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NNSA Surpasses Combined Federal Campaign Goal

Despite tough economic times, NNSA employees across the nuclear security enterprise exceeded expectations for this year's Combined Federal Campaign (CFC) fundraising season, which ended Jan. 15, 2010.

CFC is the world's largest and most successful annual workplace charity campaign, with more than 300 CFC campaigns throughout the country and around the world that help to raise millions of dollars each year.

The theme of this year's CFC campaign, which began with an opening ceremony in the auditorium of the Forrestal Building and concluded with an email to NNSA staff urging employees to support the earthquake relief effort

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NNSA Highlights Accomplishments

NNSA closed out another successful year in 2009, achieving impressive results in its core mission areas, helping implement President Obama's unprecedented nuclear security agenda and continuing enterprise-wide reforms aimed at making NNSA more efficient and effective.

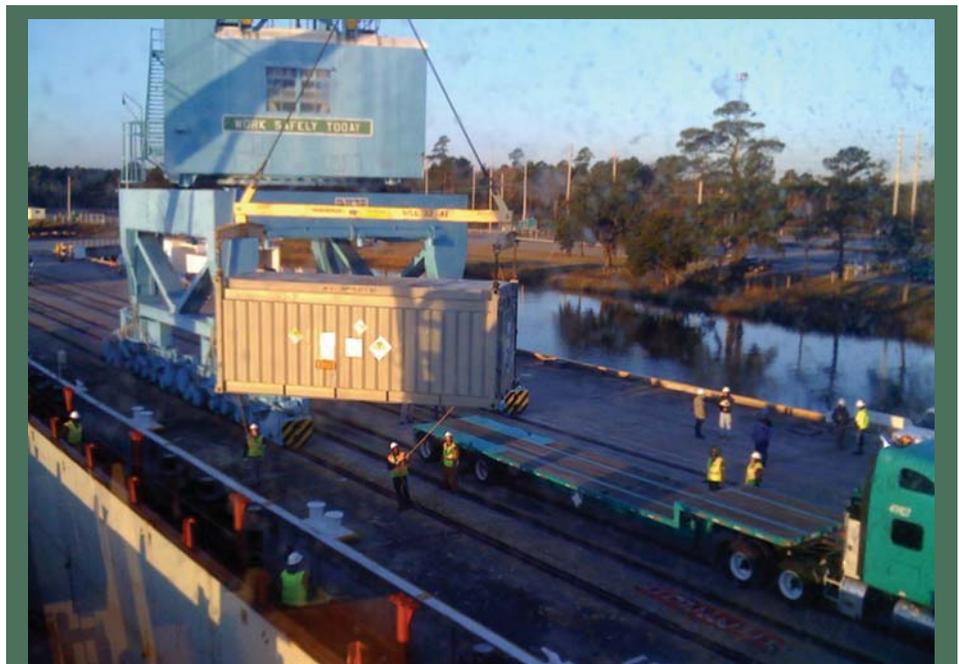
In his landmark speech on nuclear weapons issues in April, President Obama said, "Make no mistake: As long as these weapons exist, the United States will maintain a safe, secure and effective arsenal to deter any adversary, and guarantee that defense to our allies."

In 2009, NNSA supported that mission by delivering the first refurbished W76 weapon systems to the Navy and turning over final refurbished B61 strategic nuclear bombs to the Air Force. The latter was an eight-year effort that was completed almost one year ahead of schedule.

NNSA also achieved tremendous accomplishments within the stockpile stewardship program at its three national laboratories.

Lawrence Livermore National Laboratory completed the National Ignition Facility (NIF) construction project, conducted the first programmatic NIF experiment and launched the National Ignition

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SECURING NUCLEAR MATERIAL: NNSA has removed Highly Enriched Uranium (HEU) from Turkey and returned it to the United States for storage at a secure nuclear facility. This makes Turkey the fourth country to be cleaned out of all significant amounts of HEU since President Obama outlined his commitment to securing all vulnerable nuclear material around the world within four years.

Administrator's Corner



As we begin our 10th year as the National Nuclear Security Administration (NNSA) and prepare for our 10-year anniversary celebration, I would like to take a moment to sincerely thank you for a job well done in 2009, and to tell you how much I am looking forward to working with you in 2010.

Each year, you demonstrate an impressive commitment to the mission and the ability to get the job done. Last year, the President outlined a bold nuclear security agenda that puts our mission front and center: ensuring the safety, security, and effectiveness of the nuclear weapons stockpile without underground nuclear testing; securing vulnerable nuclear material around the world; strengthening nuclear nonproliferation, carrying out counterterrorism activities and emergency operations; and, providing safe nuclear propulsion systems to the U.S. Navy. In each of those areas, we excelled in 2009.

