U.S. Department of Energy

Deactivation & Decommissioning/Facility Engineering Quarterly Newsletter

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Executive Order 13514 and Sustainability Planning

Inside this Issue

The Department of Energy's (DOE) sustainability planning is underway. The challenge of the new Executive Order (EO) 13514, "Federal Leadership in Environmental, Energy, and Economic Performance," issued on October 5, 2009, is "to establish an integrated strategy towards sustainability in the Federal Government and to make reduction of greenhouse gas (GHG) emissions a priority for Federal agencies." This EO expands on the energy reduction and environmental performance requirements of Executive Order 13423, "Strengthening Federal Environmental, Energy and Transportation Management," issued in January 2007. The new EO also builds on sustainability mandates for Federal agencies contained in recent statutes, including the "Energy Policy Act of 2005" and the "Energy Independence and Security Act of 2007". It is these new and expanded challenges which the Department of Energy and the Office of Environmental Management (EM) are gearing up to meet.

"The responsibility for environmental quality is shared by all those whose actions affect the environment." - EPA

DOE Plans

DOE has set an ambitious goal of a 28 percent reduction by 2020 from its FY 2008 baseline in direct greenhouse gas emissions from sources it owns or controls and indirect emissions from generation of purchased electricity, heat or steam.

DOE's Strategic Sustainability Performance Plan (SSPP) will communicate its commitment to this goal in addition to other goals specified in the EO and outline the actions it is taking to achieve the goals.

Environmental Management Efforts

Recognizing that its overall goal is to clean up the complex (that is, "go green") EM is committed to incorporating sustainability into its work. EM is making substantial progress in the areas of improved energy efficiency and the application of renewable energy in its efforts to attain sustainability. This is exemplified through the substantial ongoing alternative financed projects at the Richland and the Savannah River Operations Offices with Savannah River leading the Department in its use of renewable energy.

EM's challenge is to continue to build on prior successes and is expected to identify new FY 2012 alternative financed sustainability pro-

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WIPP Salt finds new use: Magnum Minerals Buys WIPP Salt

The U.S. Department of Energy (DOE) Carlsbad Field Office (CBFO) negotiated an agreement to sell approximately 300,000 tons of run-of-mine salt from the Waste Isolation Plant (WIPP) to Magnum Minerals LLC of Hereford, Texas. As part of the agreement, the Carlsbad Soil and Water Conservation District (CSWCD) signed to administer the contract with Magnum Minerals, to include collecting and accounting for fees that are collected and allowing the revenues to remain in southeast New Mexico. The Bureau of Land Management was instrumental in coordinating the multi-agency agreement.

Revenues generated by the salt sales will go toward area public works projects such as range land improvement, brush control, saltcedar eradication and other noxious weeds treatment, and educational programs with local schools.

In 2008, DOE's management and operating contractor, Washington TRU Solutions, issued a request for interest in the salt mine tailings which have accumulated on the surface at the WIPP site since mining began in the 1970s. Magnum Minerals, which specializes in providing minerals and feed for the livestock industry, responded with a business plan to remove 10 truckloads of salt a day from the site resulting in a transfer of 300,000 tons over a five-year period. The salt, which likely would have been placed in a landfill, will instead be converted to a feed supplement for cattle and result in an estimated $4.5 million in cost avoidance for DOE.

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3-D Precision Models Improve Safety during Deactivation & Decommissioning

Planning for the safe and controlled deactivation and decommissioning (D&D) of highly contaminated facilities requires that engineers and managers fully understand the work space in which personnel and equipment will operate. It also requires that they then effectively communicate safety concerns and work sequences to the personnel who will perform the work. That understanding is embodied and conveyed in the work package, which traditionally contains 2-dimensional facility construction drawings and photos as well as written descriptions, which supervisors and workers must translate to the 3-D world in which the work is done. SRNL's approach with rapid prototype equipment has built plastic 3-D models at a level of detail and scale sufficient for highly effective jobsite briefings.

Use of the Savannah River National Laboratory's (SRNL) computer-produced scale replicas of SRS reactor buildings provides a significant improvement in visualization of the work space, allowing managers and supervisors to more effectively communicate safety issues and work sequences to personnel executing the physical D&D tasks.

