



National Nuclear Security Administration

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Pit Production Begins at Los Alamos

The U.S. recently produced, for the first time in 14 years, a plutonium pit. Designated as “Qual-1,” the pit was successfully manufactured by Los Alamos National Laboratory for NNSA and will be used to maintain the enduring nuclear stockpile.

A pit is the fissile core of a nuclear weapon’s physics package. Called Qual-1 because it was built with fully qualified processes, the new pit is for the W88 warhead, which is carried on the Trident II D5 Submarine-Launched Cruise Missile.

The six-year effort that produced the pit restores a capability that was lost



Los Alamos Director Pete Nanos and NNSA Administrator Linton Brooks participate in the LANL 60th Anniversary celebration.

when the Rocky Flats Plant near Boulder, Colo., shut down in June 1989. The Los Alamos pit was made in accordance with current health, safety and environmental regulations, so some materials and processes differ from those used at Rocky Flats.

NNSA Administrator Linton Brooks said, “The pit fabrication capability that has been reestablished at Los Alamos is the first step to enable the nation to replace stockpile pits in the future. This first step fulfills a

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Linton Brooks Confirmed as Administrator

Secretary of Energy Spencer Abraham administered the oath of office to Ambassador Linton F. Brooks on May 16 to be NNSA administrator and undersecretary of energy for nuclear security.

Brooks previously served as the deputy administrator for nuclear nonproliferation. Last July, President Bush named him acting administrator when the first NNSA administrator, John Gordon, took an assignment at the National Security Council. The President nominated Brooks to be administrator on February 4, 2003,

and he was confirmed by the Senate on May 1.

Prior to joining NNSA, Brooks was the vice president and assistant to the president for policy analysis at the Center for Naval Analyses (CNA), a federally funded research and development center located in Alexandria, Virginia. His extensive government experience includes service as the assistant director of the Arms Control and Disarmament Agency, chief U.S. negotiator for the Strategic Arms Reduction Treaty (where he earned the title of

ambassador), director of arms control for the National Security Council, and a number of Navy and Defense Department assignments.

“I am honored for the trust shown by the President and Secretary Abraham,” Brooks said. “We have an outstanding group of people working for NNSA and in our nuclear weapons complex, and there is much to do. I look forward to my continuing work with our nonproliferation and stockpile stewardship programs that promote U.S. national security.”

Pit Production

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major commitment to Congress and the nation.”

This capability is required to replace pits that are destructively evaluated as part of the surveillance program and to have a pit manufacturing capacity in place to deal with contingencies. Certification of the pits for delivery to the Department of Defense is scheduled in FY 07 at which time Los Alamos is expected to have the limited capability to manufacture ten pits a year. The long-term need for a facility to manufacture at least 125 pits a year is under consideration by the Department of Energy.

Certification work at Los Alamos includes fundamental physics experiments, material studies, ongoing subcritical experiments at the Nevada Test Site and hydrodynamic experiments at the newly completed Dual Axis Radiographic Hydrotest facility. Los Alamos has committed to complete the certification process and to have the ability to deliver a pit to the military that meets all stockpile requirements by 2007.

Los Alamos was identified as the site to recapture the nation’s capability to manufacture nuclear weapon pits in part because it has the nation’s only full-capability plutonium facility and has made a small number of pits since the 1940s. The plutonium facility at Technical Area 55 was modified, new equipment acquired and new technologies, materials and processes developed. More than 700 Laboratory staff and contractors have been involved in the effort that culminated in Qual-1.

NEWS BRIEFS

NNSA Expands Technology Commercialization Program to Additional Communities

A technology commercialization program that to date has established 48 high-tech companies and created more than 5,600 new jobs has received additional funding through NNSA to expand efforts to establish public-private partnerships for commercializing technologies developed at NNSA laboratories and facilities.

