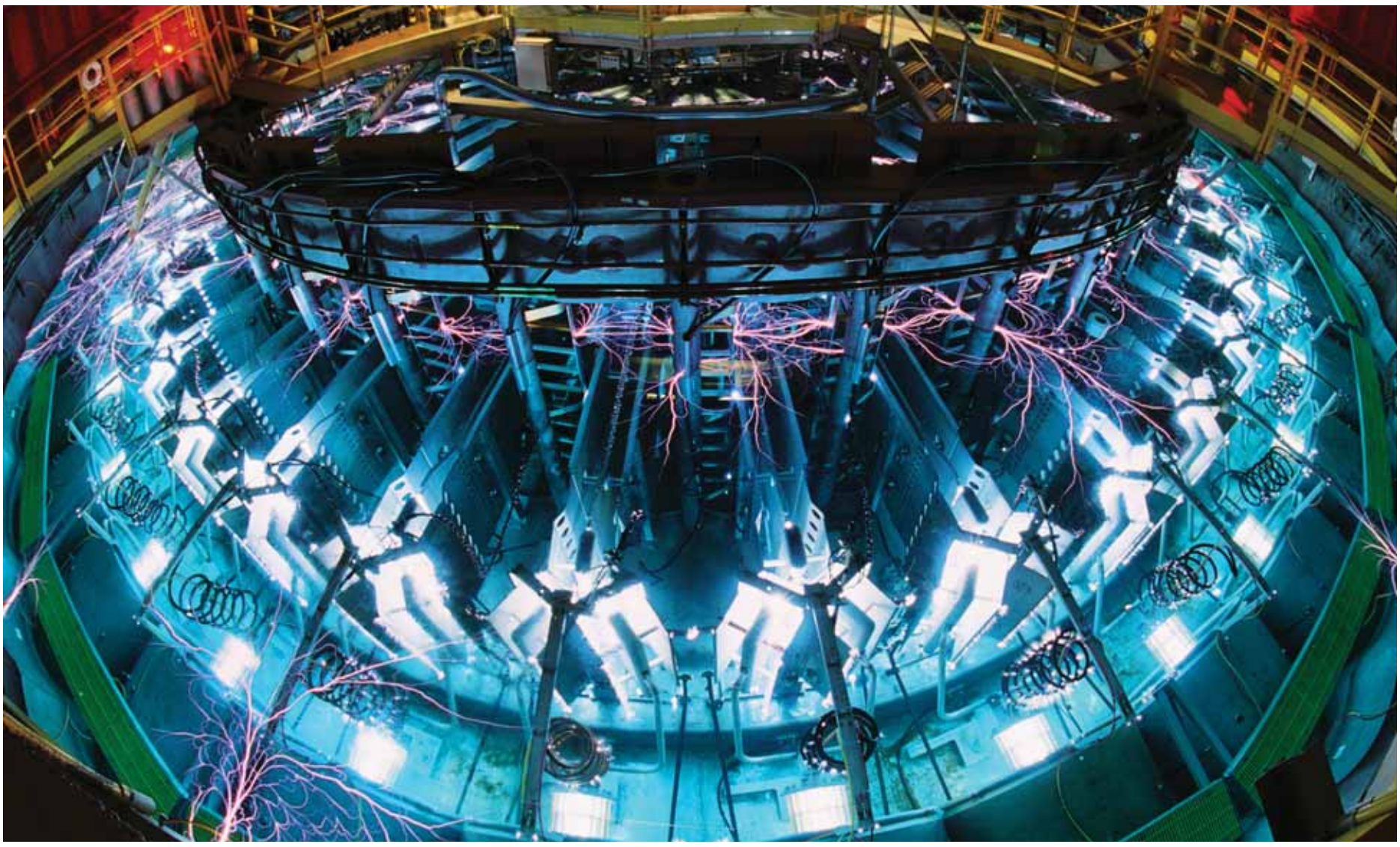


THE RINGS OF SATURN

SATURN, SANDIA'S WORKHORSE pulsed-power machine, delivers hard radiation during one of its milestone shots. The scarcity of jagged, lightning-like arcing between different water/metal interfaces means that the machine's water insulation is effective, and that relatively much of its electrical pulse is traveling on its intended path from the machine's circular exterior to its central target. For more about Saturn, and about Hermes, another Sandia big machine — the biggest gamma ray producer in the world — see the story on **page 6.** (Photo by Randy Montoya)

Sandia LabNews

Vol. 63, No. 16 August 26, 2011

Managed by Lockheed Martin for the National Nuclear Security Administration

Sandia National Laboratories

SANDIA'S COUNTERING BIOLOGICAL THREATS program has taken the lead worldwide in setting global standards for laboratory safety and security, and teaching them to practitioners. Photo and story on **page 7.**

and . . .

iPad to the rescue

New tool allows responders to visualize post-event disaster environments

DISASTER RELIEF — Chuck John and Steve Mier (both 8116) use the SUMMIT iPad app to visualize calculated building damage during an NLE-11 exercise conducted in Jonesboro, Ark. (Photo by Steffan Schulz)

By Mike Janes

Using iPad™ mobile devices, emergency preparedness officials and first responders participating in FEMA's National Level Exercise 2011 (NLE-11) in May were able, for the first time, to make use of a new, science-based software tool that allows them to view and modify accurate models of building damage and other post-event disaster effects.

With funding and direction from the Department of Homeland Security's Science and Technology directorate and support from FEMA's National Exercise and Simulation Center, Sandia developed the tool, known as the Standard Unified Modeling, Mapping, and Integration Toolkit (SUMMIT). It was piloted at the NLE-11 exercise.

"Say you're a fireman, medic, or police officer and you're participating in an annual exercise to hone your preparedness skills," says Karim Mahrous (8116), the SUMMIT project lead at Sandia. "Such drills, you realize, are vital in mitigating the damage that might arise from natural disasters or terrorist events.

"Almost by definition, however, exercise planners have an inherent challenge in creating drill scenarios that can be vividly imagined and thus acted upon by participants," Karim continues. "Typically, first responders

(Continued on page 3)

That's that

I see where the Hubble telescope has discovered another moon around Pluto, the poor little planet that went through the indignity of an official demotion in 2006, when the International Astronomical Union (IAU) deemed it to belong to a new category: dwarf planet. The Hubble discovery hasn't done anything to change its status; even with four (known) moons of its own, Pluto isn't considered worthy to be mentioned in the same semantic context as Earth, Neptune, or even Uranus.

New Mexicans, of course, have a special connection to and affection for Pluto, the little planet that could. It was discovered by Clyde Tombaugh, who taught astronomy at New Mexico State University for many years. I've always felt Pluto got a bit of a bum rap from the IAU; oh, I'm sure they're right on the technical merits, but couldn't little Pluto maybe have been grandfathered in?

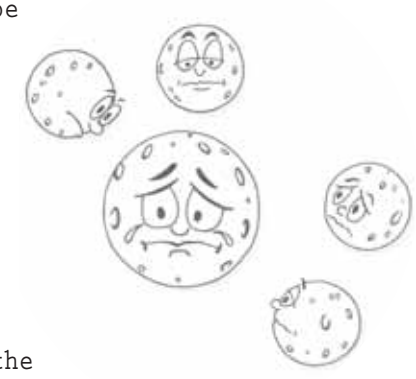


Illustration by Mike Lanigan

When I think about Pluto's demotion, I'm reminded of a newspaper column I read years ago by the great humorist Art Buchwald. Here's the setup: In 1969, Pope Paul VI for technical reasons removed St. Christopher's feast day from the Roman Catholic calendar of saints. St. Christopher, recall, is the patron saint for travelers. There was, predictably, a bit of hue and cry from certain of the faithful at this omission. It even rose to the level of a minor international flap. Buchwald, who had this brilliant ability to see the humor in just about everything, knew a good thing when he saw it. He speculated that, the insult to his good name notwithstanding, good old St. Christopher would go right on protecting travelers, calendar or no, because "he's just that kind of guy."

Likewise, demotion or not, Pluto goes right on orbiting the sun, with its four little moons in tow, because, well, because it's just that kind of planet.

