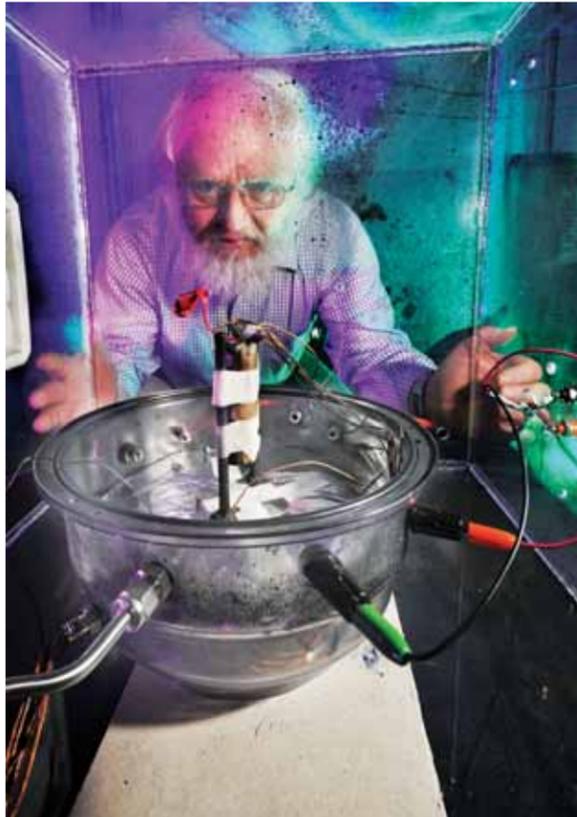


# Sandia researchers purposely damage batteries to see how much abuse they can take

Efforts are part of FreedomCAR program to get lithium-ion batteries into cars



ABUSING BATTERIES — Peter Roth prepares to blow up a battery to see how robust it is. The work is part of the DOE-funded FreedomCAR program. (Photo by Randy Montoya)

By Chris Burroughs

Researchers in Sandia's Power Sources R&D group have been driving nails into batteries, heating them to extreme temperatures, overcharging them, and putting them into some of the most adverse conditions possible to see how much abuse they can take before they blow up.

And for certain types of lithium-ion batteries the answer is a lot.

The research is part of the DOE-funded FreedomCAR program that is looking at lithium-ion batteries to be part of hybrid electric-gasoline powered vehicles and eventually plug-in hybrids.

Current hybrid vehicles run on gasoline and use nickel-metal hydride batteries as the energy storage device for the electric motor. The intent of the battery portion of the FreedomCAR program is to replace the older type batteries with safe lithium-ion batteries that have six times the energy density of lead-acid batteries and two to three times the energy density of nickel-metal hydride batteries.

"Lithium-ion batteries, generally found in laptop computers and power tools, have greatly improved over the past few years," says Peter Roth (2546), lead researcher for Sandia's FreedomCAR battery efforts. "In fact, they have improved so much that we expect to see them in hybrids later this year and possibly even in short-range plug-in hybrids within two years."

He notes the battery industry has made great strides in manufacturing safe, long-lasting, and affordable batteries. Sandia has played a role in assuring that the lithium-ion batteries are indeed safe and can oper-

ate for long periods of time.

One way Sandia researchers have helped determine how safe and long-lasting batteries are is by testing them in adverse situations to determine when and how they can fail or leak their electrolyte.

The Sandia research group obtains batteries and battery materials from research laboratories, like Argonne National Laboratory, and companies that manufacture

***"Lithium-ion batteries, generally found in laptop computers and power tools, have greatly improved over the past few years. In fact, they have improved so much that we expect to see them in hybrids later this year."***

— Peter Roth

and sell batteries. They then study the stability of the materials, their flame-retardant performance, high-temperature integrity of separators between the cathode and anode, and general thermophysical properties.

"We look at fundamental chemistry, wanting to discover the kinds of gases they emit when they are heated and explode," Peter says. "We also build smaller prototype batteries that once we get the chemistry right may eventually be built full size to go into vehicles."

(Continued on page 4)

## Sandia part of DOE project to provide clean energy in Hawaii

By Michael Padilla

With Sandia's help Hawaii will be greener than ever in a few years.

Sandia is part of a DOE-led effort to move the 50th state away from its reliance on fossil fuels and into a new era built around green technologies.

Recently DOE and the state of Hawaii signed an agreement to implement clean energy technologies that will increase energy efficiency and maximize use of the state's vast and abundant renewable resources.

The agreement establishes the Hawaii Clean Energy Initiative (HCEI), a long-term partnership designed to transform Hawaii's energy system to one that utilizes renewable energy and energy-efficient technologies for a significant portion of its energy needs.

The aim of HCEI is to put Hawaii on a path to supply 70 percent of its energy needs using clean energy by 2030, which could reduce Hawaii's current crude oil consumption by 72 percent. This type of clean energy transformation will continue to help sharply reduce greenhouse gas emissions.

Juan Torres (6332), Sandia lead for the initiative, says Sandia's role in HCEI is to provide technical advisement, analysis, and engineering support for clean energy projects, policy, and regulations.

"Sandia is serving as a bridge to help bring clean energy solutions to Hawaii," Juan says. "We are defining projects to make immediate impacts."