But that's not all. Last year, we made significant progress toward our goal of transforming a Cold War nuclear weapons complex into a 21st century nuclear security enterprise. We demonstrated global leadership in science, technology, and engineering by earning 18 of the year's R&D 100 Awards. We continued to be very effective stewards of the taxpayer's money by finding industry-leading management tools for improving the way we do business and launching new NNSA reforms.

Now, we are embarking on what is likely to be one of the most important years in our history. The President's Fiscal Year 2011 Budget Request and the Nuclear Posture Review will help shape the future of our major programs for years to come. We'll celebrate our 10th anniversary in March. The President will host an unprecedented Nuclear Security Summit in April. And we can look forward to Senate consideration of a new START Treaty and the Comprehensive Nuclear Test Ban Treaty.

All of these initiatives bring with them new challenges. And, in each of these areas, I am confident that with all of us working together as a team, we will continue building on our past accomplishments and meet and exceed the expectations we have going into this new year.

Tom D'Agostino

NNSA Highlights Accomplishments

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Campaign with an experiment on thermonuclear burn in the laboratory. Los Alamos National Laboratory conducted the first-ever double-viewpoint hydrodynamic test of a nuclear weapon component mockup at the Dual Axis Radiographic Hydrodynamic Test (DARHT) facility and completed construction of the Radiological Laboratory. The Z machine at Sandia National Laboratories re-established its shot rate capability after its refurbishment in 2007 by conducting 51 test shots in the last three months of the year.

In his April speech, the President also pledged to take concrete steps to stop the spread of nuclear weapons and prevent nuclear terrorism by securing vulnerable nuclear material around the world. NNSA played a leading role in fulfilling the President's commitment to "cut off the building blocks needed for a bomb." Last year, NNSA removed or disposed of 368 kilograms of weapons-usable highly enriched uranium fuel and plutonium — enough for more than 10 nuclear weapons — from eight countries.

In order to prevent terrorists from acquiring materials that could be used in a so-called "dirty bomb," NNSA recovered approximately 4,000 radiological sources containing more than 50,000 decayed curies in FY 2009. As part of our global campaign to strengthen international capabilities to deter, detect and interdict nuclear smuggling, NNSA upgraded physical security at more than 185 vulnerable buildings around the world that contained high-priority nuclear and radioactive material, and installed radiation-monitoring equipment at nine major container seaports and 106 international border crossings.

In 2009, NNSA continued to demonstrate our commitment to being effective stewards of the taxpayers' money by finding industry-leading tools for improving the way we do business, all while maintaining the highest security standards. NNSA's contracting reforms saved tens of millions of taxpayer dollars and earned recognition from the President and the Office of Management and Budget.

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New CT Scanners Can Image Nuclear Weapon Components

NNSA recently completed the installation and successful startup of a new surveillance diagnostic tool that is capable of detecting defects in critical components in the nation's

NNSA's Pantex Plant to develop a new X-ray computed tomography (CT) system to image nuclear weapon components. The new CT scan will enhance NNSA's surveillance program by providing

complex national security challenges and highlights our commitment to transforming a Cold War nuclear weapons complex into a 21st century nuclear security enterprise," said NNSA Administrator Thomas



CT SCAN FOR WEAPONS: X-rays from a 9-megaelectronvolt (MeV) linear accelerator (far right) travel through three tungsten collimators to the heavily shielded Confined Large Optical Scintillator Screen and Imaging System (CoLOSSIS).

nuclear weapons stockpile. The system is similar to noninvasive imaging technology that is commonly employed in the medical field to diagnose and treat medical conditions.

In response to NNSA's need to implement cost effective, optimized inspection of nuclear components, scientists at Lawrence Livermore National Laboratory (LLNL) teamed with

a precise, non-destructive means for the detection of aging phenomena on nuclear weapon components for evaluation of potential impact and to provide a basis for assuring a high level of confidence in their continued performance.

"This new system is a prime example of NNSA's ability to leverage the best science and technology in the world to solve

D'Agostino. "We are fortunate to have dedicated scientists working together from across the nuclear security enterprise to develop cutting-edge tools to monitor aging in critical weapon components."

This new tool is similar in concept to CT scanners used by doctors and hospitals to get a view inside the human body without exploratory surgery. This new capability will be

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KCP Management Earns Baldrige Award

The Kansas City Plant's managing and operating contractor Honeywell FM&T recently received the Malcolm Baldrige National Quality Award, the U.S. Government's highest honor for innovation and performance excellence. Honeywell received the Baldrige Award in the manufacturing category for its management and operation of NNSA's Kansas City Plant, which is the principal nonnuclear production site within the nuclear security enterprise.

