



Exceptional service  
... to the nation,  
to the community

**ECP campaign  
runs Oct. 8-26**

# Sandia LabNews

Vol. 59, No. 21

October 12, 2007



Managed by Lockheed Martin for the National Nuclear Security Administration

## Sen. Pete Domenici says goodbye; Labs says thank you



Photo by Randy Montoya

In an emotional day for friends and colleagues from around the state, New Mexico's senior senator, Pete V. Domenici, on Oct. 4 announced his intention to retire from the US Senate at the end of his current term, which runs through 2008. Domenici made the announcement before a crowd of hundreds of supporters at St. Mary's Catholic School in downtown Albuquerque, which he attended as a boy and which his sister now heads as principal. Domenici, who was sent to the Senate by New Mexico voters in 1972, has served in that body longer than any other New Mexican.

During his tenure, Domenici has established a reputation as a tireless advocate of American science and technology, a stalwart supporter of New Mexico's two national laboratories, and a passionate champion of the rights of Americans with mental illnesses.

Under his leadership, the labs — both Sandia and Los Alamos National Laboratory — have seen their missions grow to include a focus on national security challenges from energy and water concerns to infrastructure protection and homeland security in its broadest sense.

Upon learning of Domenici's decision, Labs Director Tom Hunter said, "Breakthroughs in nanotechnology, alternative energy, and homeland security would not have been possible without his leadership in establishing the infrastructure and capabilities needed to support these emerging technologies.

"The nation is clearly a better place because of his service in the Senate. We will no doubt be better because of his actions over the remainder of his term. Each of us is a better person because we know him and have had the pleasure of his company and working with him."

## Z rides again

**Test 'shots' signal reopening of large versatile accelerator**

By Neal Singer

Sandia's Z machine, the world's largest producer of X-rays, shook the ground in Tech Area 4 last week for the first time since July 2006 when the 22-year-old facility was gutted to undergo a complete refurbishment at a total project cost of \$90 million.

Z has been overbooked in recent years with requests for experiment time from national labs, universities, and the international community. The facility is in demand because of Z's capability to subject materials to immense pressures, compress spherical capsules and produce thermonuclear fusion reactions, fire objects much faster than a rifle bullet, and produce data for models of nuclear weapons effects — as well as, more arcanelly, create the conditions surrounding black holes in space. Given its complex mission, it was time for a more modern Z.

The improved version is capable of firing more often, at higher energies, and with improved precision.

The new facility — optimized for both z-pinch and material properties work — will increase the strength of its electrical pulse from 18 million amps to an anticipated 26 million amps. The facility also now offers improved control over the shape of its electrical pulse for better reproducibility as it enables new experimental regimes.

A z-pinch is so named because the large current passing in the vertical direction — the Z direction in cylindrical geometry — creates a magnetic field that pinches together

(Continued on page 7)

## Sandia hydrogen sensor follows unusual technology transfer path

**H2scan commercializes sensor with broad industrial appeal**

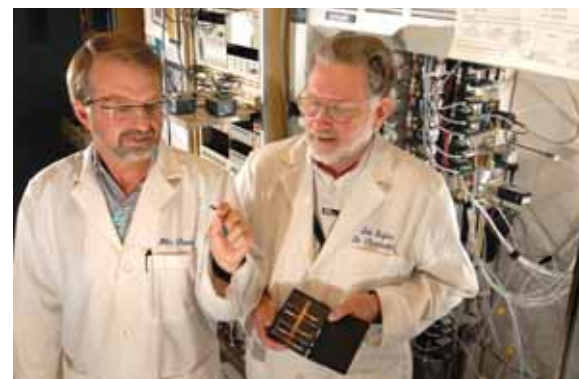
By Chris Burroughs

After more than a decade of research and development, a hydrogen sensor invented by Sandia researchers is soon to find its way into petroleum refining, hydrogen production, chemical industries, chlorine production, nuclear waste monitoring, and fuel cells.

The sensor, named by Sandia the Wide-Range Hydrogen Sensor, followed an unusual technology transfer path that in 2006 won it the coveted Federal Laboratory Consortium (FLC) Award for Excellence in Technology Transfer. The technology has been successfully commercialized by the Valencia, Calif.-based company H2scan through a license agreement and a cooperative research and development agreement (CRADA).

Retired Sandia researcher Bob Hughes (1714) led design efforts of the sensor — the only one of its kind to offer both low-range and high-range real-time hydrogen measurement capability on the same chip. It virtually eliminates false readings and extends the time between calibration, making the sensor an ideal candidate for a variety of government and commercial applications.

"The sensor is unique because it was the first to put a field effect transistor (FET) and a resistor on the same pencil eraser-size chip," says Bob.



RESEARCHERS Mike Thomas (1716, left) and Bob Hughes (ret.) work with the Wide-Range Hydrogen Sensor, developed at Sandia and commercialized by H2scan after a complex tech transfer process.

(Photo by Randy Montoya)

"The combination of the two gives it the ability to sense a range of hydrogen concentrations — from large amounts down to parts per million."

### Tech transfer path

Bob and Kent Schubert, currently manager of MicroDevice Technologies Dept. 1723, were awarded the original patent on the sensor in 1994. Two years later the technology was licensed to a

(Continued on page 4)



### Les Shephard interview

Div. 6000 VP Les Shephard leads the Labs' Energy, Resources and Nonproliferation SMU. He sat down recently with the *Lab News* to discuss some of the biggest challenges facing the nation and how his team is addressing them. The interview begins on page 5.

### Also inside . . .

- Microfluidic platform detects biotoxins . . . . . Page 3
- More Open Enrollment information . . . . . Page 10
- Sandia ECP program marks 50 years . . . . . Page 11
- Understanding niobium and tantalum. . . . . Page 12
- MESA wins green building recognition . . . . . Page 14
- City launches Family Advocacy Center . . . . . Page 16

# What's what

It was announced a few days ago that there'll be a new twist when your Kerberos password comes up for renewal in the future.

Up to now, when Kerberos passwords came up for renewal, we'd pick something with at least some semblance of pronounciability, even if the pronunciation was recognizable only to us individually. With the new plan, that thin thread to reality pretty much goes away.

Under a DOE mandate, new passwords will include a special character – such as &, \*, #, \$, etc. Probably not a problem, since there'll be a mix of letters, numbers, and symbols. Retaining a mix is a relief, because if it got to the point of including a number of symbols, your Kerberos password might begin to look like a string of cartoon profanity.

And I was reminded that, ultimately, it didn't work for ☩, who had to give up and go back to being just plain old Prince.

\* \* \*

On page 1 in this edition of *Lab News*, you'll find mention of Sen. Pete Domenici, New Mexico's longest-serving-ever US senator. He's been a great champion of Sandia and the other nuclear weapons labs, and his announcement Oct. 4 that he will not seek reelection for a seventh term was a shock.

It's a testament to his skill, knowledge, and expertise that the announcement of his retirement drew expressions of regret along with praise for the quality of his years of service – to the nation as well as to New Mexico. While you might expect to hear no regrets from Democrats over his decision to retire, the praise came from Democrats as well as Republicans.

\* \* \*

A recent question here about the origin of the term "Cowboy Blue" drew a couple of quick responses. If you missed it, and haven't otherwise encountered it, "Cowboy Blue" is code used during an emergency drill to indicate that a real emergency has occurred.

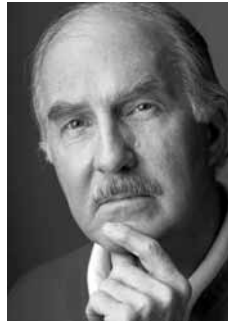
Bruce Berry (6461) called and explained that it originated with Gwen Gorman, who before retiring, was involved in emergency planning. The emergency operations group needed a term unlikely to occur in common conversation to let other emergency operations folks involved in a drill know that all participation in the drill should stop so the real emergency could get all the attention.

She came up with "Cowboy Blue" based on the color of the Dallas Cowboys' uniforms. Needless to say, Gwen was a Cowboys fan.

Diana De La Rosa (4137) also called. She said Y-12 has an equally colorful term for the same situation – October Red.

Taking a musical cue from such colorful code, if we at the labs needed a theme song during this time of budget uncertainty and its implications, we could pretty understandably adopt *Blue Bayou*.

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



HOWARD KERCHEVAL

## Homeland Security Conference set for Oct. 15-17

### Putting together pieces of the terrorism puzzle

Police in Afghanistan are among the many to benefit from Sandia's ongoing co-sponsorship of the Homeland Security Conference to be held this year Oct. 15 to Oct. 17.

"A lot of information is shared at the international level," says Ron Fernstedt, retired Utah deputy sheriff and former Special Forces officer, who has worked for the past three years as an advisor/mentor to the Provincial Chiefs of Police in Iraq and Afghanistan.

Thanks in part to information gained at the conference, he has helped teach a Kabul provincial chief about how to best protect and patrol borders.

"Terrorism is an information-age problem. Our main advantage, if we have any, is to share information from conferences as best practices," Fernstedt says. He will be among the presenters at this year's 7th annual conference, to be held at the Albuquerque Marriott Hotel, 2101 Louisiana Boulevard N.E.

Other speakers will include Henry Crumpton, ex-CIA operative and former U.S. State Department terror coordinator, and Thomas S. Davidson II, a senior military intelligence analyst and expert on border and security issues. Topics include:

- Identifying and discussing emerging threats,
- Highlighting cutting edge technological resources,
- Developing interdisciplinary partnerships,
- Interoperable communications, and
- International gangs.

"This conference is important because it brings together people who have different pieces of the terrorism puzzle. We share resources and expertise to help cover each other because we have common interests and problems," says Robert Bunker, who attends the conferences here each year. He is a Los Angeles-based adjunct professor in national security studies at California State University-San Bernardino and a professor of unconventional warfare at the American Military University in Manassas Park, Va. "This conference is a great venue for reaching out because you can gain important knowledge outside your operational area."

### Deadline change to submit classified ads for Oct. 26 issue

Please note there is a deadline change for classified ad submissions for the Oct. 26 issue of the *Lab News*. If you wish to run an ad in the Oct. 26 issue, the deadline will be noon on Thursday, Oct. 18 instead of noon on Friday, Oct. 19. This change is only for the Oct. 26 issue.

## 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.

Bill Murphy, Editor ..... 505/845-0845  
Chris Burroughs, Writer ..... 505/844-0948  
Randy Montoya, Photographer ..... 505/844-5605  
Mike Janes, California site contact ..... 925/294-2447  
Michael Lanigan, Production ..... 505/844-2297

Contributors: John German (844-5199), Neal Singer (845-7078), Stephanie Holinka (284-9227), Howard Kercheval (columnist, 844-7842), Iris Aboytes (844-2282), Michael Padilla (284-5325), Julie Hall (284-7761), Rod Geer (844-6601), Patti Koning (925-294-4911), Michelle Fleming (Ads, Milepost photos, 844-4902), Darrick Hurst (intern, 844-8009), Dept. 3651 Manager: Chris Miller (844-0587).

