



National Nuclear Security Administration

Washington, DC 20585

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First Irradiated Tritium Rods Arrive At SRS

The first shipment of irradiated Tritium Producing Burnable Absorber Rods (TPBARs) from the Tennessee Valley Authority's (TVA) Watts Bar nuclear reactor has been received at South Carolina's Savannah River Site (SRS), moving NNSA one step closer to restoring an important capability to the nation's nuclear defense.

The rods are a product of NNSA's nuclear weapons readiness campaign, and contain the first tritium produced by the United States in over 15 years. To perform as designed, every U.S. nuclear weapon uses tritium; however that tritium must be replaced after a certain period of time.

"Tritium is a vital component of the nation's nuclear weapons stockpile," said Acting Deputy Administrator for Defense

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NNSA Implements New Security Measures Recommended By Mies

More than 70 percent of the recommendations in an independent review of security across the U.S. nuclear weapons complex have already been implemented according to NNSA Administrator Linton Brooks. He said most of the other recommendations should be addressed by the end of the year.

The panel that issued the report was created in July 2003, in a five-part initiative to reinforce security oversight and strengthen long-term security

operations in the nuclear weapons complex. Brooks asked retired Navy Admiral

"I believe that security oversight and execution are greatly improved over where we were when I asked for this review."

Administrator Linton F. Brooks

Richard Mies to examine security structure, organization,

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AUTOMATED PROTECTION: NNSA Principal Deputy Administrator Jerry Paul (right) gets a briefing on the new automated security weapons system installed at the Y-12 National Security Complex to protect special nuclear materials. The new system, known as the Remotely Operated Weapon System, or ROWS, is an automated weapons platform operated by a security police officer stationed in a remote location using video cameras and electronic controls. The technology was developed by Sandia National Laboratories in New Mexico. Wackenhut Services - Oak Ridge, BWXT Y-12 and the Y-12 Site Office coordinated the deployment of the system.



## NNSA Implements New Security Measures

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interrelationships, and policies, procedures and practices. Mies and his team assessed security in the field and reviewed procedures in NNSA headquarters from October 2003 to April 2004. An initial draft report was provided to NNSA in April 2004 and a final report in May 2005.

“Admiral Mies correctly identified a number of institutional concerns that we also recognized and have worked to change during the last three years,” Brooks said. “I believe that security oversight and execution are greatly improved over where we were when I asked for this review. Admiral Mies advised NNSA about his findings as the review was underway and that has helped us get to where we are today.” Panel recommendations that NNSA has implemented include:

- Consolidating security functions and responsibilities under a single, responsible office at headquarters
- Establishing an Office of Security Oversight to assess and validate security performance and identifying areas of improvement
- Establishing a stronger vulnerability assessment capability
- Identifying protective force skills needed to protect nuclear weapons facilities
- Conducting more headquarters reviews of field security planning documents
- Strengthening formal ties and cooperation with the Department of Defense
- Establishing a program management plan to formalize security program planning

“I appreciate the work Admiral Mies and his panel did in reviewing our security. As his report notes, preserving nuclear security is a national imperative and an exceptional challenge, but it’s a challenge NNSA’s personnel are meeting every day,” Brooks said.



**ISO CERTIFIED:** Two NNSA site offices have been registered under the ISO 9001:2000 quality standard. The Kansas City Site Office, Kansas City, Missouri, and the Y-12 Site Office, Oak Ridge, Tennessee, recently became officially registered under this prestigious quality standard after successfully completing voluntary audits. The two offices are responsible for overseeing operations at the Kansas City and Y-12 National Security Complex, which are key manufacturing facilities supporting the nation’s nuclear weapons program. Members of the Y-12 Site Office are pictured in this photo with an ISO completion banner.

## First Irradiated Tritium Rods Arrive At SRS

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Programs Thomas P. D’Agostino. “This milestone is an important element to maintaining the safety, security and reliability of the nation’s nuclear weapons stockpile.”

Tritium is a radioactive isotope of the element hydrogen. Tritium decays at about five percent per year and therefore must be periodically replaced in nuclear weapons. Historically, tritium was produced at SRS in its five nuclear production reactors. The last of the reactors was shut down in 1992 and the United States has been without a new source of tritium ever since.

Since that time, NNSA has relied completely on recycling tritium to support the nuclear weapons stockpile. The need for a new tritium supply was recognized and the Department of Energy decided to pursue the production of tritium in a commercial nuclear reactor (TVA’s Watts Bar) and construction of a modern new Tritium Extraction Facility (TEF) at SRS. With construction now complete, the TEF, a \$500 million state-of-the-art facility, is undergoing startup testing and operator training with initial operations to begin in 2007.

