Sandia LabNews
Vol. 56, No. 8 April 16, 2004
Managed by Lockheed Martin for the National Nuclear Security Administration
Sandia National Laboratories

Sandia researcher brings Bell Labs technique to wiring molecules

Julia Hsu establishes electrical circuits in the nano-realm

By Neal Singer

Attaching electrical wires to a chain of atoms is a lot harder than wiring a light bulb.

That may explain why Sandia researcher Julia Hsu's (1114) invited talk on creating electrical contacts for molecules attracted approximately 250

> *"[While] large changes in conductivity can be achieved with a single molecule . . . conductivity is profoundly affected by the way in which molecules are contacted."* **from The Industrial Physicist**

researchers at the American Physical Society's March Meeting in Montreal. The overflow crowd filled the seats and jammed the aisles of the too-small double room.

Single molecules could function as inexpensive, reliable chem/bio detectors, if an electrical signal could be made to flow through a molecule in a controlled manner. Such molecules can be designed to chemically bind to specific substances. Attachment of a target substance onto the molecule would then result in easily detectable variations in electrical output.

The American Institute of Physics' *The Industrial Physicist* magazine had briefly highlighted Julia in its December issue. The magazine noted that while "large changes in conductivity can be achieved with a single molecule," still "conductivity is profoundly affected by the way in which molecules are contacted." The article helped emphasize the need to return to pursuing more fundamental problems in molecular electronics after the journal *Science* had attacked the fledgling field in an article last year for claims of technological

(Continued on page 4)

Presidential dialogue

PRESIDENT GEORGE W. BUSH speaks with Sandia retiree Irv Hall during the president's March 26 visit to Albuquerque. Irv was invited because of his work with Habitat for Humanity. President Bush thanked him for being a volunteer. Irv says he told the president, "It is an honor for a man who went to school in a one-room school house to meet the president of the United States." Bush, during his speech, singled out Irv's work with Habitat. Sandia's next Habitat for Humanity project will break ground on April 24. For more information on volunteering or donating money or materials, contact Darlene Leonard (12650) at 844-8024.

(Photo by Dean Hanson, *Albuquerque Journal*)

(Published by arrangement with the Albuquerque Publishing Co.)

Standdown report offers recommendations, results in new security awareness effort for Labs workforce

Standdown Report Team releases 34-page report soon to be available to all managers

By Chris Burroughs

Security changes designed to raise workforce awareness are on their way to Sandia — most as a result of the November Safeguards and Security Standdown.

On March 30 the Standdown Report Team delivered the 34-page report to Labs President C. Paul Robinson, who concurred with the results. It will soon be made available to all managers to share with staff.

> *"Some of these concerns are being addressed with simple fixes. Others will take a while as we identify long-term actions."*

The report identifies concerns Sandians cited during the standdown and offers short- and long-term solutions to reduce potential security risks. A large table as an attachment contains the consolidated comments and questions expressed as part of the standdown.

"I am pleased with the report and recommendations it contains," says Ron Detry, Chief Security Officer and VP for Integrated Security Div. 4000. "It shows the thoroughness and thoughtfulness people gave during the standdown and that security is back in the consciousness of Sandians."

11,500 people participated

Some 11,500 people, including employees, contractors, and consultants, received at least 16 hours of security-related training from Nov. 16-26. All divisions submitted consolidated standdown reports that were analyzed by Centers 4100 and 5500, using data-mining software.

Terri Lovato, Level II Manager of Safeguards and Security Operations Dept. 4220, says most comments from employees focused on five areas of concern: access control, foreign interactions, prohibited articles, protection of classified material, and telecommunications. These concerns in most cases correspond to areas where the workforce experienced security incidents or infractions.

"Some of these concerns are being addressed with simple fixes," Terri says. "Others will take a while as we identify long-term actions."

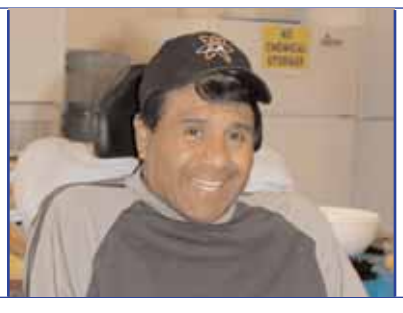
One of the first changes made increases security police officer presence at entrances to security areas. There they can identify prohibited items before they reach the limited area. Also, a foreign national request (FNR) decision diagram is being designed for FNRs.

A 'front door' to security

Coming soon will be a "new front door to security." A telephone hotline will connect callers who have security questions to individuals who can quickly provide answers to their questions or

(Continued on page 5)

Inside . . .



What's what

Plain English Campaign reported recently that in a poll of the most irritating clichés in the English language, "at the end of the day" is the most irritating. That is followed closely by "at this moment in time" and the ubiquitous use of "like" as if it were a form of punctuation. <www.plainenglish.co.uk/pressrelease.html>

Agreeing wholeheartedly, I went right to work on a letter praising the organization's effort to restore some majesty to the language by eliminating, or at least reducing, such reliance on clichés.

"I hear you," I wrote, "and at the end of the day, this is an absolutely, like, awesome example of thinking outside the box. Although it's not rocket science, at this point in time, to be perfectly honest with you, the fact of the matter is, with all due respect, we'll push the envelope and move the goalposts so we're all singing from the same hymn sheet in terms of an ongoing effort to prioritize. The bottom line, of course, is that our crack troops always see the glass half full (rather than half empty), and to be perfectly honest with you, can address the issue without putting themselves between a rock and a hard place."

But then I thought, Naaaa. . . maybe not.

* * *

While we're on the subject of wordsmithing, Mike Lord (6853) wrote from Yucca Mountain, "I'm not sure if road signs qualify for journalism, but the following street sign I saw in Al Khubar, Saudi Arabia, demonstrates the poetic nature of the Arabic language." In Arabic and English, it was a warning to drivers to watch for and be careful near pedestrians. It read: "Do not expose pedestrians to the dangers of your vehicle."

* * *

And if you're a purist, this mania we seem to have to "verb-ize" nouns is another maddening aspect of today's loosey-goosey lingo.

A colleague fumed recently about hearing a pitch on the radio for the retraining of people out of work — or for people who need to "re-career."

If I were an English instructor, I might be so aggravated by such liberties taken with the language that I would consider de-careering.

* * *

Hold it! Everybody knows the spam issue is out of hand, but it's now reaching otherworldly dimensions. I got an e-mail from Barry Goldwater, who has been dead for six years!

He was hustling sales of "the most expensive coin in the world" — the 1933 US Double Eagle $20 gold coin. But his death must have affected his reasoning power. He wanted to sell me the coin for just $19.95.

OK, so maybe it was a replica. But the offer came from Barry Goldwater! Surely you're impressed with that!

— Howard Kercheval (844-7842, MS 0165, hckerch@sandia.gov)

Dave Haaland's work honored with prestigious Coblentz Society Bomem-Michelson Award

The Coblentz Society has recognized Sandia Senior Scientist David Haaland (1812) with the prestigious Bomem-Michelson Award for his contributions to the advancement of vibrational spectroscopy.

The award, dedicated to the memory of Professor A. E. Michelson and sponsored by ABB Bomem, is presented annually to honor scientists who have advanced the techniques of vibrational, molecular, Raman, or electronic spectroscopy.


DAVID HAALAND

Dave won his award based on his seminal work regarding quantitative analysis of near and mid-infrared spectroscopy. As one colleague pointed out, David Haaland "is possibly the most important individual in the development of quantitative infrared spectroscopy."

His most influential work was published with Sandia co-author Edward Thomas in 1988 in two articles in *Analytical Chemistry*. These articles have been cited more than 800 times since then and more than 100 times in 2002-03.