Before beginning production of the 3-D models, the SRNL team creates computer-assisted design (CAD) models from the historical prints and drawings of the facilities' construction to obtain the exact dimensions. Rapid prototyping automates the translation of CAD drawings into 3-D models which then transmits the digital data to a 3-D printer called, a "Stratasys Fused Deposition Modeling®" which is essentially a high-tech glue gun. Plastic wire is fed to a computer controlled nozzle which reads the CAD data. The nozzle then melts the plastic and extrudes it very precisely creating

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Executive Order 13514 and Sustainability Planning

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Sustainability *and* ***sustainable*** *- the ability to create and maintain conditions, under which humans and nature can exist in productive harmony, that permit fulfilling the social, economic, and other requirements of present and future generation.*

jects. The first step towards this difficult task is to gather and improve data collection for key utility usage indicators. To this end, energy and water conservation evaluations of all covered facilities are to be completed by the end of FY 2012. In support of this effort buildings and processes need to be submetered, as necessary, to assist in the collection and analysis of usage data which will help to identify opportunities to reduce energy and water use and to help prioritize demolition.

Direction and guidance is being prepared that will require each EM site to prepare a "Site Sustainability Plan" by December 15, 2010. The Site Sustainability Plans will replace the current "Executable Plans" and will address plans and funding to complete energy and water conservation evaluations, install submeters as needed, and implement energy and water conservation measures. GHG reduction is a major focus of the EO and will require EM to:

- Maximize D&D within the established EM Program priorities and available funding.
- Ensure enabling the scheduled completion of West Valley.
- Develop, promote, and apply new technologies, and approaches, such as, In-Situ Decommissioning.
- Take action to enable the use of natural gas instead of diesel fuel for the Hanford Waste Treatment Plant (WTP) steam plant.
- Implement, where feasible, green and sustainable remediation.

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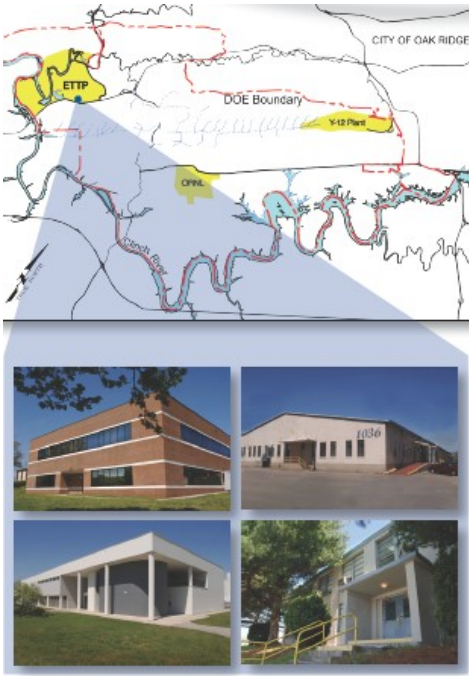
Property Transfer

Reindustrialization East Tennessee Technology Park



The East Tennessee Technology Park (ETTP), located on the far western end of the Oak Ridge Reservation, includes the site of the former Oak Ridge Gaseous Diffusion Plant (ORGDP) where uranium enrichment operations occurred from the mid 1940's until the mid 1980's. Oak Ridge's Reindustrialization efforts focus on accelerating cleanup of the ETTP by transferring underutilized facilities and infrastructure to either the private sector or the local municipality (i.e., the City of Oak Ridge). Through property transfers, the site of the former ORGDP is being transformed into a private business/industrial park, referred to as the ETTP Heritage Center. By targeting this end state, and salvaging suitable facilities and infrastructure for transfer, the U. S. Department of Energy (DOE) is reducing Environmental Management (EM) mortgages associated with operations and maintenance (O&M) and demolition of surplus facilities. It is critical that not only buildings but also land and utility infrastructure be transferred for the Heritage Center to be a viable business/industrial park.