In the nearterm, Sandia will be leading a project to help the island of Lanai achieve its goal of using 100 percent renewables for all of its energy needs, Juan says.

Sandia also plans to help the island of Kauai incorporate renewables as part of its generation portfolio. In addition, Sandia will assist privatized military housing communities with the implementation of renewables to reduce their energy costs.

Hawaii currently meets about 90 percent of its

(Continued on page 5)

# Sandia LabNews

Vol. 60, No. 6

March 28, 2008

Managed by Lockheed Martin for the National Nuclear Security Administration



## Sandia and UNM presidents sign MOU to improve research opportunities

***"Elusive" strategic alignment sought***

By Neal Singer

A memorandum of understanding that sketches programs to improve cooperation between Sandia and the University of New Mexico — as well as the possibility of metrics to measure those improvements — was signed by Sandia President Tom Hunter and UNM President David Schmidly on March 18 in Sandia's Joint Computational Engineering Laboratory.

The ideal of a more strategic alignment between Sandia and UNM has proven elusive, said Sandia director Rob Leland (9300), who with Senior VP Al Romig (0004) and Div. 1000 VP Rick Stulen negotiated the agreement in detail with their counterparts at UNM.

The planning behind the signing ceremony seemed to promise something more.

"To this point, we've only had ad hoc relations with UNM professors and departments," said Rick. "We've had no framework for our institutional commitment. This agreement will change that."

Said Tom, "We want to bring together proximity and national need to help the state build an identity as a science center that will capture national attention. And we want metrics to measure that success."

The role of computation was prominent in the MOU because, Tom later said, "Things cyber are a big factor in current research."

Said Schmidly, "I love partnerships. It's a way I've always been. The key word is leverage. People who trust each other, work together, and put their individual cultures away to work in the culture created by the partnership can achieve more by that diversity than

(Continued on page 5)



MOU SIGNING — Sandia President Tom Hunter, left, and UNM President David Schmidly sign an MOU that sketches programs to improve cooperation between both institutions. (Photo by Randy Montoya)



### BioWatch Reachback

Since August 2007, a small group of Sandia/California researchers have been operating the BioWatch Indoor Reachback Center, an early-warning system designed to detect trace amounts of biological materials. Read about BIRC on [page 3](#).



### Women's Wall of Fame

Celebrating 2008 National Women's History Month, 20 women were recently inducted into Sandia Women's Wall of Fame by Sandia Women's Action Network (SWAN). Read about the wall on [page 5](#).



### Meet Arthur Ahr

At 76, Sandia retiree Arthur Ahr asks, "What's next?" Ahr retired from Sandia, went back to school, became an attorney, retires again and climbs Mt. Kilimanjaro. See story on [page 8](#).



# BioWatch Indoor Reachback Center contributing to Department of Homeland Security effort

**Capability established to provide scientific modeling support to decision makers responding to a bioterrorism event**

By Mike Janes

Say you're an emergency response manager for a high-profile transportation facility. Among other responsibilities, you're charged with overseeing the biodetection system at your facility and knowing how to respond if a detector goes off.

What if said detectors do, indeed, sound an alarm, suggesting something may be amiss? What's your next move?

Well, if the BioWatch Indoor Reachback Center (BIRC) continues to develop at its current pace, you might just pick up the phone and speak with a Sandian.

Since August of 2007, a small group of Sandia/California researchers have been operating BIRC. It's part of the Department of Homeland Security's BioWatch program, an early-warning system designed to rapidly detect trace amounts of biological materials at various public facilities across the United States. BioWatch

assists public health experts to determine the presence and geographic extent of a biological agent release, allowing federal, state, and local officials to more quickly determine emergency response, medical care, and consequence management needs.

BIRC's role, says principal investigator Nate Gleason (8114), is to provide scientific modeling support to decision makers responding to a public release of a biohazard agent. "Our goal is have a positive impact on the first response to such an attack," says Nate.

## Quick turnaround, key insights

The BIRC is prepared to deliver information to decision makers (typically, the emergency response personnel at high-traffic transportation facilities) within two hours of notification a biohazard release. The information includes important issues such the size and location of the release and recommendations as to where sampling efforts should be focused. The BIRC can also offer insight into whether the release is merely environmental in nature, or intentional, for example a terrorist attack.

A key component of BIRC is a database that contains hundreds of thousands of possible attack scenarios. When facility managers contact Sandia to report a bio-

hazard release, researchers immediately tap into the software's vast library to help determine the most likely scenarios. As additional information from the event becomes available — from sampling, for example — predictions can be refined after taking the new data into account. Nate wrote the code that serves as the software's framework, while computer scientist Ann Yoshimura (8116) developed the visualization software.

Sandia's BIRC is staffed by members of 8114, 8116, and 8125. Those researchers involved in the program have access to detailed models, plans, and schematics for a handful of major transportation facilities (BioWatch involves some 30 facilities from across the country). These materials, combined with decades of research and collaborative efforts with such venues as San Francisco International Airport, the Washington Metropolitan Area Transportation Authority, and other high-profile transportation hubs, help Sandia researchers make accurate predictions for facility owners that can help secure and protect their buildings.