"We are very proud of the work done at the Kansas City Plant with our Honeywell FM&T partners," said NNSA Administrator Thomas D'Agostino. "This award symbolizes our enterprise-wide commitment to operational efficiency and excellence, none of which would be possible without the hard work of our employees."

The Baldrige Award, named after the 26th Secretary of Commerce, is given by the President of the United States to organizations that apply and are judged to be outstanding in seven areas: leadership; strategic planning; customer and market focus; measurement, analysis, and knowledge management; workforce focus; process management; and results.

Each applicant goes through a rigorous review, during which examiners conduct an on-site visit of finalists to clarify questions and verify information. The award is potentially given in the areas of manufacturing, service, small business, education, health care, and nonprofits.

Small Businesses Play NNSA's Mission

NNSA Exceeds Small Businesses Goal in 2009

Each Year, NNSA exceeds its small business obligation goals, demonstrating the important role small businesses play in support of NNSA's nuclear stewardship mission.

The agency distributed more than \$418 million in small business obligations for federal prime contracts in FY 2009. This was up from \$241 million in FY 2006, \$396 million in FY 2007 and \$378 million in FY 2008. In addition, NNSA surpassed its departmental small business goal by more than 15 percent in FY 2009.

The benefits of using small businesses across the nuclear security enterprise include a more efficient use of taxpayer dollars, reduced overhead operating costs and an opportunity for small businesses to gain exposure within the nuclear security enterprise. Federal contracts provide a significant opportunity for small businesses to increase their volume and take their business to the next level.

"In addition to employing thousands of people across the country, small business contracting plays an important role in ensuring NNSA can pursue our core missions and

maintain our commitment to effective stewardship of taxpayer dollars," said NNSA Administrator Thomas D'Agostino. "Small businesses are not just a key element in meeting our nuclear stewardship mission, they are a

headquarters in Washington, D.C. These blanket purchase agreements represent 11 teams of more than 80 small businesses and are open for use by any DOE department. NNSA has access to this large



VALUABLE PARTNERSHIPS: NNSA's Second Line of Defense program partners with small businesses for international installation of radiation portal monitors similar to the ones pictured here.

vital component to the economic recovery of our nation."

NNSA uses small businesses to fulfill the majority of its technical and administrative support services at its

pool of firms with diverse skills and capabilities to partner with in support of the critical nuclear security mission.

y A Key Role in

"Small businesses are not just a key element in meeting our nuclear stewardship mission, they are a vital component to the economic recovery of our nation."

Thomas D'Agostino,
NNSA Administrator

During Small Business Week, NNSA featured some of its valued small business partners from across the nuclear security enterprise:

- **Legin Group, Inc.**, a minority-owned small business, has partnered with NNSA and its Savannah River Site Office to complete more than \$15 million in construction management design, renovations and repairs for the NNSA Tritium Area facilities and another \$3 million in technical procedure writing support for the Tritium Facility.
- NNSA's Second Line of Defense program works with three small businesses to install radiation portal monitors to detect nuclear and radioactive material at international border crossings, airports and seaports around the world. The three small businesses are **Randolph Construction Services, Inc.**, **Ahtna Government Services Corp.**, and **SES-TECH Global Solutions**. These contracts, with a combined ceiling of \$700 million and periods of performance of up to seven years, demonstrate the strength of small business capabilities on an international scale.
- **TechSource, Inc.**, a science and engineering consulting firm, has played a vital role in the NNSA's Complex Transformation efforts by studying facilities consolidation and savings across NNSA.
- **PIKA International, Inc.**, an environmental services firm, focuses on environmental remediation, construction management, and low level radiological waste needs for NNSA's Pantex Plant in Amarillo, Texas.

B&W Pantex Receives Award for Providing Opportunities to Small Businesses

B&W Pantex received the Management and Operating Small Business Achievement of the Year Award from the Department of Energy for 2009.

"Small businesses are the backbone of our economy, and we are pleased with the exemplary performance that B&W Pantex has achieved in this effort," said Steve Erhart, manager of the Pantex Site Office. "The challenge now will be to work hard to maintain these great results or even exceed them in the future."

The award recognizes the tangible, annual and organizational results of B&W Pantex as the management contractor at the Pantex Plant. The results are measured in terms of dollars and percentage increases in small business procurement activity as well as policies, programs and procedures that promote small business use.

B&W Pantex was specifically recognized for its leadership and achievement in providing contract and subcontract opportunities to small businesses. For example, B&W Pantex successfully awarded three B&W Pantex Mentor-Protégé agreements, which have completed 39 projects totaling more than \$7 million. B&W Pantex also supports small businesses throughout the 26 counties in the Texas panhandle.

