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Energy Secretary Bodman Commends Key Milestone In Mixed-Oxide Fuel Program

The Nuclear Regulatory Commission's (NRC) has authorized the construction of a U.S. Mixed-Oxide (MOX) Fuel Fabrication Facility at the Department of Energy's Savannah River Site in South Carolina.

Secretary of Energy Samuel W. Bodman said, "Issuing the permit for construction of a MOX facility in South Carolina is the crucial next step in the MOX program. It is a key milestone in our efforts to dispose of surplus weapons-grade plutonium in the U.S. and Russia."

The United States and Russia are scheduled to begin site preparation activities for the U.S. and Russian MOX facilities this spring, with full construction of both facilities to begin in fiscal year 2006. More than 30 nuclear reactors currently use MOX fuel in France, Germany, Belgium and Switzerland.

"We look forward to proceeding with this nonproliferation program that will ultimately eliminate enough plutonium for thousands of nuclear weapons in both countries."

The facility will fabricate nuclear reactor fuel using surplus U.S.

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LUCKY SPARROW HAWK: Beta, an American kestrel found grounded in an oil drip pan at a Y-12 National Security Complex building in Oak Ridge, Tenn., poses in the gloved hand of building manager Ron Wilson. The story, on page 4, has a happy ending.

Brooks Discusses Stockpile Of The Future At Hearing

The administration's emerging vision for the nuclear weapons enterprise of the future would replace the existing stockpile with weapons that could be more easily manufactured and more readily available, NNSA Administrator Linton F. Brooks said at a recent hearing of the Senate Armed Services Subcommittee on Strategic Forces.

While emphasizing that NNSA's science-based stockpile stewardship program is working and that the stockpile is safe and reliable, he said the legacy stockpile was not designed for longevity. The aging weapons are being rebuilt in life extension programs that are both difficult and costly.

"The evolution away from tested designs resulting from the inevitable accumulations of small changes over the extended lifetimes of these systems means that we can count on increasing uncertainty in the long-term certification of warheads in the stockpile," he said. "To address this problem, we must evolve our strategy from today's 'certify what we build' to

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Mixed-Oxide Fuel Program

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weapons-grade plutonium. Once the fuel is irradiated in existing commercial power reactors, the plutonium can no longer be readily used for nuclear weapons. A similar facility will also be built in Russia to implement the U.S.-Russian Plutonium Management and Disposition Agreement, which commits both countries to dispose of 34 metric tons each of surplus weapons-grade plutonium.

The next step for licensing the U.S. facility will be for NNSA's contractor, Duke, Cogema, Stone & Webster, to submit an operating license application in fiscal year 2006.

The NRC previously issued a license to authorize Duke Power's use of four MOX fuel lead assemblies at its Catawba nuclear power station near Rock Hill, S.C. Before MOX fuel can be used in significant quantities, the lead assemblies must be irradiated in a reactor to confirm they will perform predictably. Irradiation of lead assemblies is a step towards permanent licensing for use of MOX fuel.

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Editors: Al Stotts and Kim Krueger.
Layout: Barbara L. Courtney.
Contributors include: Ellen Ford Boatner, Y-12; Jim Danneskiold, Los Alamos Lab; Dino Herrera, NNSA HQ; Tami Moore, Sandia Site Office; Erin Ritter, Pantex Plant; Jud Simmons, Pantex Plant; Bill Wilburn, Y-12; Bryan Wilkes, NNSA HQ; Steve Wyatt, Y-12 Site Office

D'Agostino, Hafner To Act In DP

Tom D'Agostino has been named acting deputy administrator for defense programs by Administrator Linton Brooks. He succeeds Dr. Everet Beckner, who retired at the end of April.

"Tom has a wealth of knowledge in all aspects of defense programs' activities and we are pleased that he has agreed to serve in this capacity," Brooks said. "Tom has contributed immeasurably to the success of defense programs under Dr. Beckner's leadership and we look forward to working directly with him in this challenging assignment."

Additionally, Steve Hafner, currently the assistant deputy administrator for the Office of Secure Transportation, has agreed to a temporary assignment as the acting principal deputy administrator for defense programs beginning June 1. He will replace Brigadier General Ron Haeckel, who will retire from the United States Air Force in late May.

"Steve's experience and background in the department, with Sandia National Laboratories and with the military, will serve him well in this new assignment," Brooks said.

NNSA Service Center Personnel Changes

Key personnel changes have been made at NNSA's Service Center in Albuquerque, Service Center Director Karen Boardman announced.

Larry Kirkman, associate director, Office of Federal Services, retired on April 1. Boardman has named Debby Miller, currently the associate director, Office of Business Services, to replace him.