* * *

Do you text? I'll admit that, early adopter though I have been in many areas of the digital age, I've never gotten into texting. Not bragging here; no reverse snobbery intended. It's just that I've always viewed texting as an extension of the telephone and — as my wife could tell you — I'm word-challenged, telephonically speaking. I remember the time I got a call from an old friend from middle school. We hadn't seen each other in probably 25 years when out of the blue he called to pass along some news about another classmate. We talked for a minute or so. When I hung up, my wife was flabbergasted. "You haven't talked to Dave in 25 years and you hang up after two minutes?" she exclaimed. "Well," I replied a bit sheepishly, "we said everything we had to say."

Anyhow, back to texting: I was actually able to shepherd my two kids through their teenage years without ever once sending a text message to either of them. Just sayin'.

On the other hand, a colleague here at work has found texting a useful tool for keeping in touch with his two daughters. As it happens, he was vacationing this year at his regular summer redoubt in Oceanside, Calif., where he can indulge his passion for boogie boarding (a passion I share, by the way, old surfer that I am . . . er, was). One evening, he found himself on Oceanside Pier, one of those great places where people from every strata of society meet and mingle on common ground. He needed to get in touch with one of his daughters, and as they have trained him to do, he pulled out his phone and started to tap out a text message. While he was fumbling awkwardly with the tiny keyboard, he noticed that a 10- or 11-year-old girl was watching him very closely. Apparently taking pity on his clumsy efforts, she said to him, "S'cuse me, Mister . . . if you tell me what you want to say, I'll type it for you." Ouch! He says he hasn't sent a text message — in public — since then.

See you next time.

— Bill Murphy (505-845-0845, MS0165, wtmurph@sandia.gov)

Sandia Lab News

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 wholly owned subsidiary of Lockheed Martin Corp., for the US Department of Energy's National Nuclear Security Administration.

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

Contributors: Neal Singer (845-7078), Iris Aboytes (844-2282), Patti Koning (925-294-4911), Stephanie Holinka (284-9227), Darrick Hurst (844-8009), Stephanie Hobby (844-0948), Heather Clark (844-3511), Tara Camacho-Lopez (284-8894), Renee Deger (284-8997), Jane Zingelman (845-0433), Michelle Fleming (Ads, Milepost photos, 844-4902), Jim Danneskiold, manager (844-0587)

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

Published on alternate Fridays by Media Relations and Communications Dept. 3601, MS 0165

LOCKHEED MARTIN

Lab News Reader Service

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

Retirees (only):

To notify of changes in address, contact Benefits Dept. 3332, Customer Service, at 505-844-4237, or Mail Stop 1021, Sandia National Laboratories, Albuquerque, NM 87185-1021.

Others:

To receive the *Lab News* or to change the address (except retirees), contact Michelle Fleming, Media Relations and Communications Dept. 3651, 505-844-4902, email meflemi@sandia.gov, or Mail Stop 0165, Sandia National Laboratories, Albuquerque, NM 87185-0165.

Employees:

To address concerns regarding delivery of the *Lab News* to your facility, call Mail Services Team 10268-4, at 844-3796. At Sandia/California contact the Mail Room at 925-294-2427.

Web users:

The *Lab News* is on the external web at www.sandia.gov/LabNews. *Lab News Interactive*, accessible on the internal web, is at: www-irn.sandia.gov/newscenter/interactive.

Human Resources & Communication VP John Slipke is not ***retiring***-retiring

By Iris Aboytes

When Human Resources & Communications VP John Slipke closes the door to his office Sept. 1 after working for almost 33 years, he won't be *retiring*-retiring. He is just beginning a new chapter in his life.

HR VP JOHN SLIPKE, retiring after nearly 33 years.

John says he will be consulting and doing a lot of volunteer work back home in Greenville, S.C.

"I have been involved with several nonprofit organizations since I have been in Albuquerque," he says. "Now I will have more time to be involved with the community in Greenville."

His wife, Bridget, will join him in retirement soon.

"Bridget is happy I'm retiring and coming home," John says. Because of previous commitments, John's family has remained in Greenville while he has been in New Mexico. John has three children, Ryan, Devin, and Michael.

> *"I am very proud and honored to have worked at Sandia. It has exceeded my expectations. It is a tremendous organization. Sandia helped me grow personally and professionally. My experience here has been very rewarding."*

John's career with Lockheed Martin began in California and took him to Texas, South Carolina, and finally Sandia and the Land of Enchantment. He has also been involved with several of Lockheed Martin's international operations in the Middle East, Europe, and South America, as well as joint ventures in China, Hungary, and Malaysia. His work included all the human resource functions — staffing, compensation, benefits, and labor relations.

Challenging issues, mission focus

John says there have been difficult issues to deal with since he got here.

"The issues associated with our healthcare and pension costs have been challenging," he says. "Even with these issues, the workforce at Sandia has continued to focus on the mission. This is one of the strengths of the Laboratories."

John has made himself at home in Albuquerque. In addition to serving on various community boards he is a graduate of the 2010 class of Leadership New Mexico. Through that organization he had the opportunity to meet and visit people around the state.

"New Mexicans are very open and friendly," says John. "They are warm and inviting. I will return to Albuquerque to see the many friends I have made."

John will miss the Lobos basketball team. "I've had season tickets for Lobo basketball the last three years," he says. "The Pit is a great basketball venue."

John has learned to love the New Mexico climate and will miss it greatly when he returns to South Carolina.

On most weekends, John could be seen lugging his golf clubs as he played another round of golf. If you happened to be on one of Albuquerque's beautiful bike trails and noticed a tall biker pedaling past you, it might have been John. "The weather here is so nice," says John, "I took up cycling.

"I am very proud and honored to have worked at Sandia," he adds. "It has exceeded my expectations. It is a tremendous organization. Sandia helped me grow personally and professionally. My experience here has been very rewarding.

"I will miss the people here as Sandia. I am proud to have been a part of this unique institute. But I am happy to return to my family and home."

SUMMIT MODELS are linked together to calculate building damage, and then this data (collapsed buildings, damaged buildings) is visualized in a virtual environment to provide a photorealistic view of the exercise scenario. The images here depict a before-and-after view of the damage caused by an earthquake in a residential neighborhood.

Visualizing disaster

The SUMMIT iPad app displays a photorealistic image of the calculated building damage in a virtual environment.

(Continued from page 1)

playing in an exercise must pretend and dream up how a damaged building might look. With SUMMIT, there's no more pretending."

"The SUMMIT software tool, I believe, will be a phenomenal training aid for all responders in our county," says David Moore, director of emergency management for Craighead County in Arkansas, which played a key role at NLE-11. "By having a graphical view of damaged areas, it's much easier to comprehend what's going on in the exercise and thus make smarter, firmer decisions."

Realism and 'best-of-class' models

NLE-11 took place May 16-20. First responders role-playing in the exercise in Jonesboro, Ark., had iPads available to them with the SUMMIT software, while others in a Washington, D.C., central command post were be able to see the visualization software on large screens. This enhanced, 3-D virtual view of damage available to players in the field is expected to create a new level of realism and a common operating picture for players in future exercises at national, regional, and local levels.

"Preparing responders to work within a rapidly evolving, diverse, and multijurisdictional environment — often with limited or quickly changing situational understanding — is a major challenge," says Jalal Mapar, the DHS/S&T program manager who oversees the SUMMIT program.

SUMMIT significantly improves the cycle of activities that emergency response teams undertake, including pre-event planning and equipping, training and exercises, and evaluation and improvement. By creating a collaborative environment that allows dynamic linking of "best-in-class" modeling and simulation tools and underlying data, SUMMIT increases preparedness effectiveness while decreasing the time and cost needed to train for, analyze, and respond to real or potential incidents.

"Many organizations and government agencies have already made significant investments in modeling and simulation, so this is not meant to be yet another modeling tool," says Jalal. "What is urgently needed, then, is not a whole new set of models, but an easy, quick, and user-friendly way to access and link together the most appropriate models for a given emergency drill."