The Science of Nuclear Security

NNSA, LANL Successfully Fire First Dual-Axis Hydrodynamic Shot

NNSA and Los Alamos National Laboratory (LANL) researchers recently fired the first-ever double-viewpoint hydrodynamic shot of a nuclear weapon component mockup. The experiment — conducted by LANL scientists and engineers at the Dual Axis Radiographic Hydrodynamic Test (DARHT) facility at Los Alamos — captured five X-ray images and other test data in an unprecedented simultaneous use of two electron accelerators.

The experiment is part of NNSA's stockpile stewardship program, which uses cutting-edge science, technology and engineering to experimentally confirm predictions of weapons performance made from computational simulations. This allows NNSA to ensure the safety, security and effectiveness of the nation's nuclear deterrent without nuclear testing.

NNSA's Principal Assistant Deputy Administrator for Military Application Brigadier General Garrett Harencak applauded the breakthrough. "This successful dual-axis hydrodynamic experiment is an important development in the NNSA's stockpile stewardship mission," he said. "The multiple X-ray images provided by this world-class experimental facility will inform the critical work of our scientists and engineers across the nuclear security enterprise."

Conducted inside a specially designed double-walled containment vessel, the shot used high explosives to drive an implosion of a weapons component duplicate made from non-nuclear surrogate materials. As the mockup is imploding, the DARHT facility fires two electron accelerators positioned at a 90-degree angle from one another generating high-power X-rays that are used to create multiple images of the imploding device's inner workings, which are then compared with computer predictions.

"Initial indications show excellent data return," said the hydrodynamic experiments division leader, David Funk. "The baseline experiment captured five time-dependent X-ray images and a variety of data from other diagnostics of pressure, temperature and timing. This data provides the nation with one of the most rigorous tests of our capability to predict weapons performance."



DARHT CELLS: The 3-foot-diameter induction cells of DARHT's first axis.

General Harencak Tours Pantex Facility

Brig. Gen. Garrett Harencak, principal assistant deputy administrator for Military Application in the Office of Defense Programs, visited the NNSA's Pantex Plant in Amarillo, Texas, to review the ongoing weapons



mission work performed at the site and learn more about fiscal year 2010 efforts to authorize the B53 dismantlement.

While at the site, General Harencak toured weapons facilities to view current operations, spoke to production technicians about their hands-on experience, delivered remarks about leadership to managers from B&W Pantex and the Pantex Site Office. During his address, General Harencak praised Pantex workers for their diligence to the mission and said Pantex was a key part of the nuclear security enterprise.

B53 DISMANTLEMENT IN 2010: During a visit to the Pantex Plant Steve Erhart, Pantex Site Office manager, and General Harencak discussed the B53 and the SS-21 tooling that was designed to make dismantlement faster, smoother, neater, and safer.

Sandia Laboratories Photovoltaic Cells Could Revolutionize Solar Collection Uses

NNSA's Sandia National Laboratories in Albuquerque, N.M. has developed tiny glitter-sized photovoltaic cells that could revolutionize the way solar energy is collected and used. If fastened to flexible substrates molded around unusual shapes, such as clothing, the Lilliputian cells could turn a person into a walking solar battery charger.

Fabricated of crystalline silicon, the solar particles hold the potential for a variety of new applications. The cells are fabricated using microelectronic and microelectromechanical systems (MEMS) techniques common to today's electronic foundries.

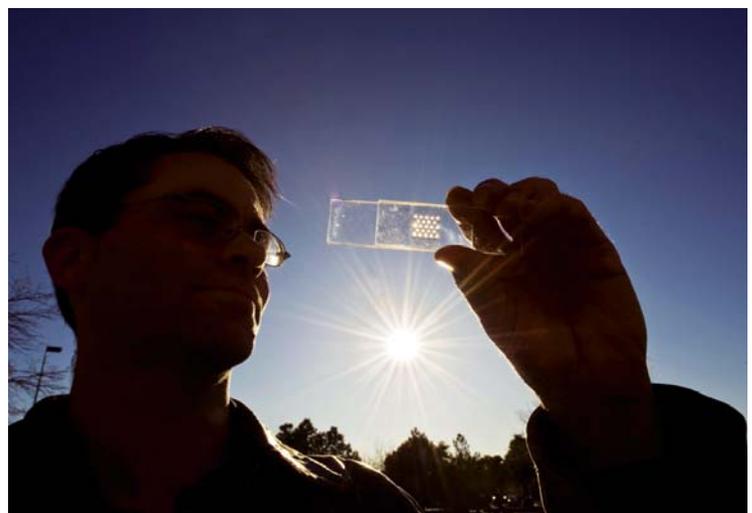
Sandia lead investigator Greg Nielson said the research team has identified more than 20 benefits of scale for its microphotovoltaic cells.