The Office of Federal Services provides human resource, training, information technology and facility support to the Service Center and its customers. The Personnel Security Department, which currently resides under the Office of Business Services, will be realigned under the Office of Federal Services.

The associate director for business services position will be competed. In the interim, Frank Baca, deputy director of the Service Center, will also serve as acting associate director for the Office of Business Services.

Mike Zamorski, associate director, Office of Institutional Affairs, has agreed to assume the position of senior safety advisor in the Office of Technical Services upon return from his detail to the Sandia Site Office. The Service Center continues to receive multiple requests for safety support.

The Office of Public Affairs and the Office of EEO/Diversity, which were aligned under the Office of Institutional Affairs, will report to Frank Baca, Service Center deputy director. The Employee Concerns Program will be aligned under Chad Glines, Financial Review and Performance Assessment Department, Office of Field Financial Management.

Brooks Discusses Stockpile Of The Future At Hearing

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tomorrow's 'build what we can certify.'"

To explore whether there is a better way to sustain existing military capabilities in the stockpile without nuclear testing, NNSA is initiating a new congressionally funded program called the Reliable Replacement Warhead (RRW), Brooks said. It will help to understand whether relaxing warhead design constraints imposed on Cold War systems could provide replacement components for existing stockpile weapons that could be more easily manufactured, more readily available, and produced with more environmentally benign materials. Additionally, it will maintain high confidence in their safety and reliability without nuclear testing for as long as the U.S. requires nuclear forces.

NNSA Administrator Linton F. Brooks

"Because they would be designed to be less sensitive to incremental aging effects, they would dramatically reduce the possibility that the United States would ever be faced with a need to conduct a nuclear test in order to diagnose or remedy a reliability problem," he said.

In addition, he said, the nuclear weapons infrastructure is not currently responsive enough to meet unanticipated events or emerging threats, or to anticipate innovations by an adversary to counter them before the U.S. deterrent is degraded.

Technically, the stockpile is wrong because current warheads were designed to maximize explosive yield with minimum size and weight and to maximize the number of warheads on a single delivery system, he said. If the stockpile were designed today under a test moratorium for delivery systems that would carry fewer warheads, technical risk would be managed differently. Size and weight would be traded for increased performance margins, system longevity and ease of maintenance.

The existing stockpile is most likely still too large, he said. The President's decision to significantly reduce the stockpile is contingent on achieving a responsive nuclear weapons infrastructure. Until then, it will be necessary to retain a substantial number of non-deployed warheads to hedge against a technical failure of a critical warhead or delivery system or against unforeseen geopolitical changes.

"Establishing a responsive nuclear infrastructure will provide opportunities for additional stockpile reductions because we can rely less on the stockpile and more on infrastructure, i.e., ability to produce or repair warheads in sufficient quantity in a timely way, in responding to technical failures or new emerging threats," Brooks said.

The post-9/11 terrorist threat requires that NNSA now consider the possibility of well-armed and competent terrorist suicide teams seeking to gain access to a warhead in order to detonate it in place.

"This has driven our site security posture from one of containment and recovery of stolen warheads to one of denial of any access to warheads," he said. "This change has dramatically increased security costs for 'gates, guns, guards' at our nuclear weapons sites. If we were designing the stockpile today, we would apply new technologies and approaches to warhead-level use control as a means to reduce physical security costs."

If RRW feasibility studies suggest the concept is technically possible, Brooks said, a small number of warheads could be produced by 2012-15 to demonstrate that an RRW system can be manufactured and certified without nuclear testing. At that point the U.S. would have the option to cut short or cease some ongoing life extension programs, apply the savings to begin transforming the stockpile with a substantial RRW component, and to use stockpile transformation to achieve a more responsive infrastructure.

"I hope the committee finds our vision both coherent and compelling," he said. "But I must emphasize that it is simply that, a long-term vision, nothing more and nothing less."

Y-12 Workers Save, Set Bird Free

A seldom-used overhead crane in the middle of World War II era building is not the place where one might expect to find any kind of wild creature, much less a bird of prey. But that's what happened at the Y-12 National Security Complex in Oak Ridge.

In February, an American kestrel, or sparrow hawk, covered with oil and unable to fly, was discovered by industrial hygienist Larry Brantley in building 92041, also known as Beta 1. The building was originally used to separate uranium for the first atomic weapon. The bird had apparently gotten into oil in a drip pan underneath the motor of the crane in the high bay area of the building. The oil had fouled the bird's feet and feathers.

KESTREL RESCUE: Larry Brantley, holding the sparrow hawk, and Ron Wilson prepare to release Beta, a female American kestrel, back to her native habitat near the Y-12 National Security Complex in Tennessee.