"When a biohazard event occurs and a detector alarms, the response by facility managers is dependent upon a number of factors and key pieces of information," says Nate. "They need to know the source and intensity of the contamination. They need to know which parts of the facilities are likely contaminated, and which ones aren't. The BIRC is able to provide this kind of information."

In addition, Nate said, BIRC makes it easier for facility managers to determine whether released organisms are infectious or not. Though BIRC does not provide public health advice or information on specific organisms, it can specify where in the facility samples of the organism can be located for testing.



AS PART OF THEIR ANALYSIS FOR BIRC, Sandia researchers like Nate Gleason (foreground), have access to a vast database that contains hundreds of thousands of possible attack scenarios. (Photo by Randy Wong)

## Understanding, backbone for success

Sandia's unique understanding of facilities, says Nate, and the fast and accurate reconstruction of the event can help managers make more informed decisions about what to do.

A recently added component of BIRC is Sandia's own Building Restoration Operations Optimization Model (BROOM) technology. BROOM is a handheld, software-based restoration and decontamination tool that contains building maps and other information to simplify tracking and sample collection in a contaminated area. Surface sampling results transmitted to the BIRC can be input into BROOM, an approach that leads to more accurate contamination maps and more certain predictions.

BIRC's resources are also available to regional BioWatch jurisdictions to support planning and exercise activities.

Among BIRC's future goals is to develop an electronic "playbook" of sorts following a biohazard event that gives participating facilities even more useful information, such as step-by-step advice and recommendations on how facilities might respond appropriately or integrate BIRC information with their own response plans.



SANDIA RESEARCHERS Nerayo Teclamarium, Nate Gleason, and David Franco (left to right) review facility plans from a major US airport. (Photo by Randy Wong)

# Sandia California News

## Sandia researchers propose method for destroying recovered chemical munitions at much faster rate than current systems

By Mike Janes

In a development that could significantly speed up the process of destroying old chemical munitions, Sandia engineers have proposed an enhanced version of the Explosive Destruction System, a transportable device widely used by the US Army to safely neutralize and discard large quantities of chemical warfare material recovered from test ranges, burial sites, and other locations.

A Sandia white paper describes the High Throughput Explosive Destruction System (HTEDS) and addresses a vital need for remediation systems to destroy recovered munitions at a substantially faster rate than can be done with current methods. This need was highlighted in a recent report by the National Research Council.

The HTEDS, say Sandia engineers, could also be used at sites such as the Pueblo Chemical Depot in Colorado and the Blue Grass Army Depot near Richmond, Ky., to treat some stockpile munitions that require special handling, particularly those that have started leaking and are now stored in secondary overpack containers.

## EDS: proven, effective technology

Sandia's HTEDS concept builds upon the Army's Explosive Destruction System (EDS), which was designed by Sandia in the late 1990s to provide a self-

contained, transportable capability to remediate small volumes of nonstockpile chemical munitions at recovery sites. The EDS has proven to be a flexible, capable, effective system and has achieved wide acceptance by public and regulatory agencies. Among other successes, the EDS destroyed sarin nerve agent-filled bomblets at the Rocky Mountain Arsenal near Denver and mustard-filled 75-mm projectiles at Spring Valley in Washington, DC. A 2005 study by Sandia also confirmed EDS' ability to safely destroy biological agents.

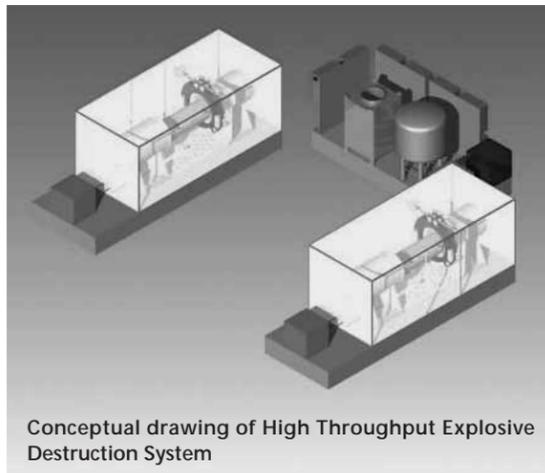
The Non-Stockpile Chemical Material Project's current inventory of remediation systems, says Brent Haroldsen (8125), includes the EDS and other technologies. Though the systems have performed well,

they were all designed to handle only very few items at a time.

Sandia's proposed HTEDS promises to optimize already proven EDS technology to process up to 60 munitions daily, increase the size of the munitions that can be treated, and make improvements to instrumentation and automation. The transportability of the EDS, as well as its proven explosives access and treatment processes that have achieved public and regulatory acceptance, would be maintained with the HTEDS. The proposed HTEDS, says Brent, could be at the prototype stage and ready for testing as early as 2010.

## HTEDS could play a role

The EDS was designed for recovered nonstockpile munitions but is also well suited for handling unusual stockpile munitions. Although these munitions constitute only a small fraction of the stockpile, they require special handling, which can slow the operation of the treatment facility.



Conceptual drawing of High Throughput Explosive Destruction System

# MESA receives DOE award for excellent service

By Michael Padilla

The MESA project can add one more award to its trophy case.

DOE Secretary of Energy Samuel Bodman has selected the MESA project team as recipients of the Secretary's Achievement Honor Award.

