June 2009

NNSA

Monthly News

NIF DEDICATION: NNSA Administrator Thomas D'Agostino addressed the role of the National Ignition Facility (NIF) in our national security during the dedication ceremony on May 29, 2009. See pages 4 and 5 for more on the NIFproject. (Photo by Karl Mondon, Contra Costa Times)

NNSA Announces Contract to Downblend 12 Metric Tons of Surplus HEU

NNSA announced that it has awarded a $209 million contract to down-blend 12.1 metric tons (MT) of surplus U.S. highly enriched uranium (HEU) and store the resulting low-enriched uranium (LEU). The contract was awarded to a team consisting of WesDyne International, LLC (a division of Westinghouse Electric Company, LLC) and Nuclear Fuel Services, Inc. (a subsidiary of the Babcock and Wilcox Company).

Under the agreement, 12.1 MT of HEU will be down-blended to about 220 MT of LEU at the Nuclear Fuel Services facility in Erwin, Tenn. The resulting LEU will have a market value of more than $400 million. NNSA expects the down-blending to begin in 2009 and to be completed in 2012. The contractors performing the down-blending work will be compensated with a fraction of the LEU; the remainder of the LEU will

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NNSA Briefs Global Initiative to Combat Nuclear Terrorism in Netherlands

As part of a U.S. delegation, NNSA's Associate Administrator for the Office of Emergency Operations Joseph Krol briefed representatives from 60 countries on NNSA's emergency operations exercises at the June plenary meeting of the Global Initiative to Combat Nuclear Terrorism in The Hague, Netherlands. As part of the two-day meeting, Krol highlighted NNSA's recent Empire '09 emergency response exercise in Albany, New York, and shared insights from previous national level exercises to help partner nations better prepare for and respond to nuclear and

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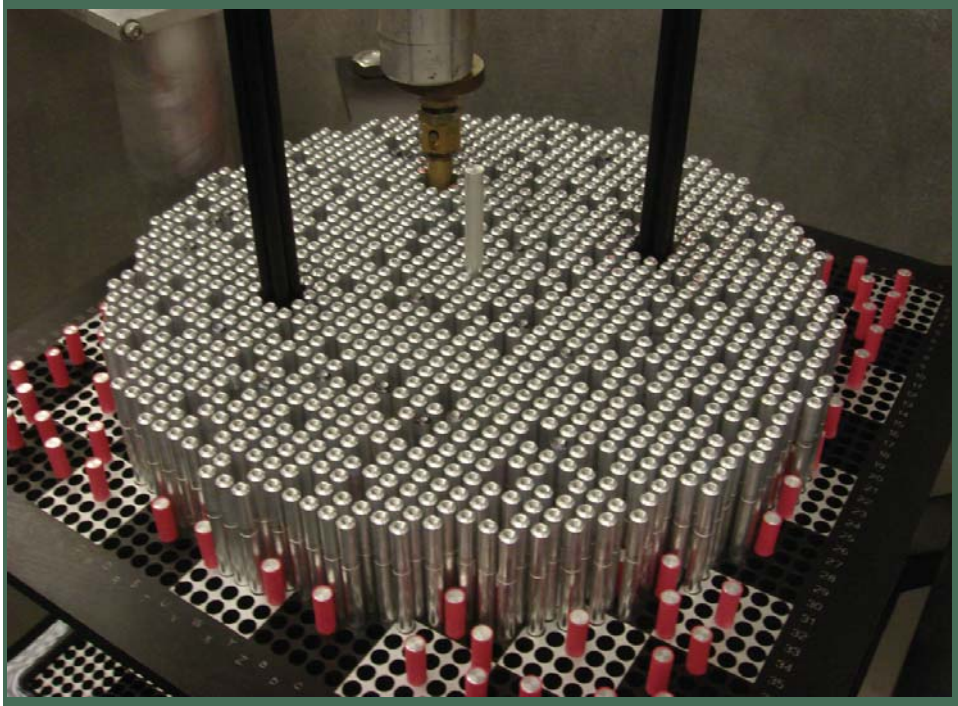
radiological emergencies.

