



“Grasslands and playas at Pantex provide food, cover and water for the site’s animal inhabitants.”

B&W Pantex Wildlife Biologist
Jim Ray

PANTEX WILDLIFE: Bobcats have moved onto NNSA’s Pantex site because it offers a safe location for their growing families. See pages 4 and 5 for more on the Pantex habitat.



NNSA MOX Facility Remains On Schedule

August marked the one-year anniversary of the start of construction for the \$4.8 billion Mixed Oxide (MOX) Fuel Fabrication Facility located at NNSA's Savannah River Site near Aiken, S.C. The MOX facility will support the 2000 Plutonium Management and Disposition Agreement between the U.S. and Russia, under which each country must dispose of at least 34 metric tons of weapons-grade plutonium, equivalent to over 4,000 nuclear weapons.

"The work accomplished in the past year on the MOX Fuel Fabrication Facility is crucial for the important role this facility will play in NNSA's nonproliferation efforts, said Administrator Thomas D'Agostino. "With full support for the budget, we will continue progress in

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NNSA Sites Remove 12 Metric Tons Of Weapons Material

With the completion of a recent shipment of nuclear material from NNSA's Y-12 National Security Complex at Oak Ridge, Tenn., a total of 12 metric tons of plutonium and highly enriched uranium (HEU) is now on the path to disposition. By reaching 12 metric tons of special nuclear material removed from its sites, NNSA has surpassed its reduction goal for the fiscal year.

"As the U.S. nuclear weapons stockpile number continues to go down, it is important for security and nuclear nonproliferation reasons to dispose of the excess weapons material," said NNSA Administrator Thomas D'Agostino.

The bulk of the material consists of HEU from Y-12. This excess HEU is shipped to different facilities for "downblending," or conversion, to low enriched uranium (LEU), which cannot be used in a nuclear weapon. Much of the LEU is slated for the Reliable Fuel Supply Initiative, a fuel

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construction and ultimately make possible the elimination of nuclear weapons-usable material, which prevents proliferation and potential misuse."

Significant construction progress has been made in one year. The heavily reinforced steel and concrete foundation of the main MOX facility building is over 80% complete with exterior and interior walls installed throughout the first level.

Overall design, procurement and construction activities remain on schedule. Operations are set to begin at the MOX facility in 2016, following extensive inspection and testing of the facility.

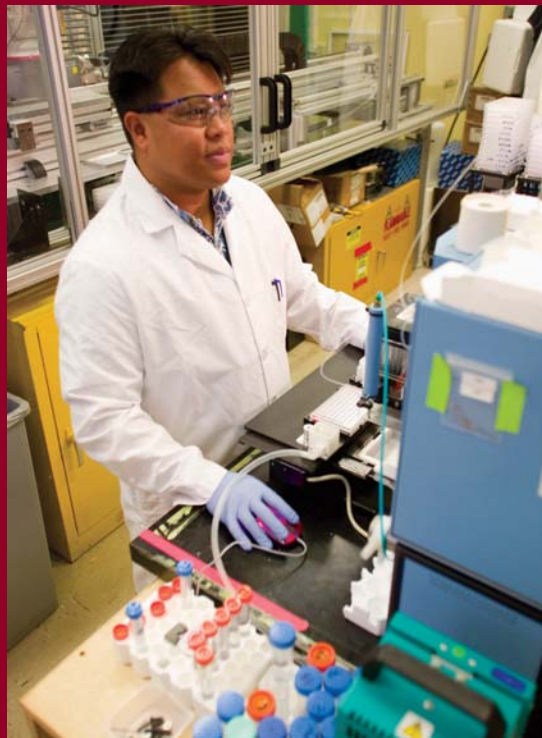
The MOX facility will fabricate surplus weapons plutonium into MOX fuel for use in nuclear power plants to generate electricity. Disposing of surplus U.S. weapons plutonium demonstrates that the United States is maintaining its nonproliferation commitments by drawing down its nuclear arsenal in a transparent and irreversible manner.