Dave received the award and honorarium at the Pittsburgh Conference in March, followed by an award symposium honoring Dave and his research.

Dave received his PhD in physical chemistry from the University of Rochester in 1973. He has been at Sandia since 1972. In 1989, he was named a Distinguished Member of the Technical Staff, followed by promotion to Senior Scientist in 1998. He has held joint appointments with the University of New Mexico as Adjunct Professor of Chemistry, 1988-present, Adjunct Research Associate, University of New Mexico School of Medicine, 1993-2001, and Adjunct Professor of Molecular Genetics and Microbiology, 2002-present.

He has won previous awards for development of Chemometrics PC software (1991 with D. K. Melgaard, 1812) and for infrared emission analysis of thin-film dielectrics (1993, with T. M. Niemczyk, UNM). Dave and Ed Thomas (12323) were awarded the first Chemistry in Statistics Award from the American Statistical Association in 1991. Along with co-inventors, Dave received the New Mexico Inventor of the Year Outstanding Achievement Award for the noninvasive glucose monitor (1993) and the New Mexico Inventor of the Year Award for Reliable Noninvasive Measurement of Blood Gases (1994).

Sandia LabNews

Sandia National Laboratories

http://www.sandia.gov/LabNews

Albuquerque, New Mexico 87185-0165
Livermore, California 94550-0969
Tonopah, Nevada • Nevada Test Site • Amarillo, Texas •
Carlsbad, New Mexico • Washington, D.C.

Sandia National Laboratories is a multiprogram laboratory operated by Sandia Corporation, a Lockheed Martin company, for the US Department of Energy's National Nuclear Security Administration.

Ken Frazier, Editor 505/844-6210
Bill Murphy, Writer. 505/845-0845
Chris Burroughs, Writer. 505/844-0948
Randy Montoya, Photographer 505/844-5605
Nancy Garcia, California site contact. 925/294-2932

Contributors: Janet Carpenter (844-7841), John German (844-5199), Neal Singer (845-7078), Larry Perrine (845-8511), Howard Kercheval (columnist, 844-7842), Will Keener (844-1690), Iris Aboytes (844-2282), Michael Padilla (284-5325), Rod Geer (844-6601), Michael Lanigan (844-2297), and Michelle Fleming (Ads, Milepost photos, 844-4902). Dept. 12640, Manager: Chris Miller (844-0587).

Lab News fax 505/844-0645
Classified ads 505/844-4902

Published on alternate Fridays by Media Relations and Communications Dept. 12640, MS 0165

LOCKHEED MARTIN

Several local companies helping with Test Capabilities Revitalization project

The Test Capabilities Revitalization (TCR) stories in the March 19 *Lab News* should have recognized several local companies that designed and developed construction documents for the Thermal Test Complex Project in Area 3 and the Aerial Cable Site Improvements Project in Sol Se Mete Canyon.

Both projects were awarded to Dekker/Perich/Sabatini (DPS), which teamed with Bridgers & Paxton Consulting Engineers (B&P). DPS also provided the computer renderings of the facilities used in the March 19 articles.

"The design firms worked under tight deadlines, with multiple layers of oversight to create designs that met Sandia's functional and budgetary requirements," says Paul Schlavin, TCR Project Manager (10824). The design firms created innovative solutions to meet the unusually short design schedule. Solutions included creation of independent design teams for each project and formal "over-the-shoulder" review presentations to augment the traditional reviews.

DPS managed the Aerial Cable design team and provided architectural design services. B&P provided mechanical, electrical, and communications designs; Chavez-Grieves Engineers provided structural design; and Smith Engineering provided the civil design.

B&P managed the Thermal Test Complex design team and provided the mechanical, electrical, process controls, and communication designs. DPS provided structural and architectural design services, and Smith Engineering provided the civil design.

Other firms involved with these projects included Balis & Co. for construction costs and schedule development for both projects; Jacobs-Sverdrup, which provided computer modeling and consulting on thermal issues; and Architectural Research Consultants, which supported the initial programming efforts. *—Will Keener*

* * *

For the record

Steve Knudsen (6211), a gas well drilling technology expert, went to the Carlsbad/Sandia site to help following the gas well blowout March 11. His name was misspelled in an article about the blowout that ran in the April 2 *Lab News*.

The last few words in a March 5 *Lab News* article about the 2003 ethics survey were inadvertently dropped. The last sentence should have read: "In addition, Jennifer reports statistics, trends, and issues to the Sandia Audit and Ethics Committee, a subcommittee of the Governance Committee of Sandia's Board of Directors."

Combustion Research Facility team and partners measure car's particulate emissions driving on road

By Mike Janes

Using a unique laser-based, soot-heating technique, a team led by researchers at Sandia's Combustion Research Facility (CRF) has demonstrated the ability to measure "real world" particulate emissions from a vehicle under actual driving conditions.

While on-board measurements of gaseous emissions are routine, real-time particulate measurements have been far more elusive, yet are essential for validating federal emissions guidelines for vehicle compliance.

Laser-induced incandescence

Pete Witze (8362) recently collaborated with Artium Technologies, Chevron Oronite, and the National Research Council (NRC) Canada to demonstrate the feasibility of obtaining on-board measurements of vehicle particulate emissions using laser-induced incandescence (LII) technology. LII is a nonintrusive diagnostic technology that can perform "real-time" measurements of particulate emissions produced by internal combustion engines.

Sandia, Artium Technologies, and the NRC have worked together to develop the portable version of LII instrumentation that was successfully applied during this recent trial. Consequently, this new method may alter the way in which the automotive industry effectively gauges particulate emissions.

AS IT COASTS on a downhill grade heading into Livermore, this Volkswagen Jetta's vehicle and engine speed measurements are time-matched with LII measurements to obtain a synchronized data set correlating real-time particulate emissions. (Photos by Bud Pelletier)

During the past decade, CRF and NRC researchers honed the LII technique, discovered in the 1970s, with the NRC securing an important temperature-measurement patent that is key to the current measurement capability.

The most notable result during the recent tests, says Pete, was obtained during the coasting descent. "Although the vehicle speed and engine rpm were reasonably steady for the period from 470 to 600 seconds, the particulate emissions suggest that fuel injection cycled on and off intermittently," he says.

While the researchers believe the ideal fueling strategy would be to turn off injection for the entire descent, the vehicle is equipped with a catalyst that needs to be kept at its operating temperature.

The average particulate emissions measured by LII during this period were 8.4 ppb, as compared to 10-11 ppb during steady-state idle. This suggests that the engine control module has been programmed to minimize fuel consumption during a descent while maintaining idle-like particulate emission levels and an active catalyst.

Increasing environmental interest

The ability to measure on-board particulate tailpipe emissions is of growing environmental interest because of the desire to validate current US Environmental Protection Agency (EPA) vehicle certification procedures. These procedures, which have been the industry standard for more than 30 years, measure emissions using a chassis dynamometer and specify engine speed to be applied during testing. Because such tests do not replicate variables such as grade changes and weather encountered under actual driving conditions, the automotive industry expects dynamometer emissions testing to be supplemented with on-road measurements in the future.

THE RESEARCH TEAM with the Volkswagen Jetta test vehicle. From left: Will Bachalo and Greg Payne (Artium), Greg Smallwood (NRC), Pete Witze (Sandia's CRF), Gary Hubbard (consultant), Brian Graskow (Chevron), and Mike Fidrich (Artium).

In general, innovative new methods are needed to evaluate the effects of mobile source emissions — both from off- and on-road sources — on air quality, especially as the EPA and state agencies, such as the California Air Resources Board (CARB), update their mobile source emission models.