At the conclusion of the plenary session, NNSA committed to working with Morocco and Spain to develop a joint international exercise to improve coordination and develop best practices in nuclear and radiological emergency response.

Participants acknowledged in a joint statement that, "this voluntary Initiative fills an important niche in bringing all levels of government, international organizations, and private sector entities together to confront this challenge."

With 75 members, the Global Initiative helps develop cooperative relationships to prevent, detect and respond to the global threat of nuclear terrorism through exercises, workshops and training, sharing of information and best practices, and the integration of resources and capabilities.



CRITICAL EXPERIMENTS: Sandia National Laboratories (SNL) Sandia Pulsed Reactor Facility 7 percent Critical Experiments has successfully completed the first series of critical experiments to support benchmarks for light water reactor higher enriched fuel tests. Pictured are the 1,148 fuel elements inserted into the core grid that were required to achieve delayed critical conditions. The core is a 45x45 array simulating nine commercial nuclear power fuel assemblies in a 3x3 array. Most commercial nuclear power reactors use 5 percent enriched Uranium fuel. By conducting critical experiments with 7 percent enriched Uranium fuel, the data will support benchmarks for the use of greater than 5 percent enriched Uranium fuel by commercial nuclear power reactors. Following review of the Restart Operations Plan and NNSA's Sandia Site Office approval, Sandia Pulsed Reactor Facility Critical Experiments' return to programmatic operations will allow a wide range of criticality experiments to be conducted at SNL.

NNSA Announces Contract to Downblend 12 Metric Tons of Surplus HEU

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be stored to support the mixed oxide (MOX) program for disposition of surplus weapons plutonium.

The contract helps implement President Obama's unprecedented commitment to strengthening and leading international nuclear nonproliferation efforts. The disposition of surplus U.S. HEU not only achieves a clear nonproliferation goal, but the resulting LEU will be used to provide assurance of fuel supply to utilities participating in the MOX program for the disposition of surplus weapons plutonium.

"President Obama has outlined a far-reaching commitment to renewing U.S. leadership in global nuclear nonproliferation efforts," said NNSA Principal Assistant Deputy Administrator for Defense Nuclear Nonproliferation Ken Baker. "This contract to downblend 12 metric tons of surplus U.S. highly enriched uranium is a clear demonstration of our leadership of nuclear nonproliferation efforts and an important part of our effort to assure a fuel supply to utilities participating in the MOX program for the disposition of surplus weapons plutonium."

The 12.1 MT of HEU will be moved from the Y-12 National Security Complex in Oak Ridge, Tenn. The resulting LEU will be stored until it is needed at Westinghouse's Columbia Fuel Fabrication Facility in Columbia, South Carolina. The NNSA's Office of Fissile Materials Disposition will oversee the down-blending effort.

Stan Watkins Named DOE Facility Rep of the Year

Stan Watkins of the National Nuclear Security Administration's Y-12 Site Office has been named the U.S. Department of Energy (DOE) "Facility Representative of the Year."

Watkins is responsible for oversight of the depleted uranium operations at the Y-12 National Security Complex, including three of Y-12's nuclear and chemical hazardous facilities.

"Stan consistently demonstrates exceptional diligence and technical competence in providing effective oversight while performing his Facility Representative duties. His tireless performance as a Facility Representative has driven multiple improvements in the facilities he oversees and across the Y-12 site," said Ted Sherry, Y-12 Site Office Manager."

FACILITY REP OF THE YEAR: Brig. General Garrett Harencak (right) congratulates Stan Watkins for receiving the Department of Energy-wide Facility Representative of the Year Award. The presentation was made during Harencak's recent visit to the Y-12 National Security Complex.

The DOE Facility Representative Award Program is a performance-based award designed to recognize superior or exemplary service by a Facility Representative over a period of one year.

