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U.S. Department of Energy, Office of Technical Program Integration

TIE QUARTERLY

Technical Information Exchange: "Sharing Experience, Expertise, and Lessons Learned."

The Savannah River Site

The Savannah River Site (SRS) is located in west central South Carolina and its southwest border meets the Savannah River. The closest major population centers are Aiken, South Carolina and Augusta, Georgia. The site comprises approximately 806 square kilometers (310 square miles): its production facilities occupy less than ten percent of the total area. SRS production facilities include a fuel and target fabrication facility, five nuclear reactors, two chemical separations plants, a tritium processing facility, a defense waste processing facility, a heavy water rework plant, a uranium fuel processing facility, and the Savannah River Technology Center (STRC).

Savannah River: A Historical Snapshot

The Atomic Energy Commission, the predecessor agency of the Department of Energy (DOE), established SRS in 1950 to produce special radionuclides for national security purposes. Strategic nuclides (e.g., plutonium-239 and tritium) were produced and used in the development and production of nuclear weapons for national defense. SRS also produced other radionuclides (e.g., californium-252, plutonium-238, and americium-241) to support research in nuclear medicine, space exploration, and commercial applications. To produce these nuclides, selected materials were fabricated into metal targets and irradiated in SRS nuclear reactors. The targets were transferred to chemical separations facilities and dissolved in acid, and the radionuclides of interest were chemically separated and converted into a solid form, either an oxide powder or a metal, which was fabricated into a usable form at SRS or other DOE sites. In addition, SRS chemically reprocessed spent nuclear fuel to recover uranium-235.

The mission of the site has changed since the end of the Cold War. Emphasis has shifted from nuclear material production to environmental management. Despite this shift, SRS remains a major defense installation capable of processing and purifying tritium and plutonium; however, the fuel and target manufacturing facilities, along with the five production reac-

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TIE Workshop Returns to Savannah River!

The Savannah River Operations Office hosted the first Technical Information Exchange (TIE) Workshop in Augusta, Georgia in November of 1991. The workshop will now return to Augusta, with Savannah River hosting the Twelfth Workshop at the Sheraton Hotel November 14-16, 2000.

The Workshop has traveled to ten other National Laboratories/Department of Energy (DOE) Operations Offices including Sandia, Lawrence Livermore, Oak Ridge, Rocky Flats, Richland, Fernald, Los Alamos, Idaho, Argonne/Chicago, and Nevada. Holding workshops in conjunction with sites across the DOE complex allows individual sites to highlight their activities and accomplishments, and permits the TIE participants to experience first hand other DOE operations. Also, many host site personnel, who would not otherwise have the opportunity to attend, are able to actively participate and benefit from the workshop experience.

In the beginning, TIE Workshops focused mainly on environmental restoration technologies, but the scope has increased over the years to include all subjects related to the management and operation of environmental restoration and waste management projects and programs. This TIE Workshop will cover a wide variety of topics, including sessions (in addition to the environmental restoration technology sessions) on subjects such as: project management, cost engineering, geographic information systems, risk, site closure procedures, regulator/stakeholder interactions, and stewardship. A complete list of the topics is available on page 10.

The TIE program has also expanded to include involvement from more than just the Environmental Management (EM) arena. TIE attendance has grown steadily to include regulator, Department of Defense, commercial, academic, and international participation. TIE Workshops promote sharing expertise, experience, and lessons learned among working level peers in DOE and other entities.

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The 12th TIE Workshop ***Registration Form*** *can be found inside this issue. Submit today!!*

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tors, are not in operation at this time. With the exception of these facilities, the processing facilities have been inventoried and are waiting for the resumption of operations to stabilize nuclear materials that are considered programmatic or at-risk.

Environmental Management: Comitted to Cleanup

The Environmental Management (EM) program was initiated at SRS in 1989 to address the closure of old burial grounds and seepage basins. During that same year, reactor operations were halted to address safety and environmental upgrades of selected reactor facilities. In 1990, the reactor fuel and target manufacturing facilities and five production reactors were taken out of service. The chemical processing facilities continued operation into 1992, when chemical processing and recovery activities were halted to address potential safety concerns. These concerns were addressed; however, before operations resumed, the end of the Cold War reduced the need for additional defense materials. Current operation of the chemical processing facilities is limited to the recycling of tritium, which continues today under the Office of Defense Programs, and to materials containing plutonium-238, which are used to support exploratory space missions.

SRS is committed to the cleanup of waste and the restoration of the site's environment. Foremost objectives are to meet regulatory requirements and stabilize nuclear materials that pose a risk to human and environmental safety. SRS is committed to support EM's corporate needs and is positioning itself to provide leadership in an integrated approach to environmental cleanup of the DOE complex. SRS infrastructure and facilities are being upgraded and maintained in order to assist the cleanup of other sites.