Though current modeling tools are effective, they all incorporate different assumptions that currently require a large amount of time, resources, and human effort to properly synchronize each model's output.

Making SUMMIT a pervasive part of emergency response

SUMMIT's software architecture will help a range of emergency preparedness professionals from the federal, regional, and local levels tap into existing models to ensure consistency, accuracy, and robustness when exercise scenarios are developed and played out.

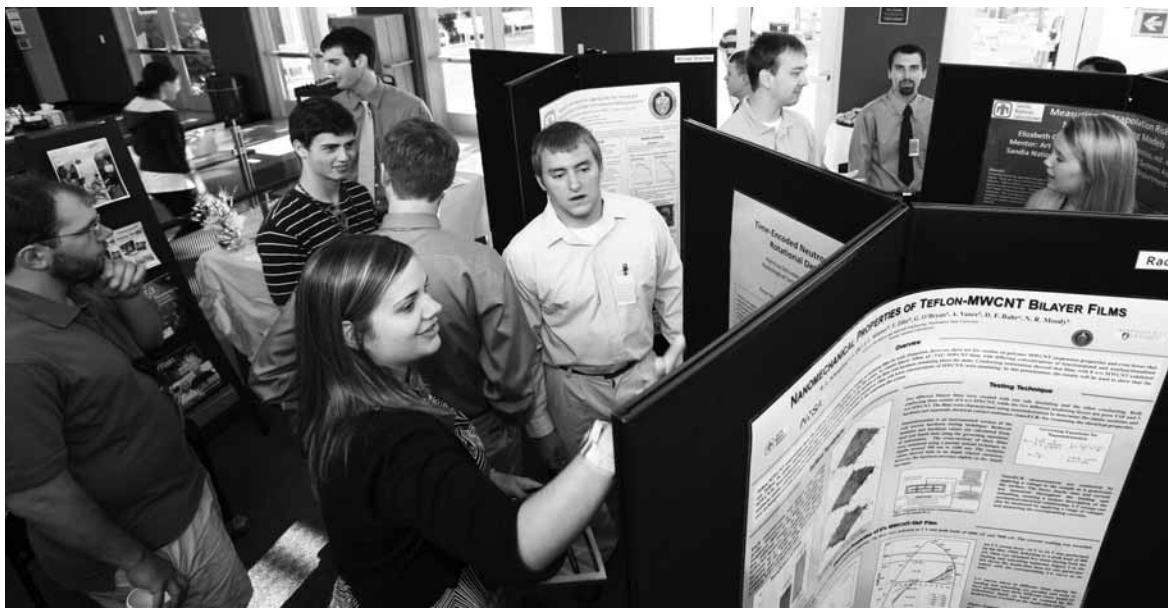
Using various models and calculations, SUMMIT can input details on buildings and infrastructure, casualties, and other key pieces of information. During exercises, it will visualize an integrated "story"' that can be made available for players in a master control cell, much like what occurred in Washington, D.C., during NLE-11.

The broader goal, says Jalal, is to make the SUMMIT capability a pervasive part of preparedness and response for emergency managers, responders, and exercise teams in the federal, state, and local government. Learn more about the project at https://dhs-summit.us/.

Sandia CaliforniaNews

SUMMIT team members Stephen Mueller (8116), Katherine Guzman (8114), and Nerayo Teclemariam (8116) running SUMMIT in the NLE-11 master control cell.

Students show off work at annual intern symposium



The annual intern symposium at Sandia/California is always a bittersweet occasion — there is excitement at seeing how much interns accomplished and learned during their summer stay, but sadness that they are taking their youth and energy back to college or graduate school. In the photo above, Patricia Schuster (8132), a graduate student at the University of California, Berkeley, discusses her project with Karl Weinfurther (8132). At left, Mari Angelica Sanchez (8261), a senior at UC-San Diego, enjoys a moment of quiet between questions about her summer research project.

(Photos by Dino Vournas)

Streamlining Sandia's compliance training process

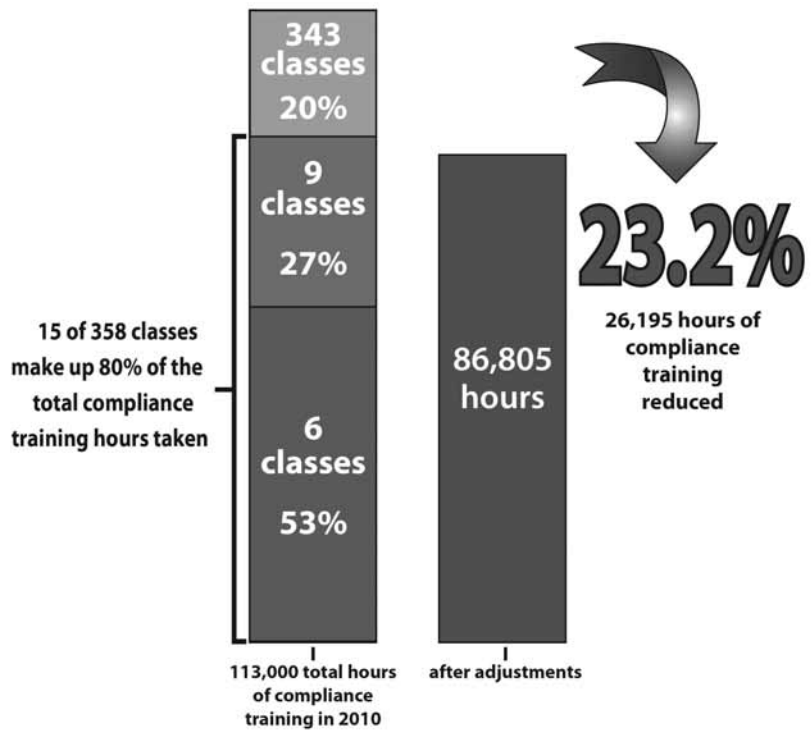
By Jim Danneskiold

Sandia workers will spend nearly one-fourth fewer hours completing required training, thanks to a broad, concerted effort by several organizations to improve compliance training effectiveness and efficiency.

With the endorsement of executives, Human Resources Corporate Learning & Professional Development (CL&PD), along with policy stakeholders, have trimmed course content to focus on essential information, reduced the number of Sandians required to take some courses, and added test-out options for certain courses.

Last year, Sandians spent about 113,000 hours in compliance training. More than half those hours were spent in six broadly required courses. Only 15 of the 358 compliance courses added up to 80 percent of the time employees spend on compliance courses.

"We set out to increase the effectiveness of corporate and organization compliance training for members of the workforce without compromising policy area performance," says Karen Gardner, director of Human Resources (3500). "A wide range of stakeholders helped with this, and it's a great example of shared initiative and shared successes."



Karen says all the training reductions Labs wide will save about $2.4 million a year in time spent on compliance training, or roughly 23 percent fewer training hours. HR and its partners in the training efficiency project have identified potential additional savings of about $700,000 annually and are continuing to look for ways to reduce training costs while making sure employees get the training they need.

Major cost savings were realized through the ongoing process improvement effort by the CL&PD organization.

One course that all Sandians take was redesigned with fewer pages and test improvements. ESH100 now should take 30 minutes or less to complete. Some classroom courses were changed to web-based versions, especially in Packaging and Transportation.

In addition, recent policy changes associated with the training effectiveness effort now permit employees to charge time in 15-minute increments, which is consistent with the actual "touch-time" for those courses and resulted in some savings.

A kaizen event analyzed the remaining 333 compliance courses for potential improvements while retaining content essential to worker safety and health. Kaizen, a Japanese word for improvement, aims to continually improve standardized workplace activities and processes and eliminate waste. Typically, a kaizen activity crosses organizational boundaries to involve the entire workforce.

Representatives from Human Resources, Environment, Safety and Health and Emergency Management (4100), Safeguards & Security (4200), Property (10263), Health, Benefits and Employee Services (3300), Facilities Management and Operations (4800), and Lean Six Sigma Operational Excellence (10602) took part in the kaizen event.