Watkins also directly contributed to accomplishment of mission-essential nuclear weapons stockpile work with regards to the W76 Life Extension Program. He played an important role in developing improved process equipment operations to material issues associated with this stockpile stewardship effort. He also maintains all qualifications required for oversight of Y-12's enriched uranium processing facilities.

Watkins has more than 38 years of experience in the nuclear security enterprise. He joined the Y-12 Site Office in 1988 as a quality assurance engineer. He held a similar position with DOE's Pantex Site Office in Amarillo, Texas, and previously was employed as an engineer with the management and operating contractor at Pantex. He received a B.S. degree in mechanical engineering from Oklahoma State University.

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Dedication of the Nationa

More than 3,000 invited guests and Lawrence Livermore National Laboratory (LLNL) employees recently attended the official dedication of the National Ignition Facility (NIF) at Lawrence Livermore, setting into motion the next chapter of one of the country's greatest scientific assets.

California Governor Arnold Schwarzenegger, U.S. Senator Dianne Feinstein (D-Calif.), NNSA Administrator Tom D'Agostino and Congressional representatives Ellen Tauscher (D-Calif.), Jerry McNerney (D-Calif.) and Zoe Lofgren (D-Calif.) were among the dignitaries attending the outdoor ceremony.

The world's highest-energy laser system, NIF consists of 192 laser beams that will focus nearly two million joules of energy and create temperatures and pressures that exist in the cores of stars and giant planets. By harnessing the massive power generated by its lasers, NIF will be able to create conditions and conduct a wide range of experiments never before possible on earth.

SCIENTIFIC ASSET: NIF director Ed Moses next to the NIF target chamber with Sen. Dianne Feinstein, California Lt. Governor John Garamendi, Rep. Zoe Lofgren, and Rep. Ellen Tauscher.

Funded by NNSA, NIF construction began 12 years ago with three scientific missions in mind.

Its first mission is to serve as a key component of NNSA's Stockpile Stewardship Program to ensure the safety and reliability of the nation's nuclear deterrent without the need for nuclear testing.

"NIF, a cornerstone of the NNSA's effort to maintain our nuclear deterrent without nuclear testing, will play a vital role in reshaping national security in the 21st century," said NNSA Administrator Tom D'Agostino. "This one of a kind facility is the only place in the world that is capable of providing some of the most critical technical means to safely maintain the viability of the nation's nuclear stockpile."

Along with this vital national security mission, NIF also offers the possibility of groundbreaking scientific discoveries in planetary science and astrophysics. By creating the conditions that exist in supernovas, in the event horizons of black holes and in the cores of giant planets, NIF will help unlock the secrets of the cosmos. These experiments will provide a rich source of previously unobtainable data to the worldwide research community.

NIF's potential to help promote energy independence has generated particular excitement.

l Ignition Facility

Global energy demand, driven by population growth and the aspirations of the developing world, already strains the planet's existing energy resources. Global demand for electricity is expected to double from its current level by 2030 and then double again by the end of the century.

At such a pace, as many as 10,000 new power plants will have to be built to keep up with this demand. Many of these plants will burn non-renewable fossil fuels - coal, oil and natural gas - and in the process release more carbon dioxide into the environment. As part of the global race to satisfy the world's thirst for energy, NIF will help advance a new form of green energy fusion.

NIF's ignition experiments are scheduled to begin in 2010, and will focus its lasers on a tiny target filled with frozen isotopes of hydrogen. The heat and pressures created by NIF's lasers will force the hydrogen nuclei to fuse together and produce a controlled fusion reaction similar to that found in the sun.

"More energy will be produced by this 'ignition' process than the amount of laser energy required to start it. This is the long-sought goal of 'energy gain' that has been the goal of fusion researchers for more than half a century," said Edward Moses, National Ignition Facility director. "NIF's success will be a scientific breakthrough of historic significance - the first demonstration of fusion ignition in a laboratory setting, duplicating on Earth the processes that power the stars."

"The state of California has long served as an incubator of science and technological advances for the nation - and the world. The National Ignition Facility at Lawrence Livermore National Laboratory will further that leadership role in the 21st Century and promises to blaze a new trail toward sustainable, carbon-free energy independence," said U.S. Senator Dianne Feinstein.

