

In This Issue

NNSA Consolidates Additional Surplus Special Nuclear Material From Livermore.....3

NNSA Nuclear Science Expertise Vital to U.S. Counterterrorism Efforts.....4

NNSA Awards Safety Professionals of the Year.....8

Refurbished W76 Warhead Enters U.S. Nuclear Weapons Stockpile

The first refurbished W76 nuclear warhead has been accepted into the U.S. nuclear weapons stockpile by the Navy. It is the culmination of a ten-year effort to ensure that the aging warhead, already years beyond its original intended life, can continue to be a reliable part of the U.S. nuclear deterrent.

“This is another great example of the unsurpassed expertise throughout NNSA’s national security enterprise,” said William Ostendorff, NNSA’s principal deputy administrator. “It becomes more and more challenging each time we extend the life of our nuclear weapons. I am proud that our dedicated scientists and engineers were able to once again

(continued on page 2)

National Ignition Facility Breaks the Megajoule Barrier

The world’s largest and highest-energy laser system already is surpassing significant milestones toward its ultimate goal - achieving fusion ignition.

Early on the morning of March 10, the National Ignition Facility (NIF), located at the NNSA’s Lawrence Livermore National Laboratory (LLNL), became the first fusion laser in the world to break the megajoule barrier. NIF’s 192 laser beams delivered 1.1 million joules of ultraviolet energy to the center of its ten-meter-diameter target chamber - more than 25 times more energy than the 60-beam OMEGA laser at the University of Rochester, the previous record-holder for production of ultraviolet energy. (A joule is the energy needed to lift a small apple one meter against the Earth’s gravity; a 100-watt light bulb consumes 100 joules a second).

(continued on page 2)



NIF OPTICS CHECKER: A National Ignition Facility technician examines a damage inspection instrument that is used to assess the optics in the target chamber.

Refurbished W76 Warhead Enters U.S. Nuclear Weapons Stockpile *(continued from page 1)*

meet this unique responsibility.”

Most nuclear weapons in the U.S. stockpile were manufactured 30 to 40 years ago, and no new nuclear weapons have been produced since the end of the Cold War. Integrated into the Department of the Navy’s Trident II “D5” Strategic Weapon System, the first W76 entered the stockpile in 1978.

NNSA must use science-based research and development to extend the lifetime of the current weapons in the stockpile. By extending the life, or time that a weapon can safely and reliably remain in the stockpile without having to be replaced or removed, of a current weapon, NNSA is able to maintain a credible nuclear deterrent without producing new weapons or conducting new underground nuclear tests.

A Presidential moratorium on nuclear testing was issued in 1992. Ostendorff said NNSA continues to meet the challenge of certifying nuclear weapons without testing. “We were able to certify that the refurbished W76 is reliable without conducting an underground nuclear test,” he said. “This is one reason why we need to continue recruiting our nation’s best scientific and engineering minds, so that we can continue doing this very complicated work.”

National Ignition Facility Breaks the Megajoule Barrier *(continued from page 1)*

"This is another important step toward maintaining the safety, security and reliability of the U.S. nuclear weapons stockpile," said NNSA Administrator Thomas D'Agostino. "At the same time, these experiments will provide scientists with a greater understanding of physics leading to the use of inertial confinement fusion for safe, clean energy production."

NIF is scheduled for completion on March 31, with a special dedication ceremony set for May 29. Once completed, scientists and engineers will use NIF to help maintain the safety and security of the U.S. nuclear weapons stockpile without underground nuclear testing. It will also advance the understanding of astrophysics and basic science, and develop safe, clean energy.

"This a major milestone for the greater NIF team, the nation and the world," said Edward Moses, LLNL's principal associate director for NIF & Photon Science. "We are well on our way to achieving what we set out to do - controlled, sustained nuclear fusion and energy gain for the first time ever in a laboratory setting."