In conducting the tests, Artium's commercially available LII instrument and ancillary equipment were placed in the trunk and on one side of the rear seat of a 2002 Volkswagen Jetta with automatic transmission and a turbocharged direct-injection (TDI) diesel engine. An on-board diagnostics scan tool interface was used to access the vehicle and engine speeds for recording while the vehicle was driven on a test route in the Livermore valley.

These measurements were then time-matched with the LII measurements to obtain a synchronized data set correlating time-resolved particulate emissions with a variety of vehicle operating conditions that included city driving, freeway driving with entrance-acceleration and hill ascent, and coasting descent on a rural road.

Pete said another unique aspect of the LII measurement technique is that, unlike other systems, it does not require an operator to conduct the tests. For this and other reasons, he said engine manufacturers have proven to be "extremely interested" in LII.

Pete spoke on the topic of on-board particulate emissions at the Coordinating Research Council's 14th On-Road Vehicle Emissions Workshop on March 29 in San Diego.

Sandia CaliforniaNews

Airpower display catches Paul Robinson's eye

WOOSH! — The F-117 Stealth fighter, a B-2 stealth bomber, and the F-22 Raptor are caught in this single photo of a low-level flyover during the Rose Bowl parade in Pasadena, Calif. Sandia President and Laboratories Director C. Paul Robinson was feeling the thrill of hearing the Marine Corps Band playing our national anthem, followed by the sounds of the jets flying over. He clicked the shutter of his new digital camera and was pleasantly surprised to see the outcome.

Innovative medical and humanitarian devices displayed at Sandia-hosted media event

Joint US-Russian work on inflatable wheelchair seat, wound-healing bag, prosthetic leg, landmine detector, other devices explained

By Neal Singer

Faster ways to heal wounds, better prosthetic devices for amputees, and a detector that prevents injuries to humans from landmines by finding them first were presented in brief overviews to media on April 1 at Sandia's International Programs Building in Research Park.

Efforts coming to fruition

The five Sandia-led humanitarian and medical projects, with histories that stretch back several years and now are coming to fruition, have the common thread of involving former Russian nuclear weapons scientists in productive, useful businesses that help people. They also involve American companies that partner with the Russians.

The Sandia and Russian researchers were available to answer questions after the presentations, as were the American entrepreneurs. Sandia researchers present included Mark Vaughn, Deepesh Kholwadwala, Elaine Hinman-Sweeney (all 15222), and Keith Miller (9125).

Improvement after the first day

Hospital administrators from Mimbres Memorial Hospital in Deming, N.M., were available to talk about their experiences using one of the devices — a thin-plastic, high-oxygen bag — to help a patient heal. "You could see the improvement after the first day," said one administrator.

The news conference was part of a week of discussion among Sandia principal investigators, US private industry partners, potential investors, and researchers and executives from Spektr Conversion, a company made up of former Russian nuclear weapons scientists in the closed Russian city of Snezhinsk.

NOT EXACTLY A DAY AT THE BEACH — In foreground of the photo above, a mannequin in a relaxed pose demonstrates one arrangement of the wound-healing Numobag, which increases the amount of oxygen available for destruction of potentially lethal bacteria. In background, Keith Miller addresses an audience of media, Russians, Sandians, and entrepreneurs at the International Programs Building on life-saving Sandia projects. To Keith's left, Bob Martin (KRQE-TV 13) and his video camera captures the event for his station. The photo at left shows an arrangement of enhanced prosthetic devices jointly created by Sandia researchers, the Russian company Spektr-Conversion, and American entrepreneurs. (Photos by Randy Montoya)

Molecules

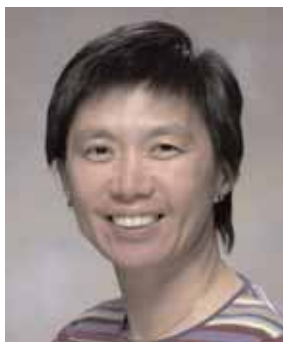
(Continued from page 1)

successes that the journal found dubious.

One problem was that earlier attempts to pass a current through a molecule foundered on the difficulty of attaching electrical nanocontact points to molecules. Electrical short-circuiting between the positive and negative contacts generally plagued device yields, and spurious electrical paths have often been misinterpreted as currents passing through the length of the signal molecule.

Julia's solution, brought with her from Bell Labs, uses a technique that resembles a child's printing set. It is called nanotransfer printing.

The molecules she uses have a chain of carbon atoms anchored by sulfur atoms at each end. These molecules form a monolayer on a gallium-arsenide substrate with one of the sulfur ends binding to the gallium arsenide. The carbon chains and the other sulfur end groups elevate above the substrate like a field of wheat rising above the ground. To the top of this raised field, Julia applies a soft silicone stamp covered by a gold film. The gold film is able to chemically bond to the raised sulfur atoms while remaining strong enough to form an otherwise unsupported canopy (something like the way an umbrella's fabric does not need to be supported at every point to form a surface), rather than dripping down to the substrate and shorting out the device.



JULIA HSU

This gold canopy and the gallium arsenide substrate form positive and negative contacts for the attached field of molecules.

Her method boasts a 97 percent success rate, she says, compared to less than five percent successful yield in devices that involved merely evaporating metals onto the stand-up molecules.

"This is still basic science, not a useful device yet," Julia says. "It does not yet have features such as integration with silicon or a separate gate to make a transistor. There are many technical challenges to realize these goals and many researchers are tackling these questions. What I am doing is laying the basic scientific foundation for this very promising but still emerging technology."

More work remains to be done, she says, to establish parameters for different metals and varying temperatures and pressures. She is building collaborations with researchers in 1100, 1700, and 8700 to establish a research program in this area within Sandia.

"This is still basic science, not a useful device yet. . . . What I am doing is laying the basic scientific foundation for this very promising but still emerging technology."

Mark J. Cardillo, executive director at the Camille and Henry Dreyfus Foundation in New York, exited Julia's talk smiling. Asked why, he said it was an excellent talk and then volunteered that "I've never had a better postdoc for being unafraid to get to the core of an issue, and I have had some very good postdocs." Cardillo was a former executive at Bell Labs, from which Julia recently emigrated to Sandia.

Julia will co-chair the fall meeting of the Materials Research Society in 2004.

Looking for child care? Summer info fair is April 27 at C-Club

Sandia's annual Summer/Childcare Information Fair will be Tuesday, April 27, from 11-4 p.m. in the Fiesta Room at the Coronado Club. The fair provides information on a wide variety of childcare options for the summer. Explora, Camp Invention, and many other summer camp reps will be present. Information on preschools, and child care centers for all ages will also be available, as will a variety of parenting information.

If you have questions or comments, contact Tama Nielsen-Trujillo at tmniels@sandia.gov.

Security report

(Continued from page 1)

will answer questions directly from a database of frequently asked questions.

Also on its way is the addition of a security e-mail hotline (security@sandia.gov). Employees may want to use the hotline to direct their security questions and concerns to a security expert and receive guidance. In addition a "question online subscriber-only newsletter" is being established. People who subscribe will receive an e-mail notice when new questions are answered in the newsletter, located on the standdown homepage.

More initiatives planned

Other security-related initiatives planned for the near future include:

• Implementing a corporate approach to security as opposed to a site approach. For example, at Sandia/California, people can't "vouch" others into the limited areas. At Sandia/New Mexico vouching is permitted. Policy will be identical at all sites, unless there is a compelling business reason for a difference. Procedures by which policy is implemented may be different because of such factors as site size and organization structure.

• Improving corporate process requirements to make them easier to read.

• Explaining security changes as they occur and communicating the reasons for the requirements.

• Improving training by providing an initial security briefing, a comprehensive security briefing, and an annual security refresher briefing for personnel with security duties.

