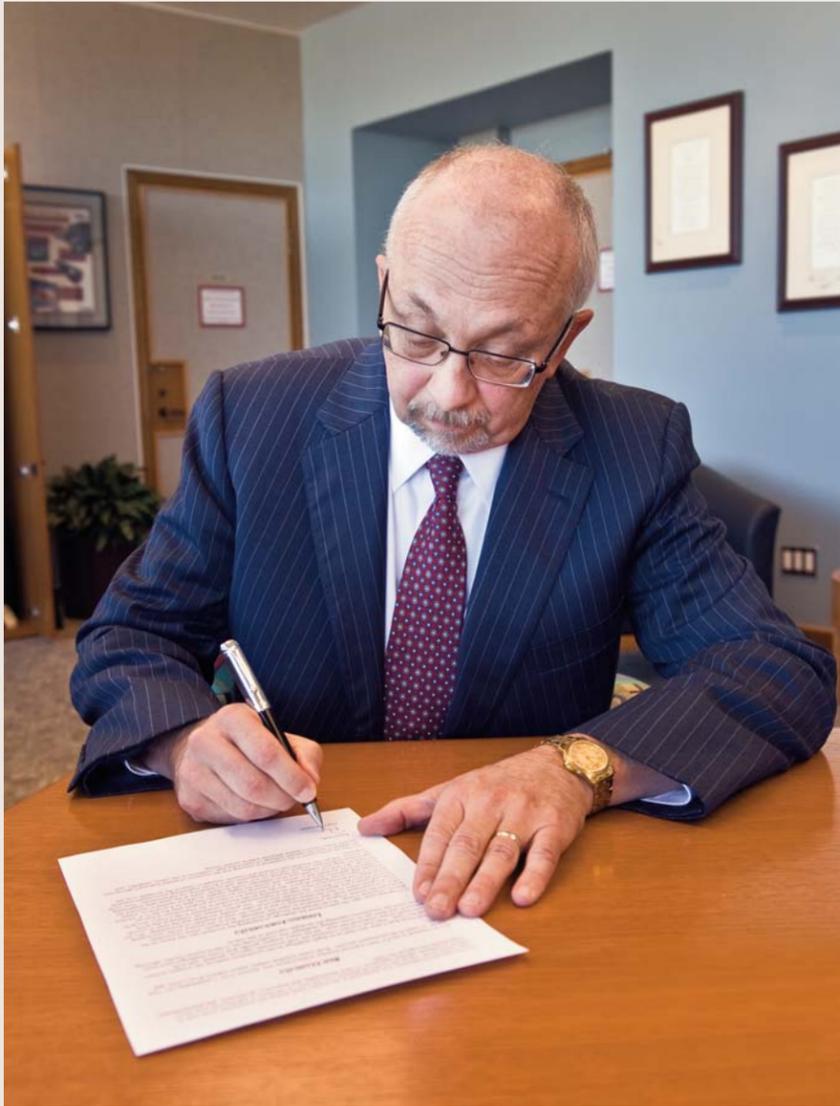


Annual Assessment letter addresses safety, security, and reliability of nation's nuclear weapon stockpile



Three NNSA lab directors independently offer assessment of the state of America's nuclear deterrent

Last week, Paul Hommert completed a milestone event in his new role as Labs director, fulfilling one of the key responsibilities he assumed with his new job: the signing of the Annual Assessment letter. Each year, based in part on the findings of their respective stockpile surveillance programs, the lab directors of the three NNSA laboratories (Sandia, Los Alamos, and Lawrence Livermore) individually submit letters to the secretaries of Energy and Defense reporting on the assessment of the stockpile. The secretaries, in turn, submit a letter to the president under their signatures certifying the safety, security, and reliability of the stockpile. (Sandia's responsibility for this annual assessment comprises the nonnuclear subsystems, designed by Sandia, that control the operation of a nuclear warhead.)

After signing the letter, Paul drafted the note here for the *Lab News*:

"Today I signed my first Annual Assessment letter to the secretaries of Energy, Defense, and the chairman of the Nuclear Weapons Council. While this is a personal letter, it rests upon the exceptional work done by all of you to support the Annual Assessment process. In that regard, I view this not solely as an individual letter but as a statement of institutional excellence and commitment to our nation's security. I cannot thank you enough for the outstanding work you do to allow me, with great confidence, to send this letter to our national leadership.

— Sandia President and Laboratories Director Paul Hommert

Inside: Labs Director Paul Hommert and NNSA Sandia Site Office Manager Patty Wagner have signed the 2011 Performance Evaluation Plan, the annual document that sets forth the performance evaluation criteria for Sandia's programmatic work and the business and operations functions that support the mission. See the photo on page 4.