No one is sure how the bird got in the building, but they made sure it got out.

Brantley found building manager Ron Wilson, told him about the bird and they went back and followed the oily trail left by the bird as it tried to escape. They found the bird hiding behind an industrial storage drum two floors below where it was originally seen. Wilson, who has experience handling birds of prey, used a heavy glove to protect his hands and caught the bird, which is about the size of a pigeon. Gary Beck worked with Wilson and Brantley to make arrangements to get the bird out of the plant.

Brantley took the bird to the Clinch River Raptor Center in Clinton, Tenn., where Brantley's wife and son work as volunteers.

The Raptor Center is a volunteer organization located at Clinton Middle School and provides rehabilitation services to injured birds of prey. The center also involves the students and community through outreach programs, and is an active participant in Y12's annual Safety Expo.

The female bird was given the name Beta. Beta was washed to remove residual oil from her feet, tail, and wing feathers, and fed a diet of meal worms and mice donated by the Oak Ridge National Laboratory's "mouse house."

While under observation, Beta received additional baths and was kept for about three weeks in a flight cage. Once verified that she could fly, Beta was returned to Y-12 where Wilson, Brantley and Beck released her back to her native habitat. Wilson said when it was time to release the bird it perched briefly on his fingers and looked around before flying off.

"If Larry had not noticed her and we had not tracked her down she would have perished in that building. We would have just found the feathers. It was one of those things that helps your soul," Wilson said.

Pantex Achieves Clean Texas, Cleaner World Partner Status

The Texas Commission on Environmental Quality (TCEQ) has notified BWXT Pantex and the NNSA Pantex Site Office that the plant has achieved membership in the "Clean Texas, Cleaner World" program.

This program recognizes entities within the State of Texas that have robust environmental management programs and specific objectives for improving environmental impacts due to facility activities. This milestone culminates months of hard work by the Environmental Management System (EMS) Implementation Team and all Pantex employees.

"Since we implemented the Environmental Management System at Pantex, we have worked hard to increase our awareness and improve the effects our actions have on the environment," said Pantex Site Office Manager Dan Glenn. "It is rewarding to see our actions recognized by this program."

The Pantex EMS is modeled on the International Organization for Standardization's ISO 14001, *Environmental Management Systems*. This model is accepted internationally and is the primary model in the United States for environmental management. The cornerstone for the system is to assess all activities, products and services for environmental impact and take appropriate actions to improve the detrimental impacts.

Pantex was admitted to the Texas program at the partner level. A future milestone for the plant is to achieve national leader level.

NNSA Authorizes Restart Of The Sandia Annular Core Research Reactor After Recent Upgrades

The Sandia Site Office (SSO) has authorized restart of the Annular Core Research Reactor (ACRR) at Sandia National Laboratories, enabling the reactor to resume countless experiments for weapons surety.

"This is an important step. It's been a lot of hard work by a lot of people, both on the part of my staff and Sandia's Tech Area-V," said Mike Zamorski, the acting director for SSO's Office of Nuclear Facilities and Safety Basis. "I want to thank every one of them for their dedication and perseverance in achieving this important milestone."

The ACRR entered a maintenance outage in July 2004 for upgrades to the Plant Protection System (PPS). The PPS upgrade was necessary to alleviate maintenance difficulties associated with parts and components that have become obsolete.

The ACRR is a water-moderated, low-power, pool-type, pulsing reactor that uses an enriched ceramic oxide fuel of uranium dioxide and beryllium oxide (UO2-BeO). Its primary mission is to provide pulse and steady-state neutron irradiation environments for the irradiation of experiments in a central irradiation cavity or one of several out-of-core external cavities, or for performing neutron radiography.

REACTOR RESTARTS: The Sandia Site Office has authorized restart of the Annular Core Research Reactor at Sandia National Laboratories in New Mexico.

Historically, the ACRR has conducted research and development activities for the weapons programs, Nuclear Regulatory Commission reactor safety experiments, other DOE nuclear development programs, and others, mainly DoD. The ACRR also maintains an authorization basis capability to be utilized for the production of medical isotopes. The isotope production capability is maintained for DOE/ Office of Nuclear Energy, although it is not currently active.

"The restart of the ACRR is extremely important to the electronic parts and system level qualification activities for the arming, fuzing and firing system used in the W76-1 Life Extension Program," said Ron Rodger, program liaison engineer for SSO's Office of Defense Programs & Quality Assurance.

Preparation for restarting the reactor after upgrades included rigorous training for operators and revisions to the Safety Basis. Both Sandia, and SSO review teams conducted independent readiness assessments.