The team developed a formal definition of compliance training, which is training mandatory for members of the workforce to successfully perform work safely, securely, and competently as documented in the Sandia requirements system of policies, processes, and procedures, i.e., ILMS, or external requirements, such as DOE requirements, Lockheed Martin Corp. requirements, or federal law.

They identified additional compliance courses that could be consolidated, eliminated, revised to take less time, or moved out of the compliance category. Their comprehensive analysis included primarily job-specific compliance courses managed by CL&PD and line organizations.

Belinda Holley, manager of Technical and Compliance Training Dept. 3521, says the team sought input from across Sandia as more than 64 percent of compliance courses are owned by line organizations.

"We asked program managers and others to consider possible elimination or consolidation with another course, for courses that present redundant or confusing information, or a content revision of the courses they owned to increase training effectiveness and efficiency," Belinda says.

The team knew where to start — the courses that take up a significant amount of worker time and are not currently a focus of the CL&PD organization. From this effort, seven compliance courses managed by line organizations were eliminated and their content will be provided in other ways.

Advanced wind energy projects test facility moving to Texas Tech University

By Stephanie Holinka

Sandia is moving its wind energy test facility to a new location near the campus of Texas Tech University in Lubbock.

Sandia, Texas Tech, and Group NIRE are pursuing a three-way research agreement under which this facility will operate. DOE's Wind & Water Power program is funding Sandia's work. Group NIRE is a clean energy company providing project development, finance and consulting services.

The site will perform primarily experimental work in turbine-to-turbine interactions and will evaluate innovative rotor technologies. It will also investigate such areas as aero-acoustics, aero-elasticity, and structural health monitoring using embedded sensor systems.

"Wind flows into a turbine, and we understand how the turbine responds," says Sandia project lead Jon White (6121). "But what we aren't as clear on is what happens to the wind as it leaves that turbine and moves to the next turbine.

"We don't have a great deal of clarity about how wind turbines interact with each other," he adds. "Once you understand that, you can better optimize performance for an entire wind farm rather than just focusing on optimizing individual turbines."

Researchers also will continue work on the structural mechanical adaptive rotor technology (SMART) rotor program at the Lubbock site. "Most wind turbine rotors today are passive structures. Sandia's SMART rotors have active surfaces similar to airplane wings, with actuators that change their shape, allowing for greater control and flexibility," Jon says.

The Lubbock site will include an initial installation of two wind turbines and three anemometer towers, with the potential to expand to nine or more wind turbines, which will allow researchers to examine how individual turbines and whole wind farms can become better "citizens of the grid" and how they can be more productive and collaborative, Jon says.

Selecting a location was not easy, says Dave Minster (6121), manager of Wind Energy Technologies.

WHENEVER THE WIND BLOWS THIS WAY — Project lead Jon White (6121) will oversee the installation of turbines at the new Lubbock site. (Photo by Mark Rumsey)

Potential wind farm and wind research sites fall into classes one through five, with class five winds being the preferred wind for research and for harvesting energy. However, only a small percentage of available sites are class five. Winds vary year-round and change seasonally, Dave says, so the site needed to be carefully characterized to ensure year-round quality wind for rapid evaluation of technologies.

But a great facility takes more than wind.

"We looked for a location that not only had a great wind resource, but also had a true commitment to wind energy; the partnership with Texas Tech does just that," Jon says.

The Texas Tech University Wind Science and Engineering (WISE) center, located at Reese Technology Center, brings a 35-year history in wind science research to the collaboration.

"WISE has strong academic program from which to draw faculty and students, and significant facilities that include a 200-meter anemometer tower, a 9,000-square-foot assembly building and a class 5 (very energetic) wind site," Jon says.

Another partner, Group NIRE, will provide direct pathways for technology transfer to industry.

"With its other partners, Group NIRE will install additional megawatt-scale wind turbines at an adjacent site for testing and collaboration," Jon says.

Sandia's wind energy program has shared an instrumental partnership for more than 35 years with the Department of Agriculture's (USDA) large research facility in Bushland, Texas. Much of Sandia's wind testing has taken place at the Bushland site, from the early days of vertical axis wind turbines to today's work on sensors and smart rotors. Given the research needs of the industry, however, Sandia and the USDA agreed that a different location was in the best interest of both organizations.

"The Lubbock site will continue the tradition of evaluating next-generation technology, such as SMART rotor, operational load monitoring, and structural health monitoring technologies, which seek to improve energy capture and reduce operations and maintenance costs," says Dave. "These national test beds expand the nation's knowledge base and capability in the design and advancements of composite wind turbine blades and turbine reliability, and that could help reduce the cost of wind energy."

Dave expects work at the Lubbock facility to begin this fall.

Texas Tech University is home to more than 31,600 undergraduate and graduate students. Texas Tech is a comprehensive higher education institution providing education in a wide variety of disciplines ranging from the arts to the sciences. Texas Tech has an internationally recognized wind engineering program with a 67-acre research facility. For more information about the university, go to www.ttu.edu.

Group NIRE is currently developing wind projects in six states and working with several international renewable energy component manufacturers to commercialize new products and technologies. For more information about NIRE, contact Mark Harral, director of commercial development, at 806-771-7722.

Powering tribal lands

Tribal Energy Program at Sandia empowers Native American students

Story by Stephanie Hobby
Photos by Randy Montoya

PANEL DISCUSSION — Sandra Begay-Campbell (center) with interns Devin Dick, Tammie Allen, Gepetta Billie, and Chelsea Chee at Sky City within the Pueblo of Acoma. Here, Sandra describes how a photovoltaic panel works to generate electricity. (Photo by Randy Montoya)

Most Americans take electric power for granted, but for people living on tribal lands, getting to the grid can be a challenge.

For example, on the Navajo Nation, a 26,000-square-mile expanse in northwest New Mexico, northeast Arizona, and southeast Utah, an estimated 18,000 households live without power, and often it's not by choice. A lack of infrastructure, transmission capabilities, and policies impede the availability of electricity to outlying tribal areas. Cost is another challenge: One mile of power line costs $35,000, and the burden largely falls on the household requesting it.

A program at Sandia addresses those challenges and connects tribal governments in remote regions with viable electricity solutions. At the same time, Sandia is training a new generation of Native American renewable energy advocates.

Interns are key to the decade-old DOE Tribal Energy Program, which provides three levels of support to tribes turning to renewable energy sources: financial assistance through competitive grants, education and training, and technical assistance from Sandia and the National Renewable Energy Laboratory in Golden, Colo. Sandia's interns provide education and training as well as technical assistance.

The program opens doors for tribes seeking Sandia's help with renewable energy projects while connecting Native American students interested in tribal energy issues with native leaders, tribes, and tribal utilities across the country.

'Empowering and encouraging'

"I've been able to see and hear for myself tribal efforts to develop renewable energy projects ranging from strategic planning on the energy front to implementation, including rural electrification to utility power generation and distribution," says Gepetta Billie (6124), a year-round intern and three-time summer program participant. "It's empowering and encouraging to see tribes act proactively to improve the quality of life for the entire community. There is still a lot that needs to be done, so the work that gets done through and with the assistance of the Tribal Energy Program is incredibly invaluable."

Sandra Begay-Campbell (6124), a member of the Navajo Nation, started the internship program in 2002 and works with tribes all over the country.

"I wanted to help build capacity within tribal governments. The goal is to get to the point where you have tribal members who have technical skills to implement these programs," Sandra says. "DOE's Tribal Energy Program funds the interns; the students do the work and intensive research. At the end of the summer, we provide DOE with their research papers. The students are able to see what is available to them, and they grow as advocates for renewable energy."

POWER LUNCH — Annie Oandasan, special projects coordinator for the Pueblo of Acoma Utility Authority, speaks with the interns about the pueblo's plans to use renewable energy resources. (Photo by Randy Montoya)

This year, Sandra selected four interns:

• **Tammie Allen** is a member of the Jicarilla Apache Nation in northwestern New Mexico and is enrolled in the Community and Regional Planning master's program in the School of Architecture at the University of New Mexico (UNM). She expects to receive her degree this summer. Allen graduated with honors in humanities from the College of Santa Fe. She hopes to work in renewable energy and community planning after graduation. Allen is also recognized for her traditional ceramic pottery work, which is displayed in galleries nationwide.