The EM strategies for managing the legacy of nuclear materials production and SRS's continuing mission in support of national security are an integral part of the five areas that comprise the SRS Strategic Plan:

- ***Environmental Quality***: SRS will continue to implement its risk-based approach to the management of legacy materials, excess facilities, and waste stabilization. Remediation of waste sites and waste treatment will continue. SRS will be a valued contributor to an integrated approach for environmental management across the DOE Complex. SRS will continue to protect and manage the natural resources of the site.
- ***Nonproliferation***: Through alliances and partnerships with others in the DOE Complex, SRS will be a cornerstone of the national effort to effectively dispose and manage excess fissile materials.
- ***National Security***: SRS will continue to be a vital factor in the safe and reliable production, delivery, and management of tritium inventories and provide backup plutonium infrastructure capability in support of the nation's security.
- ***Science and Technology***: Technologies will be developed and integrated into existing and planned processes and facilities to maximize value. National and international collaborations will be established, as appropriate, to deliver cost-effective results that respond to DOE needs.
- ***Corporate Management***: Management commitment to results and effectiveness is essential to the continued success in each product/service area. SRS will continue to ensure and improve technical and safety excellence, cost effectiveness, community support, and a viable, mission-supportive infrastructure.

Current EM activities are conducted under three major programs at the site: Nuclear Material and Facility Stabilization (NMFS), Environmental Restoration (ER), and Waste Management (WM).

Nuclear Material and Facility Stabilization

The NMFS program is responsible for the development and implementation of nuclear material management activities at SRS. This includes stabilization of production materials and deactivation and decommissioning of associated facilities prior to release to the Environmental Restoration program for ultimate decommissioning.

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The facilities in the NMFS program comprise more than 1,000 buildings; 35 additional buildings are currently dedicated to the tritium program; and approximately 300 additional buildings are in the ER and WM programs. Facilities are to be stabilized, deactivated, and placed in a two-year surveillance and maintenance process before being transitioned to the ER program.

Environmental Restoration

The ER program mission is to effectively and efficiently remediate inactive waste sites and conduct deactivation and decommissioning of facilities. The objectives are to 1) contain known contamination at inactive sites, 2) vigorously assess the uncertain nature and extent of contamination, and 3) cleanup the inactive waste sites while maintaining worker health and safety and protecting public health and the environment. The goal for all ER activities is to ensure that the risks are either eliminated or reduced to meet or fall below prescribed, safe levels.

Deactivation is a systematic reduction of risks to site workers, the public, and the environment. This is usually implemented through equipment removal, elimination to the extent possible radiological and hazardous sources, utility isolation, and similar measures. Deactivation is intended to reduce risks and thereby minimize long term surveillance and maintenance costs. The goal is to reduce facilities to a "cold, dark, and dry" or "cheap to keep" state in which they can be maintained at very low cost for many years. Decommissioning, on the other hand, is the placement of a facility in its final end state consistent with the site's land use plan.

The operations at SRS include over 1,000 facilities that are potentially contaminated with hazardous and radioactive materials. The migration of contaminants from some of these structures through the soil has resulted in ground-water contamination that may pose a major public health concern. Sound remedial solutions will be developed using public input and concurrence. The implementation of these solutions will be based on protecting both workers and the population.

More than 90 areas of concern are currently being characterized or remediated. Additionally, about 478 potential areas are undergoing preliminary evaluation, and an estimated 25 percent of these units are assumed to require a complete assessment and remedial action process. The waste sites already cleaned up will require long-term surveillance and maintenance to meet regulatory requirements.

Surveillance and maintenance includes post-closure maintenance activities for all of the ER program's closed units, except the decommissioning units. Surveillance and maintenance will include required regular maintenance such as erosion control, placement of signs, fence repair, periodic inspections, and monitoring. Maintenance will be performed on secondary roads, drainage systems, and access roads to monitoring wells. Upon completion of closure activities, periodic inspection of the units will be performed in accordance with approved post-closure inspection procedures.

Waste Management

During the production years, the goal of the WM program was to safely manage the waste generated from production activities, with primary focus on high-level waste. With the end of production and the shift to EM, the WM program is responsible for the efficient handling, storage, treatment, disposal, and minimization of solid and low-level waste resulting from past, ongoing, and future operations.

SRS has extensive waste management facilities to treat, store, and dispose of radioactive and other waste. However, these existing facilities will require upgrades and modifications. Several "new" facility initiatives are scheduled to begin operations after 2000, as specified in the recent WM Environmental Impact Statement Record of Decision.

WM activities at SRS will continue as long as the site mission continues. Decommissioning and ER activities will require support from waste management missions.

In addition, SRS is developing and implementing a comprehensive waste minimization program. Elements of this program will include waste volume allocation, financial accountability for waste volume generation, and increased use of innovative programs. The waste certification program requires low-level, hazardous, and transuranic mixed waste generators using the treatment, storage, and disposal facilities to characterize their waste streams and certify that their waste meets waste acceptance criteria (WAC). The assessment of all current low-level and mixed waste generators is complete.

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TIE Workshops have been successfully serving the DOE community for nearly 10 years. These are actual working meetings, where individuals and organizations, including regulators and international representatives, congregate to share ideas and resolve issues face-to-face. Each workshop serves as a conduit between headquarters and field personnel, and between personnel at the various sites. At these workshops everyone benefit from advances being made. The TIE Workshop is an established EM forum to disseminate and share technical information.