• Investigating technology equipment that can be used to stop people from accidentally bringing their cell phones into limited areas. Center 4100 is evaluating a cell phone detection capability that should be ready for testing by the end of the fiscal year.

"The goal of each of these initiatives is to make it easy for people to do the right thing and difficult to do the wrong thing in the area of security," Terri says.

ON TARGET — A Sandia Security Police Officer shows his skills in a recent shoot-off to choose members of the Sandia pistol team. The five-member team will compete in an annual DOE-sponsored cmpetition at the Savannah River Site in Aiken, S.C., in early May. (Photo by Cal Smith)

Security Awareness Campaign to kick off May 5

Anytime, anywhere — **security** — it's **your** watch.

That's the theme of the new Sandia Security Awareness campaign that kicks off May 5 with a celebration at the Steve Schiff Auditorium.

"Our goal is to keep members of the workforce thinking seriously about security — about how they affect the security of the work they do — and to remind them to continue incorporating security into their daily lives at work and at home," says Ann Marie Griego (4222), Awareness Campaign lead. "This goal is reflected in our new motto. We're going to start with a full day of security-related activities that will get members of the workforce thinking about security."

Planning is underway for a similar event at the California site.

The campaign is a project of Security Education and Awareness Lessons Learned (SEALL) team. (See "SEALL's mantra" below.)

The May 5 event will carry a Cinco de Mayo theme and start at 10 a.m. Master of Ceremonies Reggie Tibbetts (4224) will introduce Ron Detry, Chief Security Officer and VP of the Integrated Security Div. 4000. Ron will give a general overview about some of the changes underway in security, followed by presentations by three individuals well-versed in security issues. They are Joseph Ruffini, a retired army lieutenant colonel and security expert; Lette Birn, a search and rescue expert; and Wayne Morris, an Operations Security (OPSEC) professional assigned to Wackenhut Services Inc.

From 3-4 p.m. Security Education Film Awards — similar to the Academy Awards — will be presented to people who helped make and starred in the humorous security awareness videos everyone watched during the security standdown. Bloopers will also be shown. Security-related exhibits and demonstrations such as decontamination foam and how to lock a classified safe will be available in the Bldg. 823 breezeway. Most other security functions will also be represented to answer any security related questions.

Mariachi and guitar music will be performed all day by Sandians. Members of Mariachi Sandia are Manny Trujillo (14153), Isidro Molina (1645), John Guillen (2523), Roque Gallegos (15341), Mel Chavez (2997), and Eloy Marquez (5734).

Reggie, who helped plan the event, says people will also be able to see a reproduction of the "World Famous Original Fighting Vehicle, the Batmobile," from the 1960s television series. Cast from the original molds, it is locally owned by Michael and Khristine Esch. The convertible will be on display at the event, weather permitting.

"What better way to illustrate the history of security than to have the Gotham City Cruiser present," Reggie says. "You'll be able to see all the original features of the Batmobile such as the Bat Phone, Bat Turbine, Bat Scope, and the Bat TV. This promises to be a fun and educational day. We hope everyone will take time out of their day to attend."

Throughout the day there will be free chips, salsa, biscochitos, and securitas (like margaritas but without the alcohol) available for participants. During the noon hour the Coronado Club will have Mexican food for sale outside the Steve Schiff Auditorium. There will be drawings for fun gifts throughout the day.

Another part of the Security Awareness Campaign will be a brown bag lunch series emphasizing issues brought up in the security standdown. The first topic, which focuses on reporting requirements related to foreign interactions, counterintelligence, personnel security, and security incidents, will be presented April 28, from 11:30 a.m.-1 p.m. in the Bldg. 823 breezeway.

— Chris Burroughs

About the May 5 speakers

Joseph Ruffini retired from active duty as an Army lieutenant colonel in 1995. He has more than 25 years of experience in infrastructure security, counterterrorist operations, operations security, and information warfare. He will talk about threats in today's world.

Lette Birn, a Denmark native who went to college and worked as a teacher in Germany, is involved in New Mexico's Ski Patrol and in search and rescue in the state. She is a canine search specialist whose K-9 partner over the last 11 years has been Guinness, a black lab. He recently retired and currently she is training Spenser, another black lab. She will talk about search and rescue efforts inside the Pentagon after 9/11.

Wayne Morris is a security professional assigned to Wackenhut Services Inc. He has provided direct support to the NNSA Nevada Site office and its OPSEC Program for the last 10 years. He will talk about identity theft.

SEALL's mantra: Right info, right audience, right time, right mechanisms

The Security Education and Awareness Lessons Learned (SEALL) team takes security seriously.

This group of people represents most of the Labs' security organizations or organizations having security-related functions, including Center 4200 security programs (e.g. Foreign Interactions, Protective Force, Operations Security, Security Incident Management Program, S&S Assurance, Classified Matter, Protection and Control, Personnel Security), Cyber Security, Counterintelligence, Technical Surveillance, Import/Export Control, as well as representation from Sandia/California, Human Resources, and the Line.

The SEALL team was formed about two years ago by Gene Marquez, Manager of Safeguards and Security Training and Reporting Dept. 4222, and members of his Feedback and Improvement teams.

"The team started with a small core group and has grown to nearly 20 members thanks to the leadership of Adele Montoya (4222), SEALL team coordinator and lead," says Gene.

"Our mission is to promote the integration and effectiveness of security awareness activities," he says. "We are working to do this by providing the '4Rs' to Sandia's workforce."

The 4Rs are:

• Right security information, to the
• Right audience, at the
• Right time, through the
• Right mechanisms

SEALL's goal is to have employees consistently take the correct security actions and make decisions that will result in desired performance. It is doing this through the combination of security education, security training, and security awareness.

Security education provides basic security knowledge through the new-hire comprehensive annual refresher briefings. Security awareness involves ongoing reminders about security basics and alerting employees in a timely manner to specific undesired security performance issues and trends with the goal of "righting performance." Security training involves training members of the workforce to the level of proficiency commensurate with their security roles and responsibilities.

"A major focus of SEALL's is this security awareness program, which reinforces Sandia's corporate security culture where every worker has a role in security, and security is second nature in how we conduct business," Gene says.

NNSA administrator Brooks talks about earth penetrator work, other aspects of 21st century nuclear stockpile

Senate testimony highlights administration's nuclear policy thinking

NNSA Administrator Linton Brooks testified before the Senate Armed Services Committee Subcommittee on Strategic Forces in March to discuss the Administration's views on nuclear policy, US nuclear forces, the nuclear weapons stockpile to support those forces, and ongoing work on implementing the 2001 Nuclear Posture Review (NPR).


LINTON BROOKS

Regarding that review, he noted that it reaffirms that nuclear weapons, for the foreseeable future, will remain a crucial element of US national security strategy.

"But, consistent with the changed international environment," he said, "the Nuclear Posture Review represented a radical departure from the past and the most fundamental re-thinking of the roles and purposes of nuclear weapons in almost a quarter-century."

Key elements of Nuclear Posture Review

Brooks highlighted three key elements of the NPR:

• The review established the need for a capabilities-based force to accomplish four distinct defense policy goals: to assure our allies of our commitment to their security; to dissuade adversaries from trying to match our capabilities; to deter any threats that do emerge; and, to defend against and defeat those threats that, for whatever reason, we do not deter.

• Instead of treating nuclear weapons in isolation, the review considered them as an integrated component of American military power, thus allowing us to achieve national security objectives through other means that previously could only have been addressed with nuclear weapons.

• Instead of treating the future as static and predictable, the NPR recognized that requirements could change and that US nuclear forces must be prepared to respond to those changes, including by increasing the fraction of the force that is deployed.

