



## U.S. Removes Iraqi Nuclear And Radiological Materials

Nuclear materials that could potentially be used in a radiological dispersal device or diverted to support a nuclear weapons program have been removed from Iraq under a joint operation of the Department of Energy (DOE) and the Department of Defense (DoD).

Energy Secretary Spencer Abraham said, "This operation was a major achievement for the Administration's goal to keep potentially dangerous nuclear materials out of the hands of terrorists. It also puts this material out of reach for countries that may

seek to develop their own nuclear weapons."

Twenty experts from DOE's national laboratory complex packaged 1.77 metric tons of low-enriched uranium and roughly 1,000 highly radioactive sources from the former Iraq nuclear research facility. The DoD airlifted the material to the United States in June and provided security, coordination, planning, ground transportation and funding for the mission.

Due to safety and security issues surrounding the removed materials, the U.S., consistent with its authorities and

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## NNSA Plants Play Major Role In Stockpile Stewardship

NNSA's production complex has experienced site closures and downsizing since the end of the Cold War, but the safety, security and reliability of the nation's nuclear weapons stockpile is now supported in a variety of important ways by four one-of-a-kind facilities that interact significantly with the agency's national laboratories.

The Pantex Ordnance Plant (now the Pantex Plant) in Amarillo, Texas, and the Y-12 Electromagnetic Separation Plant (now called the Y-12 National Security Complex) in Oak Ridge, Tenn., were the first of the four facilities to enter into national service in 1942 and 1943 respectively.

In 1949, the Kansas City Plant in south Kansas City, Mo., was established in the Bannister Federal Complex, which was built by the Navy during World War II to assemble engines for Navy fighter planes. The Atomic Energy Commission asked The Bendix Corporation to manage the Kansas City

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**NEVADA TEST SITE:** The Atlas machine as it looks today in its new building in Area 6. See story on page three.

## U.S. Removes Nuclear Materials From Iraq

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relevant United Nations Security Council resolutions, took possession of and removed the materials to ensure the safety and security of the Iraqi people.

DOE also repackaged less sensitive materials that will remain in Iraq. Radiological sources that continue to serve useful medical, agricultural or industrial purposes were not removed from Iraq.

The low enriched uranium will be stored temporarily at a secure DOE facility and the radiological sources will initially be brought to a DOE laboratory for further characterization and disposition.

The International Atomic Energy Agency was advised in advance of the U.S. intentions to remove the nuclear materials. Iraqi officials were briefed about the removal of the materials and sources prior to evacuation.

The nuclear research complex, now under the responsibility of the Iraq Ministry of Science and Technology, was once a central institution for Iraq's nuclear weapons program before being dismantled in the early 1990s, following the first Gulf War. The complex was also the consolidation point for highly radioactive sources collected by the DoD with assistance by employees of the Ministry of Science and Technology within Iraq over the last year.

# KCP Cyber Security Has Cure For Computer Virus Infections

On March 9, something unusual caught the attention of the Cyber Security staff at the NNSA's Kansas City Plant (KCP).

While monitoring the network, the system detected a flurry of activity that looked like a virus. The staff quickly contacted several involved users to determine whether they had just opened an e-mail attachment. The answers were affirmative, though none of the users had seen anything that made them suspicious.

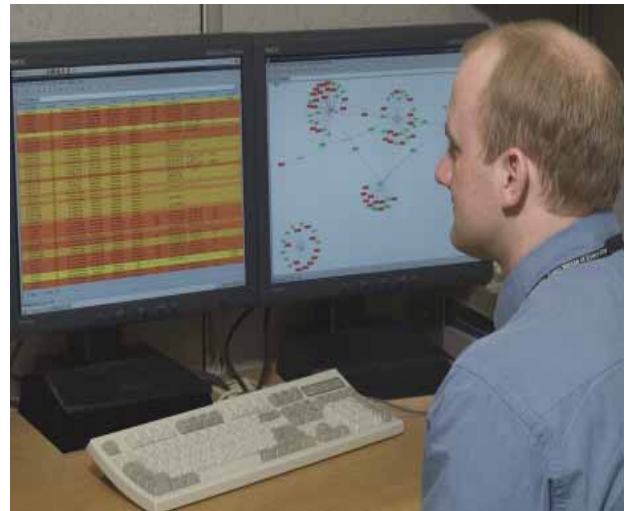
Cyber Security associates had seen the pattern before and knew it meant trouble if the problem wasn't contained quickly.

Cyber Security immediately put out notices warning associates about e-mails with executable attachments.

