



# NNSA, Lawrence Livermore National Lab Take Part in National Geographic Dirty Bomb Special

While dirty bombs — which use conventional explosives to disperse radioactive material — are fearsome, a recent *National Geographic* special highlighted the U.S. government's preparedness and hypothetical response to such a scenario.

A scenario showing the impact of a dirty bomb attack in Portland, Maine, was depicted in a one-hour special which aired Nov. 12, on the *National Geographic* channel.

The hour-long program begins with a dramatization of a car bomb that disperses radioactive material detonating on a busy street, prompting a critical question: What happens next?

Adm. Joseph Krol, associate administrator for NNSA's Office of Emergency Operations, participated in the piece and gave an interview describing the assets that NNSA and its national laboratories have ready to deploy in the event of a nuclear or radiological incident. With experts working in more than 100 countries around the world to detect, secure and dispose of dangerous nuclear and radiological material, NNSA's goal is simple: to make sure that terrorists never get their hands on the material needed for a dirty bomb.

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## Linton Brooks Medal Awarded to Y-12 CIO

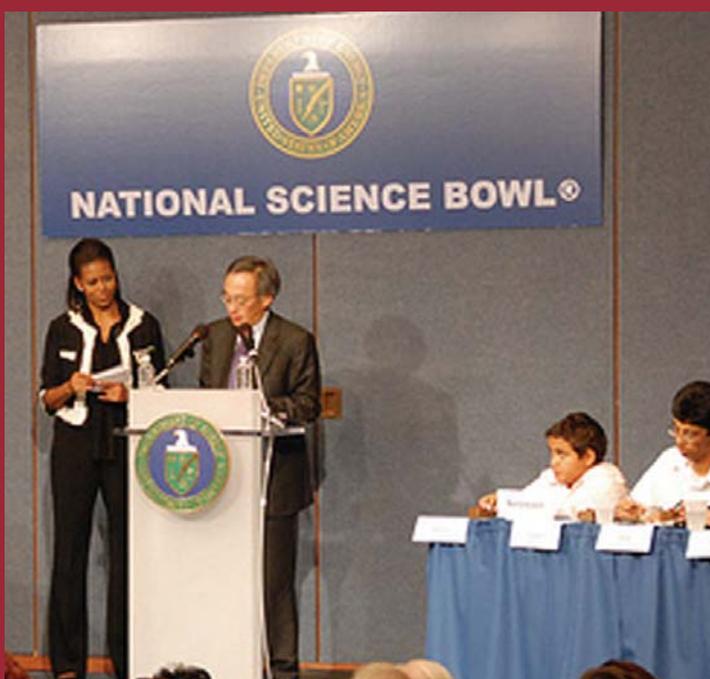
Jared "Travis" Howerton, chief information officer at the Y-12 Site Office recently received the 2009 Linton Brooks Medal for Public Service. NNSA Administrator Thomas D'Agostino presented Howerton with the honor at a ceremony at NNSA headquarters in Washington, D.C.

The award, named for former NNSA Administrator Linton F. Brooks, was established last year to recognize newer employees whose actions and deeds exemplify the spirit of a commitment to public service. Nominees must be NNSA employees with fewer than five years of federal experience whose work achievements demonstrate an exceptional commitment to public service excellence.

"This Linton Brooks award acknowledges the success of our NNSA offices across the country in developing that next generation of human talent," D'Agostino said. "This

*(continued on page 2)*

**FIRST LADY VISITS DOE, NNSA:** First Lady Michelle Obama visited DOE and NNSA headquarters to lead a practice session for young people competing in the Science Bowl, a nationwide competition coordinated by the DOE to encourage interest in science among students.



# Administrator's Corner

## *Giving Thanks This Holiday Season*

Once again, the holiday season is upon us and it's almost time to begin a new year. Without question, 2009 has been a productive and exciting year for NNSA, but I want to offer a personal message as we head into 2010.

Across our enterprise, we have so much for which we can give thanks: our friends and colleagues, our families, and the important work we are doing to protect our nation. If you're like me, this is also an excellent time to take a few minutes to remember those among us who are less fortunate — those who are not working or are unable to provide for their families as they had in years past.