CONSTRUCTION ON SCHEDULE: Exterior walls of the Fuel Manufacturing Building being erected (April 2008).

CREATING TEACHER SCIENTISTS IN THE LAB:

Michael Sana, a high school science teacher at Waipahu High in Oahu, Hawaii, is spending eight weeks at NNSA's Lawrence Livermore National Laboratory conducting biotechnology research as part of the Department of Energy's "Academies Creating Teacher Scientists" (DOE ACTS) program. Sana is conducting research into how bacteria communicate through chemical signaling to enable a population of bacteria to regulate gene expression, and therefore, behavior. This type of research would be instrumental in understanding diseases and outbreaks that might be brought on by bioterrorist activities. The three-year ACTS program was designed to create a cadre of outstanding science and math teachers with the proper content knowledge and scientific research experience to serve as leaders and agents of positive change in their local and regional teaching communities.



NNSA Sites Remove 12 Metric Tons Of Weapons Material

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supply for countries with good nonproliferation credentials.

This effort follows the removal of all nuclear materials requiring the highest level of security protection from Sandia National Laboratories and Lawrence Livermore National Laboratory's inventory reduction of 25 percent.

NNSA plans to consolidate nuclear materials at five sites by 2012 and to reduce the square footage of these sites by 2017. This will further improve security and reduce security costs, and is part of D'Agostino's effort to transform the Cold War-era nuclear weapons complex into a 21st century nuclear security enterprise.

Three Million Square Feet Of Aging Nuclear Weapons Buildings Torn Down

Three million square feet of old buildings, many from the earliest days of the Cold War, have been torn down across the eight sites that make up NNSA's national security complex. This accomplishment, achieved a year early, will allow NNSA to be more efficient in meeting its national security commitments.

"I am extremely proud of the hard work done across NNSA to quickly and safely tear down these aging facilities," said NNSA Principal Deputy Administrator William Ostendorff at NNSA's Y-12 National Security Complex, which accounted for more than a third of the building reductions. "This shows the taxpayer that we are taking steps to reduce the cost of maintaining the U.S. nuclear weapons stockpile."

Ostendorff spoke to Y-12 employees before taking the ceremonial first blow at a five-building cluster that will push the total over the three million square foot mark.

While razing three million square feet is significant, NNSA officials say more is needed. As the complex gets older, it has become increasingly expensive to maintain. At the same time, the

number of U.S. nuclear weapons continues to decline consistent with the nation's nuclear deterrence strategy. With flat or declining budgets in store for the

secure, and more cost effective. This proposal includes a 30 percent reduction in the square footage of the nuclear weapons infrastructure. By the end of the fiscal year, the



TERMINATOR: Deputy Administrator William Ostendorff operates a hydraulic excavator to begin razing an old building at the Y-12 National Security Complex.

maintenance and upkeep of the remaining nuclear arsenal, the infrastructure to support this mission must be consolidated, made more efficient, and updated in a few key areas in order to meet the needs of the future.

In order to further consolidate its facilities, NNSA has proposed a plan, called Complex Transformation, that would create a nuclear weapons infrastructure that is smaller, safer, more

following gross square footage will have been dispositioned at each of NNSA's sites: Kansas City Plant - 400; Los Alamos National Laboratory - 394,556; Lawrence Livermore National Laboratory - 408,908; Nevada Test Site - 505,279; Pantex Plant - 194,395; Sandia National Laboratories - 449,251; Savannah River Site - 5,577; Y-12 National Security Complex - 1,147,323. The total will be 3,105,689 square feet.

NNSA's Pantex Plant Creating Habitat For Native

A thriving community of wildlife exists on the wind swept acres of NNSA's Pantex Plant near Amarillo, Texas. Its terrain provides a desirable habitat for many native animals and a protected playground for new arrivals and their growing families.

Pantex Plant, the nation's only nuclear weapons assembly and disassembly facility, covers 16,000 acres or about 25 square miles. Only about 2,000 acres are currently used for plant operations. Most of the remaining land is open range except for several thousand acres cultivated by Texas Tech University.