"Emerging threats could call for new or modified warhead development, or for providing additional warheads for force augmentation. A key measure of 'responsiveness' is how long it would take to carry out certain activities to address stockpile 'surprise' or deal with new or emerging threats. . . . "

In filling in the details about many aspects of the NPR and its implications for the nation's nuclear deterrent, Brooks described the administration's concepts regarding what he calls "a responsive nuclear weapons infrastructure." Here is an extended excerpt from that section of his remarks:

"Of the many new concepts in the Nuclear Posture Review, one of the most important is formal recognition that a robust defense R&D and industrial base — a key element of which is a responsive nuclear weapons infrastructure — is as important as strike forces or defenses in achieving our overall defense goals. The demonstrated capabilities of the defense scientific, technical, and manufacturing infrastructure, including its ability to sustain and adapt, provides the US with the means to respond to new, unexpected, or emerging threats in a timely manner. If we can employ this infrastructure to produce new or replacement warheads on a timescale in which geopolitical threats could emerge, or in response to stockpile "surprise," then we can go much further in reducing the standing stockpile and meet the president's vision of the smallest stockpile consistent with our nation's security. By 'responsive' we refer to the resilience of the nuclear weapons enterprise to unanticipated events or emerging threats, and the ability to anticipate innovations by an adversary and to counter them before our deterrent is degraded — all the while continuing to carry out the day-to-day activities in support of the stockpile. Unanticipated events could include complete failure of a deployed warhead type. Emerging threats could call for new or modified warhead development, or for providing additional warheads for force augmentation. A key measure of 'responsiveness' is how long it would take to carry out certain activities to address stockpile 'surprise' or deal with new or emerging threats. . . . "

Brooks also discussed an element of the NNSA's implementation of NPR that has been more controversial than others, the study of a so-called Robust Nuclear Earth Penetrator, or RNEP.

"The Nuclear Posture Review highlighted the importance of ensuring that the weapons complex can adjust to the changing requirements of nuclear deterrence in the coming decades. In FY 2005 . . . we propose continuing the Robust Nuclear Earth Penetrator feasibility and cost study now underway. Perhaps the single most contentious issue in our budget request is continued funding for the Robust Nuclear Earth Penetrator study. This study is to determine whether existing warheads — the B61 and the B83 — could be adapted without nuclear testing to improve our ability to hold at risk hardened, deeply buried facilities that may be important to a future adversary. I want to correct several misconceptions about this effort:

"There is a clear military utility to such a weapon, which is why the Defense Department asked for it to be studied. A classified report was submitted to this committee last year on this subject and remains valid.

"Despite this utility, we will move beyond the study stage only if the president approves and funds are authorized and appropriated by the Congress. We included funds in our out-year projections only to preserve the President's options. No decision will be made until the study is completed. The law is clear that beginning development engineering requires Congressional approval.

"Even if deployed, this weapon does not represent a change from our policy goal of deterrence. Deterrence requires we be able to hold at risk that which an adversary values. Our efforts to determine the potential effectiveness of an earth penetrating weapon reflect a continued emphasis on enhancing deterrence. Once again I refer you to the classified report submitted last year."

Brooks concluded his 5,000-plus-word prepared remarks by noting that "the United States will continue to lead the way to a safer world through the deep reductions in nuclear forces codified by the Moscow Treaty, through Nunn-Lugar, and other cooperative threat reduction efforts, and through other actions. At the same time, although conventional forces will assume a larger share of the deterrent role, we will maintain an effective, reliable, and capable — though smaller — nuclear force as a hedge against a future that is uncertain and in a world in which substantial nuclear arsenals remain. Our ongoing efforts to reduce the current stockpile to the minimum consistent with national security requirements, to address options for transformation of this smaller stockpile, and to restore a responsive nuclear weapons infrastructure are key elements of the Administration's national security strategy. Carrying out these efforts will pose no risk to critical US nonproliferation objectives."

Water, water everywhere — ***everywhere***

MAKING A SPLASH — Near-record rainfall in the early days of April brought welcome moisture to the parched Albuquerque area, but also brought more water into some storm drainage systems than they could handle. On the morning of Friday, April 9, *Lab News* associate Michelle Fleming, noticing the lake in front of Bldg. 811 where a street was supposed to be, grabbed her camera and took this photo.

Author Tom Reed's 'insider's account of Cold War' fascinates receptive Sandia audience

By Bill Murphy

While he was working in the White House during the Reagan Administration, author and Cold Warrior Tom Reed said during an April 1 Sandia colloquium, "It never really occurred to me that I was at the crossroads of history."

THOMAS REED

The White House assignment sounds glamorous, said Reed, who also once served as Secretary of the Air Force under President Gerald Ford, but the reality was that it very quickly became "just another day at the office."

"It felt like working at the insurance company. There were no guys with trumpets at the front door to welcome you in the morning. And when the president asked you to write a report about something, it was just another assignment from the boss."

He certainly didn't see his experiences as the stuff for a compelling anecdotal history of the Cold War.

That changed, though, when, in the wake of the collapse of the Soviet Union, a number of "quickie books" about the Cold War hit the bookshelves.

"Time after time, when I'd read these books and come across something I knew something about, I'd say to myself, 'Wait a minute. That's not how this happened. This is a bunch of bunk.'"

Reed, in thinking back over his career, realized he had had a front row seat to many of the events that marked the Cold War: In the 1950s, he was an Air Force officer with special weapons responsibilities; in the 1960s, he was a weapons designer working directly under Edward Teller at Lawrence Livermore National Laboratory and then a technical advisor to Calif. Gov. Ronald Reagan; in the 1970s, he was President Ford's Secretary of the Air Force; in the 1980s, he was an advisor to President Reagan and head of the high-tech National Reconnaissance Office.

He had seen a lot and heard even more. He realized that there must be lots of other folks — on both sides of the Cold War — who had seen and heard other bits of the story. If he could talk to them — and the access to Soviet archives and accessibility of former Soviet Cold Warriors made it possible to tell both sides of the story — he could put together a unique book, one that told the story not from the summit but from the trenches, not from the War Room in the Pentagon or the Kremlin, but from the flight line, the conning tower, the back room. That book became *At the Abyss: An Insider's Account of the Cold War*, published in March.

All of us, Reed said, "have very clear memories of [Cold War] events that never happened, while missing the tectonic plates shifting beneath our feet."

"Good job!"

For example, we all know that Stalin died of a stroke. Wrong. That's the official account, but Reed was able to piece together the real story, one that had been rumored but never fully documented. Stalin was poisoned — "with rat poison in his wine, appropriately enough" — by Lavrenti Beria,

SECRET POLICE chief Lavrenti Beria, shown here holding Svetlana Stalin in his lap, put rat poison in Stalin's wine. Stalin sits in the background here.

A 'homecoming'

Author Tom Reed, whose book, *At the Abyss: An Insider's History of the Cold War*, offers fresh insights into forgotten, unknown, and mistakenly "remembered" details of the Cold War, called his Sandia colloquium about his book "a homecoming." Reed said he first became fascinated with nuclear weapons in all their dimensions — technical, geopolitical, and historical — during an early Air Force assignment that brought him to Kirtland — and Sandia. That fascination largely shaped the subsequent parabola of his professional career.

"This isn't a speech," he told an audience of some 250 Sandians at the Steve Schiff Auditorium. "This is family. I appreciate you letting me come here and hang out for a few days, because I love it dearly."

the secret police thug who was also in charge of the Soviet weapons program. In fact, Reed said, American weaponeers (including Sandians) played a direct role in Stalin's death. After America's "Mike" test of a thermonuclear device, Beria knew that he would be on Stalin's hit list because the Soviet thermonuclear program was not yet mature.

"[Beria] knew he had to hit first. So you guys fired off Mike and Beria bumped off Stalin. Good job!"