The Combined Federal Campaign is an excellent opportunity to provide much-needed assistance to non-profit groups that serve a variety of interests and individuals. The deadline for participating in the 2009 CFC is coming soon, so I urge you to take part in whatever way you are able.

I've always believed that the reason we have been able to accomplish so much across the nuclear security enterprise is our ability to focus on the goals at hand and our commitment to the mission. Whether we're ensuring the safety, security and effectiveness of our stockpile or protecting the world from the proliferation of dangerous nuclear material, we all take pride in coming together as part of America's national security team.

Today, I ask you to apply that determination to this time of thanks and giving. Cherish your community. Help a neighbor in need. Celebrate with your friends and family. And remember that the work you do on a daily basis is critical to our nation.

From my family to you and yours, I wish you a safe and happy holiday season. I look forward to a productive 2010 — and to continuing to make this great nation a stronger, safer place for all of us.

Tom D'Agostino



### *Linton Brooks Medal Awarded to Y-12 CIO* (continued from page 1)

award recognizes someone who has accomplished significant things in a short period of time. And this award recognizes an individual who sees a problem, takes the initiative and makes something happen."

D'Agostino lauded Howerton for his many successes at Y-12, saying that the Linton Brooks Medal "recognizes an individual who sees a problem, takes the initiative and makes something happen."



Howerton began working at the Y-12 Site Office as an information technology specialist in April 2005. He developed an NNSA-wide electronic tracking system that has improved operational efficiency and has been instrumental in moving NNSA toward a more wireless environment. His efforts have resulted in savings across the nuclear security enterprise. Howerton was named CIO at Y-12 last month.

Howerton is a native of Knoxville, Tenn., and holds a bachelor of science degree from Tusculum College in organizational management and a master of science degree from Boston University in computer information systems. He also maintains a project management professional certification and is a certified information system security professional. He and his wife, Shannon, have one daughter, Tyler Brooke.

**HOWERTON RECEIVES LINTON BROOKS MEDAL:** (Left to right) NNSA Administrator Thomas D'Agostino, Y-12 CIO Travis Howerton, former NNSA Administrator Linton F. Brooks.

# Somalia Relief Efforts Inspire NNSA Official to Inspire Others

## **Col. Garcia Brings Leadership Lessons to Work Across the Nuclear Security Enterprise**

Sixteen years ago, Air Force Col. Efen "Mongoose" Garcia and his 18 enlisted team members landed in Mogadishu, Somalia. They were dispatched there as part of Operation Continue Hope to protect various aviation assets while working in sweltering heat and dangerous conditions.

Back then, it was merely a military assignment for a young captain, but today Garcia, who was twice deployed to Somalia, brings the lessons he learned there to NNSA, where he serves as executive director to the assistant deputy administrator for Nuclear Safety and Operations. He also frequently shares his experiences with other groups in an effort to promote team-building and national security.

Garcia's team in Mogadishu supported the United Nations, the Army's Quick Reaction Force of the 10th Mountain Division, the Air Force air mobility mission, and the Army Rangers.

The Air Force RED HORSE (Rapid Engineering Deployable, Heavy Operational Repair Squadron, Engineer) combat engineer team Garcia led constructed "revetments" at the Mogadishu airport to protect Air Force, Army, and United Nations aviation assets.

The team also constructed hardened bunkers for the Air Force camp to protect against incoming mortar attacks from Somali militiamen.

Daily temperatures soared well above 90 degrees, and the team was constantly working under hostile conditions including

sniper fire, mortar and rocket-propelled grenade attacks.

"We never forgot for a moment the importance of teamwork and camaraderie while serving our country," Garcia said. "We always found ways to keep our spirits up."

During Operation Continue Hope, the RED HORSE team constructed 2.4 miles of revetment sections to provide protection for millions of dollars worth of aviation and support assets at the Mogadishu Airport.

"We completed our mission under hostile and very challenging conditions," Garcia said. "But most importantly, we brought all our folks home safely."