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

Published on alternate Fridays by Media Relations and Employee Communications Dept. 3651, MS 0165



## Make a difference Today



Campaign runs Oct. 8-26

### \$2 per pay period provides:

- Screenings for breast cancer, heart disease, and osteoporosis for one woman with no health insurance.
- A backpack filled with weekend meals for 18 underprivileged children.
- At 23¢ per meal, almost 209 meals for hungry men, women, children, and seniors.

### \$3 per pay period provides:

- One year of support and education for a stroke survivor and their family caregivers.
- One year of job mentoring and training to increase self-sufficiency for a woman transitioning from welfare to the work force.

### \$4 per pay period provides:

- One year of educational and career programs for at-risk youth.
- One week of childcare for a child from a low-income family.

### Matthew O'Brien joins Sandia as CFO and Div. 10000 VP

Labs Director Tom Hunter has announced that Matthew O'Brien will assume the role of Chief Financial Officer and VP of Business Operations Div. 10000 effective in early November. Matt is currently director of Finance and Business Operations for Lockheed Martin Air and Joint Command and Control Division in Colorado Springs.

"Matt's strong financial and business background and his prior experiences with DOE, the military, and national labs make him the right choice to lead this division," Tom said in making the announcement. "We're delighted to have him on the Sandia team."

Responding to Tom's announcement, Matt said, "I'm eager to join Sandia and help contribute to the fulfillment of its missions. I look forward to meeting the entire team and getting under way."

Tom also extended his appreciation to Jennifer Crooks for her leadership and support as acting VP of Div. 10000. Jennifer will return to her prior position as controller and director of Controller and Pension Plan Center 10500.

# Sandia researchers to develop portable microfluidic platform for rapid detection of biotoxins

By Mike Janes

Of all the threat scenarios facing emergency responders around the country, the release and spread of a dangerous biotoxin in a large public space is one of the most troubling.

The reason is simple. Though early diagnosis of biotoxin exposure is important for consequence mitigation and the key to saving lives, no current method exists for the quick, efficient detection of such poisonous agents.

That could all change one day soon, as researchers at Sandia/California have secured funding from the National Institute of Allergy and Infectious Diseases (NIAID) to design and engineer a small, portable microfluidic device that will offer rapid detection of biotoxin exposure in humans. In addition to speed, the device promises to offer high sensitivity, the capability to detect both presymptomatic and symptomatic markers, and ease of use.

The NIAID, part of the National Institutes of Health (NIH), has committed \$3.2 million to the five-year project. Sandia is leading the effort in collaboration with B.R. Singh at the University of Massachusetts at Dartmouth and Steve Binder at Bio-Rad Laboratories. Anup Singh (8321) is the principal investigator for Sandia.

## Device designed for point-of-care and point-of-incident settings

Instead of sending those suspected of being infected with a biotoxin — spectators at a sporting event who have been contaminated by a terrorist release, for example — to a medical facility where lab results could take days or weeks, Anup says a lightweight, portable device would allow onsite emergency personnel to draw blood samples and make a rapid determination as to the degree of exposure. Those in need of treatment can then be monitored, and countermeasures can be immediately executed at the facility to mitigate further damage.

“It could be a firefighter, a paramedic, or simply a primary care practitioner who might use this device one day,” says Anup. “The only stipulation is that the device’s end user will need to be authorized and trained in drawing blood, though that could change eventually. In the not-so-distant future, a more accessible and readily available specimen such as saliva might be able to diagnose toxins.”

Currently, says Anup, the technology to quickly test individuals for biotoxin exposure does



BIOCHEMIST DAN THROCKMORTON (8321) prepares to add a sample to the prototype diagnostic device. After Dan adds the sample, computer-controlled electronics direct a series of sample analysis steps. Laser-induced fluorescence is used for highly sensitive detection of assay products. The final diagnostic device will feature a miniaturized, portable fluorescence detector.

(Photo by Dino Vournas)

not exist. Those suspected of being infected must give blood samples at a medical facility and wait for laboratory analysis. The device will be able to detect toxins including botulinum toxin, SEB (Staphylococcal Enterotoxin B), shiga toxins, *Clostridium perfringens* epsilon toxin, and others.

## Builds upon success of saliva-based diagnostics project

The project builds upon the success of Sandia’s well-known “spit project,” a program also funded by the NIH (see Jan. 27, 2005, and April 13, 2007, *Lab News*). That project could allow dentists to one day quickly test patients for gum disease and other afflictions via saliva samples.

Bioengineer and microfluidic expert Anson Hatch (8321) will lead the microfluidic assay development effort. The system will incorporate microfluidic methods developed by Anson and

others at Sandia that facilitate hands-free analysis by integrating sample pretreatment with electrophoretic immunoassays that quickly measure analyte concentrations in blood. The self-contained device will consist of miniaturized electronics, optical elements, fluid-handling components, data acquisition software, and a user interface.

The technology, device, and methods, says Anup, can also be extended to detection of biomarkers of other systemic diseases and conditions such as cancer and cardiovascular disease.

## **Sandia** CaliforniaNews

### A promising partnership

The biotoxins diagnostics project represents the first time that a Sandia-led project has been funded by the National Institute of Allergy and Infectious Diseases (NIAID).

“This is a really big step in becoming a legitimate player with NIAID,” says Terry Michalske (8300), director of Biological and Energy Sciences. “We are well on our way toward establishing a strong record with the National Institutes of Health.”

Sandia’s primary foot in the door with NIAID was the so-called “spit project”, the Integrated Microfluidic System for Oral Diagnostics funded by the National Institute of Dental and Craniofacial Research, an NIH institute.

For more than 50 years, NIAID has conducted and supported basic and applied research to better understand, treat, and ultimately prevent infectious, immunologic, and allergic diseases. Since 9/11, biodefense has become an important topic for NIAID, which is where Sandia’s capabilities come into play.

NIAID’s role in NIH has grown significantly in this time. According to the NIH Almanac ([www.nih.gov/about/almanac/appropriations](http://www.nih.gov/about/almanac/appropriations)), appropriations for NIAID have more than doubled in the last five years. NIAID received approximately \$4.3 billion in 2006, compared with approximately \$2 billion in 2001. Biodefense as a research area is estimated to receive \$1.7 billion in funding in FY2007 (see the NIH website at [www.nih.gov/news/fundingresearchareas.htm](http://www.nih.gov/news/fundingresearchareas.htm)).

The 2002 NIAID Strategic Plan for Biodefense Research highlights the “unmet need for tests to rapidly diagnose, vaccines and immunotherapies to prevent, and drugs and biologics to cure disease caused by agents of bioterrorism.” According to this strategic plan, the mission of NIAID is to carry out the research needed to understand the pathogenesis of these microbes and the host response to them, and to translate this knowledge into useful interventions and diagnostic tools for an effective response.

Working with NIAID is a strategic opportunity for Sandia, and one that Terry sees growing stronger in the near future. Sandia is engaged in discussions with NIH for follow-on work to the (Microscale Immune Studies Laboratory) MISL Grand Challenge, a three-year LDRD project in collaboration with the University of Texas Medical Branch in Galveston, Texas, and the University of California, San Francisco.

— Patti Koning



## Absolutely smashing piñatas

### California site’s Hispanic Leadership Committee sponsors contest

Div. 8000 VP Paul Hommert judges entries in the Hispanic Leadership Committee’s first-ever piñata contest. Sixteen teams entered piñatas in the competition. Entries included a knitting dog, a fruity drink, hungry squirrel, and two watermelons. Trudy Thunderbird, the large bird left of Paul, won the People’s Choice Award.

(Photo by Randy Wong)

# Hydrogen sensor

(Continued from page 1)

company called DCH Technology, which learned about the Robust Hydrogen Sensor after it won a 1993 R&D 100 award as one of the best inventions of the year. Company officials wanted to use the technology for commercial applications.

The device — as new, exciting, and functional as it was — had a problem. When exposed to some corrosive gases, the sensor stopped working, rendering the technology useless for those applications.



H2SCAN CEO Dennis Reid discusses hydrogen sensor chip with lead calibration technician Antonio Adan.

After four years of work and an investment of about \$7 million, DCH Technologies could not resolve that issue, among other problems. It suffered financial difficulties and in 2002 sold its assets to H2scan, headed by former DCH consultant Dennis Reid.

The license reverted back to Sandia. Labs officials were concerned that the new company would have the same problems as DCH and wanted to prevent failure.

"This is where it gets interesting and Sandia's creativity kicks in," says Paul Smith (1031), Labs licensing agent. "We thought that if Sandia researchers could help the company with the science, there could be a breakthrough that would resolve the corrosive gas issue."

**Unusual CRADA**

In an unprecedented move, Sandia and H2scan signed a CRADA in which the license agreement and CRADA are linked so that some payments under the license agreement are forgiven as long as there is a continuing collaboration under the CRADA. H2scan provides the "funds-in" for the CRADA that began in 2003.

Bob was lured back from retirement to act as a consultant on the CRADA and advise H2scan on fabrication and testing issues for a new Wide Range version of the Robust Hydrogen Sensor. Unlike the Robust Hydrogen Sensor, the Wide

Range Sensor uses a capacitor and resistor on the same chip to achieve a measurement range of 15 parts per million (ppm) to 100 percent by volume. H2scan undertook the difficult task of fabricating the Wide Range Sensor using a number of suppliers and in-house facilities. It also completely redesigned the electronics and packaging for the complete sensor system.

## Success

In a little over a year and with an investment of more than \$1 million, H2scan had its first retail product and a handheld hydrogen leak detector capable of detecting high and low hydrogen concentrations.

In 2005 H2scan hired a PhD consultant with more than 10 years of experience at Intel to lead the sensor design process. During the next two-and-a-half years the company developed a proprietary coating over the sensor die that can withstand harsh gases such as carbon monoxide, hydrogen sulfide, and condensed water. H2scan also came up with an advanced manufacturing process that reduced completion time to make a full wafer set from three-and-a-half months to three-and-a-half days.

## Sensor to play key role in hydrogen economy

While the Wide-Range Hydrogen Sensor is currently being used for petroleum refining, hydrogen and chlorine production, and more, its real contribution will be to the hydrogen economy, once it gets rolling, says developer Bob Hughes (1714).

"It will have many applications to the hydrogen transportation and automotive industry and will be needed to monitor hydrogen levels in fueling stations and in cars and trucks burning hydrogen," Bob says.

H2scan President, CEO, and founder Dennis Reid says his company is already working with automobile companies to develop ways to use the sensors to monitor hydrogen levels in fuel cell stacks in hydrogen vehicles.

## Hydrogen scanner is smaller, faster, sturdier, and less expensive than others

The Wide-Range Hydrogen Sensor that Sandia developed and H2scan is commercializing is smaller, faster, sturdier, more user-friendly, and less expensive to manufacture than other hydrogen sensors available on the market, says the retired Sandia developer, Bob Hughes (1714).