Wildlife protection and management is a requirement guided by a number of federal regulations, executive and Department of Energy orders. Jim Ray, B&W Pantex's wildlife biologist, is responsible for compliance with these orders. His responsibilities are to know the different mammals, insects, amphibians, reptiles and birds that call Pantex home. Ray works closely with Monty Schoenhals, B&W



Pantex's agronomist, to ensure land management includes a habitat layer to meet wildlife needs.

"Grasslands and playas at Pantex provide food, cover and water for the site's animal inhabitants," Ray said.

B&W Pantex has worked



HORNED LIZARD BACKPACK:

This Texas horned lizard models a backpack transmitter that will allow Pantex to map the boundaries of its habitat.

with West Texas A&M University (WT) in Canyon, Texas, on a number of contracts to track the site's wildlife population, and recently completed a study about the facility's insects and spiders. They have been working on a herpetology

ing A Welcoming Wildlife

contract since 2003.

The herpetology contract includes the tracking of horned lizards, one of the most unique projects B&W Pantex is conducting. Small backpack transmitters are placed on the lizards so that WT students can map the reptile's habitat.

AMARILLO ARMADILLO: An armadillo, which is rarely seen in the area, visits the Pantex site.

Texas has placed the horned lizard on its threatened species list, so B&W Pantex is working to create an environment that promotes maintenance or growth of the population.

This contract includes the tracking of prairie rattlesnakes, primarily for safety information. However, the ecology information, which has never before been gathered in the Southern Great Plains, has attracted the attention of the scientific community.

Ray and WT will soon begin working with the site's growing bobcat population. Bobcats were first seen on the site in 2006. A young female settled into a wooded area near a Pantex building to deliver her kittens. Ray said the female may have

chosen the site because it offers some protection from coyotes - the bobcats' natural predator. Her original kittens have grown and are now having kittens of their own. Ray recently recorded the arrival of the fourth litter.

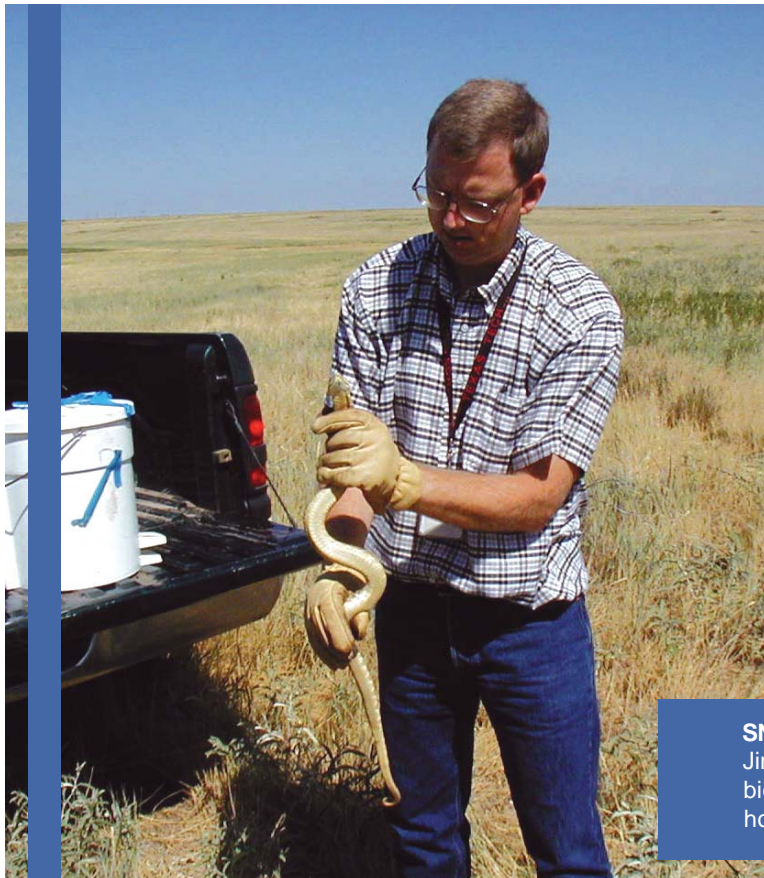
Ray's team will attach different colored ear tags on any bobcat they can catch and will place transmitter collars on the females raising families. Although bobcats, which are usually only slightly larger than a house cat, pose no danger to people, the colored ear tags will help identify individual cats if they become involved in nuisance situations. The transmitter collars will aid in mapping the females' home ranges.