"The National Ignition Facility represents the kind of versatile big science that defines Lawrence Livermore National Laboratory as a world-class scientific institution. The laser fusion project will not only help ensure the safety and reliability of the nation's nuclear deterrent, but will help lay the foundation for fusion energy and provide valuable insights into the very nature of the universe," said Congresswoman Ellen Tauscher, who represents Livermore and surrounding communities.

"A successful demonstration of ignition and energy gain at NIF would be a transforming event that would solidify fusion's potential as an important energy source," said Steven Koonin, the Department of Energy's Under Secretary for Science. "The dedication of NIF is a milestone in an exciting scientific journey that will create a lasting legacy of discovery, innovation, and security and allow the nation to reap the benefits of this visionary investment in its future."

With dedication festivities now complete, researchers will begin laser experiments to fine tune NIF, with an eye to achieving ignition, possibly as soon as late next year.

ONE OF A KIND FACILITY: California Governor Arnold Schwarzenegger speaks at a press conference following the NIF dedication ceremonies. With him (right to left) are Sen. Dianne Feinstein, Rep. Ellen Tauscher, NNSA Administrator Tom D'Agostino, UC President Mark Yudof, UC Regent Chairman Richard Blum, DOE Under Secretary for Science Steven Koonin, and LLNS Board of Governors Chairman Norman Pattiz.

"In the hands of skilled scientists, this facility will contribute to our national security by helping ensure the safety and reliability of our nuclear deterrent while advancing the skills needed to address emerging national security needs in nuclear non-proliferation."

Thomas D'Agostino, NNSA Administrator

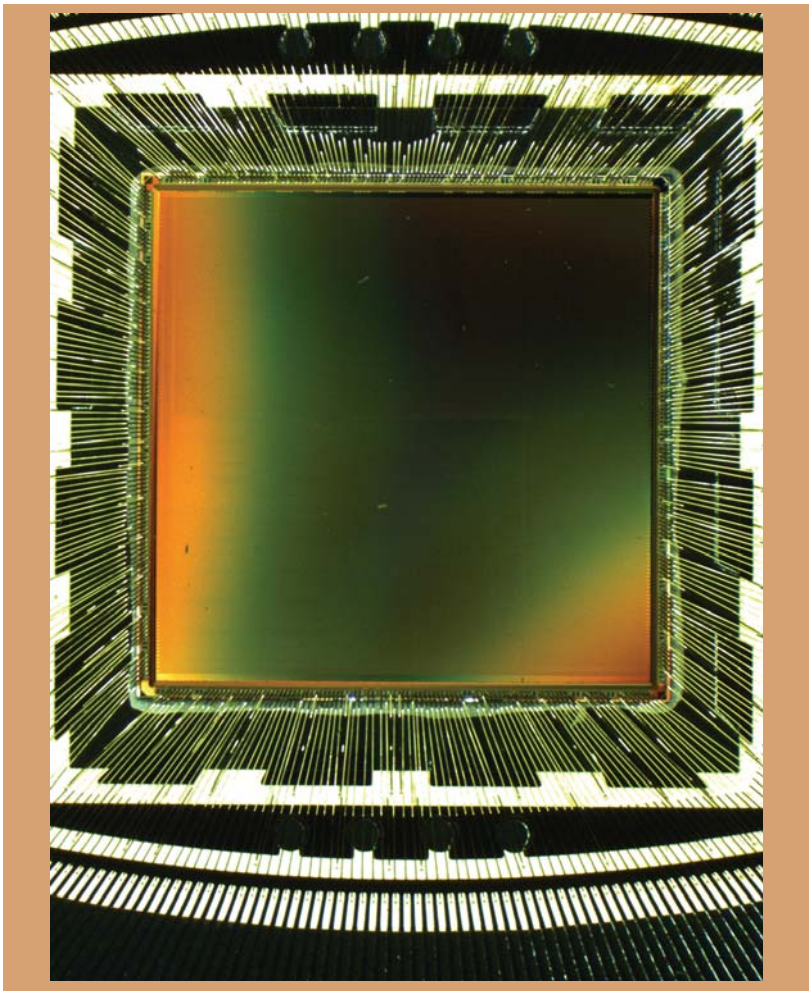
The Science of Nuclear Security

Sandia Receives DoD "Trusted" Design Accreditation

Sandia National Laboratories has received accreditation at its Albuquerque, N.M., facility to provide "trusted design" services for both unclassified and classified integrated circuits used in U.S. military and national security applications.