"Eventually units could be mass-produced and wrapped around unusual shapes for

building-integrated solar, tents and maybe even clothing," he said. This would, for example, make it possible for military personnel in the field to recharge batteries for phones, cameras and other electronic devices as they walk or rest. Other possible applications for the technology include satellites and remote sensing.

"Photovoltaic modules made from these microsized cells for the rooftops of homes and warehouses could have intelligent controls, inverters and even storage

built in at the chip level, Sandia field engineer Vipin Gupta said. Such an integrated module could greatly simplify the cumbersome design, bid, permit, and grid integration process that our solar technical assistance teams see in the field all the time."



ALL THAT GLITTERS: Sandia project lead Greg Nielson holds a solar cell test prototype with a microscale lens array fastened above it. Together, the cell and lens help create a concentrated photovoltaic unit.

NNSA, DoD Partnership Develops Technologies to Meet Warfighting Needs

Agencies Mark 25 Years of Cooperation

DOE/NNSA and the Department of Defense (DoD) are entering the 25th anniversary of a joint program between the entities that has contributed to the development of advanced technologies necessary to meet warfighting needs and improve non-nuclear munitions.

DOE and DoD signed a memorandum of understanding in 1985 establishing the DoD/DOE Joint Munitions Technology Development Program (JMP). In the 25 years since, the JMP has provided major advances in warfighting capabilities that play a crucial role in the exploration, development and transition of new technologies needed by the armed services.

"The projects developed under this agreement have leveraged the expertise of both agencies to protect our nation and those who defend it," said NNSA Administrator Thomas D'Agostino. "This long-term collaboration highlights the many ways our core investment in nuclear security is providing the tools to tackle a broader spectrum of national security and technology challenges."

The JMP provides opportunities for the collaboration of DoD and NNSA scientists and engineers to develop technologies of interest to either department, within a structured framework of technical reviews and scheduled milestones.

More than 200 DoD and DOE scientists and engineers work on approximately 35 JMP projects that require multi-year efforts and sustained, long-term investments.

The JMP is managed by the Land Warfare & Munitions Office in the Office of the Secretary of Defense in partnership with the Office of Research and Development for National Security Science & Technology within NNSA. The work is executed at Los Alamos National Laboratory, Lawrence Livermore National Laboratory and Sandia National Laboratories in collaboration with senior and technical staff from more than a dozen military agencies.

New CT Scanners Can Image Nuclear Weapon Components

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used to detect structural variations arising from so-called "birth defects" or from the aging effects.

Called CoLOSSIS (Confined Large Optical Scintillator Screen and Imaging System), the new high-resolution imaging system is used to scan weapons components to identify any anomalies that require additional attention. The system's software assembles the collected digital radiographs into a large three-dimensional image that scientists can analyze to discover any problems or anomalies.

After several years of designing and testing at LLNL, the CoLOSSIS installation and qualification was completed in September 2009 at Pantex. The project was managed and supported through NNSA's Enhanced Surveillance and Core Surveillance Programs.

The first user of the CoLOSSIS will be Los Alamos National Laboratory (LANL) in support of pit surveillance activities for the Air Force's B61 gravity bomb. Inspectors at LANL will assess these components for aging and manufacturing or other defects, and will be provided with never before seen three-dimensional characterizations of the components. Scientists will use the valuable data to develop surveillance assessments that could be used in future Life Extension Programs.

NNSA Surpasses Combined Federal Campaign Goal

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in Haiti, was "Compassion of Individuals, Power of Community."

"I could not be more proud of you and the generosity you showed this Campaign season," said NNSA Administrator Thomas D'Agostino. "Once again, you have shown that the men and women working throughout the Nuclear Security Enterprise, who are committed to keeping our country safe, are also committed to supporting their communities as well."

This year's CFC campaign at headquarters incorporated a number of fundraising events, including ice cream socials, a chili cook-off, bake sales, a breakfast served by senior executives, a jersey sponsor day where employees donated money to wear the jersey of their favorite sports team and employee push-ups. NNSA headquarters also hosted a flag football game with NNSA staff. Visit the NNSA Flickr site (www.flickr.com/NNSANews) to see photos from the game.

To learn more about how NNSA employees throughout the nuclear security enterprise gave back to their communities this holiday season, please visit the fact sheets page at: <http://nnsa.energy.gov/news/>.