Restart of the ACRR restores an integral part of testing for the national nuclear weapons complex.

Successful Los Alamos Experiment Supports Weapon Maintenance With Hydrodynamic Experiments

Using the world's most powerful flash X-ray machine, Los Alamos National Laboratory has successfully captured a high-resolution X-ray image following detonation of a mock-up of imploding weapon components.

DARHT: Aerial view of the the Dual Axis Radiographic Hydrodynamic Test facility at Los Alamos.

The experiment, conducted at the Dual Axis Radiographic Hydrodynamic Test Facility (DARHT), supports continued maintenance of a key nuclear weapon component of the U.S. nuclear deterrent, without a return to underground testing.

Over the next few months, the Los Alamos team will compare the radiographic image with computer models, closely examine any differences and refine the models so they more accurately represent weapon behavior.

"The Los Alamos success of hydroshot 3625 is a testament to the integrity and technical excellence of Los Alamos stewardship of the W76. I am extremely pleased with the great work you've done," said Everet Beckner, recently retired deputy administrator for NNSA defense programs.

DARHT is a high-explosive firing site equipped with a flash X-ray machine that records interior details of dense metal objects to create images of mock-ups of nuclear weapon components at the moment of implosion. Hydrodynamic experiments measure the implosion characteristics of weapon components using simulated materials, which permit scientists to evaluate some crucial aspects of nuclear weapon performance.

The experiment is the most recent in a series, and is designed to gather key data needed by NNSA's Life Extension Program for the W76 warhead on Trident submarine-launched Ballistic missiles.

This hydrotest at DARHT required close, extensive cooperation between the laboratory and NNSA's Los Alamos Site Office.

The first axis of DARHT has provided high-quality images to NNSA's stockpile stewardship program since late 1999 in several hydrodynamic experiments and dozens of smaller high-explosives experiments, all of which have provided images of unprecedented resolution and clarity.

At DARHT, electron accelerators produce intense, penetrating X-ray beams that, like a flash bulb, can freeze the motion of objects moving at explosively driven speeds of more than 2,000 miles an hour. Electrons used for the snapshot are accelerated to energies of 20 million volts, and are converted to X-rays that expend that energy in just 60-billionths of a second.

The second axis at DARHT, when completed, will enable stereoscopic and time sequenced views of hydrodynamic experiments. The next hydrodynamic experiment in the current series at DARHT is scheduled for this summer.

SHOT IN THE DARHT: The successful Hydro 3625 shot.

Got an article for the NNSA Newsletter? *Submit it for consideration to Astotts@doeal.gov*

U.S., Canada Cooperate In Closure Of Russian Weapons-Grade Plutonium Production Reactor

Canadian Foreign Affairs Minister Pierre Pettigrew and Secretary of Energy Samuel Bodman have announced the signing of a memorandum of understanding (MOU) to assist with the permanent closure of one of the final operating weapons-grade plutonium production reactors in Russia.

Under the MOU, Canada will contribute $9 million Canadian (U.S. $7 million) to the U.S. Department of Energy's Elimination of Weapons-Grade Plutonium Production (EWGPP) program. The Canadian contribution to this initiative is part of its $1 billion pledge under the G8-led Global Partnership Against the Spread of Weapons and Materials of Mass Destruction.

The goal of the EWGPP program is to permanently shut down three Russian nuclear reactors and replace them with fossil energy plants. These reactors, which provide necessary heat and electricity to two regions in Siberia, also generate a significant amount of plutonium that could be used to make nuclear weapons. The Russian government has agreed to permanently shut down the reactors once replacement energy is provided.

"This agreement is key to halting the production of nuclear weapons materials," said Minister Pettigrew. "We are pleased to be able to cooperate with our U.S. partners on this important security initiative."

> ***"Ending the production of weapons-grade plutonium is a non-proliferation priority for the United States and the international community."***
> ***Secretary Bodman***

"The signing of this MOU with our Canadian partners is another key step toward meeting this priority," said Secretary Bodman.

The Global Partnership Against the Spread of Weapons and Materials of Mass Destruction is a critical initiative for preventing terrorism relating to weapons of mass destruction. Canada is currently contributing to projects in all four of its priority areas: dismantlement of nuclear submarines; destruction of chemical weapons; re-employment of former weapons scientists; and disposition of fissile materials. The United States pledges approximately $1 billion annually for activities under the Global Partnership.