Ohio Field Office: Tapping into Technology is Good Business

Recognizing the value of innovative technology deployment to support the overall cleanup mission, the Ohio Field Office has tapped into a new, improved, and better disciplined way of doing business. The five Ohio Field Office sites continue to successfully demonstrate how technology application in the cleanup process proves beneficial for reducing costs and accelerating schedules.

Susan Brechbill, the Ohio Field Office Manager expressed her support, "Ohio is showing that the use of innovative technologies is not incompatible with site closure incentives, but rather is the right approach to keeping schedules and reducing costs."

"Utilizing new technologies is a critical part of The Ohio Field Office Overall Accelerated Site Closure and Long-Term Stewardship Plans. We have already been successful in demonstrating real cost savings and schedule acceleration while addressing our cleanup challenges. We take real problems to people with the technical expertise and have them develop solutions rather than create technologies and look for areas to apply them," stated Jack Craig, Director of DOE's Fernald Environmental Management Project.

Sampling solidified product

Innovative technology development and deployment funded by DOE's Office of Science and Technology (OST) has played a key role in the measurable cleanup progress at each of the five sites. The Ohio Field Office's proactive approach to meeting the changing needs of each cleanup site is evident in the field deployment of proven technologies such as the Petro Bond® Polymer Oil Solidification Agent, Pipe Explorer™ Surveying System, Real-Time Soil Characterization Integrated Technology Suite, Groundwater Re-injection Demonstration, Chemical Extraction Soil Washing, and High-level Waste Vitrification.

Miamisburg Environmental Management Project

Miamisburg had a critical need for a simple and effective disposal method for tritiated oil that will meet the waste acceptance criteria (WAC) requirements at the Nevada Test Site (NTS). Vacuum pumps at Miamisburg that supported glove boxes used for several decades produced reservoirs of highly tritiated and heavy metal-laced waste oils as defined by the Resource Conservation and Recovery Act (RCRA).

The Tritium Large Scale Demonstration and Deployment Project (LSDDP) at Miamisburg compared alternatives to the baseline options for disposal of tritiated oils. These options include incineration, long term storage for decay and use of existing organic solidification agents. The innovative alternative is a polymer solidifying agent offered by the Nochar Corporation of Indianapolis, Indiana. The Petro Bond (R) absorbent polymer oil solidification agent is designed to absorb oil without mixing or mixing equipment. The high tech polymers can be specifically developed to address the characteristics of waste oil as it exists on a given site.

The polymer agent formed an acceptable solidified mass with the site's waste oils. The Toxicity Characteristics Leaching Procedure (TCLP) values were found to be several magnitudes below burial site limits on specific metals. The material absorbed nine gallons of oil used in the demonstration within one hour, providing a quick and efficient solidification agent. LSDDP found the product to be safe, easy to use and cost effective. The polymer solidifying agent has the potential to produce considerable savings for Miamisburg, and for other cleanup projects.

In fact, this technology is currently being applied at the other Ohio sites and will be demonstrated at Savannah River, Rocky Flats, Los Alamos, and other interested Department of Energy (DOE) sites. These deployments are being jointly funded in a cooperative effort by the LSDDP and a special grant from the Pollution Prevention Program (P2). This cooperative effort between Technology and the P2 Program is believed to be unique in the DOE complex.

Columbus Environmental Management Project

Characterization underground line

The presence of radioactive contamination at the Battelle site near West Jefferson, Ohio, requires that the Battelle Columbus Laboratories Decommissioning Project (BCLDP) characterize all underground pipelines at the site suspected of being contaminated. It is estimated that the ability to

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quantitatively characterize suspected lines would show that a significant amount of pipe could be left in place, avoiding costly removal.

BCLDP has deployed a Pipe Explorer(TM) surveying system to characterize underground lines at the West Jefferson site rather than removing approximately 8,800 linear feet of underground lines. The Pipe Explorer(TM) inserts radiation detectors and video cameras into pipes to provide detailed information on the location, visual appearance and quantity of radioactive contamination. The system was successfully demonstrated at the Columbus King Avenue site.

Using the surveying system will cost the lab approximately $200,000; however projections indicate the system will save over $5 million for every 25 percent reduction in the amount of pipe.

Fernald Environmental Management

Project Fernald's challenge was to quickly and accurately characterize soil for its radiological constituents in order to flag areas needing remediation and to present the information in a manner that clearly communicated excavation directions to contractors.

Mobil Radiation Tracking System

The Real-Time Soil Characterization Integrated Technology Suite, funded by the Accelerated Site Technology Deployment Program (ASTD), utilizes three main pieces of real-time radiation equipment: the mobile radiation tracking system (RTRAK); the radiation scanning system (RSS); and high purity germanium detectors (HPGe). RTRAK is an agricultural tractor outfitted with a sodium iodide detector, a computer and a Global Positioning System (GPS). RSS is a smaller version of RTRAK that allows for analysis of areas that cannot be reached by RTRAK. The data is then sent by radio to a mapping van where a field map is printed to guide excavation decisions. HPGe uses a different detector-sensing crystal with higher resolution and is manually situated for each measurement. The successful field integration of data confirms that soils above the action level have been removed and that the soil remaining in place meets the final soil remediation criteria.