Technology Ventures Corporation (TVC), founded in 1993 by Lockheed Martin Corporation as a tax-exempt, nonprofit foundation, helps entrepreneurs create technology companies and finds qualified investors to fund them. Last year, TVC received its first award from the NNSA to extend its technology commercialization activities beyond Sandia National Laboratories, with which it has been working for the past decade. The company’s New Mexico operations have produced more than \$340 million in private-sector investments.

TVC has opened offices in Santa Fe and Los Alamos, NM; Las Vegas, NV, and Livermore, CA. They are staffed with professional project managers who are working with Los Alamos National Laboratory in New Mexico, Lawrence Livermore National Laboratory in California, and the Nevada Test Site near Las Vegas to identify technologies with commercial potential, assist entrepreneurs in forming businesses and interest investors in technology-based investment opportunities.

Y-12 Resumes Wet Chemistry Operations

BWXT Y-12 has resumed operations of the wet chemistry section of Enriched Uranium Operations at the Y-12 National Security Complex. Wet chemistry operations at Y-12 involve the recovery and purification of enriched uranium. These operations will be fully operational over the next several months.

The wet chemistry authorization by NNSA is the last in a series of milestones that are part of Y-12’s phased plan to fully restart manufacturing operations that were suspended as a part of a September 1994 stand-down. Enriched Uranium Operations received approval from the NNSA Y-12 Site Office to resume fissile material handling and storage in April 2000 and authorization was given in May 2001 to restart reduction and pour-up operations.

Programs at Y-12 include the remanufacture of nuclear weapons components, dismantlement and storage of nuclear weapons components from the national arsenal, serving as the nation’s safe and secure storehouse of special nuclear materials, reducing the global threat from terrorism and weapons of mass destruction, and providing the U.S. Navy with fuel for nuclear propulsion.

Ground Broken for Test Laboratory Facility at Pantex

Ground has been broken at the Pantex site for the new Weapons Evaluation and Test Laboratory (WETL). The new facility will bring more modern, state-of-the-art diagnostic tools to the weapons surveillance process.

The 30,000-square-foot building will cost \$22 million and house more than \$90 million worth of highly specialized equipment when it is completed in 2004.

Sandia National Laboratories has operated a WETL facility at the Pantex Plant since 1965. The current WETL is the only facility in the nation that conducts system-level non-nuclear testing on US nuclear weapon systems and components. Eighteen

Sandia employees conduct weapons evaluation tests at the current WETL facility.

The facility plays an important role in NNSA's Stockpile Evaluation Program, which monitors the reliability and safety of US nuclear weapons systems, relying heavily on test and evaluation of samples drawn from the stockpile.

Space will be available to support other activities, including non-nuclear



Sandia WETL operations manager Ted Frederiksen (left), NNSA Pantex Site Office official Jerry Johnson, Sandia Weapon Systems VP John Stichman, and Carl Durham of BWXT, which manages the Pantex site for NNSA, break ground for the new WETL facility on February 27.

explosive testing, component testing, and static-free rooms for handling devices that are vulnerable to damage from static discharge.

Update: The NNSA of the Future is on Track

Staffing plans will be formally approved this summer by Administrator Linton Brooks as the master schedule for fully implementing the NNSA reorganization remains on track.

The new organization was initiated last December, with the elimination of three regional operations offices and the shift of federal management oversight of NNSA facilities to eight site offices across the country. A service center was created to centralize most business practices and administrative services.

Managers at headquarters, site offices and the service center are completing service level agreements

to define staffing needs and they are identifying transfer requests to make sure the right skills are available where they are needed. Following a headquarters review to look for overlapping functions and to ensure that the plans have a corporate perspective, Brooks expects to approve the plans in June.

“I am confident that we can make the NNSA of the future a reality and that we can do so while making sure that all current NNSA employees are treated fairly and with dignity and respect,” Brooks said.

Filling critical positions within each NNSA organization will be accomplished by voluntary

placements as much as possible. However, directed reassignments may be necessary to fill some persistent and specialized staffing needs. Any necessary directed reassignments are expected to begin in October of this year.

An evaluation of transition assistance for federal employees is currently underway and a career transition assistance plan will be completed by June.