Historians, Reed said, are increasingly recognizing that Eisenhower — far from being the *laissez faire*, rather bumbling figure he was often por-

PRESIDENT DWIGHT EISENHOWER (center) understood the role that technology must play in the Cold War. He is shown here in a 1950 luncheon meeting (before becoming president) with scientist E.O. Lawrence and other technical leaders. Also joining the lunch group is former president Herbert Hoover, at right.

trayed as at the time — was in fact, "a genius." It was Eisenhower, 30 years before Reagan, who decided that a combination of a nuclear deterrent and a thriving US economy would eventually bankrupt the Soviet Union, Reed said. "He was right."

Other highlights of Reed's colloquium:

When the Soviets shot down U-2 pilot Francis Gary Powers, flying over Sverdlosk at 70,000 feet, they also shot down two of their own pilots who were shadowing Powers in MiG fighters at 40,000 feet.

The Soviet weapons program took a huge toll on the Soviet people. Without the checks and balances, and the natural constraints and accountabilities that characterize a democratic society, the Soviet military didn't pay much attention to environmental issues. They would dump rad-wastes into a common pit without monitoring it very closely. One of these waste pits in the 1950s went critical and exploded, forcing the evacuation of hundreds of thousands of people downwind of the site. "In the West, we never heard a thing." It was only after the declassification of Soviet archives that the incident became known, Reed said.

On the Cuban missile crisis: "We all know it was dicey," Reed said. "It was dicier than we dreamed." Because Cuba was at the end of a long and tenuous command chain, Khrushchev gave the commanding Soviet general there the latitude to use his best judgment if his forces were attacked by the Americans. The Soviets, Reed said, had 98 nukes on the island. He said he is convinced that if the US had started hitting the Soviet emplace-

AIDES SHOW Soviet boss Nikita Khrushchev remains of the U2 plane piloted by CIA pilot Francis Gary Powers and shot down in Soviet airspace.The Soviets didn't display the remains of the MiGs they accidentally shot down during the incident.

ments, the general would have unleashed his weapons, which had the capability to hit targets from Miami to Washington. "If the Kennedy brothers hadn't kept their cool and restrained the military, the fat would have really been in the fire," he said.

A key outcome of Cuba was that both combatants in the Cold War realized that better protective controls over nuclear weapons needed to be designed and implemented. Both sides developed sophisticated PAL (permissive action link) technologies, dramatically reducing the chance of miscalculation, error, or a rogue element being able to launch a nuclear strike.

Unplugging the football

"We all know there were heroes in the Cold War; they include a lot of people in this room [the Schiff Auditorium] and corresponding people in the Soviet Union." They were the senior civilian officials and military officers in the US and the Soviet Union who controlled nuclear weapons. Because people on both sides of the Cold War were rational, cautious, and rightfully terrified of the consequences of a nuclear exchange, they were able to see their respective nations through the war without the nuclear sword ever being wielded. The Soviet General Staff, Reed said, went so far as to unplug the Soviet equivalent of "the football," the briefcase with the nuclear go-codes, during the last-ditch coup attempt at the twilight of the Gorbachev regime. The military, he said, didn't want opportunistic politicians to get their hands on the nuclear button in such unstable circumstances. They trusted the US leadership to use restraint during the Soviet turmoil. That was the last gasp of the Cold War.

BORIS YELTSIN makes his famous stand on the tanks surrounding the Soviet White House during the twilight of the Soviet Union. Little did he know that the military chiefs had unplugged the nuclear "football."

One of the key lessons of the Cold War, Reed said, is that "technology counts."

"Turning your back on technology is a very foolish thing to do," he said.

"We live at the edge of the nuclear abyss still," Reed said. "For the past several years we have been working with the states of the former Soviet Union trying to help them search down and secure their weapons grade materials.

"I believe the Soviets were very good at managing and inventorying their actual weapons, but they produced plutonium like coal and didn't keep very good records on it. I just know that there are a lot of jihadists with petrodollars out there conducting the same search."

Sandian Guylaine Pollock receives Women on the Move Award

Six other Sandia women nominated for prestigious honor

Guylaine Pollock of Advanced Information and Control Systems Dept. 5517 was one of 11 women receiving the YWCA Women on the Move Award April 1. Six others from Sandia were nominated.

Guylaine, who has worked at Sandia for 18 years as a computer scientist, was nominated by the Institute of Electrical and Electronic Engineers (IEEE) Albuquerque Section. She was selected from among 88 nominees. YWCA officials stressed the importance of Guylaine's contribution to Sandia, her service to the computing profession, her efforts on behalf of nonprofit New Mexico organizations, and her participation in community activities, including her assisting the elderly.


GUYLAINE POLLOCK

As part of the award Guylaine received a Women on the Move bronze sculpture created by artist Betty Sabo. The sculpture has been given to the awardees since 2001 to serve as a permanent symbol for Women on the Move. The statue represents all women, in all stages of life, reaching out to address the concerns of today and to touch the faces of tomorrow.

The six other nominees from Sandia and their nominators were:

• Christine Coverdale (15344), nominated by Christopher Deeney (1646)

• Lori Dotson (6874), nominated by Hong Nian Jow (6874)

• Susan Kitsch (10508), nominated by Bonnie Apodaca (10500) and Billie Weatherly (10510)

• Kathryn Knowles (6852), nominated by Andrew Orrell (6850)

• Anna Nusbaum (9612), nominated by Karl Wiegandt (9610) and Nanette Morton (9600)

• Colleen Wenk (10515), nominated by Bonnie Apodaca (10500), Billie Weatherly (10510), and Maryanne Heise (10508).

The YWCA of the Middle Rio Grande established the Women on the Move Awards program in 1985 to recognize women who have made significant contributions to their communities, businesses, and organizations. The award honors women from all walks of life who have a positive impact on others through their leadership and community service. This year marks the 20th anniversary of the Women on the Move program. Sandia has participated since the inception of the program and over the past 20 years the Labs has honored 246 women with nominations, 33 of who have been recognized by the YWCA as Women on the Move.

To be named a Woman on the Move, the nominees must be exceptional women who meet three criteria: They 1) demonstrate both leadership and commitment to healthy balance in their lives; 2) exhibit outstanding professional achievements and/or volunteer contributions; 3) reflect values of diversity, peace, and social justice promoted by the YWCA.

This year's event was co-chaired by Jackie Kerby Moore, Manager of the Sandia Science and Technology Park and a 2002 Women on the Move recipient, and Judy Zanotti of New Mexico First. Jackie also serves as vice president of the YWCA Middle Rio Grande board of directors. Sandians serving on the steering committee were Carmen Good (14031), Redd Eakin (12660), and Mariann Johnston (13021). Lighting for the evening was designed and coordinated by Gary Shepherd (9335).

Sandia and Lockheed Martin were among the major sponsors of Women on the Move. Sandia was a diamond sponsor this year; however the contribution of Gary, who brought his expertise and crew to the event, elevated the Labs and Lockheed Martin to a Platinum sponsor.

Sandia News Briefs

You can now check out job openings, bid for them via the Web

Starting April 19 regular employees will be able to bid on jobs, as well as submit a resume, via the new "Find a Job" web site (www-irn.sandia.gov/HR/Staffing/findajob/jobss.htm). This new capability will replace the Job Vacancy Bid Line. The phone line will no longer be the venue for bidding on jobs. You can bid from any computer that has Internet access. The Job Vacancy Line will still allow employees to listen to current job postings, request a fax, and listen to withdrawn vacancies and dispositions of past openings, but will not allow them to bid. The new method is part of the Integrated Enabling Services SMU effort to reduce hassles and make things simpler for employees.

