



National Nuclear Security Administration

Washington, DC 20585

October 2004

## Jerry Paul Confirmed As NNSA Deputy Administrator

Former Florida State Representative Jerry Paul has been confirmed by the U.S. Senate to be principal deputy administrator of NNSA. Paul, 38, is an attorney and holds degrees in both marine and nuclear engineering. He served a pair of two-year terms in the Florida State House of Representatives.

Administrator Linton Brooks said, "This is really great news for all of NNSA and for me as I have been looking forward to having Jerry's help in carrying out all of the demanding responsibilities of the Office of the Administrator."

Paul has what Brooks described

as the perfect background to successfully represent NNSA's interests in the interagency arena, with the Congress, with state and local government agencies, and with private industry.

"On a daily basis, Jerry will help me oversee all NNSA headquarters organizations and run the NNSA Management Council and the Leadership Coalition and provide leadership and direction for all Site Office activities," Brooks said. "Over time, he will assume the duties Tyler Przybylek has so ably managed, as the

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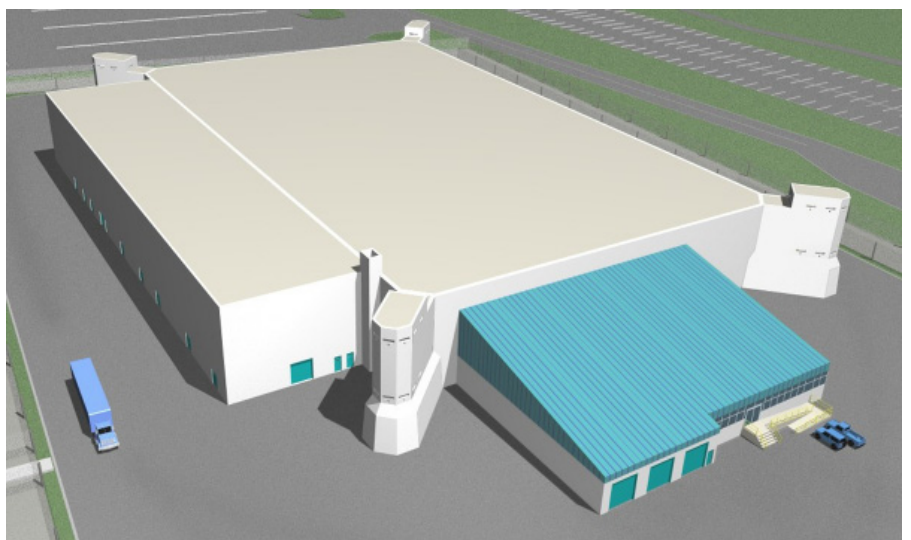
**OST BRIEFING:** Jerry Paul Visits the Office of Secure Transportation Western Command in Albuquerque, NM.

## Y-12 Awards New HEU Storage Facility Contract

BWXT Y-12 has awarded a contract to build a state-of-the-art nuclear materials storage facility at the Y-12 National Security Complex. The new facility will allow Y-12 to consolidate storage of nuclear materials, improve the site's security posture, and make managing nuclear assets more efficient and less expensive.

A construction contract totaling approximately \$120 million has been awarded to Caddell/Blaine, a joint venture of Caddell Construction of Montgomery, Ala., and Blaine Construction of Knoxville, Tenn.

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**ARCHITECTURAL RENDERING:** The new Highly Enriched Uranium Materials Facility planned at Y-12.

# NNSA Helps Train ICBM Convoy Security Personnel

Expertise developed by NNSA's Office of Secure Transportation (OST) for protecting convoy movements of nuclear weapons and special nuclear materials has made the organization a logical choice for training Department of Defense (DoD) units that have responsibility for protecting the nation's intercontinental ballistic missile (ICBM) resources.

During a recent three-week training session at Camp Guernsey, Wyo., two dozen federal and contractor employees of OST conducted the third "Road Warrior" training for nearly 90 Airmen from Air Force bases in Wyoming, Montana and North Dakota in the strategy and tactics of defending convoys that transport ICBMs. The DoD customers were very happy with the results.