• **Gepetta Billie** (6124) is a member of the Navajo Nation, grew up in Red Rock, near Gallup, N.M., and recently earned her master's from UNM's Community and Regional Planning program. She earned her undergraduate degree in environmental planning and design from UNM's School of Architecture and Planning, and also attended the Southwestern Indian Polytechnic Institute where she earned an A.A.S. in civil engineering technology. This is Billie's third summer working with Sandra and she has been a year-round Sandia intern. She hopes to continue work in tribal energy development.

• **Chelsea Chee** is a member of the Navajo Nation from Cedar Springs, Ariz., about 35 miles north of Winslow. She is working on her master's in UNM's Community and Regional Planning program. She worked for two years for a nonprofit youth organization that focused on the effect of climate change and global warming on indigenous people. With the experience Chee gains this summer, she hopes to take additional courses and eventually find work in the field of renewable energy.

• **Devin Dick**, a member of the Navajo Nation, is enrolled in the Navajo Technical College in Crownpoint, N.M., about 50 miles northeast of Gallup. He became interested in renewable energy while attending dances with his family on the neighboring Hopi reservation, where he saw solar panels and wind turbines and grew curious about how they worked. He plans to graduate in the spring of 2012 with a degree in energy systems and hopes to work for a utility or as an installer. Dick is also using his knowledge of alternative energy to make suggestions for powering a veterans' center that his parents helped establish.

The summer internship started in mid-May and ended in mid-August, and interns spent nearly half of the 12 weeks traveling to various tribal lands to meet with tribal utilities, customers, and tribal leaders to explore options for renewable energy generation.

"Sandra is really encouraging us to network and learn as much as we can about the projects," Allen says. "We've been studying funding and grant applications as well as the technology to really provide the best information to tribes and utilities."

Community planners a good match

Using renewable energy sources is increasingly popular among tribes seeking affordable and sustainable ways to meet the demands of growing populations on tribal lands. And, sometimes, it is the only way to provide electricity.

One way to get around cost-prohibitive line extensions is to provide people in outlying areas with "drag-and -drop, plug-and-play" solar/wind hybrid units. Typically, these consist of 1,080-watt photovoltaic panels and 400-watt small wind turbines, which rent for $75 a month. They generate a limited amount of power, so users still have to conserve electricity. Sandia provided technical assistance in development of these units through a partnership with the Navajo Tribal Utility Authority.

Sandra makes a point to include interns in all aspects of her work, and she hires college students, mostly from engineering concentrations. Recent interns are graduate community and regional planning students.

"Community planners are a very good match for the program," Sandra says. "They have the training to understand the needs of the community and how to facilitate dialogue. They also take feedback and determine how to set goals and projects, then build from what they heard, and know how to organize that into energy needs. That's a skill that's interesting and makes a good match."

The current interns are planning to follow in the footsteps of their predecessors and continue in a similar line of work. "I'll probably try to work for a utility, but am interested in working in the field on the technical side, installing turbines and solar panels," Dick says. "This program is a big stepping stone for me, and I'm very excited about the opportunities I'm going to have here."

Returning to tribal lands is also a priority for many students. "Ultimately, I'm Navajo, so I'd like to work within the boundaries of my tribe and be based there — that's my ideal work situation," Chee says. "If the tribe wants it, we want to tie in traditional ways of life like rug weaving, horse training, and agricultural work with technical assistance, business plans, and websites. I'd like to help with building and bringing technology to traditional ways of life to improve it a little more in terms of economic development."

BIG MACHINES

Saturn, Hermes III pulse power machines mark major milestones

THE LINEAR HERMES pulsed power machine — the most powerful gamma ray producer in the world — is serviced for its next shot by technicians, left to right Chris Kirtley, Gary Tilley, Harold Brown, and Jose Montoya (all with Raytheon K-Tech). Because of Sandia's nuclear responsibilities, Hermes and Saturn are kept in "warm, standby mode" for immediate testing of components.

Story by Neal Singer
Photo by Randy Montoya

Two remarkable pulse power machines have recently reached milestones at Sandia: 4,000 shots on the Saturn accelerator and 9,000 shots on the HERMES III accelerator.

Saturn — originally projected to have a life span of five to 10 years — 21 years ago hosted its first wire-array tests, which pulsed millions of amperes in nanoseconds through wires each thinner than a human hair. The wires, of course, disintegrated like overstressed fuses from the great flood of electricity. But the powerful magnetic field associated with the electric current grabbed the floating ions created from the shorted-out wires and pulled them together at great speeds. This released X-ray energy when the ions ran out of room and stopped suddenly, confronting each other along a relatively vertical axis. The process, called a z-pinch by geometrical reference, caused an extraordinary increase of X-ray energy output over previous methods. Its success led to installation of wire-array hardware on the larger Z machine, with gains in X-ray output that astonished the world's pulsed power community.

A spry source for data

Saturn, which became operational in 1987, was chosen for that task because its major function has been to serve as an X-ray source to test the effectiveness of countermeasures used to protect electronics and other materials against X-ray radiation from nuclear weapons. The machine, also used broadly as a physics research test bed, provides data that can be used directly or as input for computer simulations. The machine can fire twice a day. All these characteristics make it a spry source for data.

Among Saturn's more recent triumphs is the insertion by researchers of a device, first tested on smaller machines, that allows the big accelerator to emit stronger radiation at relatively low energy frequencies. This enhanced output provides data that supplements the previously scanty amount of information on materials and electronics response available for an important portion of the energy spectrum.

This was achieved, says lead researcher Vic Harper-Slaboszewicz (1344), when Sandia researchers funded by the Defense Threat Reduction Agency (DTRA) and NNSA installed opposing electric fields before and behind a tantalum converter. The tantalum metal previously had only a single electric field before it that pulled a beam of electrons into it, producing X-rays; the remainder of the electron beam was unhelpfully (in terms of creating X-rays) absorbed by aluminum or graphite placed behind the tantalum. Also, a portion of the emitted low-energy X-rays were reabsorbed by the tantalum, which didn't help output either.

The current device, called a reflex triode, creates an opposing electric field behind a thinner sheet of tantalum, as developed by DTRA at its accelerator facilities. The passed-through electrons, rather than being absorbed by a backstop as happened previously, are reversed by the opposing electric field and sent back into the tantalum to create more X-rays. When they emerge, the forward electric field sends them back into the tantalum, again creating X-rays, and so on. The thinner tantalum also reabsorbs fewer X-rays.

Firing six to eight times a day

The reflex triode enhances X-ray production at energies between 20 keV and 200keV.

HERMES III, which can fire six to eight times daily, is used primarily to demonstrate the effect of gamma ray radiation — another component of a nuclear weapon burst — on electronics and larger military hardware. First operational in 1988, it is still the world's most powerful gamma ray generator. It produces a 13-terawatt electrical pulse for 28 nanoseconds into a tantalum target to release Bremsstrahlung photons (photons released by decelerating atomic particles) into indoor or outdoor testing modes, says engineer Brad Peyton (1342). The data is used in simulation studies as well. HERMES III's total beam energy is a comparatively small 370 kilojoules, with only 600 kilo-amps but a large peak diode voltage of 18 megavolts.

Unlike Saturn and Z, whose modules are each arranged in a circular pattern that resembles a wagon wheel, with electrically in-parallel transmission lines like spokes leading to the target at the axle, HERMES uses 20 inductive isolated modules coupled to a linear transmission line that resembles a short subway train in size, shape, and amount of metal. The module voltage output is added in series, the reason for the very high voltage achieved. An outdoor test facility is large enough to accommodate tanks.

"The continued operation of these facilities is a testament to the ingenuity and dedication of personnel and management," says Ray Thomas (1342), manager of AGT Accelerator Operations.

Saturn, a predecessor to Z, has its niche. For creating soft X-ray sources, it operates at less than 10 megamps, while Z operates at 26 megamps. Saturn produces X-ray powers of less than 100 terawatts, while Z's x-ray power output exceeds 300 terawatts. But Saturn can accelerate electrons at voltages and amperages that allow materials to be tested for hard X-ray effects; the Z facility is not configured to produce these.