The labs' Category 1A status was awarded through the Trusted IC Supplier Accreditation Program of the Department of Defense (DoD)'s Defense MicroElectronics Activity.

The accreditation program is part of DoD's strategy to ensure that electronic components are trustworthy. Certification is necessary because the increasing offshore migration of all sectors of the microelectronics industry comes at a time of increasing demand for high-performance, application-specific integrated circuits (ASICs) from military and national security agencies.



KEY DATA PROCESSOR: A design that will be used in the next generation Selective Availability Anti-Spoofing Module (used in all Military GPS receivers). It was designed by Sandia National Laboratories and required a trusted design flow. It was fabricated at the IBM trusted foundry.

In support of its primary mission for NNSA as stewards of the U.S. nuclear stockpile, Sandia has developed and delivered digital and mixed-signal microelectronic products for nearly three decades. This expertise has also been applied to other national security needs including ensuring the nonproliferation of nuclear weapons and materials, reducing the threat from chemical and biological weapons and providing advanced custom designs for other agencies like the DoD. Sandia's ASIC development team develops and maintains digital, analog and mixed-signal design expertise along with deep understanding of technology offerings and design methodologies to provide custom microelectronic products and engineering services that fulfill needs of diverse customers.

Sandia provides ASIC design services for both radiation-hardened and non-radiation-hardened trusted foundries. Design capability for 350 nanometers, 180 nm, 130 nm, and 90 nm technologies enables Sandia to work with most of the trusted foundries. This includes in-house design for mixed-signal, radiation-hardened, low-volume ASIC products. Other trusted foundries — among them, IBM, National Semiconductor, Honeywell and BAE Systems — provide access to leading-edge technologies for mixed-signal, high-performance and high-density system-on-chip (SoC) solutions.

Sandia focuses on high-reliability custom solutions for high-consequence applications. An efficient and disciplined ISO 9001 certified design methodology enhances chances for first-pass silicon solutions. The labs maintain a leading-edge design tool set. Combining ASIC solutions with other in-house capabilities in fabrication and packaging, along with test, failure analysis and reliability, Sandia can offer a total integrated circuit design solution.

NNSA's Second Line of Defense Program Expands International Work

NNSA's Second Line of Defense (SLD) program has been busy expanding work by signing new agreements, commissioning new sites, and building on current partnerships around the globe to strengthen the capability of foreign governments to detect, deter and interdict illicit trafficking in nuclear and other radioactive materials. In recent weeks, the SLD program has signed agreements with both New Zealand to help fund SLD work in Ukraine, and Kenya's Ministry of Transport to install radiation detection equipment and associated infrastructure at the Port of Mombasa and train Kenyan to operate and maintain the equipment. SLD expects to sign a Memorandum of Understanding with the Republic of Croatia in the next few weeks.

In addition to the new agreements, the SLD program has gone operational at new Megaports sites at the Port of Cartagena in Colombia, the Port of Kingston in Jamaica, and the Ports of Lazaro Cardenas and Veracruz in Mexico.

NNSA's Megaports Initiative provides radiation detection equipment, training and technical support to key foreign seaports to enable them to scan cargo containers for nuclear and other radioactive materials, regardless of container destination. Around the world, the Megaports Initiative is currently operational in 23 ports and work is underway at over 20 additional ports in Asia, Latin America and the Caribbean, Europe, the Middle East, and Africa. The Megaports Initiative's goal is to equip over 100 seaports with radiation detection equipment, scanning over 70 percent of global shipping traffic by 2015 and approximately 83 percent of U.S. bound imports shipped through these ports.