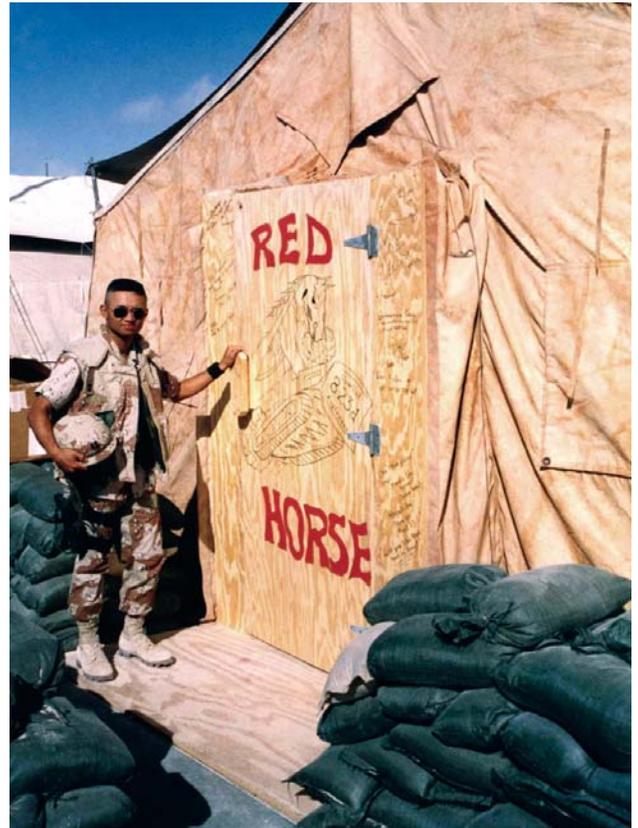
Garcia says his experiences in Somalia actually kept him in the Air Force; his deployments and assignments since then have taken him across the U.S. and to Europe, the Middle East, Central and South America, and Asia.

Garcia enjoys speaking publicly about his distinguished Air Force career and many unique experiences. He has given many talks about Operation Continue Hope to Air Force groups, and he most recently spoke at Bolling Air Force Base in Washington, D.C.

"I'm proud to have served with the RED HORSE warriors," said Garcia, but more importantly, I'm

proud to serve our great nation."

Garcia, says he uses his Air Force experience every day at



**LEADERSHIP LESSONS:** A young Captain Efen Garcia in front of the RED HORSE tent in Mogadishu, Somalia, circa Nov 1993.

NNSA working with the labs and sites across the nuclear security enterprise to fulfill national security objectives.

"I do my best to follow the Air Force core values of 'Integrity First, Service Before Self, and Excellence In All We Do' and I try to emphasize the importance of teamwork and positive attitude," Garcia said. "Whether we're in uniform or civilian clothes, we're all one team together making a positive difference for NNSA and our country."

# Climate Modeling at NNSA National Labs

NNSA's national laboratories are instrumental in conducting climate modeling and data gathering leveraging various NNSA assets, including some of the fastest and most powerful supercomputers in the world.

and the potential for the National Ignition Facility to promote advances in fusion energy.

The primary mission of NNSA's supercomputers is to meet nuclear weapons assessment and certification

