and track many D&D tasks during facility decommissioning. The system is more compact and organized than baseline methods of files containing hard copies, photographs and video tapes.

Point of Contact:

User Program POC:

Rodrigo V. Rimando, Jr. (DOE-SR) - 803-725-4118

OST Program POC:

John Duda (DOE-FETC) - 304-285-4217

TECHNOLOGY DEVELOPMENT INFORMATION

Major Developers:

Delphinus Engineering

Funding Information: (\$ in Thousands):

Total Estimated Funding: \$379

Other Deployments:

Hanford (105 C-reactor) Richland, WA, 1997

System for Tracking Remediation, Exposure, Activities and Materials (STREAM)

(OST Ref. No. 1947)

The System for Tracking Remediation, Exposure, Activities and Materials (STREAM) developed by Delphinus Engineering, is a computer application management tool for planning and tracking D&D related projects. STREAM is a tool for managers and staff to enhance productivity, safety, and ALARA principles, help ensure compliance, improve communications and training, and assist the engineering, planning, operations and waste handling organizations throughout the life cycle of a project.

DESCRIPTION OF THE DEPLOYMENT

Location: Hanford; Richland, WA (105-C Reactor)

Project Name: RL-ER06; Decontamination & Decommissioning

Date of Deployment: February-April 1997 **Technology User:** Bechtel Hanford, Inc.

Deployment Value/Impact: Hanford deployed STREAM to manage and track the D&D of the 105-C Reactor. STREAM provides for more organized, efficient, and effective project management while ensuring worker safety, understanding, and satisfaction during field work. This computer software is used to both plan and track many D&D tasks for large facilities being decommissioned. The system is more compact and organized than baseline methods of files containing hard copies, photographs and 8 mm videos.

Point of Contact:

User Program POC:
Jeff Bruggeman (DOE-RL) - 509-376-7121

OST Program POC:
John Duda (DOE-FETC) - 304-285-4217

TECHNOLOGY DEVELOPMENT INFORMATION

Major Developers:
Delphinus Engineering

Funding Information: (\$ in Thousands):
Total Estimated Funding: \$379

Other Deployments:
Savannah River Site (Heavy Water Component Test Reactor) Aiken, SC, 1997

Heat Stress Monitoring System

(OST Ref. No. 1953)

The VitalSense Telemetry System, a Heat Stress Monitoring System, is a real-time gauge of a worker's physical state while working in a heat stress environment. The system consists of electronics and wireless radio components, an 8-hour rechargeable battery supply, and a series of temperature, heart rate, and body activity probes enclosed in a small plastic case worn by the worker. The wearable monitor weighs approximately one and a quarter pounds and can directly monitor up to four channels (heart rate, body activity, and skin and ear canal temperature data). Each monitoring channel on this system can be preset to an alarm set point. If incipient heat stress or high heart rate is detected, the system will automatically activate a light-emitting diode warning device mounted near the worker's eyes or a worker manning the supervisory station can warn the worker by manually activating an alarm. After receiving the warning, the worker can withdraw from the work area and consult with the supervisor. As many as ten workers can be monitored in series up to a 1,000 feet from a single supervisory station. Individual information is automatically updated every 3 seconds and recorded by the computer in a sequential fashion. The data can be manipulated for graphs and other presentation material. The unit has been designed to accommodate (in the near future) additional channels for either more physiological signals or for monitoring external sensors such as radiation, toxic chemicals, or noise.

DESCRIPTION OF THE DEPLOYMENT

Location: Hanford; Richland, WA (105-C Reactor)

Project Name: RL-ER06; Decontamination & Decommissioning

Date of Deployment: August 1997

Technology User: Bechtel Hanford, Inc.

Deployment Value/Impact: The Heat Stress Monitor was used on eight workers during the 105-C Reactor Interim Safe Storage Project at Hanford. The workers performed 14 monitoring tasks included radiological surveying of enclosed and non-ventillated areas, equipment removal, and painting. The workers were monitored for heart rate, skin and ear temperature, and activity rate during the three days of monitoring. The monitor alarms were set off numerous times requiring workers to lower their work activities. The system provides a real-time monitoring data read-out feature which allows for immediate personnel heat stress detection.