Pantex has several healthy prairie dog towns, which are necessary for the ecosystem. These provide plant diversity, plant and animal food sources and burrows for burrowing owls, snakes and other small animals. Ray keeps a close eye on the prairie dogs so that their burrowing activity won't impact mission work.

Other animals recently documented on site were a nine-banded armadillo, a black bear, an opossum, two milk snakes, and a Texas long-nosed snake. Porcupines have visited on occasion and mule and white-tailed deer are regularly observed. Pronghorn antelopes have been seen just outside the plant's boundaries.

As the population grows and new animals move into the area, B&W Pantex will continue its study. This research will help Pantex and area land

managers better protect and manage habitat for native wildlife.



SNAKES ON THE PLAIN:

Jim Ray, B&W Pantex's wildlife biologist, relocates an eastern hognose snake.

JASPER Facility Back In Business

The Joint Actinide Shock Physics Experimental Research (JASPER) facility at NNSA's Nevada Test Site (NTS) recently celebrated a return to normal operations after a one-year period of no critical experiments.

JASPER employees worked around the clock to transform the facility from a Radiological Facility to a Hazard Category 3 Nuclear Facility. The crew celebrated its success with a Hot Shot Experiment— exactly one year to the day operations were stopped.

"The JASPER team worked extremely hard to accomplish the transformation," said Dax Jolly, JASPER facility manager, Joint Nevada Test Site Program Office, Lawrence Livermore National Laboratory. "They didn't balk at the challenges thrown at them and managed to exceed my expectations in the readiness and return to operations activities."

JASPER plays an integral role in certification of the nation's nuclear weapons stockpile by providing a method to generate and measure data pertaining to the properties of materials at high shock pressures, temperatures and strain rates. The JASPER crew achieves these goals conducting high-pressure experiments using a two-stage gas gun.

When the JASPER facility received its new classification, all operations with special nuclear material were stopped, then the entire JASPER team worked to develop a temporary Justification for Continued Operations and to implement all the new requirements and level of rigor.

As part of the transition, the JASPER facility underwent three assessments: an internal assessment, a management self-assessment and a readiness assessment. Each was performed by the NNSA Nevada Site Office, with NNSA headquarters participation. Findings had to be addressed before operations could be restarted.

"All of the crew and staff are a very talented and dedicated group of people and I can't praise them enough," Jolly said. "It is great to again have JASPER producing exceptional plutonium data, and I am excited about the upcoming operations schedule."

U1A Facility Transition Completed

The first major Nevada Test Site (NTS) facility to transfer management and operating responsibilities to National Security Technologies, LLC (NSTec) has been completed ahead of schedule. The U1A underground complex has fully shifted from its prior National Laboratories management to NSTec.

The transition of the first of five major facilities was completed 30 days ahead of schedule, and more than \$100,000 under budget, says Patrick Morris, division manager, Office of Readiness in Technical Base and Facilities. "The significance of the project is to consolidate facility management responsibilities under one management and operational contractor," says Morris. "It is intended to enhance the prioritization of facility operations, maintenance, and repair by applying consistent application of facility management requirements and authorization basis implementation."

As part of a transition plan announced September 2007, the Device Assembly Facility, the Joint Actinide Shock Physics Experimental Research Facility, the Big Explosives Experimental Facility, Baker Site, and numerous logistical facilities also will have their facility management responsibilities consolidated under NSTec's management.