ENHANCING NUCLEAR SECURITY: A State Border Guard Service of Ukraine officer demonstrates radiation detection equipment during the Second Line of Defense commissioning ceremony at the Odessa Airport in Ukraine.

The SLD Core Program has continued to expand its work with existing partners. The SLD Core Program installs radiation detection equipment at borders, airports, and strategic ports in Russia, other former Soviet Union states, Eastern Europe and other key countries. The Program has installed similar equipment at over 250 sites around the world, and ultimately plans to equip over 500 sites in 32 countries.

In Ukraine, the SLD Core Program recently commissioned new radiation detection equipment at the Odessa Airport in Ukraine to prevent illicit trafficking of nuclear and radioactive material across Ukrainian territory. This is part of the SLD Core effort to provide radiation detection equipment at more than 70 points of exit and entry in Ukraine, which is complemented by NNSA work under other programs to conduct training, and hold technical workshops. As a potential transit country for illicit nuclear and radiological materials moving between Europe and Asia, the radiation detection systems being installed across Ukraine will help increase transcontinental security by enhancing Ukraine's ability to detect, deter and interdict nuclear smuggling.

New Nevada Test Site Fire Stations

Two new fire stations will be constructed at the Nevada Test Site (NTS) as part of a subcontract awarded by NNSA's Nevada Site Office (NSO) and National Security Technologies LLC (NSTec), the management and operations contractor for the NTS.

FIRE STATION MODERNIZATION: Work has begun on two new fire stations at the Nevada Test Site (NTS) that, together, will encompass more than 40,000 square feet of space and allow cover for NTS Fire and Rescue's growing fleet of emergency response vehicles. The first station is located at Mercury; the second will be located 22 miles north of the first.

Martin-Harris Construction, of Las Vegas, has been awarded a subcontract to build the new stations at the remote, 1,350-square-mile facility, located 65 miles outside of Las Vegas. The first new fire station will be built at the Mercury compound (Area 23). The second will be located in Area 6, about 22 miles north of Station No. 1. The total cost of the two stations, including project team and administrative support, is approximately $42 million.

The test site has a long history of supporting national security. It currently supports an array of modern missions, among them counterterrorism operations and stockpile stewardship, all originating from the base camp at Mercury, off U.S. Highway 95. The new stations will replace existing stations, which have been in use for more than 40 years, said NTS Fire Chief Chuck Fauerbach.

Y-12 Tours Once Again a Highlight of the Secret City Festival

More than 650 members of the public recently received a once-a-year glimpse into the Y-12 National Security Complex as the site hosted tours during the Secret City Festival. The festival, which saw some 25,000 attendees, was designated one of the Top 100 Events in North America for 2009 by the American Business Association.

Tour guests had an inside look at Manhattan Project-era buildings and wandered through Y-12's new History Center, where they met Y-12's unofficial ambassador Connie Bolling, who supervised the young ladies who monitored the uranium separation operations and are commonly known as "the calutron girls." At 101, Bolling still recalls the early days of "mud and secrecy" in the newly created Oak Ridge with excitement and vivid detail.

The one-hour tours of Y-12 included a look into Alpha 3, which housed one of the massive alpha calutron racetracks; the Chestnut Ridge overlook, which gave tour participants a view of the entire Y-12 site in the Bear Creek Valley; and a drive by the recently finished Highly Enriched Uranium Materials Facility; Y-12's massive high-security storehouse.

Visitors experienced the site's history dating back to 1943, when the plant's job was to make enough enriched uranium for an atomic bomb.

At its peak in 1945, more than 22,000 workers were employed at the site. In the Cold War, Y-12 played a key part in the production of thermonuclear weapons, with 8,000 people working around the clock to produce nuclear weapon secondaries.

Now Y-12 is a unique national asset in the manufacture, processing and storage of special materials vital to national security and contributes to the prevention of the spread of weapons of mass destruction.