"Any training is good, but this opens us up for outside views," said 2nd Lt. Timothy Brady of the 790th Missile Security Forces Squadron (MSFS) at F.E. Warren AFB, Wyo. "This is better than just military. Working with the NNSA has been great."

"It's challenging, but worth it," said 2nd Lt. James Hagemier, who is in charge of the 741st MSFS fire teams at Malmstrom AFB, Mont. "This is progressive learning for advanced convoy protection techniques. The NNSA does this day-in and day-out; we do this periodically. The focus of

this training is to give us an education we can benefit from. Everybody brings their own tactics, and when we leave we will have more in our toolbox to draw from."

The training was conducted in three one-week phases. In phase one, instruction, coordination and



PRE-INSTRUCTIONAL WEAPON CHECK: Office of Secure Transportation MK19 instructors Vince Salas, shooting, and Ron Thatcher, check the 800 meter sight setting prior to the arrival of Air Force participants during Road Warrior III training in Wyoming.

leadership elements were discussed between OST instructors and the student instructors. Air Force participants included helicopter pilots, maintainers, security forces and other specialists. The OST instructors used a train-the-trainer approach.

Phase Two was the advanced weapons training element in which skills were improved for dealing with operational and hostile environments. The focus was protection of land-based convoys.

"This training has been fantastic," Lieutenant Hagemier said. "We fired more rounds in a nonqualification environment than we fire in a whole year at home station. Off-hand firing,

extreme-close and distance shooting, and transition firing with other weapon systems are excellent opportunities to improve. The biggest advantage was the distance shooting while performing combat maneuvers, which is physically impossible at Malmstrom AFB."

Phase Three included the tactics, techniques and procedures for defending a convoy. Elements in this phase focused on defending convoys, avoiding friendly fire incidents and other physical-security procedures.

"We are using actual tactics that we (would) use during an attack," said 1st Lt. Kevin Lombardo, 791st MSFS senior convoy commander

at Minot AFB, N.D. "We're getting more out of this training than we would at our home units."

Capt. Vic Moncrieffe, Road Warrior III commander from Air Force Space Command headquarters at Peterson AFB, Colo., said, "We train from a holistic perspective. We take all of the disciplines from multiple specialties and train them to be a team (that) can work together if a situation develops. America expects our nuclear munitions to be protected at the highest level. This training gives the expertise needed to do just that."

## LLNL's Ted Saito Receives Exceptional Public Service Award

Lawrence Livermore National Laboratory's (LLNL) Ted Saito has received the Exceptional Public Service Award from the U.S. Department of Defense (DoD) for his work in nonproliferation policy at the Pentagon from September 2002 to June of 2004. A senior staff engineer at Livermore, Saito served as special assistant to the director for nonproliferation policy, Office of the Assistant Secretary of Defense for International Security Policy, and in the Office of the Under Secretary of Defense for Policy, working on various treaties to prevent the international spread of nuclear weapons.

Saito served as the lead action officer on the Comprehensive Nuclear Test Ban Treaty, and helped draft the deputy assistant Secretary of Defense's Senate testimony on the Additional

Protocol to the Non Proliferation Treaty. He also helped develop U.S. government positions regarding the

International Atomic Energy Agency, as well as U.S. efforts dealing with nuclear weapons issues in India, Pakistan, Iran and North Korea.



**DoD Award:** Ted Saito (center) is congratulated on his DoD Exceptional Public Service Award by LLNL's Larry Ferderber (left), director of the lab's National Security Office, and Jeff Williams, of the lab's Engineering Directorate.

## Pantex Works With DoD On Environmentally Friendly Solvents

The NNSA's Pantex Plant in Amarillo, TX, wants to clean up the cleaning solvents required for use in the weapon assembly and disassembly process.

In an effort to eliminate or substitute ozone-depleting chemicals and flammable, toxic and reactive solvents with more benign replacements, Pantex has initiated a cooperative project with Department of Defense (DoD) agencies that contribute parts to weapon systems.