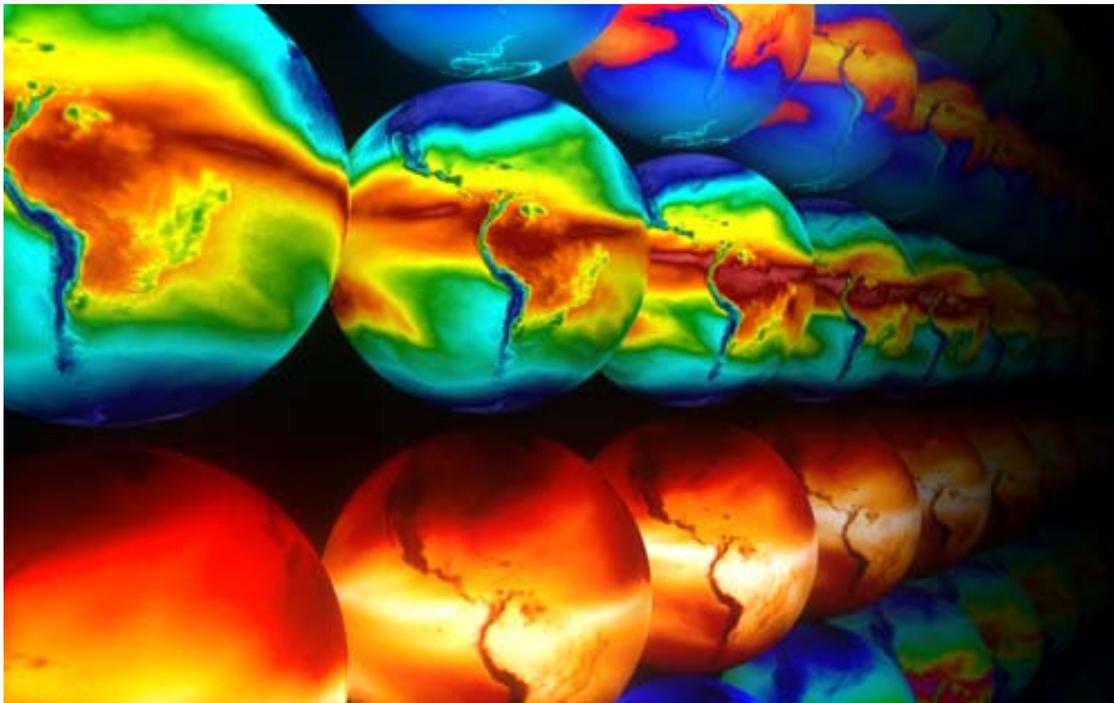
NNSA's three national laboratories house some of the world's fastest supercomputers, including BlueGene/L and Dawn at Lawrence Livermore National Laboratory, Red Sky and Red Storm at Sandia National

Laboratories, and Roadrunner at Los Alamos National Laboratory. In addition to the nuclear security mission, these extraordinary machines are often used to support other efforts in the national interest, such as addressing climate change.

At Los Alamos, the Climate, Ocean and Sea Ice Modeling Project is using advanced supercomputing to model changes in sea levels.

Researchers at Sandia have developed a

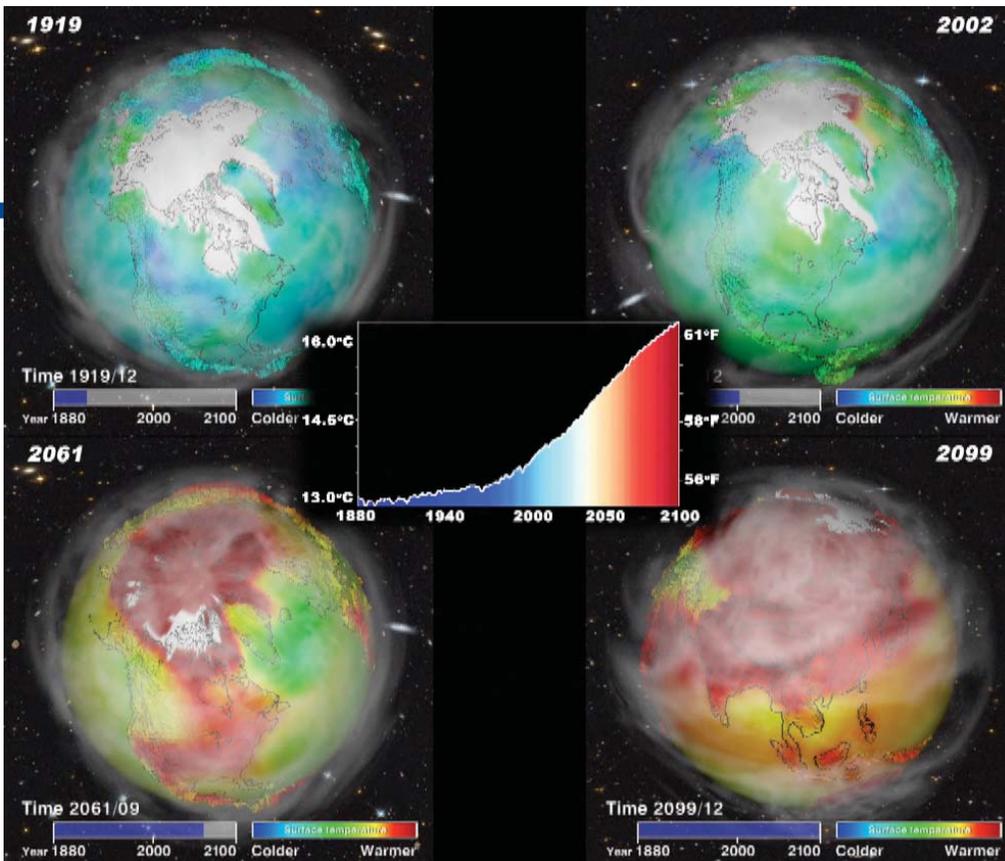
new wind turbine blade design that promises to be more efficient than current designs and should significantly reduce the cost of energy of wind turbines at low-wind-speed sites. At Lawrence Livermore National Laboratory, researchers are mapping the impact of climate change on agriculture.