Legal and Regulatory Framework

The laws governing the downsizing of DOE's defense nuclear facilities, together with regulations promulgated by DOE in response to those laws, establish a process for disposing of unneeded real property for economic development. Transfers of real property under these laws and regulations are intended to offset negative impacts on communities caused by unemployment from related DOE downsizing, facility closeouts, and workforce restructuring. The laws provide discretionary authority for DOE to transfer property at less than fair market value and to indemnify transferees against any claim for injury to person or property that results from release of a hazardous substance, pollutant or contaminant as a result of

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D&D/FE Web Based Resources

Legacy Technology Information: Now on D&D/FE Web Site

In the past, EM's science and technology programs produced various publications highlighting the progress and successes of innovative technologies. These documents are no longer in print, and though various internet resources might assist in identifying and retrieving them it sometimes can be challenging. In response to this challenge an easy to find location for EM's legacy innovative technology documents related to Deactivation & Decommissioning and Facility Engineering (D&D/FE) was created. In a recent update to the D&D/FE Program web site, a new web page has been added entitled, "Legacy Technology Information" which can be accessed at: http://www.em.doe.gov/EM20Pages/LegacyTechInformation.aspx .

At the moment one type of legacy document, once considered to be a main publication on innovative technology performance, has been posted. The "Innovative Technology Summary Reports" or

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D&D Program Map: Communicating Deactivation and Decommissioning (D&D) Program Progress

The Office of D&D and Facility Engineering (D&D/FE) has developed a comprehensive Program Map tool that provides an overview of DOE's Complex-wide facility D&D program. The D&D Program Map consolidates project data from multiple locations into a single definitive reference that can be found online at - http://www.em.doe.gov/EM20Pages/DDMaps.aspx. While the Office of Environmental Management (EM) continues to make progress in the formidable task of cleaning up the Cold War legacy and the disposition of thousands of excess contaminated facilities, the Headquarters role of tracking the D&D Program and managing the supporting data has proven to be almost as daunting as the actual field work. This is due not only to the sheer number of projects being conducted at 16 different sites, but also because there was no single compilation of D&D Program information. To get a complete understanding of the D&D Program, data had to be extracted from multiple information sources including: Integrated Planning, Accountability, and Budgeting System (IPABS), Project Baseline Summary (PBS), Analytical Building Blocks (ABBs), Facility Information Management System (FIMS), and baseline documents from the individual sites.

In 2009, the EM D&D Program changed drastically when three major initiatives expanded the scope of the EM program, resulting in an increase in the burden of tracking program progress. The first was an invitation from the Assistant Secretary for Environmental Management (EM-1) to the DOE Program Secretarial Offices of Science (SC), Nuclear Energy (NE) and the National Nuclear Security Administration (NNSA) to propose facilities and legacy waste for transfer to EM for final disposition. After reviewing all the facilities proposed for transfer, EM recommended that 63 facilities be accepted into the program.

Paralleling the EM-1 initiative, the Oak Ridge Reservation's Integrated Facility Disposition Project (IFDP) proposed to incorporate cleanup scope owned by NNSA, SC, and NE, and transfer this scope (223 additional facilities) to EM for completion. The third initiative involves EM's receipt of $6 Billion under the American Recovery and Reinvestment Act of 2009 (ARRA), of which $3.32 Billion was allocated for D&D projects across the Complex. The D&D projects undertaken with the ARRA funds are those that can be completed by 2011 and provide a benefit of significant footprint reduction. Because of this additional funding, part of the EM baseline was accelerated, with selected projects being completed 2 to 13 years earlier than originally planned. The ARRA funding also provides for accelerated transfer of some of the excess facilities from SC, NE, and NNSA mentioned previously.

To present key program information to multiple audiences, D&D/FE developed the D&D Program Map as a tool to enhance communication and further understanding. The D&D Program Map provides graphical and tabular details on facility D&D projects and consolidates program data from multiple locations into a single definitive reference.