In the meantime, regular all-hands meetings and other employee communications such as an internal Web site are being used to keep employees up to date on the implementation schedule.

Sec Abraham Presides Over Well Attended International Radioactive Sources Conference

Secretary of Energy Spencer Abraham presided over an international conference on the Security of Radioactive Sources that was held in Vienna, Austria, from

information on best practices and available resources.

In his opening remarks, Secretary Abraham told delegates that it is critically important to deny terrorists the materials they need to turn beneficial radioactive sources into deadly weapons. He emphasized the need for governments to act to identify those high-risk sources that pose the greatest security risks, and noted that officials and the general public should be educated on potentially dangerous consequences of

in their presentations.

Secretary Abraham announced that the United States would contribute \$3 million to a Radiological Security Partnership, a new initiative to help developing countries secure their high-risk vulnerable sources. As described, the Partnership will help countries track and inventory high-risk sources; work with countries around the world to consolidate and securely store such sources; and strengthen international efforts to interdict illicit trafficking at major transit and shipping hubs.

The conference sessions resulted in an extensive set of “findings” to guide states in their work within their own borders and with the international



Russian Minister of Atomic Information Rumyantsev, Secretary Abraham and IAEA Director General ElBaradei discuss ways to secure dangerous radioactive sources.

March 11-13. The Secretary had called for the conference last September at the IAEA General Conference. The United States and Russia co-hosted the event, which was organized by the IAEA. Secretary Abraham was supported by NNSA Acting Administrator Linton Brooks and NNSA’s nuclear nonproliferation staff. The conference was attended by 751 participants from 123 countries – numbers that far exceeded expectations.

The strong turnout reflects the growing importance of high-risk radioactive source security issues for countries around the world. Conference participants discussed identification and control of high-risk radioactive sources on a global scale, and shared



Ambassador Brooks, who chaired the conference after Secretary Abraham left for Russia, reviews the conference findings with the group.

the malevolent use of such sources. Other senior U.S. speakers, including Ambassador Brooks, Nuclear Regulatory Commission Chairman Richard Meserve, and NNSA Acting Assistant Deputy Administrator David Huizenga, underscored these themes

community on securing high-risk radioactive sources. The two key findings were that states should draw on IAEA resources in their efforts to locate, recover, and secure high-risk radioactive sources and establish effective national infrastructures for the safe and secure management of such sources.

Delegates agreed to organize a follow-up conference within two years to review progress in all areas.

Secretary Abraham’s opening speech can be found online at: www.energy.gov. Text of the conference findings can be found online at: www.iaea.org

Hispano Chamber Names Sandia, Lockheed Martin, and TVC Corporate Partner of the Decade

The Albuquerque, NM, Hispano Chamber of Commerce has named Sandia National Laboratories, Lockheed Martin, and Technology Ventures Corporation (TVC) its



The Albuquerque Hispano Chamber of Commerce recently named Sandia, Lockheed Martin, and Technology Ventures Corporation (TVC) its Corporate Partner of the Decade. At the news conference where the announcement was made are, from left, TVC President Sherman McCorkle, Hispano Chamber Chairman of the Board Jimmie Trujillo, Chamber President Loretta Armenta, and Sandia VP Lenny Martinez. (Photo by Randy Montoya)

Corporate Partner of the Decade by awarding the group the first-ever Aguila Award.

The award honors the corporations' contributions to community businesses, economic development, job training, and education.

Lockheed Martin has contributed more than \$14 million to New

Mexico groups and projects, including \$2 million in grants for math and science academies, a \$1 million grant for the Extreme Screen Dynatheater at the New Mexico Museum of Natural History and Science, and more than \$300,000 to the Albuquerque Hispano Chamber. Lockheed Martin and Sandia have also made a concerted effort to provide mentoring programs to small, disadvantaged, and minority businesses interested in working with Sandia. This includes workshops on how to work with Sandia's procurement system.