The goal of the joint project is to identify solvents that will meet DOE and DoD needs, production safety needs and federal Resource Conservation and Recovery Act (RCRA) and ozone-depleting chemicals (ODC) elimination requirements. However, extensive

testing is required because it will be necessary to ensure that the new solvents will not jeopardize weapons for military applications.

Pantex has spent over a year working with Navy personnel to demonstrate the need of the cooperation. They have initiated a memorandum of agreement and the Navy is supplying materials on which replacement solvents will be tested for compatibility and cleaning effectiveness. After the tests by Pantex, the Navy will conduct functional evaluations of its components following exposure to the replacement solvents to ensure that they do not interfere with the operation of the weapon.

Initial contact has been made by Pantex with the Air Force Materials

and Manufacturing Directorate to explore similar activities. It is envisioned that these organizations and their associated contractors will design a series of tests that share both materials and results. The collaborative effort will potentially facilitate process changes to more environmentally favorable solvents.

Successful identification and substitution of solvents that meet ODC and RCRA requirements will reduce overall costs to the nation's weapons complex. The Pantex collaborative approach facilitates the effort and minimizes costs due to reduction of waste streams, environmental damage and personnel health issues.

## HEU Storage Facility

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Bill Brumley, Y-12 site manager for the National Nuclear Security Administration, in a letter to Dennis Ruddy, president and

***The HEUMF is part of a 20-year plan to provide the Y-12 complex with new facilities, equipment and processes to continue upholding its missions.***

general manager of BWXT Y-12, granted authorization to allow final facility construction activities for the Highly Enriched Uranium Materials Facility (HEUMF) to begin.

“Construction of the new storage facility is the keystone of our modernization effort. This is a significant step to beginning construction of this facility,” Ruddy said.

The total project cost for the facility is estimated at \$313 million. As part of this overall project, a number of small business contract awards also are being made. The project will create an estimated 400 construction jobs for 20 to 24 months.

The HEUMF represents the largest design effort at Y-12 in more than a decade. Site preparation and other related preliminary construction activities are well under way. Construction is scheduled to be finished in 2007.

## Jerry Paul Confirmed As NNSA Deputy Administrator

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NNSA chief operating officer. In preparation for his appointment, Jerry has worked very hard to get up to speed on all NNSA programs and activities, and I am very confident that he will make invaluable contributions as a key member of NNSA’s senior leadership team.”

The Florida Sun-Herald reported that during the April confirmation hearing for Paul in the U.S. Senate he

known for his problem-solving capabilities by politicians “on both sides of the aisle,” Nelson said.

Paul holds a law degree from Stetson University, a degree in marine engineering from the Merchant Marine Institute in Castine, Mass., and a post-baccalaureate degree in nuclear engineering from the University of Florida. He has served in the



**PAUL AT LLNL:** LLNL’s Randy Simpson (left) leads a tour of the Lab’s High Explosives Applications Facility (HEAF) for NNSA Principal Deputy Administrator Jerry Paul (center) and Lab Director Michael Anastasio (right). Experiments being carried out at HEAF are used to validate computational models of NNSA’s Advanced Simulation and Computing Program, with the ultimate goal of helping to certify the safety and reliability of the nation’s nuclear weapons.

was given a glowing introduction by Sen. Bill Nelson, D-Fla. “Not only is he a fellow Floridian, he is an outstanding nominee with the right amount of technical background and experience that makes him well-qualified and ready to go right to work,” Nelson said. Paul was also

Florida Legislature since 2000. Last session, he served as chairman of both the House subcommittees on Environmental Regulation and Environmental Appropriations.

# Don't Hedge Your Bets On JASPER Shots

Not all the action in southern Nevada takes place in Las Vegas.

Sixty miles away at NNSA's Nevada Test Site (NTS), the Lawrence Livermore National Laboratory's JASPER team is on a roll. The team has staged 31 consecutive successful shots between March 19, 2001 and July 29, 2004. This includes a string of nine fully contained plutonium shots, all of which paid out valuable data and proved to be scientific winners.