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The "D&D Program Map" web page presents an integrated overview of DOE's complex-wide D&D project locations, scope, and issues and includes information on:

- The affects of the American Recovery and Reinvestment Act of 2009 (ARRA) and Facility Transfers on EM D&D Program
- ARRA D&D Scope
- Facilities to be transferred to EM for D&D
- D&D Projects Locations
- D&D Budget Profile
- Challenges and Cost Drivers
- Typical Phases of D&D
- The 25 most significant ("Top") D&D Projects (Based on Cost)
- Assumptions (Data Sources and Programmatic Assumptions)
- Major D&D Accomplishments

The maps are being updated to go beyond the top 25 projects and will include all of the D&D projects based on the analytical building block hierarchy. It is anticipated the updates will be completed by September 2010 at which time they will be updated on the D&D/FE website.

Department of Energy-Florida International University Science & Technology Workforce Development Initiative

In 2007, the Office of Environmental Management (DOE-EM) challenged Florida International University, Applied Research Center (FIU-ARC) to create a "pipeline" of FIU students trained and mentored to enter the DOE-EM workforce. FIU-ARC responded by creating a unique program where FIU students work on DOE-EM environmental restoration problems. In three years, the program has formally recruited, selected and inducted a total of forty-three (43) students. Three classes (Class of 2007, 2008, and 2009) of FIU students have been inducted and given the formal name of DOE Fellows. The FIU students are exposed to "hands-on" research by working with FIU-ARC scientists and engineers who are performing DOE EM applied research at FIU-ARC. Also as part of this program, the DOE Fellows have the opportunity to become interns at DOE site offices, DOE-HQ, national labs, and DOE contractors across the complex. DOE Fellows also participate in conferences such as the Waste Management Symposia and American Nuclear Society Conferences where they get the opportunity to present their EM related research.

Since the program's inception, DOE Fellows have completed a total of 28 internships at DOE HQ, and DOE national laboratories. This summer, an additional fifteen (15) DOE Fellows have participated in summer internships at DOE-HQ (Forrestal and Cloverleaf, at the DOE field office at Oak Ridge, and at the Oak Ridge National Laboratory and the Pacific Northwest National Laboratory.

During the past three years, the DOE Fellows have attended the Waste Management (WM) Symposia. DOE fellows made 35 presentations (poster and oral). One student was awarded 1st place at WM's Student Poster competition and another student's Poster Paper was judged the Best Professional Poster for WM09, becoming the first student in WM's history to win that award.

EM's Dr. Ines Triay, with DOE Fellows and Dr. Lagos at WM10

Of the 43 students inducted as DOE Fellows, 18 are currently pursuing master's or Ph.D. graduate degrees at FIU, and one has been hired by DOE and entered DOE-EM's Professional Development Corps (EMPDC) program. This year, an additional eight (8) DOE Fellows applied to DOE's EMPDC program.

In summary, in a 3 year period, this program has developed a pipeline of well rounded, technically competent young scientists and engineers, ready to join DOE-EM and DOE contractors and actively contribute to DOE-EM's mission to complete the safe cleanup of the environmental legacy brought about from five decades of nuclear weapons development and government-sponsored nuclear energy research.

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~ ITEM OF INTEREST ~

- EM-HQ and Field Offices are partnering to conduct **Maintenance Program Reviews** which began with a review at the Hanford Site in late August 2010. Reviews are being scheduled for the Waste Isolation Pilot Plant, Idaho National Laboratory, Portsmouth, Paducah, and Savannah River Sites. The goal of these reviews is for EM to proactively identify good practices, lessons learned, and opportunities to enhance maintenance programs.

3-D Precision Models Improve Safety during Deactivation & Decommissioning

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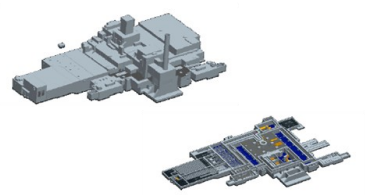
models with all the reactor facilities' structural elements, such as walls and stairwells, and every opening two inches in diameter or larger. The model of the major facilities is at a 1/96th scale and a model of the reactor vessel itself was made at 1/8th scale.