"It is so different from existing hydrogen sensors, which have numerous drawbacks," Bob says. "They have a limited range, poor reproducibility and reversibility, are subject to false alarms, and tend to be slow, unreliable, and difficult to use."

The new technology was created by integrating special catalytic alloy films onto existing complementary metal oxide semiconductor microelectronic technology at Sandia's Microelectronics Development Laboratory.

The sensor uses catalytic palladium nickel (PdNi) gate metallization on field effect transistor sensors for detecting low concentrations of hydrogen; PdNi resistor sensors for detecting higher concentrations of hydrogen; and on-chip micro-thermometers and micro-heaters for maintaining constant chip temperature.

"We now can make 7,000 sensors every three-and-a-half days and deploy our sensor in line real time in the presence of carbon monoxide, hydrogen sulfide, and chlorine," Reid says. "That is true success considering where we started in 2002."

## Sandia collaboration essential

Reid says that the partnership between his company and Sandia is what led to the fast commercialization of the sensor.

"Our success in providing commercialized products is linked directly to our close working relationship with Sandia," he says. "The CRADA gave us the opportunity to capitalize on Sandia's long history with the sensor technology, primarily in the area of process development, resulting in an extremely fast turnaround time for product development."

Without the ability to have daily interactions with the technology's creator and the use of Sandia's environmental testing capability, Reid says, the sensor would have had a longer, more expensive road to commercialization, and the company's ability to survive through the development stage would have been jeopardized. The CRADA also opened the door for future collaborations between H2scan and Sandia, says Reid.

Today, the CRADA continues. Sandia's role is to periodically test H2scan sensors in its Gas Sensor Test Bed. The facility enables testing of multiple hydrogen sensors in a wide variety of conditions not available elsewhere.

Through the CRADA, Bob participates in weekly telephone conferences with H2scan and some of its largest potential customers, discussing the latest test data and assisting in deciding efficient test plans to shorten the time between validations.

H2scan has three product lines — portable leak detectors, fixed mounted area monitors, and in-line real-time process monitors. It has delivered sensors to more than 200 government and industry customers, including a classified DOE plant in Idaho Falls, numerous oil companies, Air Products, PraxAir, Air Liquide, UOP, Total, General Electric, Boeing, Bechtel, NASA, Lockheed Martin, Merck, Nissan, Toyota, GM, Honda, Ballard, UTC, Northrop Grumman, Shell Hydrogen, Ball Aerospace, Westinghouse, and others. Reid expects to release the product soon for refineries and is working closely with the world's largest provider of systems for refiners worldwide.

Reid says that H2scan has grown from a company with seven employees to one with 22 since the initial CRADA was signed.

"As our sensor becomes known and our client list expands, I expect we will triple in size over the next two to three years, thanks to Sandia's involvement," Reid says.



DETAIL of hydrogen sensor developed at Sandia and commercialized by H2scan.

## SSO, Labs agree on FY08 performance plan



SANDIA AND NNSA'S SANDIA SITE OFFICE recently concluded negotiations on the development of the FY08 Performance Evaluation Plan (PEP). The PEP documents the negotiated performance criteria by which the site office appraises Sandia Corporation's performance in its management and operation of Sandia National Laboratories in FY08. To mark the conclusion of the negotiations, Sandia Site Office Manager Patty Wagner (front left) and Sandia Labs President and Director Tom Hunter (right) signed the finalized FY08 PEP document. Joining Tom and Patty are Labs Deputy Director John Stichman and SSO Deputy Manager Kim Davis. (Photo by Randy Montoya)

# Les Shephard: Bringing passion to energy

**VP in charge of the Labs' Energy, Resources, and Nonproliferation SMU talks about critical issues ahead**

*Note: Occasionally the Lab News talks with Sandia vice presidents and SMU leaders about important issues in their areas. This interview with Les Shephard, VP 6000 and head of the Energy, Resources, & Nonproliferation SMU, was conducted in Bldg. 811. Joining him were science writers Chris Burroughs, Neal Singer, and John German.*

**Lab News:** Will you summarize for us the mission of your strategic management unit, the Energy, Resources, & Nonproliferation SMU?

**Les Shephard:** It is "Helping our nation secure a peaceful and free world through technology and global engagement." We're about having impact on technology areas that contribute to US economic prosperity, peace, and freedom. As I think about our mission, I realize how complex it is. The complexity is due to everything being connected



*"Part of the challenge of this SMU is that until recently much of our work is not what some people view as a traditional national security challenge. In my mind energy in its broadest context has become the national security challenge."*

— energy to water, nuclear energy to nonproliferation and nuclear terrorism, climate change to carbon — all with solutions being driven through fundamental science, discovery, and technology innovation. We are involved in issues like nuclear waste disposal and nonproliferation, issues that [Principal Scientist Gerry] Yonas would call the hairy, wicked problems in which social, political, regulatory, and policy issues drive decisions. Technology is a major component — it is a necessary but not sufficient component for a solution and must always be credible, justifiable, and defensible. You must develop and deploy technology to be in the game. But most of our mission areas have certain elements that are outside the traditional purview of Sandia's work. I like the phrase, "hairy, wicked problems."

**LN:** Sandia's national security mission used to mean primarily deterrence and now it's something broader. How does ER&N's mission tie into national security?

**LS:** Part of the challenge of this SMU is that until recently much of our work is not what some people view as a traditional national security challenge. In my mind energy in its broadest context has become *the* national security challenge. How do we assure ourselves in the long term that enough energy will be available to sustain the economic prosperity of this country? Today, like at no other time in our past, national security must be considered in its global context, and energy has become a global commodity.

As the competition for energy on a global scale continues to grow, we need to ask where we are going to get our energy for the future — whether it's fossil fuels or other energy sources like nuclear, renewables, or even fusion — and how does that affect our interactions with other nations? How do we ensure that other nations benefit from the peaceful use of nuclear energy yet sustain a responsible approach to nonproliferation? Then there's a whole set of challenges tied directly to carbon and how it affects the global environment. The demand for fossil fuels is going to continue to increase and, in fact, outpace supply in the next few decades. At the same time challenges associated with carbon management will continue to increase.

So we are at a time of confluence. But these are not new issues to us. We [at Sandia] have been thinking and talking about energy challenges among ourselves and with other labs, universities, and industry for more than 30 years. We've been actively engaged in water-related activities for at least a decade. We're viewed as a national leader in

the water arena. So far no federal agency has stepped up to take ownership of water problems, which will become huge over the coming decade. Our New Mexico senators understand its importance and with their encouragement I hope to see a federal agency assert true leadership in this area. And as you know, water and energy are inextricably linked.

## Sandia's role in Global Nuclear Energy Partnership

**LN:** How does GNEP (the Global Nuclear Energy Partnership) tie into this?

**LS:** GNEP is a presidential initiative. It is one of many administration initiatives that deal with energy. Many of GNEP's key elements, however, are not new and are, in fact, an iteration of earlier energy-related initiatives. One of GNEP's early roots at Sandia, dating back to the mid-1990s, was the Global Nuclear Material Management Program that emphasized controlling and managing nuclear materials. In the late 1990s this program evolved at Sandia to a much broader vision that included the entire nuclear fuel cycle, from energy to waste to nonproliferation. The general goals of GNEP are to expand the peaceful uses of nuclear power, reduce the proliferation threat, and solve the nuclear waste issue.

Whether GNEP will continue in its present form remains to be seen. The next administration is going to have to look at it, rethink it, and figure out how to make it politically viable. In any case, the strong national security imperative associated with the objectives of GNEP will ensure it survives in some manner. Many in Congress don't fully understand GNEP — they often view it solely as an approach to solve the waste disposal issue. Internationally, some view GNEP as an OPEC-equivalent for nuclear energy. We need to help Washington work through those issues.

**LN:** What should Sandia's role be with GNEP?

**LS:** I see our contributions emphasizing key elements of the nuclear fuel cycle ranging from waste disposal and waste characterization to reactor technology, recycling, nonproliferation, and transportation. These will be integral to whatever approach to nuclear energy this country takes.

Many of the contributions we make in the energy area go back to our weapons heritage — the safety, security, and reliability of nuclear facilities have been a compelling core strength of Sandia. In particular, we are strong in systems modeling and in developing technologies that improve the overall efficiencies of nuclear reactors. In addition, we have been a leader in securing nuclear materials and technologies in Russia and other Former Soviet Union (FSU) countries. I think safety and security are the most important aspects of the expansion of nuclear power. If there is a major nuclear reactor accident in this country or elsewhere around the world, we might as well forget nuclear power as being a potential contributor to our long-term electricity demands.

## Future of nuclear power in US

**LN:** Where do you see nuclear power going in this country?

**LS:** The rest of the world has already made the decision to go nuclear. In fact, Westinghouse is now beginning to build four AP1000 reactors in China. The president also has been very clear about his intent. He's a supporter. This is the most pro-nuclear administration I've ever seen, and I anticipate that at least one utility will begin construction of a new reactor within the next several months

[announced Sept. 25 by the Nuclear Regulatory Commission (NRC)] — something that has not occurred in this country for nearly three decades.

Two things need to happen for nuclear power to have real impact on our nation's energy supply. First, we need to be able to say a year from now that the construction and operating license approach for new nuclear power plants has progressed, and that we've actually begun construction of a new nuclear power plant in the United States.

Second, the license application for Yucca Mountain must be submitted to the NRC so that we have a viable approach for waste disposal. A year ago there wasn't a handful of people in the Forrestal Building [DOE headquarters] and not many people here at Sandia who believed it was possible that a license application could be completed by June 2008. I have no doubts that the license application will be done, in large part because of Sandia leadership from our Yucca Mountain folks in Las Vegas, in partnership with the DOE and Bechtel. Submittal of the license application sends a very strong statement that this country is willing to go to that next step, which then allows the formal regulatory process to kick in. Barring national politics, which always play a role in Yucca Mountain, the license application will be submitted by June 2008.

**LN:** Is there a chance this country will begin recycle nuclear waste?

**LS:** Yes, but the real question is when. Some 30 years ago this country established a policy not to recycle spent nuclear fuel with the expectation that the rest of the world would follow our lead. Instead the rest of the world moved on, and several nations today recycle. Other countries, like India, have well-established nuclear energy programs that have progressed without significant US support. The US must decide if it is going to lead the nuclear renaissance or allow other nations to drive the global agenda. I advocate a strong US leadership position.

## Nuclear weapons, nuclear energy, nonproliferation inextricably linked

**LS:** This brings us back to this national security issue. The Sandia leadership team understands that nuclear weapons, nuclear energy, and nonproliferation are inextricably linked and must be considered together as a complex system. You just can't decouple the issues of nuclear power from nuclear weapons and nonproliferation. There are only three labs in this country, the three nuclear weapons labs, that can address this level of complexity with any sort of expertise and credibility. I personally consider this to be a unifying and critical mission area for Sandia in the future and one that ties directly to the other critical mission areas of energy mentioned earlier.