Y-12 Leads Effort To Reduce Weapons-Usable Nuclear Material Stockpile

Down blended highly enriched uranium (HEU) that was formerly part of the U.S. stockpile of weapons-usable fissile material will be loaded into the Tennessee Valley Authority's Browns Ferry Nuclear Plant in Alabama this spring. This will be the first of several down blended fuel reloads made possible through the collaboration of NNSA's Off Specification Fuel Program and TVA's Blended Low Enriched Uranium (BLEU) program.

The Off Specification Fuel Program takes enriched uranium from NNSA sources and provides it to TVA for conversion into low-enriched material to generate electricity. The program helps to reduce the U.S. stockpile of weapons-usable fissile material and helps to significantly reduce the costs associated with storage, security and disposal. The program is managed by the Y-12 National Security Complex for NNSA's Office of Fissile Materials Disposition.

More than 50 metric tons of HEU will ultimately be eliminated through the BLEU program. When blended down to produce fuel for a commercial nuclear power reactor, this material could provide electricity to every household in the United States for 122 days.

"Converting this material to reactor fuel is by far the lowest-cost option for dealing with the material, as compared to storage or disposal of the material as waste. Down blending it and burning it as fuel in power reactors eliminates its use for weapons, lowers costs and provides a benefit to the public," said Bill Brumley, Manager of the NNSA's Y-12 Site Office.

The DOE material is being shipped from several locations, including Y-12, the Savannah River Site, Idaho National Laboratory and the BWX Technologies facility in Lynchburg, Va.

Successful Upgrade Provides Enhanced Power At LANL Building

A successful electrical infrastructure and safety upgrades (EISU) project at a Los Alamos National Laboratory (LANL) building that houses a significant portion of the LANL Physics Division and the Materials Science and Technology Division, has provided its occupants with the power and electricity they need to do their jobs.

The electrical upgrades at LANL's Building 40 involved the design and installation of a new power distribution system to meet current electrical codes and standards. Electrical safety hazards such as inadequate grounding systems, overloaded branch circuits, outdated electrical equipment previously exposed employees and occupants to potential risks such as fires, arc blasts, shock or electrocution. All of these deficiencies were corrected through a total replacement of the electrical system within the building.

The project involved 20,000 staff hours, with more than 85 percent performed during normal working hours, with zero safety or security incidents. The construction work was strategically planned during the design phase to allow the new power distribution system to be installed in sections, which minimized the occupants' exposure to hazards and the amount of downtime to programmatic and scientific projects. No office was out of service for more than one week.

The EISU Building 40 project cost a total of $2.9 million and was funded from the Facilities and Infrastructure Recapitalization Program (FIRP) along with several others in a series of EISU projects across the laboratory. Overall, this series of projects is only a portion of the larger EISU project laboratory-wide $67 million effort to upgrade electrical power systems in buildings that are old or do not meet current electrical safety codes.

NNSA Official Addresses Department Of Defense Conference

For the first time, NNSA provided a presentation to a plenary session of the Department of Defense's (DoD) Diminishing Manufacturing Sources and Materials Shortages (DMSMS) conference. The recent presentation covered programmatic issues and concerns that the NNSA and DoD share. It also provided a focus for exploring strategic partnerships and complementary work opportunities of mutual benefit.

The conference was held to help DoD program managers, logisticians, and suppliers understand how to combat a wide range of weapon system, infrastructure and supply-chain/logistics obsolescence problems. DMSMS problems are an increasing concern as the service lives of DoD weapon systems are extended and the life cycles for high technology components decrease. The problem is further complicated by a reduction in the industrial base dedicated to production of military equipment.

The NNSA presenter, Roger Lewis, director of the Office of Stockpile Technology, told attendees at the conference that the NNSA has much in common with the DoD that can lead to beneficial collaborations. "We have been together with the Department of Defense since the Manhattan Project. We have taken the same journey through the Cold War with you," he said, explaining the DOE/NNSA's transition to a smaller weapons complex faced with new challenges.

The NNSA's complementary work programs can support the DMSMS problem, and several NNSA/DoD collaborations have already been successful. "We do a lot already," the NNSA senior manager said, "and we are open to doing more where it makes sense."

An information booth was staffed with NNSA and contractor personnel from the Kansas City Plant, Los Alamos National Laboratory, Pantex Plant, Savannah River National Laboratory and Y-12. The booth highlighted various technologies within the Nuclear Weapons Complex that are accessible to other agencies through a wide variety of interagency mechanisms and technology transfer arrangements.

"We talked to a lot of the conference attendees this week, and I believe that many more people who are concerned about DMSMS problems see that the NNSA can be a part of their solution," said Diana Ritter, Kansas City Site Office program manager.

Robin Spradlen, program development manager with the Y-12 Site Office, said, "I was very encouraged to see how all the sites worked together to develop and staff the booth and represent the NNSA very positively."