The staff also tracked the virus and put a stop to further replication. The situation was under control and the virus was contained within about two hours. Ten KCP computers had been infected and the business impact was nominal. At a similar-sized site without the tight security controls of the KCP, that would have been enough time for the virus to virtually shut the business down.

Viruses are more than an irritant; they can lead to significant losses of money and information. In February alone, viruses caused \$83 billion in damage and lost business worldwide. According to industry

reports, the first quarter of 2004 was a record-breaker, with nearly seven times more virus alerts than in the first quarter



**COMPUTER VIRUS PROTECTION:** Jon Green monitors several systems from his office in Cyber Security. Since 2002, he has worked to protect Kansas City Plant associates from viruses and other threats to computer systems.

of 2003.

Cyber Security scans all incoming and outgoing e-mail with detection software that is updated hourly. When a new virus does hit the plant, 70 percent of Cyber Security's resources go to work on it.

Security personnel work to track down and quarantine the virus to minimize its spread and the amount of damage it can do.

The KCP has realtime virus protection. Anytime an associate opens, changes or saves a file, it gets checked for viruses.

All that protection goes on behind-the-scenes, transparent to users, but the Cyber Security staff still recommends that associates who notice a suspicious attachment delete the message without opening the attachment.

**Got an article for the  
NNSA Newsletter?**

Submit it for consideration to  
AStotts@doeal.gov

# NTS Atlas Pulse Ready To Beat

In a ceremony at the Nevada Test Site, the Atlas pulse power machine was welcomed into a family of above-ground capabilities to support the NNSA Stockpile Stewardship Program. The dedication marked the end of a \$20.7 million effort to bring Atlas to the test site from Los Alamos National Laboratory (LANL).

“Atlas is part of our effort to use means other than nuclear testing to answer questions about the conditions of our stockpile,” said Everet Beckner, NNSA deputy administrator for defense programs. “The longer we go in time, the more we need tools like Atlas to solve the problems confronting our nation.”

Atlas is designed to provide data needed for computer models used to validate the safety and reliability of the nation’s nuclear stockpile. Atlas acts as a giant power amplifier, using energy that accumulates slowly and is stored in the machine’s capacitor banks for sudden release into a target, usually a metal with similar properties to plutonium such as tungsten, copper, tin, steel or aluminum. As the electrical current surges through Atlas, it crushes the target at velocities nearly high enough to escape Earth’s gravity - as high as 22,500 miles per hour - and generates pressures equivalent to millions of times that of Earth’s atmosphere.

Compared to other physics experiments, Atlas can concentrate more total energy on larger



**PULSE POWER MACHINE:** Mike Salazar, LANL Atlas senior target technician, shows Dr. Everet Beckner (center) and Dr. Dave Crandall (right) what one of the target’s for the Atlas Machine looks like.

(centimeter-scale) experimental targets for longer periods of time. The data from pulsed power experiments provides better physics models of material properties and implosion hydrodynamics.

Initially designed and constructed by LANL, the relocation of Atlas occurred over the last two years and involved over 400 workers from LANL, Bechtel Nevada and NNSA.

“The people are the reason this machine ran successfully in Los Alamos and will now run successfully at the Nevada Test Site,” said Sue Seestrom, LANL associate director for weapons physics. “They put their hearts and souls into making this day a reality.”

With the addition of Atlas, the Nevada Test Site now provides three experimentation platforms for national laboratory scientists. Subcritical experiments began at the test site in 1997, and the JASPER two-stage gas gun fired its first successful plutonium shot in 2003.

# NNSA Provides Unique Experience For Summer Interns

Washington, DC is alive with interns during the summer months. DOE and NNSA offer interns a unique experience, providing applied learning different from attending a lecture or sitting in a classroom.

Interns William Liou and Anne Jamison say they are gaining invaluable experiences during their summer internships at NNSA headquarters in Washington, DC. They are part of a joint DOE/NNSA partnership offering summer internships to students interested in DOE/NNSA related issues.

Stanford University student William Liou is working in the NNSA Office of Policy, Planning, Assessment and Analysis for Dr. John Harvey. He is pursuing a degree in electrical engineering and says he is learning a great deal at NNSA. “I’ve really been able to see first hand how the federal government works,” said Liou. “I am interested in both the science and policy behind advanced technology, and my internship has given me the opportunity to contribute to the policy planning process.”

Liou first learned of NNSA from one of his professors at Stanford and decided to come to NNSA in Washington through a school program this past spring. He enjoyed his work so much that he decided to stay on as a summer intern before he returns to Stanford to finish his senior year.

In the future, he would like to use his skills and experience to work on national security issues.