JASPER, an acronym for Joint Actinide Shock Physics Experimental Research, is a nearly 100-foot, two-stage gas gun within Area 27 at NTS. It's also an important experimental

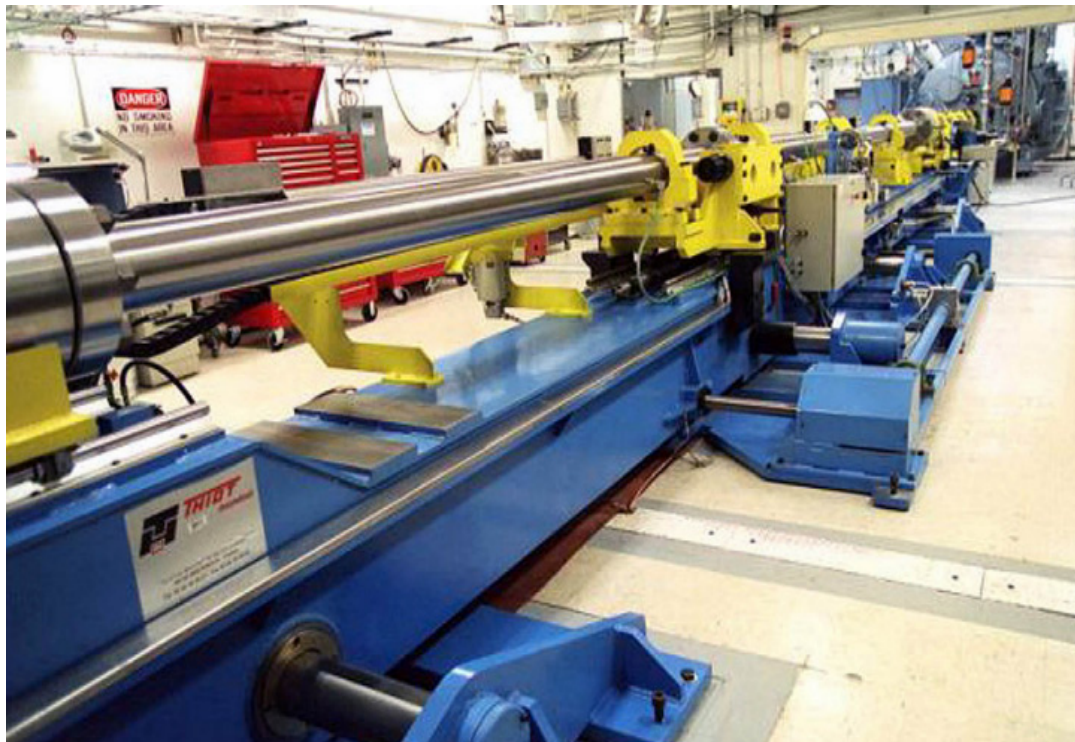
technique to determine the properties of materials at high temperatures, pressures and strain rates by shocking the material and measuring its response.

JASPER can fire small projectiles at velocities of up to eight kilometers (five miles) per

second. That's nearly 18,000 miles per hour or more than 24 times the speed of sound. When a tantalum projectile strikes a plutonium target

at those speeds, the impact produces a high-pressure shock wave that

stewardship is to help assess the aging of nuclear weapon



**JASPER:** An important tool in science-based stockpile stewardship, the JASPER gas gun compliments experiments at the 10-story National Ignition Facility as well as subcritical experiments underground at Nevada Test Site's U1a, as scientists seek to learn more about the properties of shocked materials, especially plutonium.

passes through the target in a fraction of a microsecond. During this extremely brief period, diagnostic

equipment measures the properties of the shocked plutonium inside the target.

These shock-physics experiments complement the on-going

subcritical experiment program currently at NTS. In the absence of full-scale nuclear testing, JASPER's role in science based stockpile

components, to verify that aging weapons can perform as designed.

Currently, the \$3.5 million JASPER facility and infrastructure are capable of executing about 24 experiments per year, costing about \$6 million annually over a ten-year life. While Livermore lab operates JASPER, the gun provides multi-laboratory experimental use.