These models are the focal point for work discussions by the P and R Reactor Project teams because they can be used to test out work sequences and safety concerns prior to task execution, which reduces uncertainty in the work planning and work evolution. Success with the early use of the 3-D models has established that this tool can be a standard baseline approach for managers and supervisors who are planning D&D work in highly contaminated facilities. 3-D models are now being developed to assist with the planning to D&D the Plutonium Fuel Form (PuFF) Facility at the SRS.



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Legacy Technology Information: Now on D&D/FE Web Site

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ITSRs, also once referred to as the "green books", were developed to communicate to potential technology users relevant information which might help them to quickly determine if a technology might be applied to a particular environmental management problem they needed to address. The ITSRs typically ranged in length up to thirty-nine pages and contained: a short summary, a technology description, performance data, applicability of the technology, alternative technologies, cost and analysis details, regulatory and policy issues, lessons learned, and references.

Currently the Legacy Technology Information web page is not all inclusive; however, as other legacy documents related to the D&D/FE community are identified they will be added to the web site.

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Reindustrialization East Tennessee Technology Park

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DOE activities at the defense nuclear facility.

Economic Benefit to DOE and the Community

Transfer of property at ETTP results in significant cost savings for DOE. Depending on the number of properties determined to be suitable for transfer, the DOE will save $22 million to $65 million in avoided demolition costs and $6 million to $10 million per year in O&M costs. The community also benefits. By leveraging ETTP utility and emergency response assets, the city can provide enhanced services to the community. In addition, creating a private business/industrial park increases tax revenues and provides a catalyst for job creation in the wake of the job losses associated with the restructuring of the DOE weapons complex and the completion of environmental cleanup work.

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D&D/FE IS ON THE WEB AT - HTTP://WWW.EM.DOE.GOV/EM20PAGES/DDFE.ASPX

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Technical Assistance: The Staff Knowledge Directory

The D&D/FE staff members represent a knowledge-base available to help assist projects in identifying solutions through technical assistance across a wide-range of Deactivation and Decommissioning (D&D) and Facility Engineering (FE) topics. The following listing is a sampling of knowledge areas and contact information.

James Antizzo— james.antizzo@em.doe.gov [301-903-7182]	D&D — Geology: environmental sciences, environmental regulations, energy parks initiative
George Cava *(P.E.)* – george.cava@hq.doe.gov [301-903-7641]	D&D — Mechanical Engineering: Ocean Engineering: program & project management, D&D guidance & planning, External Technical Reviews (ETRs)
Ker-Chi Chang *(PhD, P.E.)* — ker-chi.chang@em.doe.gov [301-903-1383]	FE — Civil/Hydraulic/Environmental Engineering; Environmental, Energy, and Transportation program; facility and infrastructure
John De Gregory – john.degregory@em.doe.gov [202-586-5842]	FE — Electrical Engineering: knowledge management; information research & management; robotics and remote systems; communications
Donna Green – *(Lead)* donnal.green@em.doe.gov [202-586-1467]	FE — Chemical Engineering: Land Transfer; Energy Management Initiative; Real Property Assets Management
Paula Kirk *(IPA)* — paula.kirk@em.doe.gov [202-586-5426]	D&D — Biochemistry: strategic planning, environmental engineering, environmental sciences, project management
Stephen Lien *(PhD)* – stephen.lien@em.doe.gov [301-903-0114]	D&D — Biochemistry: grant management; SBIR's; sensors & instrumentation
Don Mackenzie – donald.mackenzie@em.doe.gov [301-903-7426]	D&D — Health Physics: ETRs; radiation protection; ALARA controls
Charles Nalezny *(PhD)* - charles.nalezny@em.doe.gov [202-586-0932]	FE — Civil Engineering: Property Transfer; ETRs
Andrew Szilagyi - andrew.szilagyi@em.doe.gov [301-903-4278]	D&D — Environmental Sciences: D&D policy, guidance, and planning; end-points methodology; program/ project management
Alexander Williams *(PhD)* - alexander.williams@em.doe.gov [301-903-8149]	D&D — Chemistry: Radiation Protection & Monitoring; Radiological Cleanup Criteria (RESRAD); radionuclide chemistry, surveys, and procedures

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