Re-injection well

Fernald's use of the integrated suite of technologies provides instantaneous data analysis, display and mapping of the results. Excavation decision-making is accelerated and contractor down time is minimized, resulting in an estimated cost savings of $34 million by 2006.

Fernald was also faced with the challenge of field testing and proving a technology that would accelerate the remediation of approximately 170 acres of the Great Miami Aquifer. The aquifer had become contaminated with elevated concentrations of uranium as a result of production operations. The approved aquifer remediation strategy was originally estimated to take approximately 27 years.

A one-year, field-scale demonstration was conducted to test a groundwater re-injection system that could be effectively operated and maintained. Groundwater was pumped from the Great Miami Aquifer, treated to remove the uranium, and then re-injected into the aquifer through five strategically positioned re-injection wells. Water was injected into the five wells at a rate of 200 gallons-per-minute, for a net total re-injection rate of 1000 gallons-per-minute.

Data collected over the course of Fernald's one-year field scale demonstration indicates that deploying re-injection accelerates the cleanup process by increasing the flushing and by prohibiting the spread of contaminants. Site projections indicate that groundwater re-injection will help shorten the length of the aquifer remedy from 27 to 10 years, and result in a predicted net present value cost savings of $14 million.

Uranium removal from water

Ashtabula Environmental Management Project

The traditional approach of excavation, packaging, certification, transportation, and burial of contaminated soil at Ashtabula had been estimated at over $45 million out of a total project cost of $150 million for complete site remediation.

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TNT Bioremediation is Dyn-O-Mite

Like the Wicked Witch of the West, another danger can be melted away, only this time it's with a bucket of fingernail polish remover.

Idaho Falls— Soil found on old gunnery ranges and military wastewater lagoons is often contaminated with the explosive TNT. In some instances, the common composting method to clean the soil leaves small particles of the potentially carcinogenic substance. Researchers found that by adding acetone—the main component of nail polish remover—to this composting method, they can safely dissolve away the chunks and biologically degrade the TNT.

> The treated soil can go into INEEL's landfill and we never have to worry about it again.
>
> — *Corey Radtke*

Modifying a standard composting recipe, researchers at the Department of Energy's Idaho National Engineering and Environmental Laboratory (INEEL) successfully dissolved and degraded chunks of TNT from INEEL soil. They also found the microbial populations at work degrading the explosive lived quite happily under the modified conditions. The report by INEEL microbiologists Corey Radtke, Richard M. Lehman and Francisco F. Roberto will be appearing in this week's quarterly issue of Bioremediation Journal.

By the end of the process, the TNT is completely degraded and the acetone evaporates. "The beauty of this method is that when the experiment is done," said INEEL microbiologist Radtke, "the treated soil can go into INEEL's landfill and we never have to worry about it again."

A Dangerous Prospect

Part of the land on which the INEEL sits was a World War II era Naval gunnery range. As a result of military activities, particles of TNT ranging in size from about 56 grams to less than a hundredth of a gram contaminate about a thousand cubic yards of soil. Although the TNT is unlikely to pose an explosive hazard, the Environmental Protection Agency (EPA) denotes TNT as a possible human carcinogen under the agency's Integrated Risk Information System. As a part of its overall environmental mission and to safeguard the health of its workers, INEEL is trying to clean up the TNT legacy.

First the researchers make a slurry to degrade the TNT chunks.

Soil contaminated with TNT is not unique to INEEL, however. According to the EPA, soil at more than 30 munitions test areas across the U.S. are contaminated with TNT. For example, a World War II Naval range on the Hawaiian island of Kaho'olawe is the site of the largest funded Unexploded Ordnance Remediation Project. Last November, Radtke and colleagues traveled to a conference in Maui to make the remediation managers aware of their promising technique.

Although TNT is considered a carcinogenic compound, microbes normally found in the soil will eat it with great relish. That is, if the relish consists of old sawdust, hay, mashed sugar beets and a sampling of manures in the form of compost. Digging up soil and composting off the TNT is a tried and true method. It also provides a safe alternative to incinerating contaminated soil to burn off the explosive substance. Unfortunately, chunk TNT isn't broken down as easily by the microbes and therefore remains in the soil at the end of the composting period. Workers need to treat the chunks of TNT to make the explosive more accessible to the microbes.

No Extraction Needed

In their research, the microbiologists took advantage of earlier studies that showed acetone could be used as a solvent to extract the TNT from the dirt. They couldn't find a way to safely recover the acetone containing dissolved TNT from the soil so they decided to try composting the contaminated soil without first removing the acetone.

The microorganisms in the compost heap feast on acetone wine and chicken manure with potatoes on the side.

The chunk size variation interfered with the researchers' ability to draw conclusions on the succes of the method. To reduce the variation, they sifted the soil with a mesh that removed TNT chunks over 2.4 millimeters (a little bigger than a ballpoint pen point). The researchers used the sifted soil in two-liter compost reactors. In these, they tested how much acetone was needed, if the presence of acetone would slow down the composting degradation, and what effect the acetone had on the microbial communities responsible for the TNT degradation.