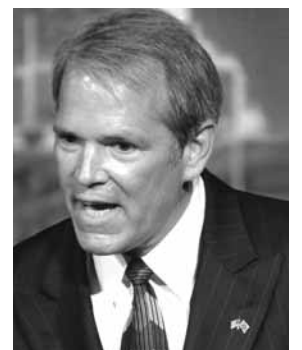
As a laboratory we have begun to focus on the complex nuclear system and these efforts are coming together in an integrated way to become a driving force for this laboratory. It's an opportunity for this laboratory to establish itself not only as a national but as a global leader focused on this critical national security mission.

**LN:** How does supercomputing tie into the future of Sandia's nuclear power work?

**LS:** I expect supercomputing to become an extremely important part of the design and development of new nuclear technologies and for other

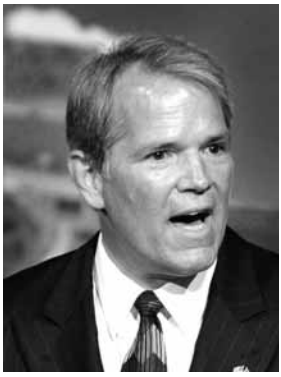
*(Continued on next page)*

*"We [at Sandia] have been thinking and talking about energy challenges among ourselves and with other labs, universities, and industry for more than 30 years. We've been actively engaged in water-related activities for at least a decade."*



# Les Shephard

(Continued from preceding page)



**“Even on my most optimistic days I can’t see the US getting to the point where it is building enough nuclear power plants to keep pace with growing electricity demands. Today roughly 19.8 percent of electricity is generated by nuclear power.”**

energy technologies as well. The design process for nuclear reactors has been essentially dormant over the last few decades in this country and elsewhere, and we have not been able to benefit from high-performance computing in a significant way. Now the design process will be accelerated and fully integrated in a manner never before realized. We will be able to assess the performance of full systems and subsystems using high performance computing, modeling, and simulation and be able to readily evaluate the potential for new materials and components without ever needing to build the actual systems. Before supercomputing has this impact, however, the NRC will have to have complete confidence that the approaches are rigorous and assure long-term safety and security of new power plants. Part of our challenge is to move the regulatory environment to a place where it recognizes and adopts these capabilities as part of the regulatory process.

## The nation’s future energy mix

**LN:** What do you see as the energy mix among fossil fuels, nuclear power, and alternative energy sources, such as wind and solar, as you look to the future?

**LS:** Even on my most optimistic days I can’t see the US getting to the point where it is building enough nuclear power plants to keep pace with growing electricity demands. Today roughly 19.8 percent of electricity is generated by nuclear power. My expectation is that 20 years from now it will be about the same, which requires significant nuclear expansion given the growing demand for electricity. This country can’t build enough nuclear power plants soon enough to meet this demand. It’s a seven-to-ten-year process to build a new plant and get it on line under the best of conditions.

Renewables, whether they be wind or solar, will play a role, but it will be limited, unfortunately. Presently in this country wind energy provides about 12 gigawatts of power and worldwide about 70 gigawatts. That’s the equivalent of about 60 to 70 nuclear power plants. We’ll continue to see an increase in the amount of wind power being deployed, probably offshore in some areas, which is where the Scandinavians, the Germans, and others are placing their wind farms. I also expect to see advanced designs of wind turbines that are efficient under low wind conditions being sited near major metropolitan areas of the United States — work that Sandia is helping to lead.

Concentrating solar power and photovoltaics will also continue to expand. An impediment to more rapid growth for these systems is reliability. This is an area where Sandia is partnering with industry to make a difference.

Having said that, wind and other alternative energy sources are not going to be a significant contributor on the national or global scale in the coming decade or more given the increasing demand. I’d like to be more optimistic, but I just can’t be.

## Fossil fuel will still be vital for decades

I don’t care how you slice, it I just can’t get to a place where technology will significantly reduce our nation’s dependence on fossil fuels for the next two decades. I think 20 years from now this nation will continue to rely on fossil fuels in a significant way. Unconventional sources of fossil fuels will become increasingly more conventional due to

technology advances. Nuclear and renewables will blunt some of the increase in demand but our demand for energy is increasing so quickly it will only allow us to keep pace with demand.

I realize that this continued reliance on fossil fuels means we must address the issues of continued generation of carbon dioxide. This is a global issue. While one may debate the impacts of carbon on global warming, anthropogenic carbon emissions are detrimental to the global environment and detrimental to the well-being of generations to come. China and India are both using more fossil fuels for generating electricity. The rate of growth for electricity demand in those countries is

enormous, and both are actively building new coal-fired power plants. It’s going to take a lot of electricity to sustain their economic prosperity. Right now China has less than 15 cars per thousand people, but it’s not going to stay that way. Both countries are building and buying significant numbers of motor vehicles. It really makes for very complex problems. So the carbon, energy, technology coupling is another great challenge for a national lab. Fortunately we have a terrific cross cutting Laboratory team that has already engaged in addressing this set of emerging issues.

## Global demand for oil

**LN:** What will that do to demand for oil worldwide?

**LS:** Oil is another part of the equation that has changed significantly over the last few years. Some-

**“I don’t care how you slice it, I just can’t get to a place where technology will significantly reduce our nation’s dependence on fossil fuels for the next two decades. I think 20 years from now this nation will continue to rely on fossil fuels in a significant way.”**

where on the order of 85 percent of known oil reserves in the world are controlled nationally. We used to talk about the importance of Exxon, Shell, Chevron, or whomever. But today a growing concern is the control of major reserves by various countries’ governments. That’s their insurance system for their own long-term energy security future.

The US government is not in this game. We have the Strategic Petroleum Reserve, but that’s less than a billion barrels and a month’s reserve. We rely on a free market, but the free market today only has access to 15 percent of the proven global reserves. A lot of the availability depends on what the nations controlling the reserves perceive to be in their national interests. Those interests could be counter to US interests. Russia, for example, controls tremendous volumes of natural gas and is expanding its national nuclear energy supply.

Russia will continue to export its gas reserves to generate revenue and expand its economy, continue to increase its nuclear energy supply for generating electricity to supply its industrial sector, and use the gas revenues to make investments in several critical sectors including technology and defense. Russia is just one example. We as a country have to make informed decisions about our future energy use and policy directions by taking into account the complex sets of technology issues and social, political, and regulatory issues in a global framework. What a great problem for a

national laboratory.

## Working the hard, wicked problems

**LN:** Tell us about some of the changes recently instituted in the Energy, Resources, & Nonproliferation SMU.

**LS:** After a lot of engagement during strategic planning, we created three lines of business within the SMU. We did this recognizing there are really complex problems that needed to be addressed in a cross-laboratory, multidisciplinary way. Sandia has always been a center-centric laboratory. To me, that is not the model for the future. So we were deliberate in identifying a set of directors who don’t have traditional center responsibilities, but instead engage across the Labs and outside the laboratory, working on really hard, complex, wicked problems. These directors are supported by multiple centers across the Laboratory.

I’ve talked a little already about the SMU’s fuel and water line of business and the nuclear energy line of business, but I’ve not talked about the global security line of business. We realized the international security program traditionally has been Russian- and FSU-centric. While Russia is a continuing long-term concern, the reality is that threats have become more global and more diverse in nature. The global security line of business takes a risk-based approach to systematically evaluating and assessing threats on a global scale that can have significant detrimental impact on our country.

In doing our strategic planning we also identified what I call “must wins.” We said there are certain things we need to do this year. The first must win was JBEI [the Joint Bioenergy Institute]. It puts us on the map relative to the biofuels business, which ties into our transportation fuels strategy for the long term. It also puts us on the map relative to our credibility within the biosciences community. It allows us to use our capabilities in high-performance computing, combustion engine research, and systems engineering to make a significant contribution from a biosciences point of view.

The second must win is Yucca Mountain, a project I have great passion around. There were a number of people here at the Labs who said we can’t be successful there. But they said the same thing about WIPP. The potential for this country to move forward in the nuclear power arena depends on that license application. Our deliverable will be completed sometime between January and March.

The third must win involves expanding our international security programs to have a global security perspective. We’ve had a number of really good ideas in this area. We are actively engaged on the issues in and around the security of critical infrastructures and energy infrastructures on a global scale. We have been funded to do the work — it is fully supported and endorsed by DOE.

## Budget trends

**LN:** What’s the budget status and trend for the SMU?

**LS:** This year our revenue ended at about \$470 million. Our desire as a SMU is to have the budget increase by a minimum 10 percent per year but to always focus on critical national security mission work. Three years ago our revenue was \$295 million. We’ve had significant growth (nominally \$170M) over the last three years.

The 2007 continuing resolution had a significant impact on our water program. Sen. [Pete] Domenici is personally interested in water and fully understands its importance to our nation’s energy future. He has proposed some very specific legislation in the water area over the last few years.

(Continued on next page)

**“We realized the international security program traditionally has been Russian- and FSU-centric. While Russia is a continuing long-term concern, the reality is that threats have become more global and more diverse in nature.”**



## Z machine

(Continued from page 1)

the ions of thin wires that serve as electrical conductors until the current vaporizes them.