The Honor Awards represent the highest internal nonmonetary recognition that DOE employees and contractors can receive for providing exceptional service to the department and the American people.

This inaugural round of the awards program generated a number of nominees from across the DOE complex. MESA was one of the first recipients of the award. Bodman will present the honor awards April 8 in Washington, D.C.

The award states: "In recognition for demonstrating outstanding project management expertise and successfully completing the SNL MESA microelectronics facilities (MicroFab



DOE SECRETARY OF ENERGY SAMUEL BODMAN has selected the MESA project team as recipients of the Secretary's Achievement Honor Award. (Photo by Bill Doty)

and MicroLab) and construction of the Weapons Integration Facility (WIF) ahead of schedule and

under budget."

The MESA integrated project team consisted of technical experts from NNSA/SSO and Sandia staff with responsibility for nine project functions: project management, project controls, construction management, ES&H, financial controls, testing and inspections, document controls, procurement, and risk management.

The team completed the microelectronics facilities (MicroFab and MicroLab) in FY2007 and dedicated the Weapons Integration Facility in August 2007. The overall project is 98 percent complete, was three years ahead of schedule, and \$40 million under budget while maintaining the original scope.

Bill Jenkins (8420), MESA project manager, said the MESA project kept green in mind during the entire project.

"With the goal of improving our environment and saving energy/resources over the facilities' lifetime, the MESA laboratories were designed with LEED [Leadership in Energy and Environmental Design] sustainable design," he says.

The MESA MicroFabrication Facility was recently awarded LEED certification and represents the first microelectronics facility in the world certified by the US Green Building Council. MESA facilities were also designed with modern force protection and antiterrorism features to protect engineers and scientists in the mission critical microelectronics and weapons integration facilities.

## Battery research

(Continued from page 1)

Peter says that some of the newer batteries, like the new lithium/iron phosphate ones used in handheld power tools, are extremely resilient and less reactive when subjected to extreme conditions, unlike other types of batteries.

These are the type of batteries the FreedomCAR program is seeking, particularly for plug-in hybrid electric vehicles (PHEV). A PHEV is a regular hybrid that operates both on gas and a battery but has an extension cord. It can be filled with gas at the gas station and also can be plugged into any 120-volt outlet for all-electric driving. It's almost like having a second fuel tank that is used first — only it is filled up at home.

Industry experts predict that plug-ins that can run 10 miles on all electric are two to three years away while plug-ins that can run 40 miles on all electric are three to four years away.

Plug-in hybrids make it essential that batteries be completely safe since they will be sitting in people's



EXPLODING BATTERY

## Research report basis of battery test standards

Besides testing batteries under abusive conditions, Sandia researcher Peter Roth is helping establish national lithium-ion test standards.

Several years ago the Society of Automotive Engineers adopted battery test procedures published in a Sandia research report as its own standard. Peter is a member of a society committee that is updating the manual. Committee chair is Dan Doughty, former manager of Sandia's Advanced Power Sources R&D Department.

garages while they recharge.

Lithium-ion batteries that will go into vehicles will be similar to computer laptop batteries. One main difference is there will be "a lot of them," Peter says.

The first hybrids using lithium-ion batteries will be on the market later this year. Mercedes-Benz has announced that it will shortly launch the S400 BlueHybrid. After that, it will launch the S300 Bluetec Hybrid, a diesel car that is combined with a lithium-ion battery. Also, General Motors plans to introduce a 40-mile plug-in hybrid with lithium-ion batteries in 2010.

**Lithium-ion team members:** Peter Roth, Dave Johnson, Craig Carmignani, Lorie Davis, Jill Langendorf (all 2546).

## Mission Hope: Teaming to build hope in the fight against cancer

By Jan Kohler (6482)

Dick Fate (6486) speaks a few times a year to anatomy students at Eldorado High School about the effects cancer has on patients and their families.

He asks the girls to get into groups of three, where they talk and giggle for a moment before Dick tells them that statistically one of the three will face cancer sometime in her life. They are eye-opening statistics because they're true. He then asks the boys to get into groups of two. The boys learn that their statistical chance of facing cancer is even worse — one in two.

For the rest of his talk, Dick has no problem keeping the students' attention.

Nearly everyone at Sandia has been assaulted in some way by cancer, either firsthand or by a relative or close friend who has battled it. April is Cancer Awareness Month, and Sandia will team with the University of New Mexico Cancer Center (UNMCC) and People Living Through Cancer (PLTC) to hold a charity fundraiser called Mission Hope in April for cancer patients and their families.