Photo by Randy Montoya



Sandia's Protective Force marks 60 years of service

Since the beginning, Sandia has been charged with protecting some of the nation's most vital national security assets.

And almost from the very beginning — dating all the way back to 1950 — Sandia's Protective Force has been the onsite security team helping ensure mission success. On pages 6-7, a series of photos depicts the security team at work over the years.



Rain or shine, Sandia researchers find new ways to forecast large photovoltaic power plant output



JOSH STEIN examines a bank of photovoltaic panels at Sandia that is similar to an array being studied on the Hawaiian island of Lana'i. Sandia and its research partners are studying how to reliably and consistently forecast PV plant output given variable cloud cover. (Photo by Randy Montoya)

By Stephanie Hobby

Sandia researchers have developed a new system to monitor how clouds affect large-scale solar photovoltaic (PV) power plants. By observing cloud shape, size, and movement, the system provides a way for utility companies to predict and prepare for fluctuations in power output due to changes in weather. The resulting models will provide utility companies with valuable data to assess potential power plant locations, ramp rates, and power output.

(Continued on page 5)

Parent Company Contribution strategy benefits Sandia

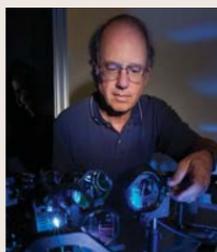
By Heather Clark

To make Sandia better prepared in case of an emergency, a request was made to require divisions to evaluate information technology applications to determine whether there are life, safety, health, or security risks if the Sandia Restricted Network were not operating properly. But before the requirement was put in place, it was reviewed by Sandia's Corporate Clearing House, says Erica Lopez-Hamby (10620), the

(Continued on page 4)

Inside . . .

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ECP campaign is Oct. 4-22

In 2009 Sandians contributed more than \$4 million to good causes in the community. See page 12 for more about how your contributions make a difference

That's that

Did you see the news reports about the United Nations Office for Outer Space Affairs – UNOOSA – establishing a new position? Word on the Web was that UNOOSA was preparing to tap distinguished Malaysian astrophysicist Mazlan Othman to serve as Earth's first cosmic emissary. According to the reports, Othman would be the intermediary between humans and aliens if formal contact is ever made.

Upon learning of the reports, Othman gamely said, "It sounds really cool but I have to deny it." The UN itself called the reports "nonsense" and so it seems: A quick check of UNOOSA's website finds no such announcement.

But is it really such a crazy idea? Although this particular report turns out to have been just so much space dust, the very fact that for several hours it was widely distributed around the Web and accepted as perfectly credible by reasonable people tells me something about the temper of the times. Most folks, it appears, seem to be perfectly willing to accept that the time has come for a formal space ambassador.

If aliens come calling, shouldn't we be prepared somehow to deal with them? Doesn't seem crazy to me.

Not that I'm suggesting any such thing is about to happen, but the nonannouncement from UNOOSA does come smack dab on the heels of a couple of intriguing news items, one intrinsically interesting from a science perspective, and one that is, frankly, titillating. First, the science news: Seems that researchers from the University of California, Santa Cruz, using the Keck telescope in Hawaii, have identified a so-called "Goldilocks" planet orbiting the red dwarf star Gliese. Goldilocks planets are – you know – not too hot and not too cold. The question, though, is, are they just right? We'll see.

Now to the titillating: A bunch of former Air Force personnel who back in the 1960s and 1970s worked with nuclear weapons – in missile silos and such – have stepped forward to claim that several US nuclear missile sites were visited by UFOs over an extended period of time and that the UFOs seemed to be able to render the weapon systems inoperable. The claimants don't seem like crackpots, but then, they never do, do they? My first response is, "Yeah, right." But, still . . . As Shakespeare put it in Hamlet: "There are more things in heaven and earth, Horatio/Than are dreamt of in your philosophy." But to borrow (again) Carl Sagan's indispensable quote, "Extraordinary claims require extraordinary evidence." And none of these UFOlogists have ever come up with that slam-dunk evidence, have they? (Well, they think they have.)