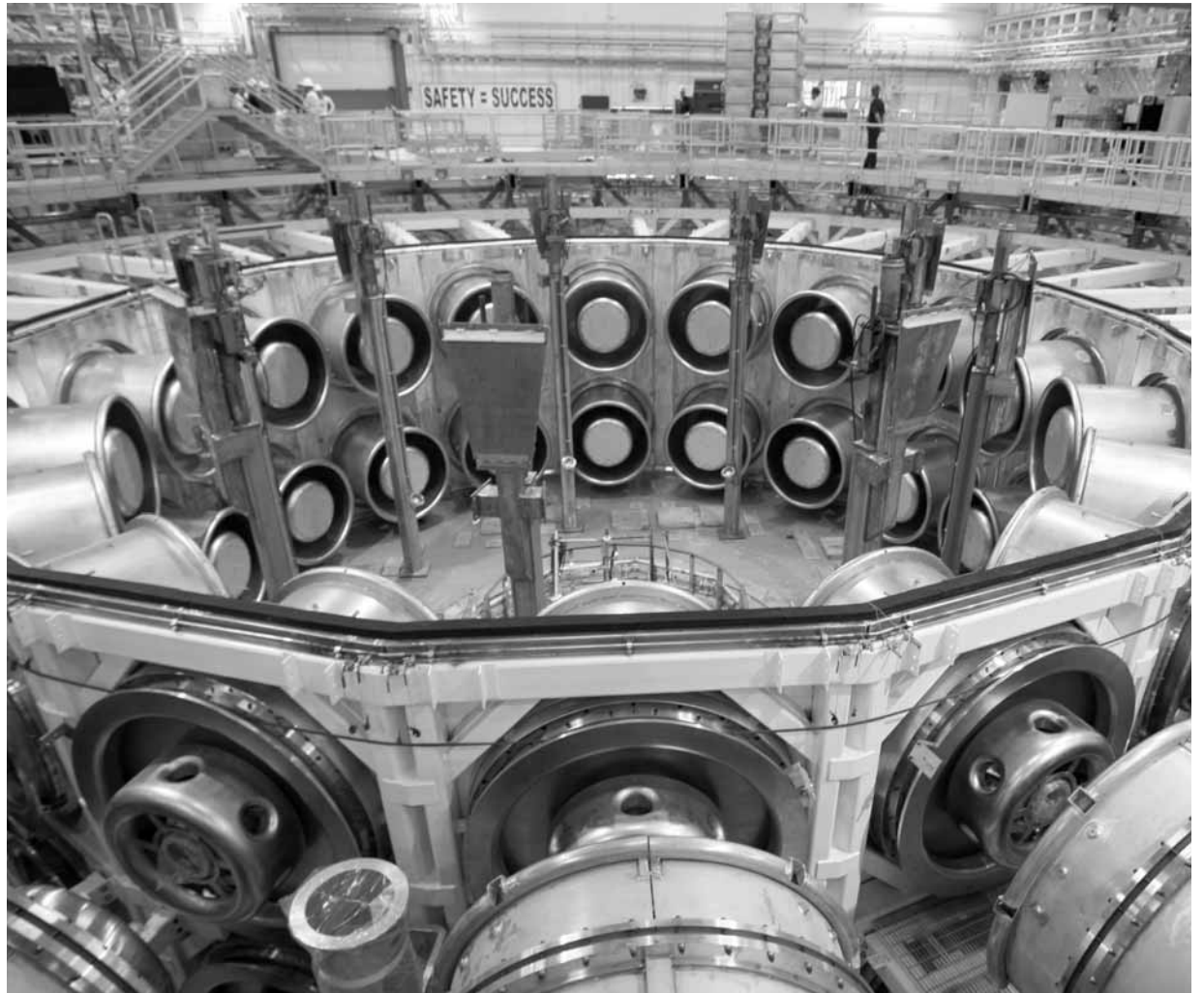
The 17.5-million-amp shot that signified the reopening of the facility was used to test new system components. It concluded an extensive facility outage during which the old pulsed power systems were removed, and the tank structure that contains the accelerator was extensively modified. New, more robust pulsed power components and subsystems were installed. Utility infrastructure modifications were made, and the accelerator subsystems were commissioned. Over the next several months, Z will conduct more tests to verify, validate, and optimize the performance and predictive models for the accelerator and determine reliable operating points for science program operation, the ultimate purpose for Z.

Z's roots go back to 1985 when it was constructed as the Particle Beam Fusion Accelerator II (PBFA II), designed for light-ion fusion research. Lithium ions were shot at a target. Z-pinch technology breakthroughs used simple electricity and the z-pinch effect. Improvements led to modifying the center portion of the machine in 1996 to utilize this approach to successfully produce high energy-density environments.

Renamed "Z," the accelerator became a workhorse for the nation's scientific community but faced operational efficiency limits due to the age of the hardware and because the pulsed power drive system was not specifically designed for z-pinch applications.

Dubbed the Z Refurbishment Project (ZR), the huge effort to modify the accelerator began with extensive design and development activity in 2002. For the first time, the detailed component design depended heavily on three-dimensional simulations of their performance.

Improvements included new capacitors that doubled the energy storage capability within the



SANDIA'S Z MACHINE during its year-long refurbishment process.

(Photo by Charlie Robinson)

same physical volume, and stainless steel electrically optimized pulsed power components for durability.

Sadly for graphic artists (but not for engineers), Z will no longer provide those dramatic "arcs and sparks" photographs that have been the signature image of visual recognition for the old facility. The water-air interface that provided

these visuals is now covered in decking that will eventually be filled with diagnostic and recording equipment.

And that is proper, says Ed Weinbrecht (1635), ZR's project manager.

"The ultimate deliverable from the facility is high quality data in support of scientific advances in high energy density-based physics," he says.

## Les Shephard

(Continued from page preceding page)

Unfortunately until our nation embraces water as a national security concern, which it will eventually, it will remain difficult to identify a single federal agency to support the work.

Folks should recognize that we build our business every day from the ground up. We've had setbacks in some areas, but I think we've done reasonably well overall.

**LN:** Who are some of the SMU's key customers?

**LS:** DOE's Office of Science, clearly. They've demonstrated an interest in investing in our infrastructure through the Combustion Research Facility, the Center for Integrated Nanotechnologies, and high-performance computing. Their investment benefits not only the SMU but the entire lab. They are an incredibly important customer, even though their funding to the Labs is relatively small compared to the whole, roughly \$55 million this year.

Other key customers are the NNSA Office of Nonproliferation, the DOE Office of Energy Efficiency and Renewable Energy and Office of Electricity Delivery and Energy Reliability, the Office of Civilian Radioactive Waste Management, and the NRC. The NRC funds us at about \$15 to \$20 million a year, money that is used for science-based engineering projects that couple modeling and simulation with large-scale experimental work. Over the years the NRC has been one of our best funding agencies for this type of work.

**LN:** How is the ER&N SMU different from Division 6000?

**LS:** The SMU and Division 6000 are two very separate entities. There is this long standing myth that Division 6000 and ERN SMU are one and the same. The truth is Division 6000 staff have critical leadership and support roles in each of the SMUs. Our goal within the SMU is to make sure that less than 50 percent of the FTEs funded by ERN sup-

ports personnel within Division 6000. We're doing that very intentionally because we need to engage the broader laboratory community in these complex problems.

**LN:** Are there any technologies on the horizon that are game changers in terms of future energy or transportation needs?

**LS:** I can't say what will be the game changers, but yes, I firmly believe there will be many. They will come out of our high-performance computing modeling and simulation capabilities, our work in materials science and nano science, and from the movement to "hybridization" — coupling of the electricity sector with the transportation sector, for example.

The Joint Bioenergy Institute and Combustion Research Facility will contribute significantly to developing alternative transportation fuels. We have developed a concept that is being supported by LDRD to develop transportation fuels using concentrating solar power and captured carbon dioxide — we call it "Sunshine to Petrol" — and this would be a game changer. I think there are also some game changers that probably aren't "hot and sexy" from a Sandia point of view, like energy efficiency [although our role as a National Center for Solid State Lighting is "hot"]. Technology will play a role, but I can't say exactly what that role will be.

What I do know is energy — whether you define it from the energy security point of view or from the environmental point of view — is a big part of the future of this laboratory, and it ties directly to our science and technology base. I am delighted that our work in this SMU generates so much excitement with new hires. They want to do something that's good, not only for the country, but for the world. Addressing the problem of energy in all of its dimensions is a great leadership challenge that will be with us for decades to come. It touches everybody on planet Earth. It provides the opportunity to change the world. I feel privileged to work with so many that want to be a part of it.

### Sandra Begay-Campbell receives UNM's Zia Award

Sandia researcher Sandra Begay-Campbell was among six people honored Sept. 29 by the University of New Mexico Alumni Association with the prestigious Zia Award.

The award is presented to UNM alumni living in New Mexico who have distinguished themselves for their philanthropic endeavors, public office, service to the university, community and volunteer activities, and business/professional fields, or who have made a contribution in education.



SANDRA BEGAY-CAMPBELL

At the Labs, Sandra is a principal member of technical staff and leads Sandia's technical efforts in the renewable energy program to assist Native American tribes with renewable energy development.

She also served six years as a UNM regent/trustee.

Sandra received a bachelor of science degree in civil engineering from UNM in 1987. She worked at Lawrence Livermore National Laboratory before she earned a master of science in structural engineering from Stanford University. She also previously worked at Los Alamos National Laboratory.

Sandra is the recipient of the 2005 UNM School of Engineering Distinguished Alumnus Award. She received the Stanford University 2000 Multicultural Alumni of the Year award and was selected as a recipient of the Governor's Award for Outstanding Women from the New Mexico Commission on the Status of Women.

"I feel very honored to receive this award on the 20th anniversary of my UNM graduation," Sandra says.

**Benefits Choices 2008 — Open Enrollment is Oct. 20-Nov. 9**

# What you need to know about Reimbursement Spending Accounts

**RSA's can be created for health care and/or day care expenses**

Start planning your 2008 Reimbursement Spending Account (RSA)

**What is an RSA?**

An RSA is a Reimbursement Spending Account, also known as a Flexible Spending Account, which is authorized by the Internal Revenue Service (IRS) and available through employers. This type of account allows you to set aside money for nonreimbursed health care and/or day care expenses on a pretax basis. As you incur health care and/or day care expenses throughout the year, you submit a claim for those expenses, and you are reimbursed with tax-free dollars from your account. A Health Care Account reimburses you for out-of-pocket medical, dental, vision, hearing, and pharmaceutical expenses such as copays, coinsurance, certain over-the-counter (OTC) medications, eyeglasses, contact lenses, eye care solutions, and even laser-vision correction. The Day Care Account reimburses you for day care expenses you incur to allow you and, if married, your spouse to work. These expenses include day care, before-and-after school programs, nursery school or preschool, summer day camp, and even adult day care. When you use either one, or both of these accounts, you reduce your taxable income so you pay less in income taxes. To see a list of all eligible expense items for either a health care or a day care account, visit our website at [www.mypayflex.com](http://www.mypayflex.com).

**What's in it for me?**

The bottom line is that an RSA will allow you to increase your spendable income because your contributions are on a pretax basis. That means less for Uncle Sam and more for you and your family to spend as you please! Let's use a real-world example: A family member wants LASIK eye surgery, and the cost is approximately \$4,000.

## Vacation Buy Plan — buy up to 44 hours

Every year during Open Enrollment, employees have the option to buy vacation. The Vacation Buy Plan (VBP) is an optional plan that allows employees to purchase vacation on a pretax (before federal, state, and Social Security taxes are deducted) basis. Why would you want to purchase vacation as opposed to taking time off without pay? The vacation hours you purchase are deducted evenly from your biweekly paychecks throughout the calendar year rather than having a financial impact all at once.

Employees may purchase a minimum of eight hours up to a maximum of 44 hours of vacation. The cost of each vacation hour is determined by dividing your full-time annual base pay as of the beginning of the calendar year by 2,080.

Purchased vacation can be used once carry-over, accrued/posted, and convertible vacation have all been depleted. Unused elected vacation hours will be sold back in the last paycheck in December at the same rate as purchased. Upon termination or retirement, elected vacation hours not used but paid for will be sold back at the same rate as purchased.

For more information on the Vacation Buy Plan, refer to Sandia's VBP Summary Plan Description (SPD). The VBP SPD can be found at [www.sandia.gov/benefits/spd/pdfs/Vacation-Buy.pdf](http://www.sandia.gov/benefits/spd/pdfs/Vacation-Buy.pdf) or by calling the Benefits Customer Service Center 844-HBES (4237).