The TPBARs will be temporarily and safely stored at the SRS’s K-Area until startup testing of the new Tritium Extraction Facility is completed next year.

*Got an article for the NNSA Newsletter?*

*Submit it for consideration to*

*Astotts@doeal.gov*



## Disintegrating Asteroid Dust Monitored For First Time

The space-based infrared sensors of the U.S. Department of Defense detected the object at an altitude of 75 kilometers, descending very rapidly off the coast of Antarctica.

NNSA visible-light sensors built by Sandia National Laboratories noticed the intruder when it became a fireball – identifying it as an asteroid rather than a missile — at approximately 56 kilometers above Earth.

Five infrasound stations, built to detect nuclear explosions anywhere in the world, registered acoustic waves from what was clearly a speeding asteroid; these were analyzed by researchers at Los Alamos National Laboratory (LANL).

Finally, the debris cloud formed by the disintegrating space rock was imaged by NASA's multispectral polar orbiting sensor.

And that should have been it. An array of sensors from multiple agencies had worked together admirably to provide basic facts. The asteroid had entered Earth's atmosphere on September 3, 2004, traveling at 13 kilometers per second. At almost ten meters across, the visitor was one of the largest meteoroids to enter the Earth's atmosphere in the past decade. Later

analysis showed that its original solar orbit was similar to that of near-Earth asteroids of a particular family, the Aten group.

Some 7.5 hours after the

***The NNSA and DOD sensors provided the first direct measurements ever made of such meteoritic "smoke."***

initial observation, an irregular cloud of unusual material was detected in the upper stratosphere over Davis Station in Antarctica by ground-based lidar.

The NNSA and DOD sensors provided the first direct measurements ever made of such meteoritic "smoke."

"We noticed something unusual in the data," said

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## SRS Wins Top Award At DOE Security Protection Officer Training Competition

A team of Wackenhut Services Incorporated (WSI) security officers from the Savannah River Site (SRS) won the Secretary's Trophy at the annual DOE Security Protection Officer Training Competition (SPOTC) held at the DOE National Training Center



**ONE GIANT LEAP:** A member of the Wackenhut Services Incorporated/Savannah River Site team clears a barrier at the 2005 DOE Security Protection Officer Training Competition in New Mexico. The Savannah River team won the Secretary's Trophy at the competition.

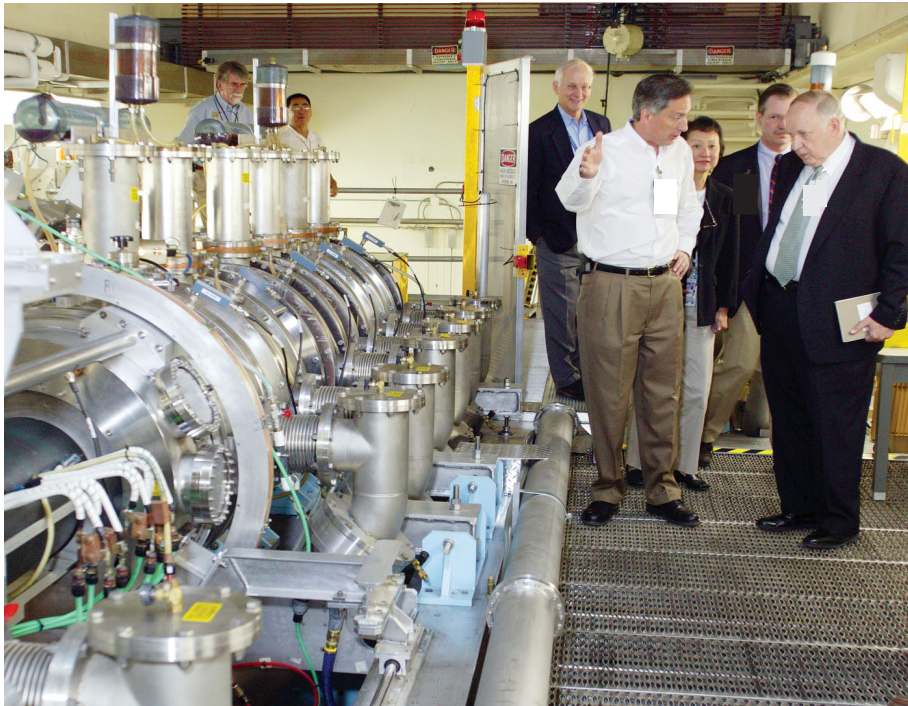
(NTC) in Albuquerque, N.M. BWXT Pantex won second place overall in the team events and WSI Oak Ridge finished third.