Div. 6000 VP Les Shephard opens the first of five lunchtime presentations (on four Wednesdays and one Tuesday) at Steve Schiff Auditorium. Events include four Sandians' survivor stories, demonstra-

tions, research updates, and life after cancer:

**Wednesday, April 2, 11:30 a.m.**

- Dick Fate — rare and recurring cancer; advice; and learning to walk on a prosthetic leg
- Jim Stephens (6482) — impact of prostate cancer

- Linda Lovato-Montoya (3654) — breast cancer
- Dr. Ed Cazzola (3300) — the role of caregiver for a spouse with cancer

**Wednesday, April 9, noon**

- Dr. Chuck Wiggins, UNMCC — cancer basics

**Tuesday, April 15, noon**

- ACTIVE (After Cancer Treatment: Involved, Vocal & Engaged) by PLTC — "Intimacy in Relationships"

**Wednesday, April 23, 11 a.m.**

- On Borrowed Time: PLTC cancer survivors demonstrate art and dance

- Local humorist Bill Resnik — "Dare to Laugh"

**Wednesday, April 30, 12:15 p.m.**

- Dr. Melanie Royce, UNMCC — Clinical Trial review, "Hope through Research"

Cancer Awareness Month at Sandia will spotlight the urgency for a cure and ways Sandia can join UNMCC and PLTC in the fight. Donations can be made through these websites: [www.irsandia.gov/hope](http://www.irsandia.gov/hope), [www.pltc.org](http://www.pltc.org), or [www.cancer.unm.edu](http://www.cancer.unm.edu).

**MESA DOE team members:** Jeanette Norte, Roke Muna, Will Ortiz, Shah Jaghoory, Robert Jones

**MESA Sandia employees and contractors:** Gilbert Aldaz, Ivory Alexander, Mateo Aragon, Bill Balassi, David Bailey, James Beals, Michael Cieslak, Bryan Drennan, Rhonda Dukes, Jon Eberhart, Dan Fleming, Chris Hall, John Harding, Karen Higgins, William Jenkins, Ronald Jones, Karen Keyworth, William Kitsos, Michael Kupay, Ernie Limon, Donald Losi, Frank Martin, David Plummer, Jennifer Plummer, Ed Sanchez, Mark Schaefer, Krista Smith, Michael Street, Gary Yuhas

## Staff promotions

**Henry Abeyta** from senior manager, line of business director, Global Security Dept. 6900, to director of that same center.

**Ronald Farmer** from PMTS, Nuclear Reactor Facilities Dept. 1381, to manager, System & Software Quality Engineering Dept. 12341.

**Kerry Kampschmidt** from manager, Legal Business Development Dept. 1700, to director of that same center.

**Mark Lee** from PMTS, Semiconductor Material & Device Science Dept. 1123, to manager, CINT Science Dept. 1132.

**Reggie Tibbetts** from team lead, Facilities Approval Team Dept. 4234, to manager, Information Security Dept. 4234.

**Kenneth Buck** from team lead, Design Definition Dept. 8948, to manager, Engineering Services Dept. 8247.

**Devon Powers** from PMLS, Business Analysis Budget and Planning Dept. 8521, to manager, Public Reactions and Strategic Communications Dept. 8528.

**Margaret Quinn** from PMLS recruit staff and University Partners Dept. 8524, to manager of that same department.

**Carl Skinrod** from DMLS, Business Analysis Budget and Planning Dept. 8521, to manager, California Site Business Office Dept. 8521.

## Retirements

Retiring and not seen in *Lab News* pictures: Ella Sam (10264), 33 years; Carol McLain Phelps (2625), 25 years; Theresa Garley (9535), 29 years; Bernard Jacksits (2736), 34 years; Janice Jacksits (2736), 24 years; Genevieve Corona (5736), 28 years.

# Women's Action Network unveils 2008 Wall of Fame

By Iris Aboytes

Celebrating 2008 National Women's History Month, 20 women were recently inducted into Sandia Women's Wall of Fame by Sandia Women's Action Network (SWAN). Honorees were selected for their professional and community contributions.

Before the 1970s, the topic of women's history was missing from general public consciousness. To address this situation, the Education Task Force of the Sonoma County (California) Commission on the Status of Women initiated a "Women's History Week" celebration in 1978 and chose the week of March 8 to coincide with International Women's Day.

In 1981, Sen. Orrin Hatch (R-Utah) and Rep. Barbara Mikulski (D-Md.) cosponsored the first joint congressional resolution proclaiming a "Women's History Week." In 1987, the National Women's History Project petitioned Congress to expand the celebration to the entire month of March.

This year's honorees are uniquely different and uniquely alike as they work to keep Sandia's mission in their sight. The women were recognized in five different categories: Earning Recognition, In the News, Key Contributions, Serving Our Communities, and Lasting Career Achievements.

The posters are located in the Bldg. 800 hallway. Can you guess who the woman is who grew up in Panama, is multilingual, and trained as an artist in

Florence? She learned to ask why not, before she learned why. Perhaps you would like to identify the woman who enjoys the 3Rs — reading, racing, and rodeo. Do you know the musician who is a violinist in the Albuquerque Philharmonic Orchestra?

Are you best friends with the inductee to the Whitworth College Heritage Gallery Hall of Fame? She was head coach of the championship women's volleyball team. Bet you are best friends with the mother of three doctors. Do you recognize the woman who would like to go sailing to distant lands?

These are just some little tidbits of information about the women who were selected this year to Sandia Women's Wall of Fame.



TWENTY WOMEN were recently inducted into Sandia Women's Wall of Fame by Sandia Women's Action Network. Here Bobby Griffin, left, and Emilio Lopez (both 4827) look at this year's honorees in Bldg. 800. (Photo by Randy Montoya)

Go to [www-irn.sandia.gov/hr/eeo/swan/](http://www-irn.sandia.gov/hr/eeo/swan/) for more information on SWAN.