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After determining the optimal concentration of acetone to use, the team sampled the composting reactions to see how fast the microbes were breaking down the TNT. Without the acetone, the compost reactions still had an average of 2000 parts per million after 20 days. The addition of acetone allowed the microbes to degrade the TNT to less than 500 parts per million within one day and to safe levels within a week.

A Cool Feast

Treating the soil with acetone alone did not degrade the TNT as fast as with the addition of composting, but how the compost speeds up the contaminant degradation is not known. The researchers point out that the acetone may be dissolving the TNT, thus making it available to the microbial communities in the compost. Alternatively, since microorganisms can use acetone as a food source, the solvent may enable the microbes to metabolize the TNT chunks in a way that isn't yet clear.

> There are so many microbial communities doing the same thing, we have flexibility in the field.
>
> — *Corey Radtke*

The researchers note that the compost doesn't heat up as fast when acetone is added, but that the temperature -- usually an indication of microbes working in high gear—does not seem to be important for TNT degradation. They suggest that perhaps the acetone creates such a feast for the microorganisms that they don't have to work as hard to degrade the explosive substance.

Fast Food or Fruit Salad?

To understand the effect acetone had on the microbial communities, Lehman tested whether the acetone substantially changed the communities. He used a method that categorizes bacterial communities based on what they eat—similar to comparing a fast-food-eating community (the U.S.) to a rich-cream-sauce-and-pasta-eating community (the French).

The chunks of TNT have a wide range of sizes.

Using a panel of 95 different bacterial foodstuffs, INEEL team found that compost reactors with and without acetone had different microbial communities at work. However, the acetone-containing compost degraded the TNT without the researchers having to tailor the compost to TNT-containing soil.

"We're pretty sure there are at least three distinct communities doing the same thing," said Radtke. "The fact that there are so many gives us flexibility in the field. It makes the composting problem an engineering one and not one where we have to worry about the science behind it." For example, instead of having to grow certain bacterial strains in the laboratory to eat TNT, users of this method will only need to assure their soil conditions and recipes are consistent.

Scaling Up

The team has already scaled its experiments to 30-gallon batches of soil. Due to INEEL's strict safety and documentation requirements, however, they don't know how much money this method could save the national lab. INEEL has about a thousand cubic yards of TNT-contaminated soil, about 40 garbage truckfuls. An article published in the Bioremediation Journal, "Increased biotransformation efficiency of chunk-TNT contaminated soil using acetone pretreatments," can be found in Volume 4, Issue 1, pages 57-67.

INEEL is a science-based, applied engineering national laboratory dedicated to supporting the U.S. Department of Energy's missions in environment, energy, science and national defense. INEEL is operated for the DOE by Bechtel BWXT Idaho, LLC, in partnership with the Inland Northwest Research Alliance.

Would you like to see your article appear in the next TIE QUARTERLY???

Submit your success story or lessons learned to Blaine Rowley, URS Corporation, or Adrienne DeBacker, ATL International, Inc. by September 8, 2000 and you can be sure your message will be read by thousands!

Blaine can be reached at 301-353-0031 or by email at blaine.rowley@smshq.com.

Adrienne DeBacker can be reached at 301-515-6798 or by email at amg@erols.com.

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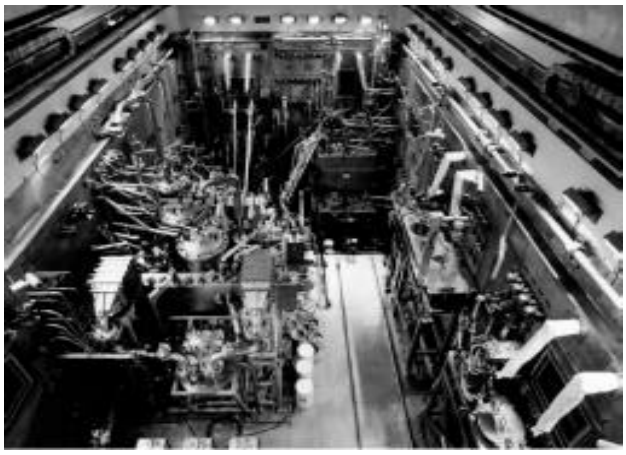
With assistance from the Integrated Technology Remediation Demonstration (ITRD) program, Pilot Plant equipment was moved from Fernald to Ashtabula, where soil washing was successfully demonstrated. Based on Pilot Plant results, a full-scale soil washing plant was designed and constructed.



Vitrification Cell

The chemical extraction technology provides a remediation approach for the 40,000 tons of uranium contaminated soil at the Ashtabula Environmental Management Project. To leach the uranium from the soil, chemical extraction soil washing uses 0.2 carbonate solution which is heated to approximately 115 F and contacts the soil for approximately 90 minutes. The process results in contaminant removal efficiencies of approximately 85 percent and volume reductions in excess of 98 percent. The clean soil product from soil washing operations is analyzed using X-ray fluorescence to ensure that free release standards have been met.

The soil washing process has successfully cleaned 11,000 tons of soil to date resulting in cost savings of over $2.2 million. The plant has provided a clean soil product that meets all regulatory requirements for reuse as clean backfill soil. Over 98 percent of the contaminated soil entering the plant is recycled as clean material. The volume of contaminated by-product material requiring disposal at an approved burial site is only two percent.