NNSA Administrator Linton Brooks presented the Secretary's Trophy to the Wackenhut Savannah River team. The trophy is given each year to the overall winner of team events. Ryan Strader of the WSI/SRS team earned first place in the overall individual events and was designated Security Officer of the Year.

Allen Ford of WSI/SRS won second place in overall individual events and Jeffrey Climer of BWXT Pantex won third place. A complete list of individual scores and standings can be accessed online at <http://www.spotc.doe.gov/standings/split.aspx>.

Also on hand at the awards banquet to congratulate the winners were Glenn Podonsky, director of the DOE Office of Security and Safety Assurance; Marshall Combs, director of the Office of Security; Michael Kilpatrick, director of the Office of Independent Oversight and Performance Assurance; and John Hyndman, director of safeguards and security training for the NTC.





**BROOKS AT LIVERMORE:** Ambassador Linton Brooks receives a briefing on Lawrence Livermore National Laboratory's (LLNL) flash X-ray machine from LLNL's Charles McMillan during a recent visit to the laboratory. In background (from left) are Wayne Shotts, LLNL deputy director for Operations, Camille Yuan-Soo Hoo, manager of NNSA's Livermore Site Office, and Bruce Goodwin, LLNL associate director for Defense and Nuclear Technologies.

## Ron Cherry Wins Safeguards Award

Ronald C. Cherry, a foreign affairs specialist in the NNSA's Office of Defense Nuclear Nonproliferation, received the Institute for Nuclear Materials Management (INMM) Distinguished Service Award for 2005 at the institute's annual conference in Phoenix. The award honors Cherry's contribution to the field of nuclear safeguards.

Cherry has been formulating and coordinating U.S. nuclear material safeguards and nonproliferation policy for more than fifteen years. He first joined DOE in the Office of Safeguards and Security's Technology Development Program in 1990, where he managed research and development projects pertaining to nuclear material protection, control and accounting. In 1992, Cherry joined DOE's Office of International Safeguards, which he later managed under the NNSA. In this role, he oversaw the implementation of International Atomic Energy Agency (IAEA) safeguards at DOE facilities, including Y-12, Hanford and Rocky Flats. Recently, Cherry has played an instrumental role in the domestic implementation of the IAEA Additional Protocol. He has also made substantial contributions to the development of U.S. policies to stem proliferation threats in Libya, Iraq, Iran and North Korea.

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**CONGRESSMAN CLEAVER VISITS KCP:** Honeywell FM&T Vice President Bob Jensen talks to Rep. Emanuel Cleaver of Missouri's fifth district about production work performed by the Kansas City Plant. Cleaver, who once worked at the Kansas City Plant, is currently serving his first term in the House of Representatives and sits on the Financial Services Committee. Cleaver toured production areas and spoke to associates about the important role the Kansas City Plant plays in national security.



# NNSA Response Teams Exercise With Navy

The simulated crash of a single engine aircraft into a submarine base wharf in Georgia initiated an August emergency response exercise involving NNSA's Accident Response Group (ARG) and the U.S. Navy's Submarine Base Kings Bay.

Two nuclear Tomahawk land attack missiles that were being moved inside an explosives handling facility on the wharf were damaged in the exercise scenario, which necessitated deployment of the ARG team.

The ARG is a highly trained team of scientific and technical personnel who have knowledge and expertise in nuclear weapons that are designed and maintained by NNSA's national laboratories and plants.

The team's mission is to manage resolution of significant incidents or accidents involving U.S. weapons or components. The ARG is equipped to provide worldwide support to the Department of Defense (DOD) if nuclear explosives or components in its custody are involved in an accident.

Debbie Monette, assistant manager for national security at NNSA's Nevada Site Office, was the Senior Energy Official for the exercise. She said, "The level of realism at the accident site for this exercise was very impressive. Also impressive was the immediate level of cooperation by the Navy as we were welcomed into exercise play. It was the quickest, most efficient integration I have experienced as a Senior Energy

Official for an ARG exercise with DOD."