BI-PARTISAN

COMMISSION VISIT:

NNSA's Y-12 National Security Complex was one of the stops on a recent visit by the Congressional Commission on the Strategic Posture of the United States, which is examining the nation's strategic posture in all of its aspects – military capabilities, arms control initiatives, and nonproliferation strategies. This includes all uses of nuclear weapons and all tools to counter the nuclear threat to the U.S., including missile defense and countering

nuclear proliferation. Members of the commission, representatives from NNSA production facilities, and key NNSA Headquarters officials participated in the visit, which included a full day of briefings and tours. Among the commissioners attending the Y-12 visit included William Perry, commission chairman, former secretary of defense; John Foster, director emeritus of Lawrence Livermore National Laboratory; John Glenn, former senator and NASA astronaut; and James Woolsey, former director, Central Intelligence Agency. During their tour, commission members and headquarters representatives toured a Y-12 production facility and the Highly Enriched Uranium Material Facility.



NNSA Consolidates Additional Surplus Special Nuclear Material From Livermore

More than 55 percent of the plutonium and uranium materials stored at the Lawrence Livermore National Laboratory (LLNL) in California have been relocated. Material in the most recent shipment was moved to the Savannah River site in Aiken, S.C. and the Y-12 National Security Complex in Oak Ridge, Tenn. under high security.

"This latest shipment reduces the inventory of special nuclear material at Livermore Laboratory by an additional 20 percent for a total reduction of 55 percent since 2006," said NNSA Administrator Thomas D'Agostino. "We continue to do these shipments safely and securely and have accelerated this project by two years. We are well on our way to keeping our commitment to the Livermore community and the nation as a whole."

The shipment is part of NNSA's plan to remove high-security nuclear material from LLNL by 2012. This is the seventh shipment to leave LLNL since the de-inventory project was initiated.

As part of its complex transformation initiation, NNSA plans to consolidate nuclear materials at five sites by 2012, with significantly reduced square footage at those sites by 2017. This will further improve security and reduce security costs and is part of NNSA's overall effort to transform the Cold War-era nuclear weapons complex into a 21st century nuclear security enterprise. The latest shipment from LLNL was completed in full compliance with existing safety and environmental laws and procedures.

Materials must be processed to stable forms and repackaged to meet federal shipping and storage requirements prior to shipment. The original date to remove all high-security material from LLNL, based on equipment capability and capacity, was 2014. NNSA has developed a timeline to remove this material as early as possible, accelerating the target completion date to 2012. To reach this goal, NNSA is installing extra equipment to increase capacity.

NNSA Contributes to the Front Line Fight Against WMD Trafficking

To enhance the U.S. ability to detect and prevent the trafficking of weapons-usable technologies, NNSA recently hosted agents from the Department of Homeland Security's Immigration and Customs Enforcement (ICE) at the Kansas City Plant as part of a continuing effort to provide practical training and technical support to U.S. export enforcement agencies. As a direct result of this training, agents are now better prepared to recognize sensitive U.S. technology sought by proliferators.



NNSA LEADS TECHNICAL TRAINING: An export controlled 5-Axis machine tool useful for making parts for commercial and weapons use, featured in a training session at the Kansas City Plant.

The agents are part of ICE's Counter Proliferation Investigations division, which focuses on criminal activities that violate national security export control laws for munitions and missile- and weapons of mass destruction-related dual-use goods. NNSA instructors emphasized dual-use goods that have missile and nuclear applications. This is a challenging area because many of these items have commercial uses far afield of their weapons applications. For example, carbon fiber is used commercially in products like bicycles and golf clubs, but also can be used to manufacture uranium centrifuge rotors and missile components.

NNSA plans to sponsor three more hands-on training sessions in 2009 where DOE/NNSA technical experts aid investigators' efforts in countering illicit procurement in the United States. NNSA, the leading provider of technical training of this kind to U.S. and foreign government agencies, offers a half-dozen training courses aimed at controlling trade, and will hold approximately 80 training events for 2,500 participants in 2009.