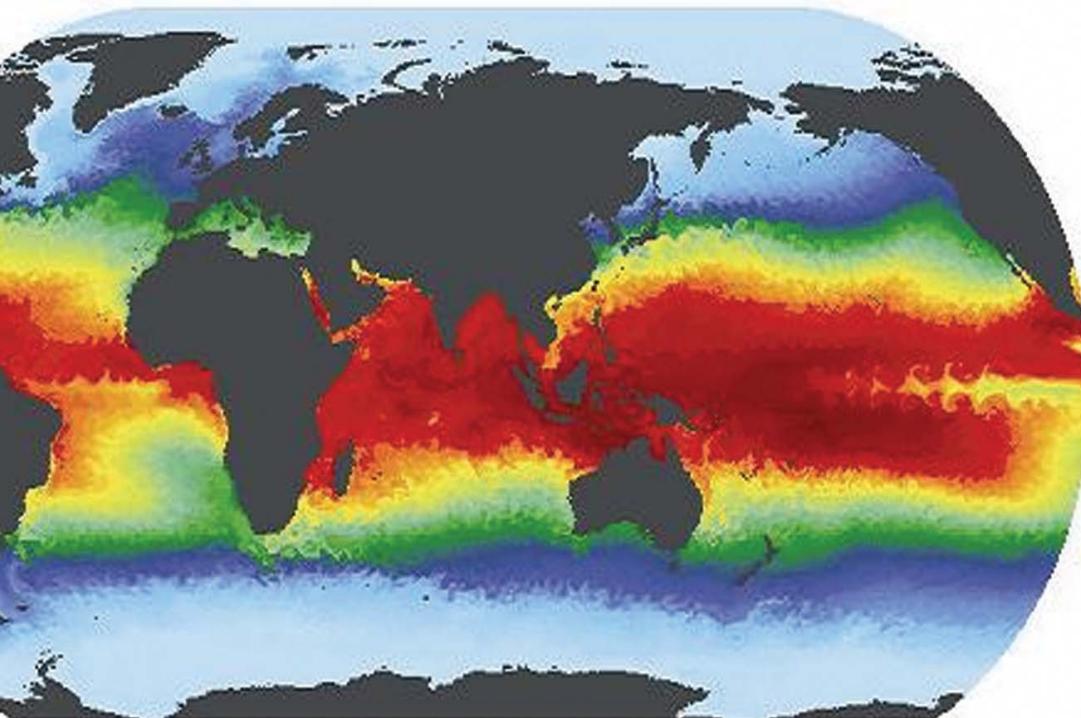
A Sandia National Laboratories simulation of the Community Climate System Model.

Earlier this year, NNSA Administrator Thomas D'Agostino highlighted the role of key NNSA assets in addressing global climate change at a White House briefing on the national security implications of global climate change. D'Agostino discussed NNSA's advanced supercomputers being used to model climate change, the development of new technologies that are improving wind turbines,

requirements, including work on weapon codes, weapon science, computing platforms, and supporting infrastructure. Through close coordination with other government agencies, Advanced Simulation and Computing tools also play an important role in supporting nonproliferation efforts, emergency response and nuclear forensics.