One way Saturn does this is by varying the range of anode-cathode gap settings of three concentric diodes to change the electron endpoint voltage and therefore the X-ray photon output spectrum. Also, the pulsed power portion of the accelerator can be varied to one-half or even one-third of its full power, to allow a wider range of test spectrums for customers. The settings can be varied rapidly to accommodate customer requests, often within a few hours. Another Saturn mode is the plasma radiation source, which uses a z-pinch to produce "cooler" X-rays than the diodes, with explosion debris controlled by baffles or halted by transmission windows so customers achieve maximum data.

'Warm, standby mode'

The machines, known as user facilities, operate on relatively limited funding — roughly $5 million annually for both. They provide test shots for Sandia research, WFO (work for others), and at DOE or DoD request.

The work is out there. Saturn currently fires approximately 110-120 times a year and HERMES fires about 350 times a year. SPHINX, a small machine that produces a fast X-ray pulse, can fire every 6 minutes. It has fired approximately 25,000 times in its lifetime.

This high shot rate and total, of which the technicians are proud, is because the machines are required by DOE to stay in "warm, standby mode," says Brad. This is because Sandia is responsible for the arming, firing, and fuzing of the nuclear deterrent and DOE requires that Sandia maintain facilities available for immediate testing of components. Other users who benefit from this constant preparedness are WFO customers (e.g. DoD contractors and White Sands Missile Range). The average WFO payback is approximately $1.2 million annually, says Brad.

Accident scene: mock lab sees steady dose of biohazards

Photos By Randy Montoya

Accidents in the laboratory can have as much impact on global public health, economies, and stability as a naturally occurring pandemic or a biological weapon attack. With this in mind, Sandia's Countering Biological Threats (CBT) program has taken the lead worldwide in setting global standards for laboratory safety and security, and teaching them to practitioners.

A coterie of public health and laboratories professionals from Afghanistan was among the most recent student groups to visit Sandia and undergo training on biohazard response and containment. The CBT program, a growing part of the International, Homeland, and Nuclear Security Strategic Management Unit, maintains a mock laboratory in the International Programs Building and uses it and other locations throughout Sandia and Kirtland Air Force Base to stage life-like exercises.

"In some cases, the equipment in the mock laboratory is more advanced than what the students have back home. But if they're planning to modernize, which many are, having the hands-on training beforehand is vital," says Eric Cook (6822), who teaches biorisk management through the program.

Offering a catalog of courses, the international component of the CBT program, International Biological Threat Reduction, tours the globe, teaching scientists, government officials, and even law enforcement personnel best practices for the safe, secure, and responsible handling and containment of biological material and response to emergencies. Training is a significant component to many of the program's activities, which cover 40 countries.

— Renee Deger

Reconnecting

Annual Retiree Social offers opportunity to reminisce and get reacquainted

Photos by Norman Johnson

By Iris Aboytes

This year's Retiree Social was held recently at the Embassy Suites on Lomas. If the resounding success — more than 1,500 retirees attended — is any indication, retirees have lost none of their passion for Sandia. It was old home week for many of them.

The registration tables had name tags for everyone in attendance, helping retirees reconnect names and faces.

Because of the large attendance, the biggest inconvenience was having to wait a little longer in line than might be ideal, depending on each person's arrival time. Most retirees took advantage of the lines to get reacquainted and reminisce.

Some arrived by bus, others drove. The big ballrooms were filled with jovial, fun-loving Sandians who were happy to see their friends once again. Many retirees remained at the Suites well past the allotted time.

There were many comments about the excellent food. Retirees Ellis Heustess and John Erni made a point of saying they hope Sandia continues to hold the annual event at the Embassy Suites. They acknowledged a few logistics issues, but gave it an overall thumbs up.

"The social in itself reminds retirees they are still Sandians and are respected as such," says coordinator Sandy Smallwood (3333). Sandy and her team worked at making each retiree feel welcome.

Following are updates about some of our retirees:

Donna Benson *has been retired 13 years. "I love it," says Donna. "My husband Bob and I are travelers. We go somewhere every month. We just got back from a trip through the Southeast. Next month we are going to Texas."*

Donna and Bob have also been to Israel and Africa five times. She and her husband, a retired physician, go to the gym six days a week. "We are healthier than we have ever been," she adds. "I love that we are healthy and have the freedom to get up and go."

"Retiring is not like a dead-end street," says ***David Tafoya.*** *"Life keeps on going. When I retired, it was too late to start a wild career so I have filled my life with part-time jobs. I am currently working for the Isotopes, by choice. I get to watch the game, get a free hotdog, and exercise all at the same time."*

David worked at Sandia 32 years and has been retired eight years. "Coming to the social was great," he adds. "It's like old home week. I enjoyed working at Sandia and all its interesting places, but am happy I retired. I had a good career. The only thing I missed was the people."

"I don't miss work," says ***Renee Foster****, "I miss the people." She retired from Sandia after more than 36 years. Her time is filled with church and volunteer work. Of course, she is still a devoted Lobo basketball fan.*

"I always wondered how I would know when it was time to retire," says Renee. "My friends would tell me, 'You will know.' They were right. I love being retired."

Lori Cordova *says it's wonderful not having to wake up to the alarm. "Life changes for the better," says Lori. "I enjoy being able to do what I want to do. I am honored to have worked at Sandia during the time that I did. Because of Sandia I was able to earn a college education. No one can take that away from me. It is one of the gifts that keeps on giving."*

Lori retired from Sandia three years ago. She says one of her favorite things while she was here was working on the Employee Caring Program (ECP). "If I had to do it again, I would not do anything differently," she says. "I have no regrets."

When ***Joe Angel*** *retired about 25 years ago, after working more than 36 years, he did not realize he would become a wood carver. "I love waking up and looking out the window," says Joe. "What I do depends on the weather."*

Joe can carve whatever comes to mind. He says one of his carvings, a miniature covered wagon, is what most people like.

"When I worked at Sandia we all had nicknames," says Joe. "The laughter we shared made everything easy. "It was a different time."

Tomas Gutierrez *retired just eight months ago after 30 years. "My biggest task is taking my granddaughter, Nicole, to school, then picking her up," Tomas says. "I have wanted to do it for a long time, but was always working. I love being a full-time grandfather. Sandia was great, but I love retirement."*

Lavender Fernandez *loves jazz, especially singing it. Since she retired from Sandia more than a year ago, she has been taking piano lessons. That way she gets to accompany herself. "I love my music," she says. "I have even taken up belly dancing. My husband, Hugh Barlow, a retired professor of criminology, and I do a lot of travelling. Life is good; I am following all my dreams. I love it."*

Stan Benavidez *retired in 2001 after 24 years. "Retirement is good," he says. "Don't be afraid. There is always something to do to keep you busy."*

After Stan retired from Sandia, he worked as a DOE security escort for six years. "Being retired is having no pressure," he says. "You don't have to be at any place at a certain time, unless you decide. I enjoyed my work at Sandia, but enjoyed the people most of all. Now it is all good."

When ***Dwight Newell*** *retired five years ago after more than 27 years at Sandia, he went to work for his wife. Together they own Exotics of the Rain Forest. "Now instead of working 12-hour days, I get to expose young kids to parrots, snakes, and lizards," says Dwight. "I have always liked working with kids. I used to be a professional clown.*

"I get a great sense of accomplishment as I introduce youngsters to these types of animals. I really enjoy it. If you are thinking about retirement, go for it. You won't be sorry."

Shakespeare is alive and well as Jane Zingelman brings *The Merchant of Venice* to life

By Iris Aboytes

Backpacks and school supplies line the aisles of local stores as our youth return to school. But it is not just the young population that is returning to school. Through the Institute for Lifelong Learning for New Mexico, Jane Zingelman (3601) will be leading a class on comprehending Shakespeare's *The Merchant of Venice*.