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Submit it for consideration to  
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## Sandia, Navy Plan New Carriers

Researchers at NNSA's Sandia National Laboratories in New Mexico are helping the U.S. Navy create the next generation of aircraft carriers by reviewing and analyzing current Carrier Air Wing flight operations, maintenance and support functions.

The primary goal of Sandia's project is to assist the Navy in achieving manpower reductions of at least 10 to 30 percent while increasing the amount of technology on board an aircraft carrier to reduce the overall workload per sailor.

"We will be probing each of these areas to find ways to maintain or improve air wing performance while reducing personnel and making the remaining jobs more desirable," said Jeff Brewer, Sandia engineer and project principal investigator. "This will be done while simultaneously improving the air wing staffing decision-making process."

The first phase of the project is a four-month evaluation of current Navy air wing operations, structure and improvement alternatives. The second is a six-month phase in which Sandia will conduct an in-depth analysis of the alternatives established during the evaluation.

Sandia is assisting with the Navy's CVN 21 program that is being carried out to develop the next-generation aircraft carrier. The actual carrier that will result in 2013 or 2014 will be designated as the CVN 78, the Navy's 78<sup>th</sup> aircraft carrier.

"The idea is not to simply have fewer people on board who work harder than previous crews," said Brewer, "but to enable organizational changes, technology improvements and work practice changes to achieve the desired operational capability of the air wing and make jobs more desirable for the personnel in the system."

## LLNL Computer Is Second Fastest

Lawrence Livermore National Laboratory's newest supercomputer, named "Thunder," has made an impressive debut at number two on the prestigious "Top500" list of the world's fastest computers.

Configured with 4,096 Intel Itanium 2 processors, Thunder is rated with a peak speed of 23 teraflops (trillion operations per second) and achieved 19.94 teraflops on the LINPACK benchmark. Number one on the Top500 list is Japan's Earth Simulator, whose LINPACK performance is rated at 35.8 teraflops.

Thunder was designed primarily for scientific research in areas such as materials science, energy and environment, biology, structural mechanics and cosmology. Most of these studies have either a direct or indirect bearing on the laboratory's national security missions.



**MENTOR AWARD:** Charles D. Harrington (right), a technical staff member at Los Alamos National Laboratory (LANL), has received the 2004 Women's Career Development Mentor Award. The award recognizes individuals who promote the career development of women at the laboratory and recognize and applaud individuals who exhibit exemplary informal or formal mentoring to women. Harrington mentored LANL scientist Teryn Ebert, to his right. Also pictured are LANL director Pete Nanos and deputy director Carolyn Mangeng.

# Sandia Rocket Sled Track Celebrates 50 Years Of Service

When retirees and current staff of the rocket sled track operation at Sandia National Laboratories in New Mexico gathered to celebrate the facility's 50th anniversary this summer, they heard retiree Paul Adams share his eyewitness account of the track's first test in July 1954.

supply the information to assure the safety, security and reliability of the nuclear stockpile. The folks who are here today developed a lot of that knowledge. And for that, Sandia says, "Thank you."

"We are moving into a new regime now. We have evolved

massive, instrumented concrete block at 750 feet per second to estimate the effect of a crash into a nuclear power plant containment building.

Sandia's sled track operation includes two separate tracks – a 10,000-foot track for testing items



**CRASH TEST:** Among the more dramatic tests to be conducted at Sandia's rocket sled track facility is this crash of a complete F-4 Phantom into a massive reinforced concrete target to estimate the effect of a crash into a nuclear power plant containment building.

One of several dozen retirees who joined in the anniversary celebration, Adams said the first test was a fairly low-speed test. "It was an impact test on a bomb nose to check out the contact fuses. The sled got about three quarters of the way to the target and the front shoes failed. After that, the sled was airborne."

He paused, and with a wink and a nod, and to general laughter, added, "I don't think there have been any failures since!"

The many uncertainties in the risky, high-speed work have challenged the staff ever since, but successful tests have far exceeded unsuccessful ones over the years.