NNSA Nuclear Science Explores Counterterrorism Efforts

To meet one of the nation's greatest national security challenges, NNSA and the Department of Energy (DOE) have increasingly focused science and engineering skills on preventing nuclear terrorism. The NNSA Office of the Deputy Under Secretary for Counterterrorism was established to coordinate counterterrorism activities across the department, to be the focal point for Improvised Nuclear Device (IND) matters, and to be the department's principal point of contact with other U.S. government agencies and foreign governments on counterterrorism issues. The current Deputy Under Secretary is Dr. Steven Aoki.

NNSA's expertise in nuclear sciences is central to the national

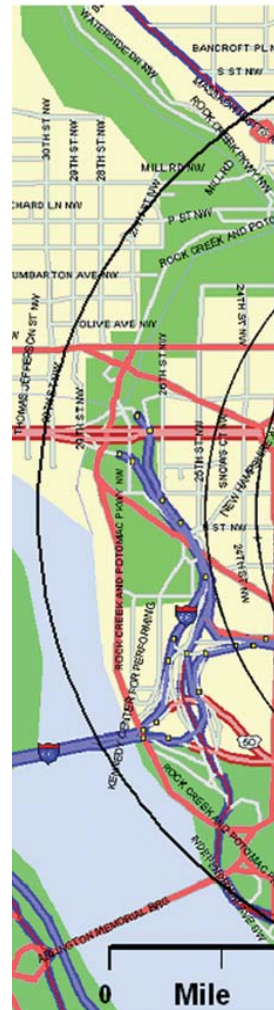
effort to deter, detect, defeat, or attribute an attempted or actual nuclear or radiological attack. DOE and other agencies rely on the national laboratories' knowledge of nuclear weapons design to identify novel and unconventional nuclear threats, support the design and evaluation of radiation detection systems, design technologies to disarm a terrorist nuclear device, and to evaluate the safeguards and security of existing and future nuclear facilities.

NNSA and DOE counterterrorism efforts are closely coordinated with other U.S. government agencies, including the Departments of State, Defense, and Homeland Security, the Federal Bureau of Investigation (FBI), the Nuclear Regulatory Commission, the

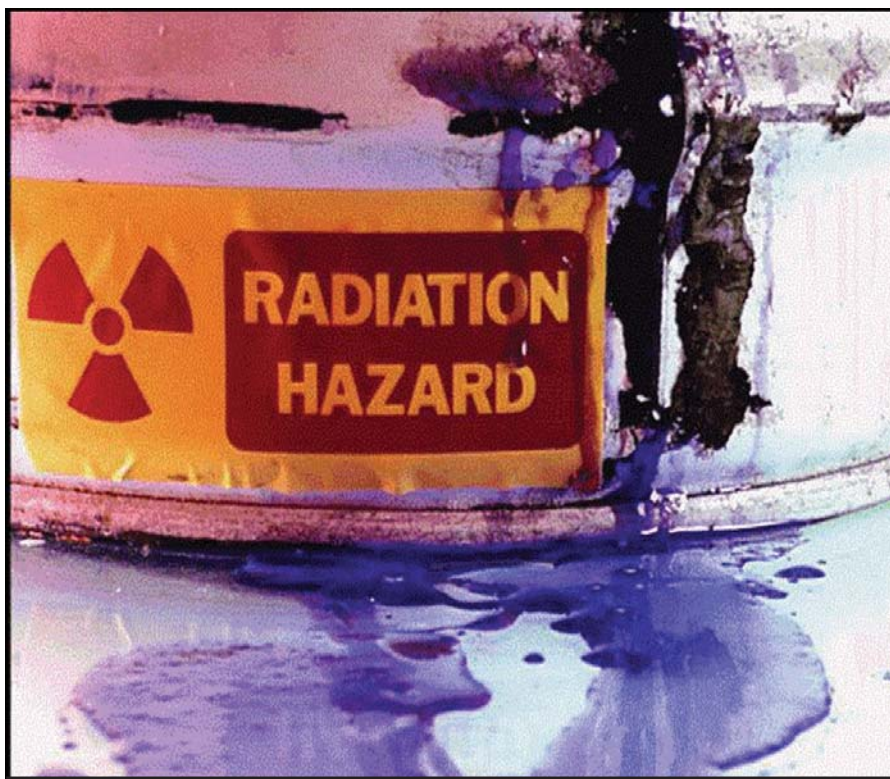
National Counterterrorism and Counterproliferation Centers, and the National Security Council and Homeland Security Council. In fact, US Special Operations Command recently assigned a liaison to NNSA to bring mutual interests and capabilities closer together.