The institute offers daytime academic-level courses, lectures, and field trips to stimulate the intellect and help expand the knowledge of adults 50-plus in the Albuquerque area. Offerings are taught by experts; many are retired professors and professionals. The member-driven, volunteer-run structure keeps quality high and fees low.

> ***"The classics may be boring at one time in life and positively riveting at another."***
>
> **— Jane Zingelman**

Jane, a literature major, was not particularly interested in Shakespeare, but after earning her degree she went back and began rereading his plays. "Wait a minute," she thought. The plays that she had read had different meanings. "The plays did not change," says Jane. "Perhaps because of life's experiences, I read what seemed were new plays with completely new meanings."

She began to think that if her perception and meaning of the plays had changed, maybe they had changed for other people, too. She asked her friends and colleagues if they wanted to get together to discuss the various Shakespeare plays. Imagine all the insights, energy, and light that could be shed on the different plays if a bigger group would enter the discussion.

Jane was not taken seriously at first, but eventually several people did get together. Each time, it was Jane who led the discussion. Her two-hour sessions include an hour of discussion to see what the groups thinks is going on and an hour of viewing DVDs of the various plays to see what each director's interpretation is.

JANE ZINGELMAN and GEORGIA

"The discussion usually focuses on plot, character, and interplay of motives," says Jane. "We read key scenes aloud. Shakespeare's poetry is often called 'music' because it has a rhythm that is natural to our English-speaking ear. As for meaning, we all start with the same text but take different paths and find different insights. It's wonderful to share and full of surprises."

Jane says she uses a facilitation technique called Shared Inquiry, which draws on personal experience while staying true to the text as the groups try to resolve meaning problems.

When years ago Jane told her dad, Dick Tardiff, an electrical engineer, that she wanted to be a literature major, he said. "Why? It's boring." His experience with classic literature had been in school. He read *Silas Marner*. He told Jane the book was so boring he couldn't even finish it, but wrote a book report. Several years later, Jane's parents were picking Jane up at the airport.

"'Where's Dad?' I asked my mom," says Jane. "'He's over there holding up the wall,' my mom replied."

He had bought a tattered copy of *Silas Marner* at a rummage sale for 25 cents and was rereading it. Her mom told Jane that her dad couldn't put it down and even bought the DVD starring Ben Kinglsey.

"That made me smile," says Jane. "The classics may be boring at one time in life and positively riveting at another."

If Jane's name sounds familiar, it is because she is the *Watercooler* editor. Maybe we should all gang up on her and have her lead us in a discussion of *Romeo and Juliet* through the *Watercooler*. Just kidding. Jane is open to having a book club-type discussion on Shakespeare's plays during lunch.

When Jane is not talking about Shakespeare or editing the *Watercooler*, she is taking walks with her standup comedian husband, James, and their family of rescue mutts, Jack, Pookie, Cocoa, and the newest addition, Georgia, a terrier-mix with Andy Rooney eyebrows.

If you want to know who is Shakespeare's *Merchant of Venice*, contact Jane. Remember you, too, can go back to school.

Roberta Rivera honored as Employee Member Representative of the Year by GEM — the National GEM Consortium

By Iris Aboytes

Roberta Rivera (3555) was recently awarded the Employee Member Representative of the Year by the National Consortium for Graduate Degrees for Minorities in Engineering and Science's (GEM) 35th anniversary conference and gala held in Washington, D.C.

The National GEM Consortium (GEM) is a nonprofit corporation whose core business is providing graduate fellowships in engineering and science to highly qualified people from communities where human capital is virtually untapped. GEM develops funding to award fellowships and builds mentor networks to support fellows in achieving academic and professional success.

Roberta is the team leader for the recruiting organization. Prior to that she was the team leader for the Student Internship Programs, where she had been for more than 10 years. Roberta is the New Mexico site fellowships administrator and liaison for the National Physical Science Consortium (NPSC) and the National Consortium for Graduate Degrees for Minorities in Engineering and Science.

Roberta's career at Sandia began in 1992 as an intern. She worked in the Human Resources Department, where she says she found her calling and selected her college major. She was hired in 1997 and obtained two graduate degrees through Sandia's assistance program. Now, as the recruiting team leader, she is responsible for the recruiting efforts for the Labs.

Historically, GEM has enabled Sandia to support student interns earn graduate degrees, but one of Roberta's first achievements in her new position was to pilot a new relationship with GEM, allowing Sandia to use GEM to fund Masters Fellowship Program (MFP) candidates. Nine students are part of the pilot program, with each student starting graduate school this fall semester.

This relationship will provide considerable cost savings to Sandia and hopefully allow Sandia to continue its support of Sandia's MFP, previously known as one-year-on-campus. The minority hiring program sends employees to grad school (Stanford, MIT, and Georgia Tech, for example) and pays them a large percentage of their salary while in school. Sandia pays the full cost of tuition. With GEM, Sandia's out-of-pocket tuition costs are cut almost in half.

ROBERTA RIVERA and her mother, Esther Montoya, at the National GEM consortium gala in Washington, D.C.

Roberta took her mother, Esther Montoya, to the ceremonies. "As a single mom, she really pushed me to go to college," Roberta says. "My mom worked two jobs to raise me on her own. She worked for Albuquerque Public Schools from 8 a.m. to 3 p.m., picked me up from school, took me to the sitter, and then was at work at the old St. Joseph's hospital from 4-8 p.m. She worked at the hospital from 10 a.m. to 8 p.m. on Saturday and Sunday. She sent me to private school, put braces on my teeth, got me my first car, and everything else in between — talk about sacrifice.

"I never felt like I didn't have her," says Roberta. "She was amazing. My mom made me feel like I was her entire world. I grew up thinking that working hard was normal, but she told me that an education would provide an easier path than the one she took. She made sure I went to college. Maybe this is why I am so passionate about our interns and our educational programs like GEM."

Roberta's mom retired from both employers and now has just one job, working at Presbyterian Hospital. "She has a fantastic schedule that allows her to spend great quality time with my family and me," says Roberta. "My mom is finally retiring — for real — next year."

Roberta is married to Sandian James Rivera (6512). Together they have two sons, Santiago Antonio, age 5, and Sevastían Isaias, age 3. Roberta says that her oldest son is obsessed with numbers, especially the concept of infinity. "We know our boys are young but we talk to them about going to college all the time," says Roberta.

Sandia is in a unique and enviable position, facing another record year of hiring. "With final numbers still pending, we are anticipating a hiring plan of about 900 regular hires, 500 interns, as well as limited-term and postdoc employees," says Roberta. "I am determined to do my part to ensure that this workforce be diverse in every way.

"GEM is all about helping students, who have oh-so-many challenges, get their degrees. I started 19 years ago as an intern in a program for financially disadvantaged students. Without Sandia's commitment to diversity, I would have never gotten in. Now through my work with partners like GEM, I play a role in helping minority students pursue their dream of getting their degrees."

Mileposts

New Mexico *photos by Michelle Fleming*

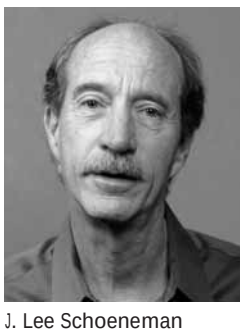
Gary Romero
40 10241

Brett Bedeaux
35 5943

Guy Northcutt
35 2995

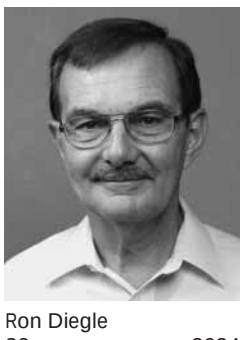
Recent Retirees

David Wenger
34 1675



J. Lee Schoeneman
35 5331

Ronnie Albers
30 2542



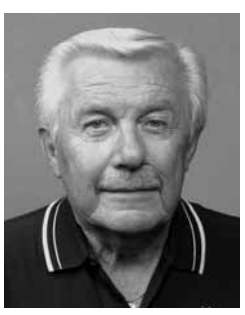
Ron Diegle
30 2624

Richard Farwell
30 5098

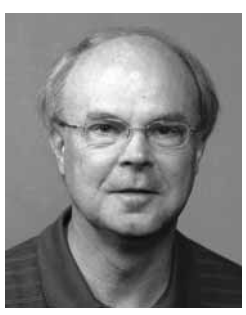
John Garcia
30 4844

Barry Hess
30 9510

Dale Marsh
30 4848



Robert Mattison
30 2541



Cliff Renschler
30 2730

Adrian Romero
30 2734

Larry Shapnek
30 5434

Barbara Surbey
30 5212

Darrick Jones
20 1521

Michael Wong
20 1443

William Aldrich
15 5403

Arnie Baker
15 270

Peanut Butter & Jelly (PB&J) youngsters smell like rich kids, thanks to Center 4800

By Iris Aboytes

When Jennifer Lovejoy (4824), Dina Jaramillo (4842), Angeleen Saiz (4848), and Lavone Jones (4871) went on a tour of Peanut Butter & Jelly Family Services as part of Sandia's ECP campaign last fall, their hearts melted. In addition to having a successful ECP campaign, they were determined to do something more with the help of their 4800 center family.