Instructions for enrolling in the VBP are available in your Benefits Choices 2008 Open Enrollment HR Self-Service website.

In most cases, this expense would be paid with post-tax income over the span of a year. However, if you put this money into a health care RSA, it will be paid with pretax income, and you will save approximately \$1,080 (see example):

Annual Tax Savings	With RSA	Without RSA
Estimated Family Taxable Income	\$50,000	\$50,000
Cost of LASIK Eye Surgery	(\$4,000)	\$0
Taxable Income after LASIK Surgery	\$46,000	\$50,000
Estimated Taxes (Federal & SS)	\$12,420	\$13,500
Post-Tax Income	\$33,580	\$36,500
After-Tax Dollars Spent	\$0	\$4,000
Post-Tax Income	\$33,580	\$32,500
Saving	\$ 1,080	\$0

**How do I get started?**

Sandia has made setting up an RSA simple. During your annual enrollment period, you will be allowed to put aside a portion of your salary on a pretax basis. If you decide to enroll in a health care and/or day care account, you will need to estimate the amount you will spend on out-of-pocket health care expenses and/or day care expenses during the plan year. When estimating your expenses, please remember that several over-the-counter items such as aspirin or other pain relievers and cold/sinus remedies are eligible for reimbursement as well. To assist in estimating your out-of-pocket expenses, worksheets have been created for you to use. The expense planning worksheets, as well as an RSA savings calculator, are available at [www.mypayflex.com](http://www.mypayflex.com).

The amount you choose to set aside will be deducted from your paycheck in equal amounts each pay period throughout the plan year. The money deposited into your RSA account(s) can then be used to pay for eligible medical, dental, vision, hearing expenses, OTC medications, as well as day care expenses.

**How do I get reimbursed?**

As you incur health care and/or day care expenses, you will submit a claim for reimbursement via fax or mail. Reimbursements are made on a scheduled basis; however, you can file claims

as often as you would like. Your RSA dollars will be used for reimbursement, which will be provided by check or direct deposit into your bank account.

Your claims can also be submitted online at [www.mypayflex.com](http://www.mypayflex.com) via Express Claims. This process is quick, easy, and always available. With Express Claims, you can also elect to have your reimbursement deposited directly into your checking or savings bank account. In most cases with Express Claims and direct deposit, you will be reimbursed within 48 hours, allowing you to maximize your spending power.

**Reimbursement methods**

**Express Claims:** [www.mypayflex.com](http://www.mypayflex.com)  
**Fax:** 402-231-4310  
**Mail:** PayFlex Systems USA, Inc.  
 PO Box 3039  
 Omaha, NE 68103-3039

**How do I keep track of the balance in my account?**

To check the balance in your account, view transactions, or check the status of a claim, simply access your plan information at [www.mypayflex.com](http://www.mypayflex.com). PayFlex has also implemented an enhanced Integrated Voice Response (IVR) system providing immediate access to account balances, overpayment resolution, as well as to obtain fax numbers and addresses for claim submission. To access our IVR system, please call **800-284-4885**.

**What if I don't use all the money in my account? Will I lose it?**

Yes. Money left over in your account at the end of the year is forfeited. You can avoid forfeitures by carefully reviewing your prior year's expenses and planning only for predictable costs. Sandia has elected to include a grace period within the health care plan, so you will be allowed 75 additional days after the end of your plan year to use your RSA funds. For example, if your plan year ends on Dec. 31, Sandia will allow expenses to be incurred through March 15. In addition, PayFlex has established partnerships with various online vendors to help you spend your RSA dollars more efficiently. Accessible via our website, you can buy items such as glasses, contact lenses, and eligible OTC medications using your PayFlex™ Card, or any other major credit card. When using your own credit card, you will receive a receipt to use for reimbursement.

*(Continued on next page)*

## Voluntary Group Accident (VGA) Insurance

VGA Insurance is an optional, employee-paid accident insurance that provides financial protection to employees and families for covered accidents. Employees can purchase insurance coverage in amounts from \$10,000 to \$300,000, in units of \$5,000 (maximum \$300,000 combined coverage in all plans). Premiums are paid through payroll deductions.

Employees have three types of coverage options to select from and may select any combination:

- **Plan I-A:** Employee-Only Coverage.
- **Plan I-B:** Family Plan may include employee, spouse, and children. Specific rules apply to coverage of dependents. The election amount chosen will result in a benefit amount as follows: spouse only, 50 percent of election amount; spouse and children, 40 percent and 10 percent each; children only, 15 percent each.

- **Plan II:** Employee-Only Common Carrier insurance covers the employee for accidents aboard public transportation.

For more information on the plan, cost of the coverage, and how to enroll, visit the Open Enrollment website.

**Open Enrollment website:**

Employees and Retirees: <http://oe.sandia.gov>  
**Sandia Labs Health Benefits and Employee Services (HBE)**

Customer Service  
 HBE Customer Service @ <http://hbe.sandia.gov>  
 Benefits Customer Service has moved to:  
 Innovation Parkway Office Center (IPOC)  
 3rd floor, Suite 3G (outside the Eubank Gate)  
 Hours: 8 a.m.-4:30 p.m.  
 Mail Stop 1463  
 505-844-HBES (4237) or  
 1-800-417-2634, ext. 844-HBES (4237)



## 'Put your drive in gear': Sandia's 2007 ECP campaign celebrates 50 years of giving

By Iris Aboytes

Sandia's annual employee giving program was born in 1956 with 91 percent of Sandians participating and raising a total of \$63,900.

Ted Sherwin, manager of Sandia's Public Relations Department at the time, was the architect of what eventually became ECP. He knew other organizations around the country were adopting so-called federal giving program, which combined annual employee Community Chest contributions. He felt these plans had some of the elements Sandia was looking for in his plan. Year-round giving by payroll deduction would be the key. After lots of meetings and lots of hours, ECP was born.

The plan was initially called the United Fund, and it incorporated 24 Community Chest agencies. Sandians were encouraged to give their "fair share." Many formulas were used to arrive at a fair share. One of the most popular was giving one hour's pay each week of the year. The accepted rule of thumb was "make your contribution large enough so that your conscience

is satisfied — let your conscience be your guide." Year-round giving was made possible for the first time by payroll deduction.

The importance of the campaign was illustrated in a special *Lab News* edition called "Red Feather Special."

One of the big draws of the 1956 campaign was a jingle contest.

Three lines were provided and Sandians completed the jingle. Clock radios bought with privately donated funds were given to the writers of the top 10 jingles.

In honor of its inception in 1956, Sandia will publish three winning jingles in the *SDN*, one each week of the campaign. A set of movie tickets will be given to the top two winners each week. The entries will be judged by *Lab News* writers.



New ECP Logo

A new and more modern logo has been designed by Tara Camacho-Lopez (3654) to reflect the giving heart in each one of us. The logo helps usher in the next 50 years of the program.

Here is an example of one of the winning entries in 1956.

*Christmas and United Fund  
Come but once a year  
A chance to help your fellowman  
So put your drive in gear*

## Two Sandians receive American Physical Society prizes

**Julia Phillips and Gary Grest honored by professional society**

By Neal Singer

Two Sandians will be awarded major prizes by the American Physical Society at its annual March meeting.

Julia Phillips (1100) will receive the George E. Pake Prize, meant to recognize and encourage outstanding work by physicists combining original research accomplishments with leadership in the management of research or development in industry.

Julia was cited for her leadership and pioneering research in materials physics for industrial and national security applications.

Past Sandia president C. Paul Robinson won this award in 2003.

Gary Grest (1133) was awarded the Aneesur Rahman Prize, given annually to recognize and encourage outstanding achievement in computational physics research.

Gary's work was characterized as "ground-breaking" in his development of computational methods and their application to the study of soft materials, including polymers, colloids, and granular systems.

"Congratulations to Julie and Gary," emailed Sandia VP Rick Stulen (1000). "These achievements and their recognition are extremely impressive."

Each prize consists of \$5,000, an allowance for travel to the March meeting at which the prize is awarded and certificates presented that cite the contributions made by each recipient. Gary will deliver the Rahman Lecture and Julia will present an invited talk.

APS annual prizes and awards, more than 40 in number, recognize outstanding achievements in research, education, and public service. With few exceptions, they are open to all members of the scientific community in the US and abroad.

The nomination procedure involves APS-appointed selection committees that guarantee the awards' high standards and prestige, according to the society.

### And in California . . .



## RSAs

(Continued from preceding page)

### What is available online at [www.mypayflex.com](http://www.mypayflex.com)?

- Account Information
- RSA Tutorial
- RSA Savings Calculator
- Expense Planning Worksheets
- Listing of Eligible & Ineligible Expense Items
- Frequently Asked Questions
- Administrative Forms & Publications
- IRS Forms & Publications

### Questions?

If you have any questions or wish to obtain account information via our IVR system, please call PayFlex at 800-284-4885. Customer service representatives are available 7 a.m. to 7 p.m. CST, Monday through Friday.

### Day care expense requirements

Day care expenses are those that must be incurred to enable you and your spouse, if married, to be gainfully employed. The expense must be incurred for services received after the effective date of your election and during the plan year to which it applies. The expenses must be for a qualifying individual. This includes a dependent younger than age 13, a spouse, or other dependents who are physically or mentally incapable of self-care and for whom you can claim an exemption.

The day care services must be provided by an eligible day care provider. This includes a licensed day care facility that complies with applicable

state and local laws and any individual who is not a tax dependent of yours or a child of yours age 19 or older. Day care expenses must be for services incurred, not for services to be provided in the future. The annual expense reimbursement may not exceed the lesser of your earned income, if married; your spouse's earned income; or \$5,000 (\$2,500 if married, filing separate income tax returns). You must file Form 2441 annually with your individual tax return identifying all your day care providers.

### Health care expense requirements

Health care expenses must be incurred for services rendered on or after the effective date of your election and during the plan year including the grace period as explained above. Each individual, for whom you can incur expenses, generally includes a dependent who you are entitled to claim as dependent on your federal tax return, as well as a spouse or other tax dependents who are physically or mentally incapable of self-care.

All expenses must be for services incurred and already provided, not for services to be provided in the future. In addition, the expenses may not have been reimbursed and must not be reimbursable by insurance or any other source. You cannot claim the same expenses as a deduction on your annual income-tax return. Other ineligible items include individual insurance premiums, other group insurance premiums, and long-term care expenses.

### Special plan rules

- You may enroll in a RSA only during Open Enrollment or when you first become eligible. This enrollment covers your pay periods from your effective date through the end of the plan year.

- Once you establish your plan year contribution, you may only change it if you experience a change in status.

- Any amount(s) left in your account(s) at the end of the plan year will be forfeited.

- You may file plan year claims through the run-out period as established by the plan.

- You do not have to enroll in your employer's health insurance plan to participate in the Reimbursement Spending Accounts. If you or your family members are covered for health insurance elsewhere, you can still claim qualifying out-of-pocket health care expenses under the RSA.