Sandia has also placed more than \$300 million in contracts in New Mexico in the past fiscal year, with \$223 million going to small and minority businesses. Sandia is now helping the Hispano Chamber develop the "e-mercado," a program that allows small businesses to participate in e-commerce.

Many Sandians have been members of the Hispano Chamber board, leaders of various committees, and participants in a variety of chamber initiatives.

TVC was established by Lockheed Martin in 1993 as a non-profit, tax-exempt corporation to help commercialize technologies from the national laboratories and to create jobs.

Infrastructure Update: Security Upgrade Project Underway at Livermore

A stretch of road between Lawrence Livermore and Sandia national labs in California will be closed to the public beginning this summer after new control point facilities and road improvements are completed. A design developed jointly by Lawrence Livermore National Laboratory (LLNL) and Sandia will create vehicle and pedestrian control entrances at both the Vasco Road and Greenville Road ends of the East Avenue corridor.

The project will consist of widening portions of East Avenue, installing control point kiosks, embedding pop-up barriers in the roadway and building a visitor and turnaround area on the Sandia property at the west corner of Vasco Road and East Avenue. The visitor and turnaround area will consist of a "super kiosk" for badging and permits, visitor parking as well as stops and turnarounds for public and Laboratory buses. A truck inspection station will be built just north of East Avenue near Greenville Road, on Livermore Lab property, to inspect all trucks making deliveries to Sandia and the Lab. The inspection station will be located in what is now the parking area near Bldg. 619.

Got an article for the NNSA newsletter?

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Livermore Studies Blast Effects On Buildings

As an increased security awareness takes hold in government, new techniques for protecting embassies, military facilities and national infrastructure, including bridges, buildings and dams, are being developed. How structures and facilities are built and designed is a key component to making them safe.

Advanced computer simulations performed at Lawrence Livermore National Laboratory (LLNL) and the U.S. Army Engineering Research and Development Center can be used to examine the performance of representative structures under blast loadings and to explore design alternatives. These regimes of behavior are quite different from those associated with more typical design requirements such as an earthquake.

Lawrence Livermore engineer Bob Ferencz illustrated some of the issues that arise when mitigating the effects of bomb blast on infrastructure during a security technology session at the 2003 annual meeting of the American Association for the Advancement of Science.

The simulation technologies used were originally developed within the Department of Energy's Defense Programs activities at LLNL and Sandia National Laboratories. Some of these technologies have already found wide acceptance in non-defense uses, such as for crash safety simulation in the automotive industry.

Ferencz, who participated in the AAAS session titled "Security for

Life: The Science Behind Security Technologies," noted that blast resistance already is a design criteria for some critical structures. He discussed a project that Livermore is working on with UC Berkeley in which engineers are trying to prevent buildings from progressive collapse similar to what happened after the blast at the Murrah Federal Building in Oklahoma City.

Engineers are working on mitigation strategies for existing and new buildings so that in case of a blast near a building, fewer building occupant injuries would occur and the building would be safe from collapse long enough for search and rescue teams to enter and get trapped occupants out.

Sandia Z Machine Produces Fusion Neutrons

Throwing its hat into the ring of machines that offer the possibility of achieving controlled nuclear fusion, Sandia National Laboratories' Z machine has created a hot dense plasma that produces thermonuclear neutrons.

The neutrons emanate from fusion reactions within a BB-sized deuterium capsule placed within the target of the huge machine. Compressing hot dense plasmas that produce neutrons is an important step toward realizing ignition, the level at which the fusion reaction becomes self-sustaining.

The amount of energy a larger

successor to Z could bring to bear offers the still-later possibility of high-yield fusion — the state in which much more energy is released than is needed to provoke the reaction initially to occur. The excess energy could be used for applications such as the generation of electricity, said Tom Mehlhorn, a project leader on the machine.

Z causes reactions to occur through the application of huge pulses of electricity applied with very sophisticated timing. The pulse creates an intense magnetic field that crushes tungsten wires into a foam cylinder to produce X-rays. The X-ray energy, striking the surface of

the target capsule embedded in the cylinder, produces a shock wave that compresses the deuterium within the capsule, fusing enough deuterium to produce neutrons.