Anne Jamison is a recent graduate

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# LLNL Replaces Substandard Facilities With FIRP Funding

Replacing substandard and inefficient facilities is one of Lawrence Livermore National Laboratory's (LLNL) highest priorities in facilities management.

Modern, efficient structures reduce the ongoing maintenance for facilities that have exceeded their life expectancy and eliminate maintenance backlog and associated costs. Also, co-locating dispersed groups or teams of people is vital for operational efficiency and to save space.

LLNL has completed its first "design-build" office facility, which will house more than 100 people with an average of 120 square feet per office in keeping with Government Services Agency (GSA) standards.

The streamlined design-build process enabled LLNL to meet the project's aggressive 15-month schedule within a budget of \$4.9 million, which would have been difficult to accomplish with the traditional "design-bid-build" approach. The NNSA's Facility and Infrastructure Recapitalization Program (FIRP) made this project possible. The FIRP is a direct-funded program specifically aimed at reducing maintenance backlog and eliminating

substandard facilities.

Energy efficient sustainable design features, such as a skylight and large windows in each office, provide



**DESIGN-BUILD SUCCESS:** The first streamlined construction process building at Lawrence Livermore National Laboratory has been completed on time and on budget.

natural lighting. Other sustainable design features include an energy efficient and reliable HVAC system, energy saving motion sensor light switches, an efficient irrigation system with drought tolerant landscaping, and exterior sun control devices.

The design-build approach is being used increasingly at all levels of government, transportation/public utilities and educational institutions because it is the most cost-effective way to build facilities.

A series of additional replacement buildings are planned over the next few years at LLNL to improve the quality of work space for hundreds of employees.

## News Briefs

### Brooks Receives Award at DOE/NNSA Seminar

Administrator Linton F. Brooks was the recipient of the Best Practices award for his employee communications called "Lintgrams" at the Joint 2004 Department of Energy Human Resources and EEO/Diversity Symposium in Pittsburgh, Pa. Brooks told the 300 participants that leaders should be persons of honor and integrity who know their stuff and take care of their people.

### Santa Clara Pueblo Officials Attend D.C. Meeting

Joseph Bruce Tafoya, Lt. Gov. of Santa Clara Pueblo in New Mexico, and other Santa Clara officials attended a recent meeting at NNSA Headquarters to discuss educational intern and scholarship programs. The NNSA Office of Diversity and Outreach, headed by Mary Ann Fresco, is developing a program to collaborate with the DOE Minority Education Program of the Office of Economic Impact and Diversity.

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# LANL Scientist Fred Begay Selected To New York Academy Of Sciences For Lifetime Achievements

Fred Begay of the Los Alamos National Laboratory (LANL) Government Relations Office was recently elected to the New York Academy of Sciences.

“I’m pleased and proud to receive the New York Academy of Sciences award and to be included in the oldest academy in the country,” Begay said. “The Academy is widely recognized as one of the world’s foremost organizers of scientific conferences and symposia and has evolved beyond convener to include the roles of communicator and mentor.”

Begay’s LANL career began in 1971 in the former Laser Research and Technology Division as a nuclear physicist where he participated in numerous controlled thermonuclear fusion programs. He has worked for

various groups throughout his career, including the Physics and Human Resources divisions, the Science and Technology Base Programs Office

Begay has received numerous awards for his contributions in science, science education and public service, including the Ely Parker Award, American Indian Society for Engineering and Science, 1992; Lifetime Achievement Award, National Science Foundation, 1994; Distinguished Scientist Award, Society for the Advancement of Chicanos and Native Americans in Science, 1999.

Begay also has had numerous films produced about his life including the “Nation within a Nation,” Hearst Metrotone News, 1972; “In Our Native Land,” Sandia National Laboratories, 1973; “The Long Walk of Fred Young-Begay,” British Broadcasting Corporation and NOVA, 1978; and “Dancing with Photons,” KNME-TV, 1997.

Begay earned his bachelor’s degree in physics and math, his master’s degree in physics and a doctoral degree in nuclear physics, all from the University of New Mexico.



Fred Begay

and the Community Relations Office. He currently is a member of Los Alamos’ Tribal Relations Team in the Government Relations Office. Begay works on science and technology outreach programs for the Navajo government.

## Unique Experience For Summer Interns

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of Virginia Tech and using her newly acquired bachelor’s in political science to contribute to NNSA’s Office of Diversity and Outreach. Anne heard of NNSA by word of mouth and



William Liou

thought it would be a great place to gain more professional experience. She mentions the main highlight of her internship is the substantive work she is getting to do in diversity and outreach.

“The Office of Diversity and Outreach has really included me in



Anne Jamison

everything that they do,” said Jamison. “I really feel like I am contributing, and that they value my contributions.”