West Valley Demonstration Project

Approximately 600,000 gallons of high-level radioactive waste were stored at the West Valley Demonstration Project. Solidification of this high-level waste was necessary to place it into a stable form for long-term disposal.

A vitrification facility was operated to safely stabilize the high-level waste in a solid glass matrix. The vitrification process produced 246 canisters of high-level waste glass. The remaining challenge is to remotely size reduce process components using the vitrification expended materials processing system and to dismantle the facility.

The vitrification process substantially reduced the volume of high-level waste and further ensured protection of the environment from potential releases by producing a stable waste form.

The Vitrification Expended Material Process was selected for funding support by the ASTD program through the Tanks Focus Area (TFA). The innovative technologies deployed have allowed separation of the high-level waste from low-level waste and enabled packaging for storage and disposal.

Demonstration and deployment of new, innovative technologies that have proven benefits or have the potential to make the work safer, less expensive and less time consuming remains a top priority with the Ohio Field Office's cleanup efforts.

"We will continue to be aggressive, looking for innovative ways to work safer and more efficiently," stated Craig. "As the Ohio Manager, I am committed to the continued infusion of new technologies into the Ohio projects and to the deployment of successful technologies across the complex," said Brechbill.

SELLS Spring Meeting

In April 2000, the DOE Society for Effective Lessons Learned Sharing (SELLS) held its Spring Workshop in Oakland, CA. The theme for the workshop, hosted by DOE Oakland, Environmental Safety and Health Division, was 'Lessons Learned: The Path Forward.' The Workshop included a tour of Lawrence Berkeley Laboratory. Participants from private industry and other federal agencies were invited to attend the meeting and discuss their Lessons Learned Programs. Participants included: J. M Huber Corporation; Navy Center for Applied Research in Artificial Intelligence, Naval Research Laboratory; Port of Seattle, Seattle-Tacoma International Airport; Chevron Corporation; and Booz-Allen & Hamilton, Inc. A Defense Nuclear Facilities Safety Board member was also in attendance. DOE and Contractor Lessons Learned Program Managers and Coordinators from across the complex also shared information on recent Lessons Learned Program initiatives, Integrated Safety Management System Verification, and status of Lessons Learned Program implementation at their sites. Discussions focused on defining the path forward in implementing management expectations identified in the new DOE Standard, The DOE Corporate Lessons Learned Program (DOE-STD-7501-99). The workshop was successful in providing an opportunity to share best practices and open doors for better communication in the future.

Visit the SELLS website for proceedings from the April meeting (*http://tis.eh.doe.gov/ll/proceedings/proceedings400.htm*).

Fernald Technology Transfer with the Hammer Training Facility

Fluor Fernald Technology Application conducted a technology transfer with their sister site Fluor Hanford on two new and innovative technologies: the Personal Ice Cooling Suit (PICS) and the Oxy-Gasoline Torch. The transfer initially involved training over 20 lead instructors on technologies at the Volpentest Hazardous Materials Management and Emergency Response (HAMMER) Training and Education Center in Richland, Washington. These new instructors are subsequently training federal employees and contractors performing work at the DOE Hanford Site.

Trainers experiencing the Personal Ice Cooling Suits for the first time.

(Oxy-Gasoline tank, torch, and cutting

PICS technology was originally demonstrated and deployed at Fernald. PICS circulates cool water through a system of flexible tubes incorporated into a comfortable garment that can be worn under Personal Protective Equipment (PPE). The layers of PPE worn by the employees trap heat and hinder the body's natural cooling methods. PICS uses bottles filled with ice and small battery powered pumps to circulate chilled water from the ice bottles through the tubing of the garment, thus removing the heat generated and cooling the worker. The ice bottles can be changed easily and quickly, providing continuous protection from the affects of heat stress, thereby resulting in improved worker well being and productivity, and reduced worker fatigue.

The Oxy-Gasoline Torch is an innovative steel cutting torch that uses gasoline as a fuel source, instead of the typical pressurized acetylene. When cutting steel 1 to 4 inches thick, the Oxy-Gasoline Torch has been proven to cut 100% to 300% faster than acetylene. The Oxy-Gasoline Torch is designed so the gasoline remains a liquid through the torch system until it reaches the tipeliminating the possibility of backflash, making it much safer to use. To cut a similar quantity of steel, the Oxy-Gasoline Torch will use 2.5 gallons of gasoline compared to 250 pounds of acetylene. The use of the Oxy-Gasoline Torch technology during steel cutting tasks will result in increased cost savings (10-fold minimum), enhanced portability, improved productivity, and increased worker safety. In summary, the Oxy-Gasoline Torch is reported to cut steel faster, safer, and cheaper than acetylene. In addition to Hanford employees, several representatives from local trade unions were present to take part in the hands-on demonstration of the Oxy-Gasoline Torch.

Local Trade Union members are amazed by the performance of the Oxy-Gasoline Torch.

Fluor Fernald is an avid proponent and an early pioneer of the hands-on approach to technology transfer and deployment. The HAMMER facility emphasizes a direct hands-on approach to train personnel and to illustrate the many benefits of using new technologies.