- Remember that your expenses must be incurred during your period of coverage.

Expenses are considered as having been incurred when you are provided with the health care or day care and not when you are formally billed, charged for, or pay for the care.

### Change in status rules

IRS guidelines may allow you to change your plan contribution during the plan year only upon the following conditions:

- Change in legal marital status (marriage, divorce, legal separation, annulment, or death of a spouse)

- Change in number of tax dependents (birth, adoption, or death)

- Change in employment status that affects eligibility

- Dependent satisfying or ceasing to satisfy coverage requirements (reaching limiting age, marriage)

- Change in residence that affects eligibility

To apply for a change, you must complete a mid-year change-in-election form through HBES within 31 days of the date of the event.

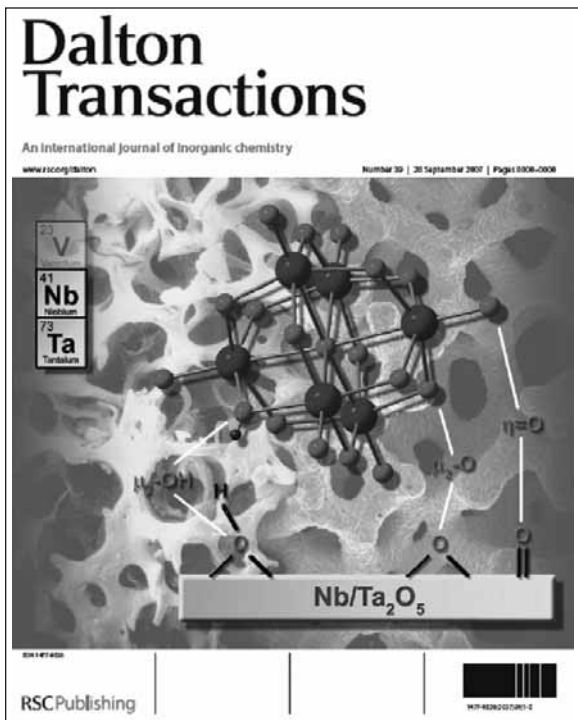
# Secret lives of two elements uncovered by Sandia researchers

## 'Hot' paper is cover story in Royal Society of Chemistry journal Dalton Transactions

By Neal Singer

Differences discovered between the properties of niobium and tantalum may lead to new electronic materials, tweaked band gaps, and new photocatalysts, says Sandia researcher May Nyman (6316).

May, along with postdoc Travis Anderson (6316), reported these unexpected disparities in a cover story of the Oct. 28 *Dalton Transactions*, an international inorganic chemistry journal published by the Royal Society of Chemistry, the



COVER OF journal *Dalton Transactions* featuring research by May Nyman and several coauthors.

British equivalent of the American Chemical Society. The paper also received the distinction of being picked among "the hottest science" by referees of that journal on its web page.

"The elements tantalum and niobium are in the same column on the periodic table," says May. "Their electronic configurations are related and their ions are virtually identical in size. Generally, the prevailing paradigm has been that their characteristics are very similar. They are described that way in chemistry textbooks. But we found that tantalum oxides are considerably more inert and less soluble than niobium oxides, and we wanted to understand why."

The unexpected difference, as well as a new "soft chemistry" method of forming compounds containing them, means that new materials with tailored properties may be

### Section 3161 announcement:

## Possible workforce restructuring at Sandia National Laboratories and its satellite facilities announced

Note: The following information was distributed by NNSA's Sandia Site Office to the news media on Oct. 9.

The Department of Energy (DOE), the National Nuclear Security Administration (NNSA), and NNSA's Sandia Site Office (SSO) today announced that they have begun work on a draft workforce restructuring plan (Plan). The draft Plan, being developed consistent with Section 3161 of the National Defense Authorization Act for Fiscal Year 1993, is required whenever workforce restructuring may occur at a DOE defense nuclear facility.

The Section 3161 Plan will mitigate the impact of any potential workforce reductions among the employees at Sandia National Laboratories, its satellite facilities, and the surrounding communities, and will be developed in consultation with affected stakeholders. It will set forth the Department's approach for responding to the changing missions and contractor structure at Sandia National Labora-



RESEARCHER MAY NYMAN, right, and postdoc colleague Travis Anderson (both 6316) have discovered unexpected differences in the properties of niobium and tantalum, which, given their positions on the periodic table, should have similar characteristics. May, Travis, and several coauthors have published a paper on their findings in the British Royal Society of Chemistry journal *Dalton Transactions*. (Photo by Bill Doty)

formed more simply. The old method, called "the volcano method," involved melting oxides together at very high temperatures. The "soft" method was published by May and others this past summer and involves chemical finesse rather than brute force.

### 'Inertness is important'

Tantalum oxides are used in medical implants and hypoallergenic surgical tools, as well as to help form ceramics that hold nuclear waste, because of their inertness in liquid media. They resist destruction by radioactivity and do not poison the body by deteriorating in its tissues.

Tantalum oxide is also used in cell phones as capacitors primarily because of its ability to hold electrical charge, but even there, says May, "Inertness is important."

But the underside of usefully inert materials like tantalum oxides is they are hard to work with. They tend to precipitate out of solution in an uncontrolled and undesirable way.

Niobium is easier to work with, but less inert for reasons poorly understood until May and coworkers used the soluble Lindqvist "cluster" ions to explore this question.

The ion is composed of tantalum and oxygen

or niobium and oxygen, and contains only 25 atoms each. The predictable and repetitive structure of these collections of ions lends itself to study more than do tantalum or niobium oxide surfaces, which are formed of a disordered collection of oxygen and tantalum or niobium atoms. Therefore the ion was a possible model to study

*"Generally, the prevailing paradigm has been that their [niobium and tantalum] characteristics are very similar. They are described that way in chemistry textbooks. But we found that tantalum oxides are considerably more inert and less soluble than niobium oxides, and we wanted to understand why."*

Sandia researcher May Nyman

the surface — if they behaved the same way.

"Much to our surprise, the Lindqvist ions proved to be ideal models for both the structural features and the chemical reactivity of the tantalum and niobium oxide surfaces," notes Travis.

"We did one of the few studies of both oxide surfaces and cluster ions where both behave the same way," May says, "and the study revealed unprecedented differences in the behavior of niobium and tantalum oxides."

The difference was in the way that water exchanges with oxygen atoms in both the clusters and at the surfaces of these materials. In the tantalum materials it exchanges in a way that makes it unstable, and precipitating it onto a surface is one way to stabilize it. In niobium materials, the reaction with water results in stable species that can stay in solution more easily.

Understanding how tantalum oxide behaves in aqueous media, and controlling it by soft chemistry, should lead to the production of new tantalum and niobium oxide materials with optimum characteristics.

Other authors on the paper include Mark Rodriguez (1822,) Francois Bonhomme of the Ecole Centrale de Paris, Joel Bixler (Sandia summer student, University of Texas-Austin), and Todd Alam (1816). The work was done in collaboration with Bill Casey, a professor at University of California Davis.

The work was funded by Sandia's Laboratory Directed Research and Development office.



tories and its satellite facilities for FY2008 and beyond.

The draft Plan is available on the SSO website ([www.doeal.gov/sso](http://www.doeal.gov/sso)) for public comment through Oct. 19, 2007. The draft Plan will be finalized at the end of the stakeholder comment period.

Sandia Corporation, a subsidiary of Lockheed Martin Corporation, the management and operating contractor for Sandia National Laboratories and its satellite facilities, is evaluating options for restructuring its work force, should restructuring be necessary. The action is part of Sandia Corporation's ongoing assessment of the skills mix of the current work force in comparison to the skills mix necessary to carry out current and future missions.



ALL NEW EQUIPMENT — Modern equipment and efficient techniques rejuvenate Sandia's machine shop. Using an updated recapitalization strategy, the shop acquired 11 new machines this year. Adding the new machines is just one of several ways the machine shop has responded to customer feedback. (Photo by Bill Doty)

## Machine shop works to get back into customer service

By Jacqueline Cieslak

When customers enter the machine shop in Bldg. 840, they are greeted by a large yellow banner reading "Excellence in the customer's interest" — a motto the shop has worked to adopt through changes over the past 11 months.

"Before, we were organized in a way that was convenient for us," says David Plummer, director of Manufacturing Science & Technology Center 2400. "Now it's easier for our customers. We have really picked up the motto of 'We're putting service back in Service Center.'"

After David became director in December 2006, he and Carla Chirigos (2024) directed the business operations staff — including Lynne Starkweather and Elizabeth Roll (both 2024) — to spend the following months working on a comprehensive study on the business health of the Bldg. 840 shop.

"After interviewing most of the workforce in the shop and nearly 100 Sandia customers, we came up with a list of 30 recommendations of what the shop could do differently," Elizabeth says. "Times had gotten leaner for the shop, and we didn't necessarily understand the economics of our business well enough to react quickly to change."

In FY06, the Nuclear Weapons SMU provided funds to cover the shop's financial shortfalls. This year, however, the shop has not required any bailout or subsidy from Nuclear Weapons or any of the other SMUs.

"That's probably our biggest accomplish-

ment," Elizabeth says.

Other changes to the shop all have focused on improving customer service, and business operation staff members say they hope these changes will eventually help the economic side of the shop as well.

### 2431 reorganization

Before the recent changes, Dept. 2431 was organized in sections based on the type of work they did. Now, it's organized in a more customer-friendly way. Three new sections — Machining and Liaison Services, led by Daryl Reckaway (2433-1); Machine Shop, led by Joe Stephenson (2431-2); and Machine Shop Infrastructure, led by Doug Abrams (2433-2) — work together to get all types of shop work done.

Joe Harris, senior manager of Manufacturing Enterprise Dept. 2430, and Matt Donnelly, manager of Machining Operations Dept. 2431, are the architects behind the concept of centralizing operations within the shop. Customer service representatives now sit at the main entrance on the west side of Bldg. 840, creating one primary point of entrance for the customer.

Along with this reorganization, the shop now keeps a job board at the front with the service representatives. Customers can stop by and check the status of their job anytime. Matt hopes to eventually see the job board move online, giving customers yet one more way to obtain information.

### New machines

In FY07, the shop purchased 11 new pieces of equipment. According to Joe, this is the most machines ever purchased in a single year. However, there is a major difference between the types of machines they're purchasing now and the ones they bought in the past.

"We identified that we have a shortage of basic or standard CNC [computer numerical controlled] machinery required to support the business," Matt says.

In the past, the shop would invest in unusual equipment that would allow it to provide unique services to Sandia customers. Now the shop is changing to try to be able to provide the more common services in a more cost-effective way.

The shop has disposed of 12 pieces of manufacturing equipment this year. With more money coming in, Matt says the shop will continue to invest in more practical machines to do the everyday

work for customers.

For Sandians needing quick-and-easy jobs, the shop now has a machinist on call (845-SHOP). Begun in early July under the direction of Doug Abrams (2433-2) and Linda Wood (1057), the service has had about a dozen calls so far, and in more than half the cases has managed to get the parts back to the customer in the same day.