PB&J began as a volunteer effort in 1972 and was funded for the first time in 1974. In the early years, when a child asked, "What's the name of this school?" another child responded, "Call it Peanut Butter & Jelly. . . because that's what we eat all the time." At that time, peanut butter and jelly was in abundant supply from commodity food programs.

Peanut Butter & Jelly Therapeutic Preschool has pioneered the use of interactive parenting and bonding programs as an effective way to prevent child abuse and neglect and as a way to preserve the family unit.

One of the stories related to the group during the tour was about a family adopted by PB&J for Christmas. PB&J supporters adopt about 400 families during the holidays. "Many families request laundry soap," says Dina Maayan, PB&J development director. "These families usually have money for milk or detergent, cold cuts, or bleach. Detergent and bleach take a back seat. The families make detergents stretch. In some instances, they just use water."

This particular family used the laundry detergent given to them. In a subsequent visit to the family, a little 6- or 7-year-old boy wearing a hooded sweatshirt, told the PB&J representative, "Now I smell like the rich kids."

"The time, the heart, and the spirit offered by each participating individual at Sandia Labs has created a true miracle of generosity that will bless lives of our families," says Susannah Burke, PB&J executive director. "Your sharing is a testimony to the goodness of the human spirit. Thank you so much for your caring support."

There were other stories of families that were helped by PB&J, but this was one that pulled at their hearts. "When we heard the stories, we knew that we could help," says Jennifer. "This little boy did not want toys; he just wanted to smell like the rich kids. It took us a few months to get organized with the Christmas-in-July idea, but once we told our groups about PB&J, the response was overwhelming.

"There was competition among the departments to see who could bring in the most donations. There were no losers. The big winners were the families from PB&J.

"With the response being so overwhelming, we needed help to deliver our donations. Transportation came to our aid and helped us load and deliver all the supplies. Four huge bins containing personal toiletries, household cleaning products, school supplies, baby food, etc., made their way to PB&J."

Among the supplies were 6,208 loads of detergent. Lots of PB&J children will now be smelling like rich kids.

OVERWHELMING SUCCESS — John Cerutti (4844), Jennifer Lovejoy (4824), and Angeleen Saiz (4848) are all smiles as they prepare to deliver donated items to Peanut Butter & Jelly Family Services.

Learning about science is always in season

By Iris Aboytes

For many students and teachers, summer is a welcome time to take a break from school. But for many, summer can also be a time to enhance learning. Sandia's Community Involvement Dept. 3652 provides a variety of summer learning opportunities for both students and teachers.

The **POWER (Power On to Water and Energy**) program provides an opportunity for teachers to better understand water and energy challenges and potential solutions. Content knowledge is improved through field trips, tours, and presentations that focus on resources unique to Sandia and New Mexico. Malcolm Siegel (6222) and Vince Tidwell (6926) shared water resource information with 17 local teachers who participated in the two-week program.

The POWER (Power On to Water and Energy) program provides an opportunity for teachers to better understand water and energy challenges and potential solutions.

More than 400 children enjoyed hands-on science activities during the **Fun in the Sun** program. The program's goal is to stimulate excitement and interest in science among under-represented children attending summer daycare programs. Sites included community centers in the East Mountains, South Valley, and Santa Ana Pueblo. Coordinator Cheryl Garcia (3652) invited interested Sandians to participate in the program. Volunteers included Miriam Maldonado (9342), Andrea Ambrosini (6124), and Carolyn Daniel (6234).

Fifteen high school juniors were selected to participate in the eight-week **STAR Intern program** that gives students who have taken advanced placement classes in math and science the opportunity to participate in the research-based mentorship program. These students were hosted by: Tim Lambert (6124), Susan Altman (6915), Jake Deuel (6532), Khalid Hatter (1111), Bruce Kelley (6632), William Yelton (1725), Shawn Dirk (1821), Larry Humphries (6232) and Richard Kemp, Bernadette Hernandez-Sanchez, Tim Boyle, and Hongyou Fan (all 1815).

Wendy Amai (6532) and Todd Alam (1816) each hosted a **Faculty and Student Team (FaST)**. Teams from New Mexico Highlands and West Texas A&M participated in Sandia research projects over the summer.

THE STAR INTERN PROGRAM gives students who have taken advanced placement classes in math and science an opportunity to participate in a research-based mentorship program. Shown here are STAR students from 2010 and 2011.

Sandia was one of the main sponsors of this year's **New Mexico Hispanic Youth Institute**. This four-day college campus experience provides high school students with workshops emphasizing academic achievement, career choices, community service, and civic responsibility. Luis Amezcua (6621) served as a Hispanic Hero. Julie Cordero (4879) led volunteers Norb Tencza (421), Carlos Esteva (1816), Rebecca Lopez (4826), and Melissa Martinez (2616) to provide an Engineering Career Workshop.

As summer ends, the students and teachers return to school — refreshed and ready for another academic year. Community Involvement continues recruiting volunteers to inspire the next generation of scientists and engineers. Fall programs include CroSSlinks Science Volunteers, classroom presenters, science and math event judges, reading tutors, and school-based mentors.

Photos by Rachel Baros

THE FUN IN THE SUN program aims to stimulate excitement and interest in science among under-represented children attending summer daycare programs.

Paid time off may be available, science kits are provided, and employees, staff augmentation contractors, students, and retirees are all welcome. For more information, contact Darline Polonis (3652) at 284-8340.

"All of our summer programs depend on Sandia volunteers," says Community Involvement manager Amy Tapia. "Our volunteers are the heart and soul of all of our major efforts."

THE NEW MEXICO Hispanic Youth Institute, a four-day college campus experience, provides high school students with workshops emphasizing academic achievement, career choices, community service, and civic responsibility.

Annual Solar Fiesta! set for this weekend

As a member of the business community in New Mexico, Sandia has the opportunity to take advantage of this event which typically attracts nearly 3,000 people from across the state.

This year, Sandia will be a key sponsor and will showcase its capabilities in a series of technical presentation booths. This outreach opportunity will allow the Labs to highlight its ideas, products and services to a wider audience.

This year's event will be at the Albuquerque Academy, which offers a chance to touch an affluent community in an environment conducive to sustainable education.

The theme this year is "Building a Sustainable Lifestyle." The focus is on the total homeowner picture, from designing and building solar homes to retrofitting existing structures with solar hot water, PV, or wind systems.

The precepts and practices of using natural lighting, permaculture, and modes of transportation that reduce pollution will be explored.

Habitat for Humanity house

HABITAT FOR HUMANITY DEDICATION — Sandia's 11th Habitat for Humanity house, built for Susana Peña (Candy) and her son, Albert, was recently dedicated by Executive VP and Deputy Labs Director for Mission Support Kimberly Sawyer. Approximately 315 employees, family members, retirees, and friends helped build the home. Community Involvement Dept. 3652 helped coordinate the construction and recruitment of volunteers. Pictured here, from left to right are: Susana Peña, Candy's mother; Judy Lucero, Habitat executive director; Candy's father; son Albert; Candy; Candy's grandmother; and Executive VP Kimberly Sawyer.