In addition to ARG's weapons and health and safety

**MEET THE PRESS:** Riland Carson (left), senior science advisor for the Federal Radiological Monitoring and Assessment Center, explains a plume monitoring map to mock media reporters at a news conference during an emergency response exercise at the U.S. Navy's Kings Bay submarine base in Georgia. Helping him hold the map is Greg Dempsey of the U.S. Environmental Protection Agency.

experts, a Radiological Assistance Program (RAP) team was deployed to the exercise from NNSA's Savannah River Site in South Carolina to conduct initial radiological monitoring and assessment of the accident site. As ARG phased deployment teams arrived at the site, the RAP team integrated with them and the Federal Radiological Monitoring and Assessment Center (FRMAC). FRMAC, headquartered in Las Vegas, Nev., gathers radiological information such as plume and deposition predictions, exposure rates and dose projections and

provides the results of its data collection to state and federal officials. The Atmospheric



Release Advisory Capability located at Lawrence Livermore National Laboratory was also utilized for the exercise.

Navy and ARG personnel encountered real technical challenges in recovering mock missile and warhead units from the wharf and bay area of the simulated accident. Participants also had to deal with severe weather conditions that spun off from what was at that point a tropical storm named Katrina.

## U.S. And Libya Sign Sister Laboratory Arrangement

Libya's National Bureau of Research and Development and NNSA's Sister Laboratory Program have signed an arrangement that establishes a foundation for new scientific cooperation.

This sister laboratory arrangement demonstrates the commitment of the United States and Libya to the peaceful uses of nuclear energy in accordance with the Treaty on the Nonproliferation of Nuclear Weapons. The arrangement is a result of ongoing collaboration involving the United States, the United Kingdom, and Libya, following Libya's historic decision to dismantle its weapons of mass destruction programs.

Scientists from the laboratories of the two organizations say they look forward to beginning joint activities under this program, which will focus on research reactor applications, including nuclear medicine, and other applied scientific endeavors.

# 9/11 Technologies

Even before 9/11, NNSA scientists, engineers and technicians were engaged in strategic thinking about national infrastructure vulnerabilities. They were already conducting research and development of technologies that could be used to safeguard American lives and property in the event of terrorist attacks.

Since 9/11, NNSA has applied its world-class scientific skills with a renewed sense of urgency to support a wide variety of national security innovations. They include radiological, chemical, biological and explosives detection and analysis systems, tools to help government agencies and officials with emergency decision-making,

and technologies for border protection and emergency communications. These two pages list titles of the technologies by facility of origin. For a detailed list of the technologies contact Al Stotts, [astotts@doeal.gov](mailto:astotts@doeal.gov).

## Lawrence Livermore National Laboratory

- ◆ "The Detective" Radiation Detector and Identifier
- ◆ BioWatch
- ◆ Handheld Advanced Nucleic Acid Analyzer (HANAA)
- ◆ Autonomous Pathogen Detection System (APDS)
- ◆ Homeland Defense Operational Planning System (HOPS)

Developed by the Savannah River National Laboratory, the BritePrint system device is a small, lightweight, battery-powered, high intensity light source for onsite fingerprint detection. This technology offers hands-free operation. The unit provides sufficient blue light intensity to compete with more expensive and cumbersome current devices.

## Los Alamos National Laboratory

- ◆ National Infrastructure Simulation and Analysis Center (NISAC)
- ◆ Threat Analysis and Warning
- ◆ ASPECT plane
- ◆ Palm CZT spectrometer
- ◆ Suitcase Portal Monitor
- ◆ Immigration & Naturalization Service: Guidance on Entry/Exit System
- ◆ The Biological Aerosol Sentry and Information System (BASIS)
- ◆ Chemical Detection. The Swept Frequency Acoustic Interferometer
- ◆ Bioforensics
- ◆ Protecting U.S. Borders, Bases and Cities
- ◆ DOE/NNSA Triage and DHS Reachback

## Savannah River National Laboratory

- ◆ ACE – Aerosol Contaminant Extractor
- ◆ Aerosol-to-Liquid Particle Extraction System
- ◆ BritePrint™ Fingerprint Detection Device
- ◆ Dead Reckoning Pedometer
- ◆ RADMAPS
- ◆ Rad Pole Cam



Jason Hurley of the Y-12 National Security Complex Vulnerability Assessment Resource Center displays a 3-D simulation model used to evaluate and analyze facilities. The center is part of Y-12's Homeland Security initiatives.