Historically, the national laboratories have managed several NTS facilities using established home laboratory practices, principles, and health and safety requirements. As such, implementation of health and safety, security, and compliance requirements would vary among the NTS facilities.

Citing a shift over the years to "authorization basis-driven activities" and the need for a consistent application of basis requirements and potentially more efficient uses of resources, NNSA issued a directive that makes NSTec assume full responsibility and accountability for managing and operating all facilities on the NTS.

NNSA's Pantex Plant Joins Texas A&M University To Advance Nuclear Engineering Safety Education

NNSA's Pantex Plant will join a multi-partner collaboration led by the nuclear engineering program at Texas A&M University to develop an integrated nuclear safety program supporting the nuclear energy resurgence. The project is supported by grant funding from the United States Nuclear Regulatory Commission (NRC). The operational model adopted by B&W Pantex is known in the nuclear industry as a "High Reliability Organization" (HRO). An HRO demonstrates successful avoidance of system catastrophes in an environment where project risk factors and complexity result in low probability of high consequence accidents. HRO operations apply best practices gleaned from the "lessons-learned"

of previous disasters in related fields.

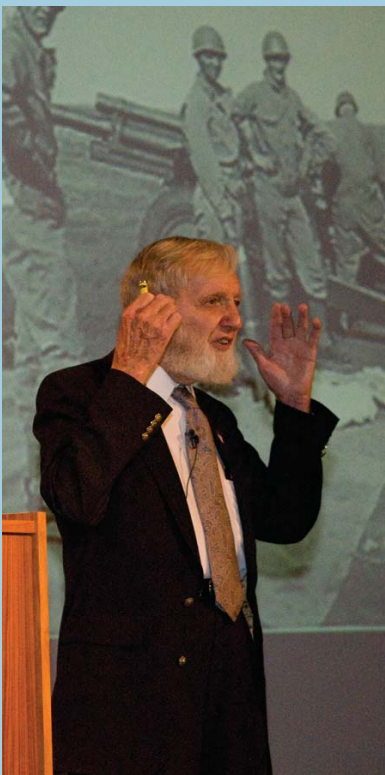
"B&W Pantex continually strives to become an HRO, and we have invested heavily in developing a unique and practical approach for successfully managing hazardous operations while sustaining the highest levels of production and support for our customer," said Bill Mairson, manager of the B&W Pantex Environment, Safety & Health Division.

"As the largest nuclear engineering program in the nation, we accept the tremendous responsibility of preparing the next generations of nuclear engineering leaders, and it is imperative they fully understand the safety

supporting the resurgence of nuclear energy," says Dr. Raymond J. Juzaitis, Texas A&M nuclear engineering department head and holder of the Sallie and Don Davis '61 Professorship. "B&W Pantex's breadth and depth in high reliability operations adds the industrial perspective, which will significantly shape our new, integrated nuclear safety program."

In addition to B&W Pantex, other partners in Texas A&M's nuclear energy safety curriculum development project include Sandia National Laboratories, Luminant, South Texas Project and Duke Energy. The project at Texas A&M is led by Associate Professor Karen Vierow, who is the principal investigator on the NRC project.

Nuclear Weapons Pioneer Speaks At DOE



Leon Smith

Manhattan Project pioneer Leon Smith, a Director Emeritus of NNSA's Sandia National Laboratories, recently shared his experiences with a captivated audience at DOE/NNSA Headquarters in Washington, D.C.

As a member of the fuzing group, Smith was deeply involved in preparing the bombs that were dropped on Hiroshima and Nagasaki and he was a key player in post-war nuclear testing. His talk was accompanied by a number of photos that he took at Los Alamos and at Tinian, the island where the "Little Boy" and "Fat Man" bombs were finally assembled and loaded onto the "Enola Gay" and "Bockscar." He recalled the secrecy and seriousness of the Los Alamos mission that he and the other pioneers undertook.