## Hawaii

(Continued from page 1)

energy needs through imported oil refined into gasoline for transportation and diesel for electricity. Because of its location, Hawaii's gasoline and electricity prices are typically the highest in the nation, says Juan.

Alexander Karsner, DOE assistant secretary for energy efficiency and renewable energy, and Kevin Kolevar, DOE assistant secretary for the Office of Electricity Delivery and Energy Reliability, have committed DOE technical and policy expertise and capabilities to help demonstrate reliable, affordable, and clean energy technologies in Hawaii.

"With an abundance of natural resources and environmental treasures, Hawaii is the ideal location to showcase the broad benefits of renewable energy at work on an unprecedented scale," says Karsner.

"Hawaii's success will serve as an integrated model and demonstration test bed for the United States and other island communities globally, many of which are just beginning the transition to a clean energy economy."

DOE will work with Hawaii to further the potential of its natural resources, including wind, sun, and bioenergy resources. DOE will engage experts in clean energy technology development to help Hawaii to launch several projects with public and private-sector partners that target early opportunities and critical needs for Hawaii's transition to a clean energy economy. Projects include designing cost-effective approaches for the exclusive use of renewable energy on smaller islands and designing systems to improve stability of electric grids operating with variable generating sources, such as wind power plants on the islands of Hawaii and Maui.

Other DOE-led projects that are part of this agreement include expanding Hawaii's capability to use locally grown crops and byproducts for producing fuel and electricity and assisting in the development of comprehensive energy regulatory and policy frameworks for promoting clean energy technology use.



CHARLIE HANLEY, manager of Solar Systems Dept. 6335, checks out a photovoltaic system at Sandia. Recently DOE and the state of Hawaii signed an agreement to implement clean energy technologies that will increase energy efficiency and maximize use of the state's abundant renewable resources. (Photo by Randy Montoya)

## This year's honorees

### Lasting Career Achievements:

Autumn Higgins (1381)  
Wendy Cieslak (1010)  
Davina Kwon (8770)  
Peggy Warner (9532)

### Key Contributions:

Ann Campbell (5220)  
Wendy Clayton (6753)  
Karen Devine (1416)  
Theresa Lovato (4220)

### Serving Our Community:

Wendy Amai (6472)  
Julie Bouchard (6325)  
Pauline Bruskas (10224)  
Jo Cunningham (10221)

### Earning Recognition:

Elaine Raybourn (6345)  
Carla Scott (9537)  
Bobbie Williams (2454)  
Seethambal (Sita) Mani (5719)

### In the News:

Donna Djordjevich (8116)  
Leslie Phinney (1513)  
Christine Roth (1825)  
Beverly Silva (1717)

## Sandia UNM signing

(Continued from page 1)

either individually can do."

UNM's interests, he said, "are to see [our joint] research grow, move into the marketplace, address national needs and those of New Mexico, and —" he paused for emphasis — "impact the success of our students."

Al, who preceded Tom and Schmidly at the podium, pointed out areas of mutual interest in which joint research could be beneficial.

According to Al, MOU goals include securing external funding for research projects in computing and information infrastructure that leverage the alignment's connection to LambdaRail — a new, high-speed version of the Internet.

Also highlighted by the MOU, said Al, are informatics (an emerging area of information research with applications in data-rich fields like biology, ecology, climate science, and homeland defense), and cognition (targeting rapid advances in health sciences and national security).

Among the possibilities of the MOU would be a joint recruiting program to use mutual strengths to entice good researchers to the region.

Another objective is to improve opportunities for top-quality students from UNM to find placement at Sandia, and to assure that the university is viewed as one of the most competitive suppliers of top talent to the nation.

Creation of the Institute for Science and Engineering Studies (ISES) is expected to support these themes through joint recruiting and appointments, as well as shared access to laboratory facilities and intellectual property agreements.

UNM already holds the largest dollar value of joint contracts of any university with Sandia.