Point of Contact:

User Program POC:
Jeff Bruggeman (DOE-RL) - 509-376-7121

OST Program POC:
John Duda (DOE-FETC) - 304-285-4217

TECHNOLOGY DEVELOPMENT INFORMATION

Major Developers:
Mini-Mitter

Funding Information: (\$ in Thousands):
Total Estimated Funding: \$28

Other Deployments:
No additional deployments have been identified

Sealed-Seam Sack Suit

(OST Ref. No. 1954)

From October 1996 through August 1997, a total of six different innovative personal protective clothing were demonstrated for contamination protection, safety, and comfort under the 105-C Reactor LSDDP. LANL and Hanford Industrial Safety & Hygiene Departments performed heat stress and temperature measurements in an environmental chamber, and fabric penetration tests (one test on the fabric and the other while the fabric was worn). The suits tested included: Comfort Guard 150 FRHAM KoolSuit Kappler ProShield I and ProShield II Kappler NuFab Kappler Tyvek Copiah Creek (cotton baseline) All six suits were tested against baseline using three different sizes of personnel in two environmental conditions. The tests were conducted at 35 degree C with a relative humidity of 70%, and at 0 degree C with a relative humidity of 50%.

DESCRIPTION OF THE DEPLOYMENT

Location: Hanford; Richland, WA (Site-wide D&D)

Project Name: RL-ER06; Decontamination & Decommissioning; also other D&D applicable
PBS

Date of Deployment: September 1997

Technology User: Bechtel Hanford, Inc.
and other D&D
contractors

Deployment Value/Impact: Based on the results of the 105-C Reactor LSDDP demonstrations and testing, the Comfort Guard 150 and Pro Shield I are being deployed extensively throughout all Hanford D&D activities due primarily to superior comfort and lower cost compare to baseline Tyvek.

Point of Contact:

User Program POC:

Mrs. Shannon N. Saget (DOE-RL) - Tel. 509-372-4029

OST Program POC:

John Duda (DOE/FETC) - Tel. 304-285-4217

TECHNOLOGY DEVELOPMENT INFORMATION

Major Developers:

Comfort Guard and Kappler

Funding Information: (\$ in Thousands):

Total Estimated Funding: \$122

Other Deployments:

No other deployments of these two suits have been identified

Corrosion Probe

(OST Ref. No. 1985)

The use of an electrochemical noise corrosion probe and corrosion inhibitor monitors in a high-level waste tanks will allow for real-time monitoring of corrosion processes and corrosion inhibitor effectiveness. The electrochemical noise-based corrosion monitoring system continuously measures concentrations of nitrate, nitrite and hydroxide ions, which are the key to minimizing corrosion in steel tanks. Data from the monitors will minimize sampling requirements and chemical additions to the tanks. In conjunction with the electrochemical noise probe, the optimum concentrations for minimizing corrosion can be determined.

DESCRIPTION OF THE DEPLOYMENT

Location: Hanford Site

Project Name: Hanford Tank 241-AZ-107

Date of Deployment: Fiscal Year 1997 **Technology User:** Lockheed Martin
Hanford Corporation

Deployment Value/Impact: Carbon steel tanks at Hanford storing high-level waste may be subject to corrosion from nitrate ions. Corrosion prevention for these tanks is based on controlling the tank chemistry by adding an inhibitor solution. Inhibitor additions are based on waste sample analysis and can increase waste volume that must ultimately be treated significantly. The corrosion probe was developed to provide continuous, rather than periodic data and limit the amount of inhibitors added.

Point of Contact:

User Program POC:
Catherine Louie, DOE-RL, (509) 376-6834

OST Program POC:
Ted Pietrok, DOE-RL, (509) 372-4546

TECHNOLOGY DEVELOPMENT INFORMATION

Major Developers:

Lockheed Martin Hanford Corporation

Funding Information: (\$ in Thousands):

Total Estimated Funding: \$1,295

Other Deployments:

None.

Gas Recontainerization

(OST Ref. No. 2016)

Gas Recontainerization removes gas from damaged cylinders, characterizes it with on-board analytical equipment, and vents it or recontainerizes it, as required. Oak Ridge National Laboratory identified a need to treat 100 compressed gas cylinder at the laboratory and approximately 1000 at the Oak Ridge Reservation.