Jamison will be continuing her education this fall. She is pursuing a master’s degree in the Public and International Affairs at Virginia Tech.

## NNSA Plants Play Major Role In Stockpile Stewardship

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facility and build non-nuclear components for nuclear weapons. Finally, the Savannah River Site, located south of Aiken, S.C., was constructed during the early 1950s to produce the basic materials used in the fabrication of nuclear weapons — primarily tritium and plutonium-239.

Today, these four facilities form a significant component of NNSA's stockpile stewardship program, which endeavors to predict, discover and evaluate problems in the current stockpile, especially issues associated with component aging or defects.

**The Pantex Plant** develops, tests and fabricates high-explosive components and supports test assemblies for weapon safety and reliability analysis and certification.



The plant also assembles weapons as part of life extension programs and dismantles surplus weapons. It also provides interim storage and surveillance of plutonium pits.

Randomly selected weapons from all stockpile programs are returned to Pantex each year for surveillance, testing and evaluation. They are disassembled, tested and evaluated to determine if components are in working order. Components are physically removed, built into test configurations and subjected to electrical and explosives testing. Components and subassemblies are also assembled into flight test assemblies which the design laboratories use to analyze and certify weapons.

**The Y-12 National Security Complex** manufactures nuclear weapon secondaries and components. The secondary is a nuclear stage in a modern, two-stage nuclear weapon.



Y-12's stockpile stewardship role centers on the manufacturing of components required for maintaining, refurbishing, retrofitting and creating weapon systems for the stockpile. The stockpile evaluation program detects and evaluates potential problems that could affect safety, use, control and reliability of weapons.

Y-12 also dismantles retired weapons, providing receipt, dismantlement and disposition of returned weapon components received primarily from Pantex following initial dismantlement there. Y-12 also supports NNSA readiness campaigns to develop and maintain capabilities needed for confidence in stockpile certification and life extension programs. Another important function of Y-12 is to process and store highly enriched uranium. In fact, Y-12 is the primary national storage site for weapons-grade enriched uranium.

**The Kansas City Plant** develops or procures non-nuclear components that include electronic, electromechanical, mechanical, plastic and non-fissionable metal parts for nuclear weapons. Examples include precision detonator cables for several weapon



systems as well as the complex Mechanical Safe and Arm Detonator for the refurbished W-87.

Over the past 50 years, the products manufactured at the Kansas City Plant have become smaller and much more complex. The facility has evolved into a high-tech research production facility that specializes in science-based manufacturing.

**The Savannah River Site** supports stockpile stewardship by ensuring the safe and reliable recycle, delivery and management of tritium, a radioactive isotope of hydrogen that is a common component of modern stockpile weapons that enhances their performance. With a half-life of 12.3 years, tritium decays about five percent per year and must, therefore, be replenished periodically.



U.S. tritium production stopped in 1988. Since then, tritium needed to replenish nuclear weapons has been recycled from dismantled weapon systems removed from the stockpile. In the future, tritium-producing rods will be irradiated in light water reactors operated by the Tennessee Valley Authority, then transported to the Savannah River Site where the tritium will be safely and efficiently extracted and loaded into reservoirs for shipment to the Department of Defense.

# Space Simulator Models The Universe On A Budget

For the past several years, a team of astrophysicists at Los Alamos National Laboratory (LANL) have been using a cluster of roughly 300 computer processors to model some of the most intriguing aspects of the Universe. Called the Space Simulator, this de facto supercomputer has not only proven itself to be one of the fastest supercomputers in the world, but has also demonstrated that modeling and simulation of complex phenomena, from supernovae to cosmology, can be done on a fairly economical basis.

According to Michael Warren, one of the Space Simulator's three principal developers, "Our goal was to acquire a computer which would deliver the highest performance possible on the astrophysics simulations we wanted to run, while remaining within the modest budget that we were allotted. Building the Space Simulator turned out to be an excellent choice."

The Space Simulator is a 294-node Beowulf cluster with a theoretical peak performance just below 1.5 teraflops, or trillions of floating point operations per second. Each Space Simulator processing node looks more like a

computer you would find at home than at a supercomputer center, consisting of a Pentium 4 processor,



**THE SPACE SIMULATOR:** Michael Warren, one of the principal developers, says the goal was to acquire a computer that delivers the highest performance while remaining within a modest budget.

1 gigabyte of 333 MHz SDRAM, an 80 gigabyte hard drive and a gigabit Ethernet card.