The Deputy Under Secretary for Counterterrorism also leads an interagency effort to improve nuclear materials security worldwide. In bilateral interactions with international partners, including Russia, France, the United Kingdom, Japan, and Belgium, cooperation is continuing on a wide spectrum of topics including material protection, threat assessments, training and evaluation, exercises, and research and development.

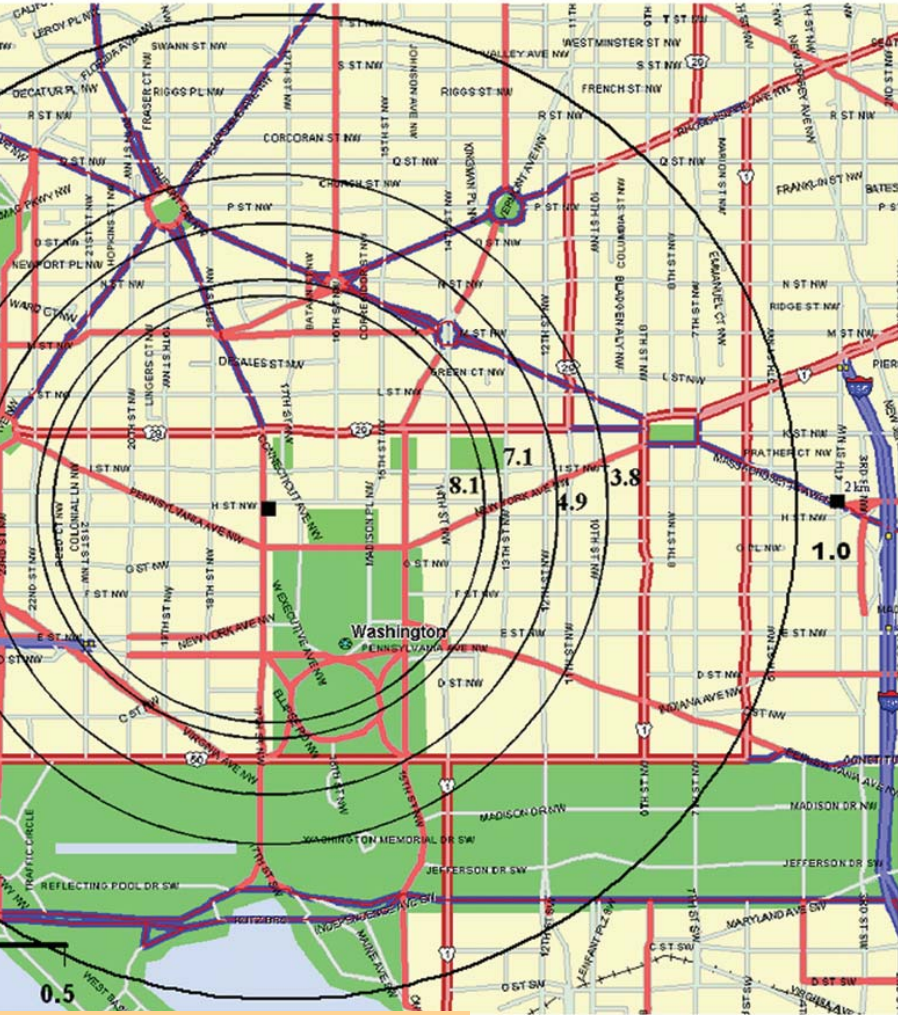
The office also conducts counterterrorism exercises to include the Silent Thunder series, which is sponsored jointly with the FBI to examine federal, state, and local capabilities, roles and responsibilities to respond to terrorist weapons of mass



DETER, DETECT, DEF... contours for its training



ertise Vital to U.S.