"Pulsed power electrical systems have always been energy-rich but power-poor," said Ray Leeper, a Sandia manager. "That is, we can deliver a lot of energy, but it wasn't clear we could concentrate it on a small enough area to create fusion. Now it seems clear we can do that." A partial confirmation of the result came about when theoretical predictions and lab outcomes were determined to be of the same order of magnitude.

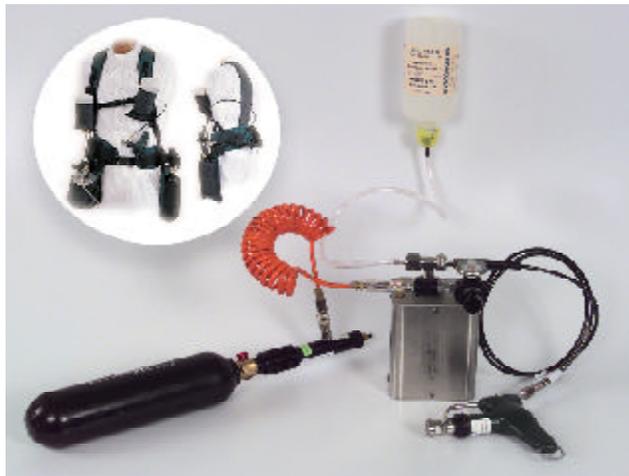
Kansas City Plant Associates Win FLC Award

NNSA's Kansas City Plant will collect another Federal Laboratory Consortium (FLC) Excellence in Technology Transfer Award for its partnership with Felton International in

The needle-free system, known as the Pulse™ 200, has received FDA clearance for use in the swine production industry. A technique that does not use traditional needles and

syringes to administer vaccinations eliminates the potential of needle fragments finding their way into the food supply. In the case of the swine industry, it improves overall meat quality by reducing meat tissue damage from injection site reactions and meat discoloration from bruising.

Providing fast, large-scale inoculations without spreading blood-borne pathogens is a longstanding veterinary and human health-care challenge. Unsafe, needle-free injection systems have existed since the end of World War II. The U.S. military used them for vaccine delivery until the early 1980s when they were banned after it was found they transmitted blood-borne diseases. This was also a familiar technology in wide use throughout the former Soviet Union (FSU). Millions of citizens and soldiers of the Soviet Union alike received inoculations with needle-free injectors.



The needle-free injector presently used by Seaboard Farms in Shawnee, Kans. The Kansas City Plant partnered with Felton International in Lenexa, Kans., and a pair of Russian firms to develop a needle-free injector, which has been approved by the FDA for use on animals.

Compressed air actually injects the medicine through the skin. The medicine is propelled by a Co2

cannister worn by the individual administering the vaccinations. The concept is somewhat similar to the way a paintball gun works.

The advantages of needle-free systems over the traditional syringe and needle systems were well known - lower costs, faster delivery, reduced pain, improved availability of vaccines, improved worker safety and safer disposal of dangerous needles and related waste. The challenge was to solve the pathogen transfer problem while retaining the advantages of the needle-free injector system.

Lenexa, Kans.; and Russian companies, MedEquipment and Russki Most Management in the development of a needle-free injector.

The Kansas City Plant associates who worked to facilitate and provide the overall direction and technical support to turn this product into reality received their award at the 2003 FLC National Meeting in Tucson, Ariz.

“We never started this process with the idea that we wanted to win a national award,” Paul Quirk, project management specialist, said. “I’m just tickled that the judges were able to see the time, effort and validity of this project and reward us.”

“We’ve implemented several practices on our farms to reduce the risk of foreign objects. However, the best way to handle a food safety risk is to eliminate the source,” says Rod Brenneman, president of Seaboard Farms in Shawnee. “We’re pleased to be the first pork producer to use needle-free technology in swine production and to lead the industry in a direction that improves food safety and builds consumer confidence.”

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