Lawrence Livermore National Laboratory computer model showing simulations of changes in surface temperature and sea-ice extent.



Simulation from Los Alamos National Laboratory's Climate, Ocean and Sea Ice Modeling Project.

## Other National Laboratory Climate Modeling Work

- Predicting that human-caused greenhouse gas increases should lead to more warming in the tropical troposphere (the lowest layer of the atmosphere) than at the tropical land and ocean surface
- Modeling long-term fossil fuel consumption to find out that the Earth could potentially see a 14.5-degree increase from current temperatures if humans continue to use fossil fuels in a business-as-usual method over the coming centuries
- Developing a mobile laboratory and instrumentation to measure and characterize greenhouse gases, with an emphasis on carbonaceous gases; this one-year effort will include three planned field measurement campaigns in 2010
- Examining many sub-systems of the national infrastructure including energy, water, telecommunications, transportation, and human health; combining this infrastructure capability with advanced climate modeling expertise to predict how impacts from climate change might cascade throughout our infrastructure

# The Science of Nuclear Security

## NNSA Highlights New Developments in High Energy Density Physics Research

NNSA experts highlighted recent advances in the high energy density physics research conducted at its world-class experimental facilities at the 51st Annual Meeting of the American Physical Society's Division of Plasma Physics in Atlanta this month.

Presentations were given by representatives from the NNSA's National Ignition Facility (NIF), the largest and most energetic laser ever developed; the Omega laser system, a premier laser research facility; and the Z machine, the world's largest X-ray machine.

"These advances demonstrate the NNSA's investment in cutting edge high energy density research that supports our core nuclear security mission," said NNSA Administrator Thomas D'Agostino. "These facilities are major components of NNSA's technical program to ensure the reliability of our nation's nuclear deterrent in the absence of underground testing. The research done across the nuclear security enterprise, in combination with detailed computer simulations and other test data, is providing the groundbreaking science to meet our national security needs while promoting broader national priorities."

Highlighting results from recent NIF tests, NNSA and Lawrence Livermore National Laboratory (LLNL) showed that NIF's laser beams can be effectively delivered

and are capable of creating sufficient X-ray energy to drive fuel implosion, an important step toward the ultimate goal of fusion ignition. Scientists from the Laboratory for Laser Energetics, which houses the Omega laser

45 km/s.

These facilities work in concert with other scientific and computing capabilities to help NNSA scientists maintain a safe, secure and effective nuclear deterrent without underground testing.



**GROUNDBREAKING SCIENCE:** Brig. Gen. Garrett Harencak (right), NNSA principal assistant deputy administrator for military application, on a recent tour of the Omega Laser Facility housed in the Laboratory for Laser Energetics at the University of Rochester.

system, also presented new results showing that the facility had achieved the highest fusion capsule compression to date. Sandia's Z machine team recently announced that Z has increased its X-ray power output to 340 terawatts, its X-ray energy output to more than two megajoules, and the velocity at which it can propel a flyer plate — small metal disks used in shock loading experiments — to

Together, these tools will help experts evaluate key scientific assumptions in current computer models, obtain previously unavailable data on how materials behave at temperatures and pressures like those in the center of a star, and help validate NNSA's supercomputer simulations by comparing code predictions against observations from laboratory experiments.

## UNLV, NTS Team Up on UAV Flight Test Project

The NNSA's Nevada Test Site (NTS), a massive outdoor laboratory and national experimental center near Las Vegas — has teamed up with the University of Nevada Las Vegas (UNLV) and a private company, Unmanned Aerial Systems (UAS), to launch a Flight Test Plan that will test improvements in unmanned aerial flight.

The partnership will take UNLV engineering students and unmanned aerial vehicle (UAV) experts to Frenchman Flat at the NTS to test downlinks on the Nightwind 2 UAV as it flies at various altitudes and distances over the site. The tests will further the understanding of enhanced UAV command and control from long distances. The data can be extrapolated into "distance versus signal strength" charts, which will aid in determining appropriate bandwidths and data rates for a variety of line-of-sight distances from Ground Station to UAV.