# NNSA Applies World-Class Scientific Skills



## Sandia National Laboratories

- ◆ PROACT
- ◆ Weapons of Mass Destruction Decision Analysis Center (WMD-DAC)
- ◆ PROTECT
- ◆ A Critical Infrastructure Protection (CIP) initiative
- ◆  $\mu$ ChemLab™
- ◆ Decontamination foam
- ◆ SMART systems
- ◆ Hound and MicroHound
- ◆ Explosives Personnel Portal
- ◆ Percussion-Actuated Nonelectric (PAN®) Disrupter

## Nevada Test Site

- ◆ Mobile Emergency Communication Network (MECN)
- ◆ Infield
- ◆ SPARCS
- ◆ Explosive Materials Detector
- ◆ Rescue Radar

## Y-12 National Security Complex

- ◆ Vulnerability Assessment Resource Center
- ◆ Virus Propagation Analysis Tool
- ◆ Future Medical Shelter System (FMSS)
- ◆ Corridor Access Police Tracking Uniform Records Exchange (CAPTURE)
- ◆ Infrared Tactical Sensor
- ◆ Nuclear Forensics Analyses



A bomb technician aims a PAN Disrupter at a suspect bomb. The PAN, originally developed at Sandia National Laboratories, has become the primary tool used by bomb squads nationwide to disable conventional, handmade-type bombs remotely.

# Eastern Command Groundbreaking

A groundbreaking ceremony for the Federal Agent Facility-Eastern Command of the NNSA Office of Secure Transportation (OST) Defense Programs, was held in August at Oak Ridge, Tenn. Acting Deputy Administrator Thomas D'Agostino provided the keynote remarks. The new facility will house approximately 150 federal agents and replaces a 30-year-old facility designed to house approximately 60 federal agents. Robert Steen, special project manager at Eastern

Command, was responsible for coordinating facility design, property, and project management for the new building. Management, staff and federal agents of OST attended the ceremony. The new facility is expected to be open by September 2006.



**GROUNDBREAKING FOR NEW OST FACILITY:** Mike Flynn (left), manager of Office of Mission Operations, OST, Thomas D'Agostino (center), acting deputy administrator for Defense Programs, and Dennis Reese, acting assistant deputy administrator for OST, turn the first dirt for the new Federal Agent facility in Tennessee.

## Disintegrating Asteroid Dust Monitored For First Time

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Andrew Klekociuk, a research scientist at the Australian Antarctic Division. "We'd never seen anything like this before, a cloud that] sits vertically and things blow through it. It had a wispy nature, with thin layers separated by a few kilometers. Clouds are more consistent and last longer. This one blew through in about an hour."

There was certainly something unusual about the cloud. It was too high for ordinary water-bearing clouds (32 kilometers instead of 20 km) and too warm to consist of known manmade pollutants (55 degrees warmer than the highest expected frost point of human-released solid cloud constituents). The cloud could, of course, have been made of dust from a solid rocket launch, but the asteroid's descent and the progress of its resultant cloud had been too well observed and charted; the pedigree, so to speak, of the cloud was clear.

What was really unusual about the cloud was the size of its particles. Computer simulations

agreed with sensor data that the particles' mass, shape, and behavior identified them as asteroid constituents roughly 10 to 20 microns in size. Micron-sized particles are big enough to reflect sunlight, cause local cooling, and play a major role in cloud formation.

The capabilities of defense-related sensors to distinguish between the explosion of a nuclear bomb and an asteroid fireball that releases similar amounts of energy - in this case, about 13 kilotons - could provide an additional margin of world safety. Without that information, a country that experienced a high-energy asteroid burst that penetrated the atmosphere more deeply might lead a hair-trigger military response unit to believe either that its country has been attacked or that a nearby country is testing a nuclear weapon.

The NNSA sensors' primary function is to observe nuclear explosions anywhere on Earth. Their evolution to include meteor fireball observations came when Sandia's Dick Spalding recognized that ground-based processing of data might be modified to record the relatively slower flashes due to

asteroids and meteoroids. Sandia computer programmer Joe Chavez wrote the program that filtered out signal noise caused by variations in sunlight, satellite rotation, and changes in cloud cover to realize the additional capability. The Sandia data constituted a basis for the energy and mass estimate of the asteroid.

"Our observations suggest that meteoroids exploding in Earth's atmosphere could play a more important role in climate than previously recognized," wrote Klekociuk and other researchers, including Sandia's Spalding, in a paper published in the August 25 issue of the journal *Nature*.

Klekociuk, along with researchers from the University of Western Ontario, the Aerospace Corp., LANL, and Sandia found evidence that dust from the asteroid burning up as it descended through Earth's atmosphere formed a cloud of micron-sized particles significant enough to influence local weather in Antarctica.