Karen McGinnis, the HAMMER Director, said "Similar to Fernald, we've found that the hands-on approach to training is very effective and desirable, especially with the type of technologies you are providing us. With this technology exchange, we can now integrate the Personal Ice Cooling System into our training curriculum and more than 3000 people will be trained on their use and will know where to get them."

Mark Peters, the Fluor Fernald Technology Application Manager, stated "The people trained today will remember and take back to their various work groups throughout the Hanford Site what they learned because they were able to get their hands on the technologies. They were able to experience first hand the benefits of the torch, by actually cutting steel and the cool suit, by actually putting it on and wearing it."

The transfer and deployment of the PICS and Oxy-Gasoline Torch innovative technologies has been very successful. As of May 2000, 214 cool suits and 170 torches have been deployed to several DOE sites, commercial nuclear sites, and other non-nuclear industries. The deployment strategy has been to train the end users directly or through training institutions like the HAMMER facility, vocational schools, union apprenticeship programs, or universities, and let them experience the technology first hand.

The Fluor Fernald Technology Application Department is committed to deploying winning technologies across the DOE Complex and the HAMMER facility is an optimum training location for this purpose.

For more information, contact Mark Peters/ Fluor Fernald Technology Application at (513)648-4117.

Twelfth TIE Workshop On Nov. 14-16, 2000

The planning of the Twelfth Technical Information Exchange (TIE) Workshop is currently underway and TIE planners are inviting you to share knowledge and lessons learned from current or projects completed this past year with others, and with the many speakers participating from across the DOE complex. The theme for this workshop is "Sharing Experience, Expertise, and Lessons Learned." The Savannah River Operations Office will host this Workshop. Listed below are several topics that we believe, at this time, are important to the DOE "community." Topics are chosen by the Field Area Technology Representatives and by you, past workshop participants. We have provided brief summaries under each topic to give a better understanding of what will be discussed during the session.

Thank you for your interest and remember, workshop registration forms are due by November 3, 2000. Please copy the registration form on page 11 or visit the TIE web site (http://www.em.doe.gov/tie) and use the electronic version.

Workshop Topics

Accelerated Site Technology Deployment (ASTD)

The ASTD program has been developed to help reduce the financial risk the field organization must accept in deploying new technologies.

Cost Engineering

EM needs to collect and share technology cost information to better understand cost parameters, and what software, tools, techniques, or cost data are available for developing estimates for environmental projects and technologies.

GIS

Geographic information systems (GIS) provide high-quality data for ongoing remedial activities, for better understanding of the data, and for communicating concise, spatially-oriented data to decision makers, regulators, and other stakeholders.

Ground Water

Many current technologies for contaminated ground water characterization, containment, and treatment are ineffective or too costly. Highlights of cost effective sampling, monitoring, and innovative treatment technologies will be discussed.

Innovative Remedial Technologies

Technology development and implementation at DOE sites is one of DOE's Strategic Plan objectives. Information on programmatic integration, cost performance, and technology development and deployment, including approaches to overcome barriers to implementation, will be presented.

Inovative Technology Remediation Demonstration (ITRD)

Participation in the ITRD program contributes to the technology deployment process. It provides support for screening technologies, conducting treatability tests and field demonstrations, and developing data to support regulatory and stakeholder presentations.

Project Management

DOE project management direction developed over the last few years has changed the way many DOE sites manage their projects. This session will discuss how site project management conforms to programs such as Integrated Safety Management, Integrated Planning, Accounting, and Budgeting System, value engineering, DOE Order 435.1, and Life Cycle Asset Management, including integration across the EM programs.

Regulator/Stakeholder Interactions

Working in a teaming environment with regulators and stakeholders from the inception of a remediation project through completion improves efficiency and accelerates the regulatory approval process. Presentations will focus on regulator and stakeholder project involvement.

Risk

Discussions will focus on methods used to calculate risks and to effectively present the results to the stakeholders without the tendency to be overly conservative.

Sampling

Presentations will highlight procedures, protocols, and processes developed to sample soil, water, hazardous waste, spent fuel, high-level waste, and other similar media.

Site Closure

As remediation is completed at DOE sites, these sites may either be released from EM responsibility (except for long-term stewardship responsibilities) or the site may be released from DOE ownership. Presentations will share proven site closure procedures that are efficient and effective.

Stewardship

This session will dicuss DOE stewardship obligations for sites including development of long-range and comprehensive land use plans, and long-term monitoring, surveillance, and maintenance for any waste or contamination left on site after EM activities have been completed.

Emerging Waste Management Practices

The focus of this session will be on waste storage, reduction, treatment, shipment, acceptance criteria, and disposal procedures and alternatives, including potential problems with remote handled wastes.

Vadose Zone

Contamination in the vadose zone can act as a source for ground water contamination or as a direct exposure pathway. Discussion will revolve around innovative vadose zone modeling, characterization, remediation, and monitoring technologies.