The UNLV College of Engineering established the UAV Center of Excellence with federal funding and support from Sen. Harry Reid. The College has undertaken a series of projects to provide practical applications for theories developed by UNLV faculty and students. Examples of UAV-related activities have included vertical takeoff and landings of UAVs and UAVs powered by the smallest known heavy fuel turbine engine. UAS has used the NTS previously for similar research projects.

Established as the former Atomic Energy Commission on-continent proving ground, the NTS has seen more than four decades of nuclear weapons testing. Since the nuclear weapons testing moratorium in 1992 and under the direction of the Department of Energy and NNSA, test site use has diversified into many other programs such as emergency response training, conventional weapons testing, and waste management and environmental technology studies.



### ***NNSA and Lawrence Livermore National Lab Take Part in National Geographic Dirty Bomb Special*** (continued from page 1)

NNSA's Lawrence Livermore National Laboratory (LLNL) also participated in the special. Brooke Buddemeier, a certified health physicist in LLNL's Chemical, Biological, Radiological and Nuclear Consequence Countermeasures Program, was interviewed about ways to protect emergency responders. Page Stoutland, the director of Strategy for LLNL's Global Security principal directorate, discussed the use of nuclear forensics to help identify the perpetrators of such a terrorist attack.

The program features LLNL's National Atmospheric Release

Advisory Center and its Interagency Modeling and Atmospheric Assessment Center and discusses how both centers are used to support first responders with cutting-edge radiological plume modeling.

The piece gave NNSA and its labs a chance to communicate how they would respond in the event of a real-life incident. Both Adm. Krol and the LLNL scientists explain how teams would deploy, gather and share the critical information, and provide medical advice for all types of radiation exposure. With

state-of-the-art computer modeling, aerial surveillance and radioisotope identification, NNSA is able provide crucial information to first responders to help them disseminate information to the community.

Access to such information is critical. Radiation is invisible and something our communities' first responders do not routinely face. The work of NNSA across the enterprise to develop the tools and technologies to respond to a nuclear or radiological incident are critical elements of our national security.

# Sandia Announces Completion of Mixed Waste Landfill Cover Construction

After more than a decade of hard work, public involvement and state government oversight, the environmental restoration project at NNSA's Sandia National Laboratories has successfully completed the construction of an alternative

***“If it had not been for the personal perseverance of the project team members, this mission would have withered. Now that the remedy is in place the team is looking forward to sharing lessons learned from the project.”***

**Joe Estrada**  
**Federal Project Director**  
**Sandia Site Office**

evapotranspirative cover at the Mixed Waste Landfill (MWL), a 2.6-acre site located in the west-central portion of Kirtland Air Force Base in Albuquerque, N.M.

The protective cover consists of four engineered layers, including three layers of compacted soil and a biointrusion rock barrier that will keep burrowing animals out of the former disposal areas. Together, these four layers and the native plants will control water infiltration, thus isolating the wastes. Cover construction was

completed ahead of schedule, within budget and without any safety incidents.

The MWL was established in 1959 as a disposal area for low-level radioactive waste generated by Sandia's research facilities. Low-level radioactive waste and minor amounts of hazardous waste were disposed in the MWL from 1959 through 1988. Over time, the radioactive materials in the landfill decay and become less hazardous.

The MWL has been monitored since 1969. An extensive investigation effort, and active studies of the MWL since 1991, provided the technical foundation for the determination that the landfill is not expected to contaminate groundwater and does not represent an unacceptable risk to human health and the environment.



**SUCCESSFUL COMPLETION:** An aerial view (top) of the Sandia National Laboratories' Mixed Waste Landfill, from 1987 before construction of an evapotranspirative cover. The construction of the Mixed Waste Landfill cover was completed (bottom) in September 2009, and includes four engineered layers including a biointrusion rock barrier.

**COMPLEX CLEANUP:** Excavators began full-scale demolition on Cold War-era buildings at Los Alamos National Laboratory on Dec. 1. Buildings at Technical Area 21 — slated for demolition — once housed plutonium production and historic, nonweapons research.



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