DESCRIPTION OF THE DEPLOYMENT

Location: Oak Ridge, Gas Cylinders at Oak Ridge National Laboratory

Project Name: OR-S804 Compressed Gases

Date of Deployment: May 1997

Technology User: Oak Ridge National Laboratory (ORNL)

Deployment Value/Impact: A skid-mounted mechanical unit that characterizes the contents of a compressed gas cylinder and vents the content if non-hazardous or transfers it to new container as required for the particular gas. The transfer occurs without venting the hazardous material to the atmosphere. The skid is transportable and much of the developmental work has been completed by Los Alamos National Laboratory.

Point of Contact:

User Program POC:

Mr. Johnny O. Moore (DOE OR) - Tel. 423-576-3536

OST Program POC:

- Mr. Thomas B. Conley (Lockheed Martin Energy Systems - Oak Ridge National Laboratory) - Tel.(423) 574-6792
- Mr. Jay Roach, LMITCO, (208) 526-4974
- Mr. Bill Owca, DOE-ID, (208 526-1983

TECHNOLOGY DEVELOPMENT INFORMATION

Major Developers:

- Los Alamos National Laboratory (LANL)
- Oak Ridge National Laboratory (ORNL)

Funding Information: (\$ in Thousands):

Total Estimated Funding: \$130

Other Deployments:

None

Heel Retrieval for SRS

(OST Ref. No. 2097)

In the baseline method for removing high level waste tank heels, water is introduced into the tank under pressure. The force of the water mobilizes the sludge. The resulting slurry is then pumped from the tank, either for pipeline transfer to a neighboring tank or for treatment. The process of sluicing and pumping is repeated until the residual sludge is removed. This process is time consuming and costly. A commercially available technology system consisting of a robotically operated service arm, a water monitor on the end of the arm, and a waste extraction system for transferring the mobilized tank heel from the tank was deployed in Tank 17 at the Savannah River Site to remove the heel faster and cheaper than the baseline technology.

DESCRIPTION OF THE DEPLOYMENT

Location: Savannah River Site

Project Name: SR-HL02 F Tank Farm (Tank 17)

Date of Deployment: 1997

Technology User: Westinghouse
Savannah River
Company

Deployment Value/Impact: The SRS has a regulatory agreement to remove from service by the year 2028 its 24 high level waste tanks that do not satisfy the full secondary containment criteria. To remove the tanks from service, the waste must be removed and the tanks must be closed. The technology system for heel retrieval will enable this goal to be met.

Point of Contact:

User Program POC:
Tom Gutmann, DOE-SR, (803) 208-7408

OST Program POC:
Ted Pietrok (DOE-RL) - tel. 509-372-4546

TECHNOLOGY DEVELOPMENT INFORMATION

Major Developers:

No Major Developers information has been defined

Funding Information: (\$ in Thousands):

Total Estimated Funding: \$2,030

Other Deployments:

None

Wireless Remote Monitoring System

(OST Ref. No. 2104)

The RadStar Wireless Remote Monitoring System, developed by SAIC, monitors personnel dose and area exposure rate remotely from a predetermined command center located outside radioactively contaminated areas. A host personal computer monitors and records information transmitted from electronic dosimeters and collected by a transceiver base station using RadStar software. A radio transceiving alarming electronic dosimeter, wireless radio components, radiation detector, and a 9-V alkaline battery are contained in a small case worn by personnel. A dosimeter reader reads the dosimeters and resets them after use. The monitor weighs less than 400 g and is designed for gamma detection. Each dosimeter can be preset to alarm at a set point with either an audible alarm or light-emitting diode and will warn both the worker and the base station. Straight line signals can be transmitted over 10,000 ft.

DESCRIPTION OF THE DEPLOYMENT

Location: Cooper Nuclear Power Station; Brownville, NE

Project Name: NA - Non-DOE Deployment

Date of Deployment: Beginning in May 1997 and still in service
Technology User: Cooper Nuclear Power Station

Deployment Value/Impact: The Wireless Remote Monitoring System was deployed for permanent use at the Cooper Nuclear Power Station beginning in May 1997 for personnel and area monitoring during refueling outages and area monitoring in the steam-driven turbine building. The system provided real-time monitoring of worker dose levels, helping reduce the risk of worker exposure.