"The original vision was to be more convenient for our customers," Linda says. "Rather than the customer having to come to the shop with the materials, we would send our people to the customer."

Customers can stop by the machine shop in Bldg. 840 in Tech Area 1 to schedule work or, depending on the scale of the work, call 845-SHOP to schedule a job.

Customers can also receive assistance in drawing up plans for the job from a professional machinist, who will come right to the customer's office.

"In addition to cost, schedule, and performance, the customers were concerned about collaboration and communication," Lynne says. The machinist on-call service provides another avenue for customers to engage in that desired collaboration.

### Other changes

Most of the changes in the 840 machine shop are the result of a common goal: to make the shop more customer-oriented. The shop is also working on the following:

- Implementing the software "Job Boss" to keep the entire shop more organized electronically.
- Offering the option of firm-fixed-pricing for well defined statements of work or drawings.
- Establishing a second liaison office in Tech Area 4 to better serve the customers there.
- Restarting the Apprentice Program under a different model.

"We're really working hard to better serve our Sandia customers," Lynne says. "The point that we want to get across is that change has happened. We've listened to you, customers."



IT GOES IN THIS WAY — Tim Mitchell (2431) loads a cutting tool, this one intended for future use, into a new Haas milling machine's automatic tool changer. (Photo by Bill Doty)

### Sandia's ECP giving through the decades

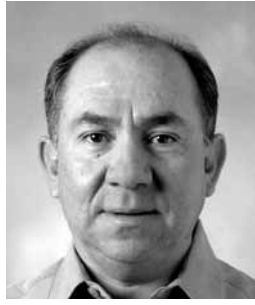
1956 - \$63,900  
 1966 - \$261,767  
 1976 - \$518,006  
 1986 - \$1,163,630  
 1996 - \$1,579,993  
 2006 - \$3,335,202



**ECP campaign runs Oct. 8-26**

# Mileposts

New Mexico photos by Michelle Fleming



Marcelino Armendariz  
30 1711



Larry Azevedo  
30 2542

## Recent Retirees



Ron Haid  
41 2996



Rodney May  
30 1505



Kenneth Miller  
30 2952



Larry Stevenson  
30 2951



Diana Suina  
30 1053



Joe Santana  
38 2993



Gilbert Maestas  
25 10263



Michael Vahle  
30 5500



Francis Bouchier  
25 6418



James Bruniske  
25 4863



Thomas Merewether  
25 2736



Mark Platzbecker  
25 1749



Sheldon Tieszen  
25 1532



Ed Cole  
20 1726



Joe Polito  
20 9000



Rudolfo Sanchez  
20 4844



Rodney Schmidt  
20 1437



Donna Bauer  
15 10513



Charles Olguin  
15 1521

## MESA MicroFab gains environmental certification

**LEED award from US Green Building Council shows we're 'green' again**

By Neal Singer

Sandia makes fine widgets and has powerful supercomputers. But the Labs also embraces environmental sustainability.

The newly completed three-story MESA Microsystems Fabrication (MicroFab) facility was recently certified under the Leadership in Energy and Environmental Design (LEED™) Green Building Rating System developed by the US Green Building Council.

It is believed to be the first microchip fabrication facility to obtain this prestigious certification.

LEED certification is granted only to building projects that demonstrate superior performance in five key areas of human and environmental health: sustainable site development, water savings, energy efficiency, materials selection, and indoor environmental quality.

Energy efficiency is an integral part of the MESA project design, including a highly efficient and innovative Central Utility Building plant that serves both the MicroFab and the adjacent Micro-Lab buildings. The cleanroom functions of the MicroFab lead to a natural emphasis on indoor air quality, including application of low-emitting materials and use of high-efficiency air filtration media.

Since semiconductor manufacturing involves significant process water use, the MicroFab incorporates a high-efficiency ultra-pure water generation process, process water recycling loop, and

reclaim/reuse of water for cooling tower and scrubber applications.

Other project-specific green measures include accessibility to alternative transportation options, occupant-based water-efficient plumbing fixtures, and low-water-use landscape design.

Resource conservation through waste management, incorporation of recycled content materials and locally manufactured materials were also emphasized in the project.

Currently, there are approximately 1,000 LEED-certified buildings worldwide with another 8,000 building projects seeking LEED certification.

The MicroFab facility is one of the most complex buildings at Sandia and is the first of three new facilities that make up the Microsystems and Engineering Sciences Applications (MESA) complex. Its structure includes sophisticated safety systems and controls because of the hazardous materials used in the production of compound semiconductors. The MicroFab provides cleanrooms and transition cleanroom space, support



**CERTIFIED GREEN** — The three-story MESA Microsystems Fabrication (MicroFab) facility was recently certified under the Leadership in Energy and Environmental Design (LEED™) Green Building Rating System developed by the US Green Building Council. (Photo by Bill Doty)

labs, chemical and specialty gas rooms, and a service yard.

Other "green" Sandia buildings include the Center for Integrated Nanotechnology (CINT), the Joint Computational Engineering Laboratory (JCEL), and the Weapons Evaluation Test Laboratory (WETL) at the Pantex Plant near Amarillo, Texas.

# New Albuquerque Family Advocacy Center to open Oct. 24

By Iris Aboytes

A mother with small children is being abused by her husband. Statistics show the children are also often being abused. How can it stop? How can they all get to safety? What does the mom do? Where does she go first? Help has many possibilities — law enforcement, legal, medical, and education systems, etc., etc. How about the faith community?

The Albuquerque Family Advocacy Center has been established in partnership with the city of Albuquerque and United Way of Central New Mexico (UWCNM). The AFAC is a multidisciplinary, colocated facility of organizations and services that assist adult and child victims of intimate partner violence, child abuse, sexual assault, and rape. It houses government and nonprofit service providers under one roof to make it easier for victims to get access to the services they need to improve their lives.

Sandia/Lockheed Martin recently donated \$25,000 to the center. The Labs Leadership Team toured the facility and received a briefing on its mission. (See story below.)

The center is on the second floor of 625 Silver Ave. SW. It is one block from the city's free bus service that circles around downtown every seven minutes. It is open 8 a.m. to 5 p.m., Monday through Friday. Agencies that provide medical, advocate, and law enforcement services will have 24/7 access to the facility. Acute sexual assault exams for adults or children will be done whenever they are needed.

Each organization maintains its own auton-

The Albuquerque Family Advocacy Center will be open from 8 a.m. to 5 p.m., Monday through Friday. It will be accessible 24 hours a day, seven days a week, 365 days a year with medical, law enforcement, or advocate onsite partners. The FAC phone number will be 243-2333 and the web address will be [www.abqfamily.org](http://www.abqfamily.org).



THE HARD FACTS — A delegation of Sandia's Laboratory Leadership Team headed by Labs Director Tom Hunter (fourth from right) traveled to the soon-to-open Albuquerque Family Advocacy Center (AFAC) to tour the facility and receive a briefing the agency's mission from Joanne Fine, left, project director, Family Advocacy Center. Sandia/Lockheed Martin donated \$25,000 to the Center. The money will be used to sponsor special rooms that will provide snacks and clothing for traumatized victims. (Photo by Randy Montoya)

omy, structure, and funding, but the city of Albuquerque provides free office space and United Way of Central New Mexico is providing the one-time costs to support the facility.

Research has consistently shown that victims of family violence who successfully move into healthy living situations need up to 32 different organizations to help them get there. Many victims return to abuse because the systems in place to help them are hard to reach. For some it is difficult to find the courage to move forward after being so seriously hurt for a long time. In many cases, it is the abuse of the children that moves the victim to action.

The AFAC makes it possible to go to one site where there are medical personnel, law enforcement professionals, advocates, and forensic interviewers (who reduce the number of times a victim has to tell their story). The information is recorded for court purposes. Multiple entities can remotely

observe the review and add questions.

Safety is paramount at the AFAC. A security system is in place to safeguard each victim. The



DURING A TOUR of the Albuquerque Family Advocacy Center, Labs Director Tom Hunter (center) shares a moment with United Way of Central New Mexico Executive Director Jack Holmes (left) and Albuquerque Police Chief Ray Schultz. (Photo by Randy Montoya)

reception area of the AFAC will be accessible from the elevator. The remainder of the floor will be accessible by security card access only. The AFAC will be a victim-only site. Police will bring suspects to other locations to interview.

Care has been taken to give the facility a warm and welcoming atmosphere, a place where help is freely given. Victims can come and decide for themselves what services they want or what services they do not want. They take the first step in taking their lives back.

As she conducts a briefing at the Family Advocacy Center, project director Joanne Fine challenges visitors to imagine a world free of rape kits and rape exams, a world where clothing isn't wrapped in white butcher paper to preserve forensic evidence. She asks visitors to envision a world where children live not in an atmosphere of chronic abuse, shame, and pain, but in an environment rich with laughter and affirmation. The Family Advocacy Center, she says, cannot by itself bring about that world, but for the victims it serves, it can restore some of the trust that has been stripped from them. It can help them re-engage the world with confidence and self-respect.

Also available at the center is a Reflection Room. Whatever the victim's faith, the hope is that this will be a beginning of a peaceful journey.

## AFAC onsite partners

- Albuquerque Police Department
- Albuquerque SANE [Sexual Assault Nurse Examiners]
- Asian Family Center
- Bernalillo County District Attorney
- Bernalillo County Sheriff's Department
- Child Protective Services, CYFD
- District Court
- ENLACE Comunitario
- Family & Community Services, City of Albuquerque
- Legal Aid of New Mexico
- NM Crime Victim Reparations
- NM State Police
- Para Los Niños, UNMH
- Rape Crisis Center of Central New Mexico
- Resources Inc. Victim Assistance Unit

## Sandia/Lockheed Martin donates \$25,000 to Albuquerque Family Advocacy Center

Members of Sandia's Laboratory Leadership Team toured the new Albuquerque Family Advocacy Center recently.

On Nov. 1, 2006, the City of Albuquerque and United Way of Central New Mexico (UWCNM) agreed to partner to build a Family Advocacy Center in Albuquerque.

UWCNM examined Scottsdale and Mesa FACs and met with the San Diego Family Justice Center.

The decision to continue was made and the Albuquerque Family Advocacy Center began to take shape. It will open Oct. 24.

Sandia/Lockheed Martin donated \$25,000 to the new Center. The donation enables Sandia to sponsor two rooms. One is the family snack area where two refrigerators will be fully stocked. The other will contain clothes and shoes. Victims' clothes are frequently kept for examination.

The Mix is What Matters!

The Corporate Diversity Team is hosting a Block Party

Please join us! Everyone is welcome.

When: Tuesday, October 23 11:30 - 1:00 PM

Where: Tent next to the T-Bird Cafeteria

Come and see what your Diversity Councils have on display — and see how you can get involved!

Contact Lupita Serna at 845-3401 for more information.