Each individual node cost less than \$1,000 and the entire system cost under \$500,000. The cluster achieved Linpack performance of 665.1 gigaflops per second on 288 processors in October 2002. (A gigaflop is a billion floating-point

operations per second.) At the time, the simulator was the 85th fastest computer in the world, according to the TOP500 list (see [www.top500.org](http://www.top500.org)). Since then it has moved down to #344 on the most recent TOP500 list as faster computers are built. However, Warren and his colleagues are not worried. They built the Space Simulator to do specific astrophysics research, not to compete with other computers. It was never designed to compete with laboratory's massive supercomputers and in fact, is not scalable enough to do so.

The Space Simulator has been used almost continuously for theoretical astrophysics simulations and has spent much of the past year calculating the evolution of the Universe. In addition to simulating the structure and evolution of the Universe, the Space Simulator has been used to study the explosions of massive stars and to help understand the x-ray emission from the center of our galaxy.

In addition to Warren, the developers of the Space Simulator include Los Alamos staff members Chris Fryer and Patrick Goda.

## Laboratory Diversity Calendar Gets DOE Award

Los Alamos National Laboratory (LANL) has received a U.S. Department of Energy "2004 Diversity Best Practices" award for an online calendar that promotes diversity awareness among laboratory employees.

Representatives from the laboratory's Diversity Office accepted recognition for the Weaving Our Worlds (WOW) Diversity Calendar at

DOE's Human Resources & EEO/ Diversity Symposium in Pittsburgh.

The WOW Diversity Calendar is an entertaining, online calendar and educational resource for laboratory employees that contains more than 800 cultural, religious and historical observances, as well as birthdays of famous people and heroes from diverse backgrounds. The Diversity Office created the calendar when

several laboratory surveys indicated that employees were interested in increasing their diversity awareness through proactive, nonthreatening, informal and voluntary avenues. The WOW Diversity Calendar can be found online at <http://lanldb1.lanl.gov/lanl/lanlevents.nsf/WOWCalendar?OpenForm&callDate=Current>.

# Bechtel Scientist Develops Geiger Counter For Pets

Most cities and states maintain plans to keep families safe in the event of a nuclear accident. Thanks to Dr. Craig Marianno, a Nevada Test Site senior scientist, those plans can now include family pets.

Marianno developed a new animal portal monitor that can scan caged pets for radioactive contamination without workers having to touch them. Cages slide into the short, open-ended box structure that resembles a kennel. The pet monitor measures normal background radiation and can detect in a maximum of ten seconds whether a pet - or any other object placed inside it - reads at a rate higher than the background.

“I think we’re in a time that the pet is no longer just an animal,” said Marianno. “In some cases, it is a cherished family member.”

A single monitor costs about

\$10,000 to build and is expandable to fit over animal chutes to scan livestock. It could also be adapted to work with other types of radiation detection equipment.

The only alternative pet scanning method requires rescue workers to hold pets while passing a hand-held survey instrument entirely around animals’ bodies. Each time workers handle contaminated pets they must change their anti-contamination gear to prevent cross-contamination of other animals. As an added safeguard, workers undergo monitoring after each animal they monitor.

Marianno’s new pet-scanning monitor was demonstrated as part of

the state of Minnesota’s full-scale nuclear preparedness exercise from



**ANIMAL PORTAL MONITOR:** Pet portal system designed by Bechtel Nevada scientists allows radiation technicians to survey family pets faster without having to handle the animals

June 14-16, 2004, in which an entire pet decontamination and monitoring program was pioneered. Ten animals were run through the portal monitor, and the equipment performed as expected.

## Livermore Gets OPSEC Award

Lawrence Livermore National Laboratory’s Operations Security (OPSEC) program received third place honors at the 2004 National Operational Security Awards. There were 81 award nominees from within the national operations security community, including the Department of Energy, National Nuclear Security Administration, Department of Defense, Federal Bureau of Investigation, General Services Administration and the Central Intelligence Agency.

The awards presentation was part of the annual National OPSEC Conference & Exhibition, which is intended to provide training and networking opportunities for security professionals.



**COMPUTER SECURITY AWARD:** Livermore’s Computer Incident Advisory Capability recently received a certificate of appreciation and recognition from DOE’s chief information officer. The team, from left: Sue Grimsley, Paul Krystosek, Wolf Schaefer, Kathy Hansen, Doug Lim, Addam Schroll, Bill Orvis, Tim Meier, Denise Sumikawa, Andrew Brown, Donna Couture, Steven Suppe, Tony Bartoletti, John Dias, Stephen Wong, Marvin Christensen. Kneeling, from left: Julie Driscoll, Kathryn Knerler. Not pictured, Vickie Carroll.