# Mileposts

New Mexico photos by Michelle Fleming  
California photos by Randy Wong



Gregory Kolb  
30 6335



Keith Miller  
30 10248



Ernest Salas  
30 10265



Ron Stoltz  
30 8302



Bruce Criel  
25 10520



Joseph Gustwiller  
25 5413



Frank Lesperance  
25 10267



Richard Lucero  
25 6753



Michael Pedroncelli  
25 5338



Ann Riley  
25 10222



John Ludwigsen  
20 5431



Jim McCoy  
20 2125



Justine McNabb  
20 5993

# Recent Retirees



John C De Baca  
33 1523



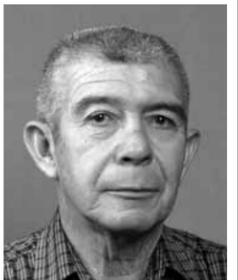
Jerry Miller  
32 2715



Pauline Dobranich  
28 310



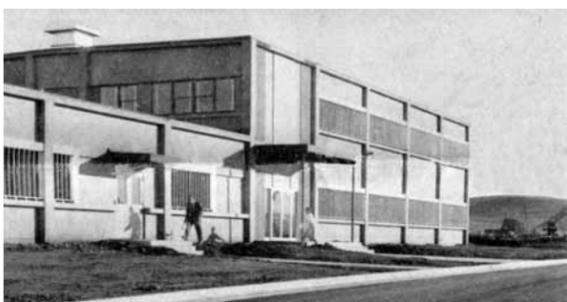
Arlee Smith  
27 1128



Leonard Vigil  
27 10267



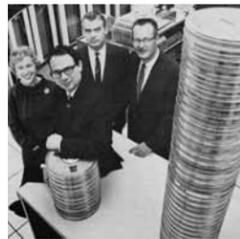
**50 years ago . . . Livermore Branch marks its second birthday** with steady growth. Since the Atomic Energy Commission announced that Sandia Corporation was opening a branch at Livermore, Calif., the branch has grown rapidly. Starting as a department,



BEFORE AND AFTER views of plant construction of the Livermore Branch show some of the progress made in two years since the branch was opened.

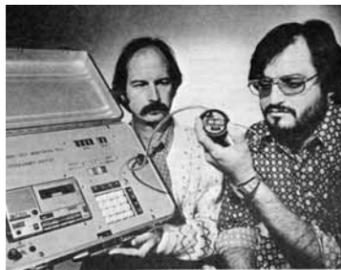
the branch has grown to a superintendency and then to a vice presidency. Personnel has jumped from a handful assigned to spearhead opening of the branch to an enrollment now standing at 275 and increasing daily. **Several Sandia Corporation employees are currently participating in AEC experiments at the Nevada Test Site**, which are being conducted to assure the nuclear safety of weapons during shipment and storage. The tests do not involve stockpile weapons, but are experiments intended to determine which among several designs afford maximum assurance of safety in handling and storage of operational weapons. **About 150 employees of Sandia Corporation are expected to participate in Hardtack**, the forthcoming nuclear weapons test series at Eniwetok Proving Ground. The Sandia employees are among the 400 to 500 employees of the Atomic Energy Commission and Los Alamos Scientific Laboratory who will be present.

**40 years ago . . . A new payroll computer program is expected to save \$54,000 annually.** The benefits and savings are the result of converting a computer program used to process Sandia's payroll from 9-PAC language to a new FORTRAN format. The new program effectively uses advanced techniques in data processing. **The electrical energy needed to light a 100-watt light bulb for six minutes** could produce a mechanical shock equivalent to accelerating a one-pound object from a standstill to 850 miles per hour. With this small amount of energy, a Livermore Laboratory test facility simulates that shock by means of electromagnetic repulsion techniques.



FROM 93 TO 19 REELS of magnetic tape is one of the reductions made possible in the changeover of payroll computer programs.

**30 years ago . . . An electronic seal which readily reveals tampering** has been designed and built at Sandia Laboratories. A series of laboratory tests on working models is now underway before 10 of the seals are sent to the International Atomic Energy Agency (IAEA) for field test. A major goal of IAEA, is timely detection of attempts to divert nuclear material from peaceful uses to the manufacture of nuclear weapons in Nuclear Non-Proliferation Treaty countries. **A new Lightning Arrestor Connector has been developed** to direct or nearly so, lightning strikes that can cause malfunctions of weapons instrumentation — and possible major destruction. If lightning zapped a weapon through the external skin connector, the LAC would short out on the surface of the conducting web and current would go to case ground — thus protecting internal components downstream from cabling.



SELF-MONITORING electronic seal and accompanying programmer-verifier unit are displayed by Jim Campbell and John Aragon of Systems Studies and Engineering Division.



ED EHRMAN, one of the principal developers of the Lightning Arrestor Connector, shows the internal weapon cabling and cutaway.

**20 years ago . . . The first firing — several weeks ago — of Hermes III**, a gamma-ray simulator that's part of the Simulation Technology Laboratory (STL) complex, was successful. The significance of this house-sized machine, whose purpose is to generate a light-



HOUSE-SIZED HERMES III gets some maintenance attention between test shots.

ning-like bolt of electrons that produces a flood of radiation activities for the pulse-forming section of the machine, is to test current weapons systems — especially their electronics — for radiation vulnerability. **Collectively called the Portal and Perimeter Monitoring System**, TOSI includes tamper-indicating fences



SANDIA'S TOSI (Technical On-Site Inspection) facility is a test-bed for several means to verify the number of "treaty-limited items" (certain types of nuclear-tipped missiles, for example).

and surveillance cameras, a vehicle-weighting scale, sensors that measure a vehicle's size and shape, and data acquisition and authentication capabilities.

**10 years ago . . . In his March 19 testimony to the Strategic Forces Subcommittee of the Senate Armed Services Committee**, Paul Robinson gave a real world example — Sandia's responsibilities to design and produce neutron generators — to illustrate how DOE's ASCI and ADaPT initiatives "are already helping us improve the performance of our stockpile responsibilities."

# At 76, Sandia retiree Arthur Ahr asks, 'What's next?'

*Retires from Sandia, goes to school, becomes an attorney, retires again, and climbs Mt. Kilimanjaro*



By Iris Aboytes

Arthur Ahr retired from Sandia with 30 years of service in January 1991. He wasted no time in trying to figure out what he was going to do next. "Becoming an attorney was something I had wanted to do since high school," he says. "Life and responsibilities changed my course for a little while."