After his military service, Smith joined Sandia's bomb fuzing group in 1947, while it was still attached to Los Alamos Scientific Laboratory. Smith initiated systems engineering in 1955 and directed the components, weapons development, and monitoring systems groups before retiring from Sandia in 1988.

Smith said he frequently gets the inevitable question, "How did you feel when the bomb was dropped on Hiroshima?" He said he greeted it with a feeling of relief that the war was going to end soon and that while many lives were lost in the bombings, many hundreds of thousands were spared.

After the talk, NNSA Principal Deputy Administrator William Ostendorff presented Smith with an Award of Appreciation. Smith then signed many autographs and posed for pictures with current nuclear weapons stewards.

NNSA-Funded Research Projects Win 9 R&D Awards For 2008

NNSA's three national laboratories and the Y-12 National Security Complex have won 9 of the 100 awards given out this year by R&D Magazine for the most outstanding technology developments with promising commercial potential. Overall, Department of Energy laboratories won 30 of the 100 awards. The coveted awards are presented annually in recognition of exceptional new products, processes, materials or software developed throughout the world and introduced into the market the previous year.

"I'm very proud that DOE scientists and engineers captured over a quarter of this year's R&D 100 awards," Secretary Bodman said. "This is yet another example of how the department, our national laboratories, and our security complex are continuing to demonstrate world-class leadership in scientific and technological innovation, as we enhance our energy security, national security and economic competitiveness."

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Secretary of Energy Samuel F. Bodman

R&D 100 awards are selected by an independent panel of judges based on the technical significance, uniqueness and usefulness of projects and technologies from across industry, government and academia.

The complete list of R&D 100 awards will appear in the September 2008 issue of R&D Magazine. Here is a list of NNSA's award-winning projects:

Lawrence Livermore National Laboratory (Livermore, Calif.) - Three Awards

- SecureBox - a low-cost, reliable, reusable advanced cargo container security system to improve the security of cargo containers during shipping.
- Autonomous Alignment Process for Laser Fusion Systems - a revolutionary "hands-off" system that directs and aligns multiple high-energy laser beams to enable controlled man-made fusion reactions.
- Dynamic Transmission Electron Microscope - provides the highest resolution ever for digital imaging of ultrafast material processes on the billionth of a meter scale.

Los Alamos National Laboratory (Los Alamos, N.M.) - Two Awards

- 3-D Tracking Microscope - the only confocal microscope capable of following the motion of nanometer sized objects, such as quantum dots, organic fluorophores, single green fluorescent proteins, as they move through three-dimensional space at rates faster than many intracellular transport processes.
- Laser-Weave - grows high-strength inorganic fibers into useful shapes and complex patterns, braid or weave strong cables, cloth or composites with lasers, produce new high-value, cost-effective refractory ropes and textiles and prototype novel high-aspect ratio microelectrical mechanical systems.

Sandia National Laboratories (Albuquerque, N.M.) - Three Awards

- Xyce (Trademark) Parallel Electronic Simulator 4.0.2 - the first analog tool capable of full simulation of large digital circuit systems through the use of massively parallel computation, rather than resorting to accuracy-compromising simplifications used by other tools.
- Silicon Micromachined Dimensional Calibration Artifact for Mesoscale Measurement Machines - improves measurement accuracy for producing miniaturized devices such as fuel injectors, watch components and inkjet printer parts as these high-volume parts are being manufactured.
- Superhydrophobic Coating - a transparent coating that isn't just impermeable to water, but actually makes it bounce off a surface to help prevent corrosion, protect electronics and antiquities, or provide a new, more efficient surface to collect pure water.

Y-12 National Security Complex (Oak Ridge, Tenn.) - One Award

- Negligible-Residue Tack Cloth or Non-tacky Tack Cloth - traps dust, dirt or other particles in the cloth as it is wiped over the surface of the material being cleaned.

For more information about DOE R&D 100 awards go to http://www.science.doe.gov/Accomplishments_Awards/RD_100_awards/2003rd100.htm