FEAT: NNSA uses mock data to show blast g programs.

NNSA and DoD: Partners in Counterterrorism

The mission of the United States Special Operations Command's (USSOCOM) is to plan and synchronize Department of Defense operations against terrorist networks. Understanding that the fight against global terrorism is not just a military effort, USSOCOM representatives have been detailed to numerous civilian federal agencies, including NNSA.

One goal of this effort is to establish a trusted relationship between USSOCOM and NNSA. Lt. Col. Tom Jarzen has been assigned to NNSA, and sits in the Office of Counterterrorism.

"NNSA makes an important contribution to the U.S. effort to combat terrorism and USSOCOM appreciates that," said Dr. Steven Aoki, deputy under secretary for counterterrorism. "I'm extremely pleased with the close partnership we have with them. This relationship is made stronger by their presence here in our organization."



destruction (WMD) incidents. The exercise scenarios feature a "crisis response" phase to emphasize law enforcement actions to detect, deter and prevent a terrorist WMD incident from occurring as well as a "consequence management" phase that

emphasizes local, state, and federal emergency managers' and first responders' efforts to respond to, mitigate and recover from the effects of an incident.

NNSA and DOE expertise and capabilities are central to U.S. efforts to counter nuclear terrorism.

Nevada Test Site Gets New Communication Center

An upgrade of the Supervisory Control and Acquisition Data (SCADA) communications center at the Nevada Test Site (NTS), which provides for control of the communications infrastructure at the test site has been completed under NNSA's Facilities and Infrastructure Recapitalization Program (FIRP).

Angela Colarusso, assistant manager for safety and operations, Nevada Site Office, stated, "The NTS power system is very important to the success of the missions at the Nevada Test Site. This new, modern SCADA system is the eyes, ears and brains of that power system. The



MODERN OPERATIONAL EFFICIENCY: Supervisory Control and Acquisition Data Power System Dispatch Center built at the Nevada Test Site.

test site power system dispatchers now have a modern, reliable facility to safely operate and maintain the NTS power system."

Dino Herrera, director of the FIRP at NNSA headquarters, said, "This project is the most important of vital electrical deferred maintenance FIRP projects that have been completed at the test site. This state of the art facility will improve operations and promote energy efficiency."

The new system provides an operational efficiency that allows the development and execution of a cost effective and comprehensive preventive maintenance program. The project replaced the existing modem interfacing communications processors in the substations with new, modern ethernet-capable communications processors to connect the control and data acquisition units in the five substations to the master command and control console in the Mercury Switching Center via a fiber optic loop.

The control center was built to include a dropped acoustic ceiling; energy efficient, recessed fluorescent lighting fixtures; ceiling-mounted spot lights above the command and control console; a fire suppression system; heating ventilation and air conditioning system; a fire detection and alarm system; a raised floor throughout; and existing equipment and controls relocated as appropriate.

SRS CONSTRUCTION: The start of the construction phase for the Savannah River Site's (SRS)+ new Waste Solidification Building was recently celebrated with a groundbreaking ceremony. Participating in the event was (from left) Bill Clark, director of Project Integration Division, NNSA Savannah River; Congressman Paul Broun, Georgia; Doug Dearolph, NNSA Savannah River Site Office manager; Ken Chacey, director of Site Engineering and Construction Management, NNSA; Jack Sependa, executive vice president, Savannah River Nuclear Solutions, LLC; Jeff Allison, DOE Savannah River operations manager; Tom Cantey, DOE federal project director for the SRS Waste Solidification Building, NNSA.