Arthur enrolled at the University of New Mexico School of Law the same year he retired. "My three years were packed solid with law classes, research, and paper preparation," he says. "It was not easy, but with determination I just kept moving forward. I planned ahead to take summer classes so I would not be overloaded in regular semester classes. My wife Pat and I went to Guanajuato, Mexico, in the summer of 1992, where I took classes in immigration law and Mexican law."

He was awarded his law degree in May 1994 and passed his bar exam on his first try in October of that year. For 11 years he worked for AARP from January through April as a volunteer tax preparer during tax season.

After Arthur became an attorney, he assisted senior citizens for little or no fee for 10 years. "I provided a wide range of nonlitigation services such as wills, trusts, and property transactions," says Arthur.

"I am now an inactive attorney, he says. "A tumor on my pituitary gland caused me to retire and give up an active schedule." Arthur had surgery, and eight months later he began training for a trip to climb Mt. Kilimanjaro.

"In early 2007, I watched *Volcano Above the Clouds* on PBS," says Arthur. "That rekindled my long interest in climbing Kilimanjaro. Mt. Kilimanjaro is in northeastern Tanzania at 3 degrees south of the equator. The peak of Kilimanjaro, Uhuru, is at 19,340 feet (5895 meters). It is the highest point on the African continent, the highest volcano on any continent, and the highest freestanding mountain in the world."

"If I was ever going to do it, I better go soon," he says. It did not seem like a good idea for Arthur to go alone so he enlisted his son Andrew and his son-in-law Jack Greenberg.

He had a year, so he began to get in condition for the climb. He walked five to seven miles a day, three days a week. At the gym, he worked to strengthen his upper body. Weekends were spent climbing the Sandias.

On Jan. 21, 2008, Arthur, his son, and his son-in-law left for Kilimanjaro. Their actual climb began on Jan. 24. On day three, Andy had difficulty breathing during the night. "I could hear the gurgling in his chest," says Arthur. "By early morning, he needed oxygen to breathe. A jeep was requested, and Andy was taken down to the hotel."

"We continued our climb and reached the peak of Kilimanjaro on Jan. 31," says Arthur. "I wore my heavy coat, goggles, and heavy gloves. The day was cloudy bright. My position was behind the lead guide. We started out gradually going up, then steep, then very steep. The guide cut

footholds with his ice ax as we moved from snow to ice. At the top it was warm and glorious. Our trip was blessed. The sun was shining and there was very little snow around. Our then seven-person group that included Brad from Seattle, Pia, his sister from Wisconsin, Jim, Steve, and Rudy, Minnesota farmers, and Jack and I linked arms and walked to the peak together."

Since Kilimanjaro is a national park, park ranger huts are located at different parts of the trek. You sign their book going up and going down. This is to identify

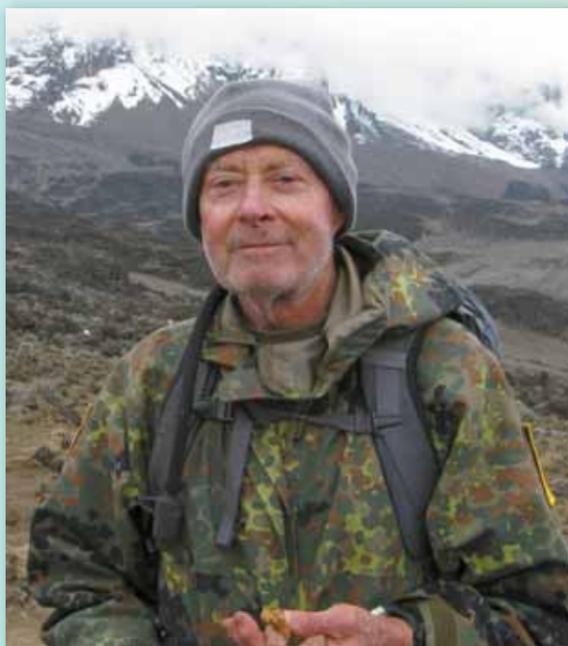
the whereabouts of people on the mountain. "At one of the stops we met with a group of German climbers," says Arthur. "One of them told me that he was 68 years old. I did not tell him I was 75. I will be 76 on March 27."

On the first day when the guides introduced themselves, the group was told they would be addressed by their first names. "The guide in charge, looked at me and told me that during the trip I would be called 'Babu' which means 'revered one,'" says Arthur. There had not been anyone as old as 75 on any of his prior trips. He told me he intended to make sure I got to the peak."

Arthur is going to take time to rest and will decide what he wants to do next. He and his wife Patricia have already gone down the Amazon, and visited Antarctica, the Holy Land, Egypt, China, and Russia.

"As I think back, climbing Kilimanjaro was a dream come true," says Arthur. "It still seems like a dream. Did I really do that?"

What will "Babu" do next?



TIME OUT — Arthur takes a moment to enjoy a snack and drink some water during a rest stop.



SAFETY FIRST — A belt around the waist and hooked to a rope made it safer to climb.



A JOB WELL DONE — Arthur poses with the guides as he holds his certificate of completion.

## SANDIA SAFETY SQUAD