Tom Bickel, director of Sandia's Engineering Sciences Center, lauded the work done at the track over the past 50 years and cited its importance to Sandia's and NNSA's nuclear weapons mission: "He said the track has been "instrumental in our ability to

over the past years from a test-only based approach to a test approach with computation, and we continue to provide challenges to a new staff out here . . ."

Dave Bickel (no relation to Tom) managed the track for a total of 22 years during the period of 1963 to 1994. He recalled several major milestones in the track's history, including the big test in which a tractor-trailer was collided with a locomotive diesel engine. That test, designed to measure the survivability of nuclear shipping containers in catastrophic events, was a demanding setup and generated considerable interest. Some 600 people showed up to watch it, and the event was covered on television by the major news networks.

Dave Bickel also noted the famous F-4 test, in which an F-4 fighter aircraft was slammed into a

at very high speeds and a 2,000-foot track for testing very large items. The operation includes a large suite of advanced instrumentation capabilities for gathering data and a variety of high-speed still and video cameras.

Tom Bickel concluded the celebration with an invitation and a challenge to the attending retirees who pioneered so much of the sled track technology: "Don't be strangers to us," he said. "I know how much knowledge is resident between the ears [of you folks]. As much as we like to think we know everything nowadays, and that computers will solve every problem, that's not the case, so I'm always looking for a few good ideas — and those are not discriminated by age."

# NNSA Volunteer Raises Soldier's Spirits With Gift

Charles "Chuck" Dougherty, the Administrative Officer for the Office of Defense Nuclear Nonproliferation is a man of action, both inside and outside of the office. He manages personnel issues and other administrative matters for the \$1.3 billion dollar office and he is also a published author. "Chuck Dougherty's Running Washington: a Guide to 101 Washington Area Running Trails" was published by Vandamere Press in 1987.

More recently, Chuck's community volunteer spirit led him to assist in an effort to help a soldier who was seriously injured in Iraq. The contact for this effort grew out of his involvement as the assistant leader for his son's Boy Scout troop.

Another parent from the troop asked Chuck if he knew anyone with an old laptop to donate. He learned from the parent that her cousin, an Army Ranger who had recently lost both legs while on active duty in Iraq, was hospitalized at Walter Reed Hospital, and was very depressed.

Chuck started calling parents in the troop to see if they could raise funds for a new computer. Many were interested and ready to help. The soldier's cousin raised \$300 from people at her workplace, a local news service. The Boy Scout troop then agreed to contribute \$500 of hard-earned funds from its treasury. Within a week, Chuck and the cousin had raised \$1,495, more than enough for a brand new laptop for the soldier. It

was just what the doctor ordered, thanks to the activism of an NNSA employee.



Charles Dougherty

# LANL Advances The Art And Science Of Silica Aerogels

Aerogels are low-density, transparent materials used in a wide range of applications, including thermal insulation, porous separation media, inertial confinement fusion experiments and cometary dust capture agents. But for more demanding applications, their physical properties need to be enhanced.

So, scientists at NNSA's Los Alamos National Laboratory have recently demonstrated a novel method for chemically modifying and enhancing silica-based aerogels without sacrificing the aerogels unique properties.

Made of silica, one of the Earth's most abundant materials, aerogels are as much as 99 percent air, giving them not only the highest thermal insulation value and highest surface area, but also the lowest acoustic

conductivity and density of all known solid materials.

The aerogels' extraordinary thermal insulation ability makes them capable of withstanding temperatures in excess of a thousand degrees Fahrenheit. Because they are composed mostly of air, there is little solid content available for maintaining the structural integrity of the aerogel, making them brittle.

In research reported at the 228th national meeting of the American Chemical Society, laboratory scientist Kimberly DeFriend described a process for modifying silica aerogels. With the addition of a silicon monolayer, an aerogel's strength can be increased four-fold.

Los Alamos has recently begun to expand and advance its ability to synthesize and manufacture aerogels. This improved capability will allow

scientists to more closely study and improve their quality and it will help meet the laboratory's needs for inertial confinement fusion and high-energy-density physics aerogel targets.

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