Take Our Daughters to Work Day April 22

The Sandia Women's Action Network (SWAN) is sponsoring Take Our Daughters to Work Day — for girls age 9-15 — Thursday, April 22, this year. Refreshments will be served in the Steve Schiff Auditorium lobby during registration, 6:30-9:30 a.m., and an 8 a.m. opening general session there will be followed by a day of job shadowing. The registration form and participant information are available on the TODTWD website: www-irn.sandia.gov/HR/HomePages/3511/04todtwd.html.

Larry Bacon named Senior Member of IEEE

Larry Bacon (15333) has been elevated to the grade of Senior Member of The Institute of Electrical and Electronics Engineers. Senior Member is the "highest professional grade for which application may be made and requires experience reflecting professional maturity." Only 7.3 percent of all IEEE members achieve this grade.

Princess Jeanne neighborhood remembered

Do you remember Princess Jeanne Park, the shopping center, the schools, swimming pool, or the "gates?" How about people in the neighborhood? Perhaps you met neighborhood developers Dale or Jeanne Bellamah and have a story to tell about them? Princess Jeanne Neighborhood Association is collecting photos, slides, movies, booklets about the original houses, advertisements, and personal reminiscences for a 50th anniversary celebration May 15 and 16. The association is also taking contributions for a commemorative cast bronze memorial to be dedicated during the celebration. For more information, contact Diane Terry, 293-2099.

Lab News Reader Service information

The *Sandia Lab News* is distributed in-house to all Sandia employees and on-site contractors and mailed to all Sandia retirees. It is also mailed to individuals in industry, government, academia, nonprofit organizations, media, and private life who request it.

Retirees (only):

To notify of changes in address, contact Carol Wade, Benefits Dept. 3341, at 505-845-9705, e-mail cawade@sandia.gov, or Mail Stop 1021, Sandia National Laboratorties, Albuquerque, NM 87185-1021.

Others:

To receive the *Lab News* or to change the address (except retirees), contact Michelle Fleming, Media Relations and Communications Dept. 12640, at telephone 505-844-4902, e-mail meflemi@sandia.gov, or Mail Stop 0165, Sandia National Laboratories, Albuquerque, NM 87185-0165.

Employees:

To change the number of copies of the *Lab News* your Mail Stop is receiving please call Honario Anaya, Mail Services Team 10268-4, at 844-3796. (At Sandia/California contact the Mail Room at 294-2427.

Web Users:

The *Lab News* is on the Web at www.sandia.gov/LabNews.

Feedback

Any thought about security gate X-ray machines? Also, some streets are too 'fun' for pedestrian crossings

Q: *Has Sandia ever considered an X-ray baggage check machine? Yesterday, as I was leaving my building, a couple of guards were doing baggage checks. One officer grabbed my purse, pulled out my wallet and commenced to look through it and unzipped and looked through other parts of my purse. Is this a common practice? He also unzipped my lunch bag as well. I find this very invasive and not very professional. With all our high-tech equipment, one would think of a more modern way of checking bags that is not so invasive. Please advise.*

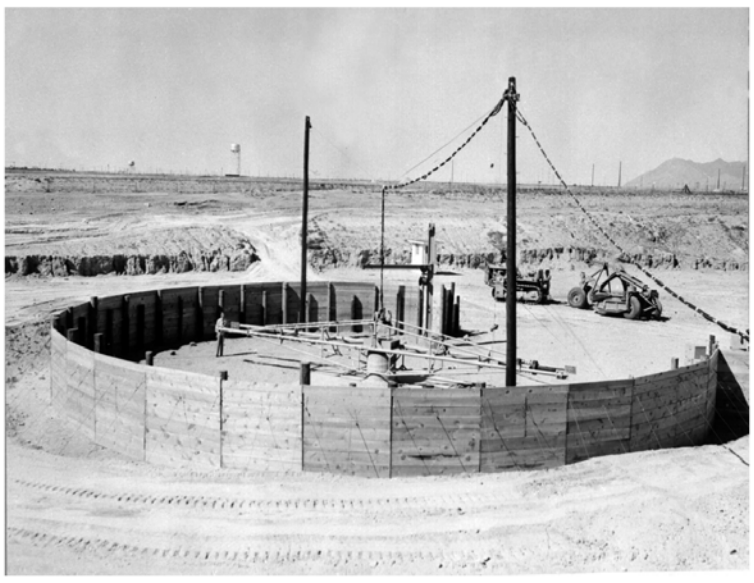
A: Yes. Sandia has considered the use of X-ray machines as used in our airports. In fact, such machines are used at the entry point to Area 5, where we are required to search all bags because Area 5 is a Protected Area. As you point out, this type of search process is modern and much less invasive than a manual search. Unfortunately, the cost of the equipment and the multitude of entry points to our tech areas make the cost of implementation prohibitive. So, unless the threat conditions increase to where we are required to always search all packages entering a tech area and we can greatly reduce the number of gates (with the resulting inconvenience), we will be unable to implement your suggestion. We recognize that inspection of packages and personal items can be offensive and we ask for your patience as we perform our duties to protect Sandians and the nation's valued assets. *— Ron Detry (4000)*

* * *

Q: *I just read a Feedback Q & A about the traffic lights at NCO bypass and 12th Street that are scheduled to be replaced in 2004. Will this include pedestrian traffic light controls and additional crosswalk stripping? This area is really fun to get across in heavy traffic.*

A: Thanks for the inquiry; there are no current plans for pedestrian controls or additional crosswalks at the intersection of NCO Bypass and 12th Street. Pedestrian controls would require a significant investment by the USAF for new poles, additional signals, and supporting infrastructure. The criteria for the placement of crosswalks are presented in the Manual of Uniform Traffic Control Devices. The current crosswalks meet these criteria; any additional crosswalks would not meet these criteria for providing safe crossings. *— Ed Williams (10864)*

1950s



Environmental testing: To meet its ordnance design and testing responsibilities, Sandia established a suite of environmental test facilities, including large, specialized versions of centrifuges, drop towers, burn facilities, shock equipment, and impact facilities such as sled tracks and air guns. In 1950, the first large centrifuge was designed and constructed by Sandia engineers south of the main technical areas at the New Mexico site.

The Soviet Union's detonation of its first nuclear weapon in August 1949 and the beginning of the Korean War later that year pushed Cold War and arms race concerns to the forefront of national security policy. Sandia continued to grow, adding a new site in Livermore, California, to support the new extension of the University of California Radiation Laboratory established there. New weapon designs were introduced to expand the U.S. stockpile and meet specific military needs. Warheads were introduced to arm missiles, a new delivery system available in this period. Modifications to concepts of bomb design reduced the maintenance and preparation required for the stockpile. The concept of the "wooden bomb" was that it would require little or no maintenance while it waited in the stockpile, available for use at a moment's notice. Laydown weapons offered the ability to deliver a bomb to a target and delay its detonation to a specified time. Both goals required significant new component design and testing to achieve durability and to withstand the shock of landing on a hard target. Sandia's efforts resulted in successful designs for both.

Nuclear testing: Sandia provided data capture, telemetry, and analysis support for U.S. nuclear tests in the Pacific and, beginning in 1950, at the Nevada Test Site. In October 1952, Operation Ivy demonstrated the feasibility of designing a deliverable thermonuclear weapon.

This page is a reproduction of the second in a series of new posters highlighting Sandia's decade-by-decade history since its origins in the mid-1940s. The posters are mounted on heavy glass for permanent display in the hallway outside the Labs' executive suite in Bldg. 802.