Los Alamos Researchers Create 'Map of Science'

Scientists at NNSA's Los Alamos National Laboratory (LANL) in New Mexico have produced the world's first Map of Science—a high-resolution graphic depiction of the virtual trails scientists leave behind when they retrieve

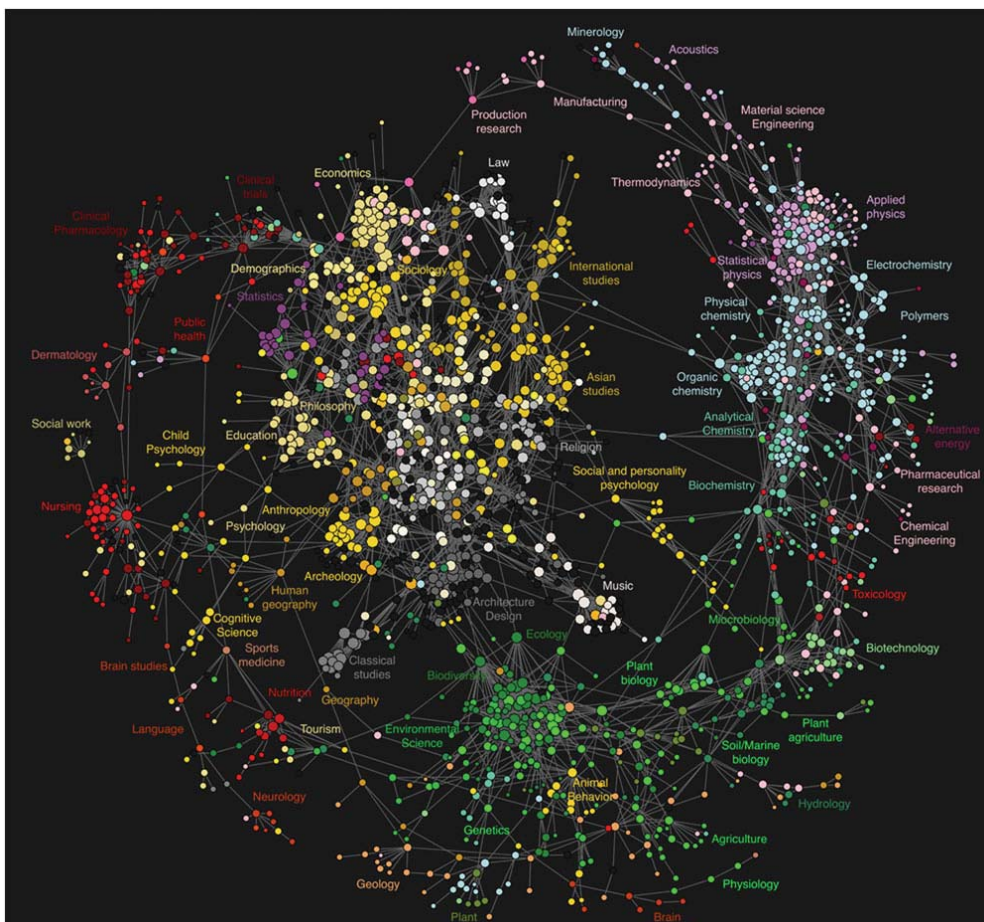
to determine the true impact of articles and journals.”

While science is of tremendous societal importance, it is difficult to probe the often hidden world of scientific creativity. Most studies of

words, citation data observes science as it existed years in the past, not the present.

Bollen and colleagues from LANL and the Santa Fe Institute collected usage-log data gathered from a variety of publishers, aggregators and universities spanning a period from 2006 to 2008. Their collection totaled nearly 1 billion online information requests. Because scientists typically read articles online well before they can be cited in subsequent publications, usage data reveal scientific activity nearly in real-time. Moreover, because log data reflect the interactions of all users—such as authors, science practitioners and the informed public—they do not merely reflect the activities of scholarly authors.