Point of Contact:

User Program POC:

Mr. Gary Armknecht (Cooper Nuclear Power Station) - Tel. 402-825-5387

OST Program POC:

John Duda(DOE/FETC) - Tel. 304-285-4217

TECHNOLOGY DEVELOPMENT INFORMATION

Major Developers:

Science Applications International Corporation

Funding Information: (\$ in Thousands):

Total Estimated Funding: \$61

Other Deployments:

No additional deployments identified in FY1997

Tank Waste Conveyance System

(OST Ref. No. 2116)

The Tank Waste Conveyance System combines a hose management system and a jet pump to retrieve sludges from the Department of Energy's radioactive waste storage tanks. Typically, these sludges are difficult to remove and convey. After a high-pressure water cutting jet loosens sludge from the tank bottoms the sludge is directed into a hose controlled by the Hose Management Arm. A jet pump then removes the sludge and liquids from the tanks. The entire system is moved around inside the tanks by a robotic arm or vehicle. Overview cameras in the tanks and cameras located on the robotic arm and vehicle provide equipment operators a view of the tank interiors and waste removal activities.

DESCRIPTION OF THE DEPLOYMENT

Location: Oak Ridge, GAAT Tank W-3

Project Name: OR-43203, Bethel Valley Remedial Action, Gunite and Associated Tanks Treatability Study (GAATTS)

Date of Deployment: July - September
1997

Technology User: Lockheed Martin Energy
Systems

Deployment Value/Impact: Under the GAATTS, Oak Ridge is removing sufficient waste from tanks to allow the tanks to be closed and enable progress on the restoration of the Bethel Valley watershed. The tank waste conveyance system provides the capability to move the retrieved waste out of the tank and into staging areas for treatment. To date sludge and debris have been removed from two 85,000 gallon tanks.

Point of Contact:

User Program POC:
Jacquie Noble-Dial, DOE-OR, (423) 241-6184

OST Program POC:
Billie Mauss, DOE-RL, (509) 372-4512

TECHNOLOGY DEVELOPMENT INFORMATION

Major Developers:

- Waterjet Technologies Inc.
- Pacific Northwest National Laboratories

Funding Information: (\$ in Thousands):

Total Estimated Funding: \$2,016

Other Deployments:

No Related Deployments information has been defined

Stabilized Contaminates using Arrow-Pak Polymer Macroencapsulation

(OST Ref. No. 2159)

The current industry practice for the targeted waste stream is long term interim storage. This process provides an alternative to long term interim storage. The first step of this process compacts 55 gallon drums into pucks. The second step places the compacted pucks into 79 gallon overpack drums and fills the voids between the pucks with a void space filler or grout. The third step macroencapsulates the overpack drums containing the compacted pucks inside a sleeve designed for the drum.

DESCRIPTION OF THE DEPLOYMENT

Location: DOE-RL, Richland, Washington (Disposal trench at Hanford)

Project Name: RL-WM04 Solid Waste Treatment (macroencapsulation of mixed waste debris stored at Hanford site)

Date of Deployment: October 1996 - May 1997

Technology User:

- Westinghouse Hanford Company
- Arrow-Pak, Inc.

Deployment Value/Impact: Eliminated 1000 drums of mixed waste debris stored at the Hanford site. A volume reduction of approximately 75% was obtained which reduced the overall cost of disposal. This compaction and macroencapsulation system is portable and relatively simple to operate. This process minimizes waste handling and potential exposure issues found in other physical/chemical treatment processes, as applied to ALARA principles.

Point of Contact:

User Program POC:
Joe Waring, DOE-RL, (509) 373-7687

OST Program POC:

- Mr. Lee G. Irons (Rust Federal Services-Hanford) - Tel. 509-372-0734
- Bill Owca, DOE-ID, (208) 526-1983
- Vince C. Maio, LMITCO, (208) 526-3696

TECHNOLOGY DEVELOPMENT INFORMATION

Major Developers:

- Westinghouse Hanford Company
- Arrow-Pak, Inc.
- Department of Energy
- Lee Irons

Funding Information: (\$ in Thousands):

Total Estimated Funding: \$1,000

Other Deployments:

Planned deployment in FY99 at Oak Ridge