Mileposts

New Mexico photos by Michelle Fleming
California photos by Bud Pellitier


Don Schueler
40 7040


Marlin Kipp
30 9232


Frank Lasky
30 2523


Robert Miera
30 2995


Dave Campbell
25 1736


Keith Meredith
25 14402


David Bailey
20 10821


Jodi Case
20 3521


David Faucett
20 2665


Walter Gill
20 9132


Patrick Gronewald
20 6211


Willard Hareland
20 2954


Leonard Lorence
20 15341


Bobby Rush
20 2342


James Turner
20 2115


Charles Valerio
20 10844


Rick Contreras
15 5925


Sue Goudy
15 9224

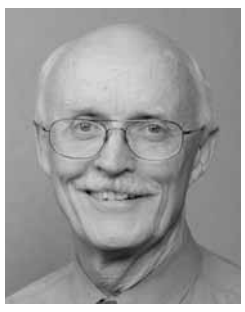

Roy Jorgenson
15 1642


Bob McInteer
15 12610

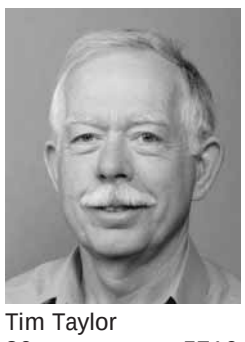

Monte Miller
15 4213


Tom Zifer
15 8762

Recent Retirees


Frank Bacon
36 2560


Doug Schuler
36 2952


Tim Taylor
36 5716


Jeff Philbin
33 12333


Gary Phipps
33 5713

Manager promotions

New Mexico

Daniel Carroll, from PMTS, Mission Analysis & Simulation Dept. 5526, to Manager, NNSA NDS Satellite Payloads Dept. 5733.


DANIEL CARROLL

Dan joined Sandia in April 1985. He worked in Reactor Safety for four years. He joined the Nuclear Explosion Detection System (NDS) project in 1989 and stayed for seven years.

Dan became a manager in 1992, but decided he wanted to return to technical work, so he stepped down from management and worked in Center 9200 for nine years developing ASCI code with the ALEGRA team. He recently returned to the NDS area.

After grad school, Dan worked three years with EG&G at Los Alamos National Laboratory on weapon diagnostics analysis at Nevada Test Site. He later joined LANL to work on nuclear weapon design codes and stayed there seven years until coming to Sandia.

Dan has a BS in physics from the University of Santa Clara and a PhD in physics from the University of Wyoming.

* * *

Roger Hartman, from PMTS to Manager, Second Line of Defense Dept. 6956.

Roger joined Sandia in September 1990 after retiring from the Air Force. Since joining the Labs, he has worked in the Military Liaison Department, where he was a field engineer; ES&H Program Office; and the Airworthiness Assurance Department, where he was project leader for Federal Aviation Administration support for new air carrier oversight system and matrixed to Center 5900 to work in the Advanced Atmospheric Radiation Equipment program.


ROGER HARTMAN

He has a BS in aeronautical engineering from the US Air Force Academy, an MS in aeronautical engineering from the Air Force Institute of Technology, an MBA from New Mexico Highlands University, and is a registered professional engineer.

Retiree deaths

Richard Aulta Poe (age 90) .....Feb. 10
Laudente H. Montoya (81).....Feb. 13
Gardner B. Green (79) .....Feb. 14
Evelyn J. Hughey (83).....Feb. 18
Lewis K. Jones (82).....Feb. 19
Edwin L. Jenkins (85) .....Feb. 19
James Karo (86).....Feb. 21
John A. Smith (72).....Feb. 22
Robert M. Halsey (83).....Feb. 26
Edward G. Paboucek (71) .....March 1
Elmer R. Pitts (76) .....March 3
Jesus J. Sanchez (64).....March 5
Lloyd Earl Lincoln (97).....March 5
Leo Henry Bressan (82).....March 7
Noel O. Kent (81).....March 8
Domingo B. Martinez (87) .....March 9

Sandia retiree Pat Long finds joy in small accomplishments after spinal cord injury in car accident

By Iris Aboytes

In his excitement to go on vacation the day before Christmas break, 2002, Pat Long (10255) thought he might have left his Kerberos password on top of his desk. He got back into his truck and returned to Sandia. His rented motor home awaited his return, but Pat did not make it back.

After discovering his Kerberos was indeed secure, he headed back home. Attempting to get on the I-40 westbound, he was hit by a Dodge Viper which caused him to roll over the embankment and onto I-40. No longer visible through the dust generated by the rollover, Pat was hit by another vehicle heading westbound. As the EMTs worked to get Pat out of his seatbelt in his overturned vehicle, he said to them, "Be careful, I think my neck is broken." Pat indeed had a broken neck. He would be in a wheelchair.

During surgery he had a plate inserted to stabilize his neck and prevent further injury to his spinal cord. After a week in the hospital and while being transferred to a rehabilitation hospital his collar bone was broken. He went home after seven weeks and on a routine doctor's visit it was discovered that the plate had moved and was in danger of severing his spinal cord. He had a second surgery. This time the plate was repositioned and a titanium cage inserted to provide additional stabilization. During his recovery from the second operation, he got an infection that resulted in a third surgery to remove infected tissue and another six-week hospital stay. Pat finally made it home for good the end of May.

"Sandians are wonderful," says Mona, "and it seems like they help because they want to, not because they have to."

The two weeks his wife, Mona, had planned on being on vacation instead became two weeks of attending various training sessions and meetings with health care professionals to learn to care for her husband.

"Pat goes to therapy and he is getting stronger every day," says Mona. When he first got out of the hospital he could not do anything for himself. Now he is feeding himself, operating his power chair, shaving, and doing other tasks to become independent. Pat has a full-time nurse who cares for him while Mona works. The nurse is primarily Spanish-speaking. Pat is teaching her English and she is teaching him Spanish.

Pat was at Sandia 17 years, first as a custodian and then in the motor pool. Many people at Sandia know him not as Pat but as the "Tire Guy" because he spent a big part of his days responding to trouble calls, such as fixing flat tires on Sandia vehicles. "The best part of my job was people interaction," says Pat. "That I miss."

PAT LONG with his wife Mona celebrating his recent retirement. (Photo by Michelle Fleming)

His friend Roy Flanders (10848) says Pat is very low keyed and subdued. He just goes about his work. "One time we were on the same bowling team," says Roy. "He surprised me because as quiet as he was, he would roll that ball down the lane so hard it would scare me that he would break the pins. He meant business. He was most improved bowler one year."

Roy visited Pat every day when he was in the hospital and still visits him several times a week. "It is not a big deal," says Roy. "It is on the way to my house. Besides it is so amazing to see Pat and his wife, they are not negative or bitter."

Members of the Metal Trades Council have been very supportive and generous with their time and talents. They have donated money, done yard work, installed driveway lights, repaired the patio, painted, and worked on general repairs in the family home. Dave Martinez and Andrew Silva (10845) installed the plumbing in the newly remodeled wheelchair-accessible bathroom. Dave and an MTC crew are scheduled to install a new cooler for the summer. Richard Parker (10843) put a roof on Pat's treasured dove cage.

"Sandians are wonderful," says Mona, "and it seems like they help because they want to, not because they have to."

Pat, 53, has recently retired and is grateful to Sandia and Sandians. "The benefits were needed and appreciated," says Mona. "We had enough things to worry about. "It was great not having to worry about that."

"Thank you," says Mona. "The words seem small when I know that the appreciation Pat and I feel is so much greater. It was wonderful, as the help was given freely. We did not realize how much people could care. This is definitely a life change for us. Every day we learn something together and find joy in small accomplishments."

Sandia teams with local businesses for annual School to World event

DR. EINSTEIN was one of 567 volunteers speaking to New Mexico 8th and 9th graders at the 5th annual School to World event on March 13. More than 2,200 students from 94 New Mexico schools attended the event and had the opportunity to talk one-on-one with professionals representing more than 150 different careers. (Photo by Bill Doty)