Whenever a scientist accesses a paper online from a publisher, aggregator, university, or similar publishing service, the action is recorded by the servers of these Web portals. The resulting usage data contains a detailed record of the sequences of articles that scientists download as they explore their present interests. After counting the number of times that scientists, across hundreds of millions of requests, download one article after another, the research team calculated the probability that an article or journal accessed by a scientist would be followed by a



MAP OF SCIENCE: This map created at LANL illustrates the online behavior of scientists accessing different scientific journals, publications, aggregators, etc. Colors represent the scientific discipline of each journal, based on disciplines classified by the Getty Research Institute's Art and Architecture Thesaurus, while lines reflect the navigation of users from one journal to another when interacting with scholarly web portals.

information from online services.

Research leader Johan Bollen said, “This research will be a crucial component of future efforts to study and predict scientific innovation, as well novel methods

scientific activity rely on citation data, which takes a while to become available because both the cited publication and the publication of a particular citation can take years to appear. In other

subsequent article or journal as part of the scientists' online behavior. Based on such behavior, the researchers created a map that graphically portrays a network of connected articles and journals.

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NNSA Awards Safety Professionals of the Year

Federal and contractor Safety Professional of the Year awards for 2008 have been announced by NNSA.

Xavier F. Aponte, functional area representative for electrical safety, NNSA Nevada Site Office (NSO) was named the 2008 Federal Safety Professional of the year. Lloyd Gordon, laboratory chief electrical safety officer for Los Alamos National Laboratory was named as a recipient of the 2008 Management & Operating (M&O) Contractor Safety Professional of the year.

The award recognizes distinguished service and outstanding safety related achievements and contributions. This marks the fourth year that NNSA has recognized one of its federal safety professionals and its first year in recognizing an M&O contractor safety professional.

"Aponte and Gordon have demonstrated outstanding leadership, oversight and skill in implementing effective safety

programs at their respective facilities. Their contributions have helped NNSA to develop better tools and gain better insight into solving longstanding problems and driving electrical safety improvements across the complex", said NNSA Administrator Thomas D'Agostino.

Aponte, a native of Carolina, Puerto Rico and a mechanical engineering graduate from the Polytechnic University of Puerto Rico began his federal career with the U.S. Department of Labor's Occupational Safety and Health Administration. He has worked at NSO as a safety engineer since 2005. At the site office, he developed improved oversight procedures for facility representatives, enhanced oversight and training programs in electrical safety. Aponte serves as a contributing member to the DOE's Hoisting & Rigging Technical Advisory Committee, its Construction Safety Advisory Committee and its Voluntary

Protection Program Steering Committee.

Gordon, an experimental researcher with a background in pulsed power engineering and plasma physics, holds a doctorate in electrical engineering from Texas Tech University. During the first 15 years of his career, he conducted and supervised research for DOE, the Defense Nuclear Agency, the National Aeronautics and Space Administration, Lawrence Livermore National Laboratory, Auburn University, and the University of Texas, Arlington. Gordon served as chair of the 30-member Energy Facility Contractors Group's (EFCOG) Electrical Safety Subgroup in 2008 and has chaired or co-chaired EFCOG/DOE Electrical Safety workshops for the past five years. He is also the primary author of the Electrical Severity Measurement Tool, which is now used across NNSA to categorize and report electrical incidents.

TQP ACCREDITATION: The NNSA Sandia Site Office (SSO) is the second site office in DOE to attain accreditation of its Technical Qualification Program (TQP). Accreditation of the TQP demonstrates a strong commitment of excellence on the part of the organization. Establishment of a TQP is required by organizations that provide assistance, guidance, direction, oversight, or evaluation of contractor activities that could impact the safe operation of a defense nuclear facility. Accreditation demonstrates that SSO has an effective program in place to ensure the technical competency of its employees. Technical competency of the federal staff is a major emphasis of organizations with responsibility for defense nuclear facilities and continues to be a focus of the department and the NNSA. "We are very pleased with SSO receiving this accreditation," said SSO Acting Manager Kim Davis. "While this reflects well upon the entire SSO staff, I would like to recognize Jim Todd and Allen Tate for their role in this achievement."



Left to right: Kim Davis, Allen Tate and Jim Todd.