12th TIE Workshop Registration Form
Workshop Dates - November 14-16, 2000

(Please feel free to make copies)

Personal Data

Name _____

Organization _____

Mailing Address _____

e-mail address _____

Phone Number _____ Fax Number _____

Lunch

I wish to attend the Keynote Speaker's Luncheon on November 15, 2000 Yes ❑ No ❑

(Absolute deadline for luncheon reservation is November 3, 2000)

Fee *(There is a $75 registration fee to attend the workshop, which includes all workshop activities.)*

Please charge my credit card: ❑ VISA ❑ MasterCard ❑ American Express

Credit Card Number: _____ Expiration Date: _____

Name of Card Holder: _____

NOTE: If you are paying by check, please make check or money order payable to **The Twelfth TIE Workshop.** *If you do pay by check, please fax a copy of the completed registration form to Adrienne DeBacker, ATL International, Inc.at 301-972-6904, and mail your check and the original registration form to Adrienne at 20251 Century Boulevard, Suite 200, Germantown, MD 20874. All registration forms must be received by November 3, 2000.* ***Questions?*** *Call Adrienne at (301) 515-6798 or e-mail her at amg@erols.com.*

Hotel Information

The following hotels will host this workshop and have a limited number of rooms set aside with the current government per diem rate. Please reference ***DOE TIE Workshop*** when making your reservations or you ***WILL NOT*** receive the discounted rate. Make your reservations early. The cut off date for the receiving this rate is October 27, 2000.

Sheraton Augusta Hotel (site of workshop)
2651 Perimeter Parkway
Augusta, Georgia 30909
Phone: 706-855-8100
Fax: 706-860-1720
Room Rates: $55.00 + tax (Standard Room)
$89.00 + tax (Suite)

Comfort Inn
629 Frontage Road, N.W.
Augusta, Georgia 30907
Phone: 706-855-6060
Fax: 706-855-8008
Room Rates: $55.00 + tax (Standard Room)
$89.00 + tax (Suite)

Tour Registration Form (Twelfth TIE Workshop Tour, November 16, 2000)

If you are planning to go on the tour, please provide the information below and return it by October 31, 2000. Please bring legal photo identification with you.

Please state current level of security clearance: BAO ❑ "L" ❑ "Q" ❑ None ❑

Name exactly as it appears on legal photo identification
(Type/Print Neatly) _____

Social Security Number _____ Date of Birth _____ U.S. Citizen? Yes❑ No❑

Any special needs we should know about? Yes ❑ No ❑

If so, please explain. _____

Payment Policy: Absolutely no refunds after October 12, 2000, but substitutions are allowed.

Attend TIE and See What can Happen to You!

There's no "goofing" off at TIE. We're serious and this is a setting where environmental restoration and waste management professionals with similar interests, programs, and problems across the Department of Energy (DOE) Complex and non-DOE sites can learn from one another and help propagate more effective management and remediation of contaminated sites. It is also a place where professionals can gain insight and determine the direction they should take with projects they are involved. The following story illustrates this point.

At the 1999 TIE Workshop held this past November in Las Vegas, Nevada, Dr. Herbert Inhaber, the President of Risk Concepts in Las Vegas, shared a valuable experience he had at the Workshop, which was the first he had attended. Dr. Inhaber, as the name of his company implies, is involved in risk management. He met Dr. Martin Edelson of the Ames Laboratory in Iowa, who shares an interest in studying how worker risk and public risk are corelated during DOE cleanup work. There were many common issues that they had both worked with.

After some discussion, they realized a valuable way to bring DOE risk results to a much wider audience would be to prepare and lead a symposium at the annual American Association for the Advancement of Science (AAAS) meeting. The next one will be held in San Francisco in February 2001. Their proposed title is provocative, and designed to draw people from many disciplines - Is the Government Spending Too Much to Reduce Radiological Risks?

It is important that advances made at DOE facilities or funded by DOE and private industries be shared with others so all can benefit from the results. The AAAS is perhaps the largest general science meeting in the world, and is attended by most of the major U.S. science journalists, so it is an excellent forum to present their results to a diverse audience.

The proposed symposium concept was rejected by AAAS. However, the two plan to persevere for a more public discussion of this important topic. Both believe that more attention needs to be directed towards worker risk and that EM's technology development process could provide improved worker protection that can be applied to private sector construction work.

As noted previously, TIE Workshops provide the setting so that scientists and engineers from around the world, can meet and further their studies. Dr. Inhaber stated that with respect to the AAAS symposium, he and Dr. Edelson spent a lot of time organizing it and that their "relationship blossomed, although there were the inevitable differences of opinion (all resolved)." Without the TIE Workshop, these two gentlemen probably would not have met.

For more information, contact Martin Edelson, Ames Laboratory at 515-294-4987 or edelson@ameslab.gov.

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Editor in Chief:
Adrienne DeBacker
ATL International, Inc.

Executive Editor:
Lawrence Ball
Blaine Rowley
URS Corporation

Managing Editor:
Sherie Earle ten Hoope
ATL International, Inc.

Contributing Editors:
Diana Coho
ATL International, Inc.

If you have a question or wish to contribute to the TIE QUARTERLY, please contact:

Adrienne DeBacker
ATL International, Inc.
20251 Century Boulevard
Suite 200
Germantown, MD 20874
Phone: 301-515-6798
Fax: 301-972-6904
Email: amg@erols.com

UNITED STATES DEPARTMENT OF ENERGY
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