* * *

Speaking of Carl Sagan, this year marks the 30th anniversary of the landmark PBS series *Cosmos*, which Sagan hosted with wit, flair, and intelligence. It was one of the first broadly appealing programs that took a serious, sustained science-based look at our universe and its mysteries. Since the dawn of the space age in 1957, there had been plenty of popular, gee whiz programs about spaceflight, of course, and rocket ships and men on the moon, but *Cosmos* made folks say "gee whiz" about black holes and space-time conundrums, and "star stuff." The program, which as of 2009 was still – astonishingly – the most widely watched PBS series ever, with an estimated 500 million viewers worldwide, likely inspired bright young people – including, I'll bet, more than a few who now work at Sandia – to pursue careers in the sciences. Carl Sagan made science – dare I say it? – sexy and *Cosmos* made Sagan a star. He became a regular guest on *The Tonight Show* with Johnny Carson, himself a boundlessly curious man and serious amateur astronomer.

Sagan filled the role, which I think is essential, of the very public scientist. And he filled it well. I'm not sure that we have his equivalent today. If he were still around (he died in 1996) he'd be the perfect human being to fill that role – you know, the one the UN didn't create.

See you next time.

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

Technology Ventures Corp. wins \$1 million award from US Commerce Department



TECHNOLOGY VENTURES CORPORATION

The US Commerce Department has awarded Technology Ventures Corp. (TVC) \$1 million to develop an infrastructure to get promising technologies ready for the market.

US Commerce Secretary Gary Locke announced that six entities across the country won the i6 Challenge awards. He made the announcement on behalf of the Commerce Department's Economic Development Administration, the National Science Foundation (NSF), and the National Institutes of Health (NIH), according to a Commerce Department news release.

The award helps identify the nation's best ideas for technology commercialization, and entrepreneurship, says TVC's communications director, Michelle Mang.

TVC — a nonprofit, charitable foundation funded by Lockheed Martin and DOE to commercialize technologies and create jobs — was the winner in the Austin, Texas, region.

TVC will develop the infrastructure under the federal Small Business Innovation Research (SBIR) program to turn technologies into commercially viable enterprises, according to the release.

"I applaud the winners of the i6 Challenge on their tremendous achievement," Locke said in his announcement. "Each of the winners exemplifies the entrepreneurial spirit that drives innovation and will help move America forward by increasing our competitiveness around the world. The i6 Challenge represents a key component of President Obama's innovation strategy — to move great ideas from the lab to the marketplace to create jobs and economic growth."

TVC may be eligible for additional NIS and NSF awards.

TVC has helped form 112 new businesses, created more than 13,500 jobs, and has helped its client companies obtain \$1.15 billion in investments.

Recent Patents

Note: Patents listed here include the names of active and retired Sandians only; former Sandians and non-Sandia inventors are not included. Following the listing for each patent is a patent number, which is searchable at the US Patent and Trademark Office website (www.uspto.gov).

* * *

Michael McDonald (5633), T. Scott Gladwell (6472), Robert Anderson (6472): Controlling Motion Using a Human Machine Interface. Patent No. 7,802,193

Hy Tran (2541), Andre Claudet (2617): Mesoscale Hybrid Calibration Artifact. Patent No. 7,788,818

Malcolm Carroll (1725): Isolating and Moving Single Atoms Using Silicon Nanocrystals. Patent No. 7,790,051

Louis Romero (1414): Passive Levitation in Alternating Magnetic Fields. Patent No. 7,795,770

Retiree deaths

Frank Sayner (age 90)	July 26
Howard H. Sander (88)	Aug. 5
Joe Donald Benton (79)	Aug. 5
Phyllis M. White (75)	Aug. 7
George A. Uszuko (86)	Aug. 12
Milton John Clauser (70)	Aug. 14
Oscar F. Goodwin (84)	Aug. 18
Ida Nelson (98)	Aug. 18
Dale L. Peckumn (81)	Aug. 19
Joyce M. Loiacono (71)	Aug. 21
Herbert W. Loemker (83)	Aug. 22
Edward L. Ashland (95)	Aug. 22
Donald John Buntun (86)	Aug. 22
Ruthe Lynn Vandewart (64)	Aug. 25
Robert E. Humphrey (81)	Sept. 2
Margaret M. Both (93)	Sept. 4
W. B. Norwood (83)	Sept. 4
Robert J. Fogler (57)	Sept. 12
William J. Howard (88)	Sept. 13
Wilfred Sanchez (80)	Sept. 13
Robert R. S. Everett (81)	Sept. 14
Stephen Allen Dupree (68)	Sept. 22
David Arthur Hendren (66)	Sept. 23
Clifford G. Wagner (72)	Sept. 30



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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), Karyn Scott (284-8432), Darrick Hurst (844-8009), Stephanie Hobby (844-0948), Heather Clark (844-3511), Michelle Fleming (Ads, Milepost photos, 844-4902).

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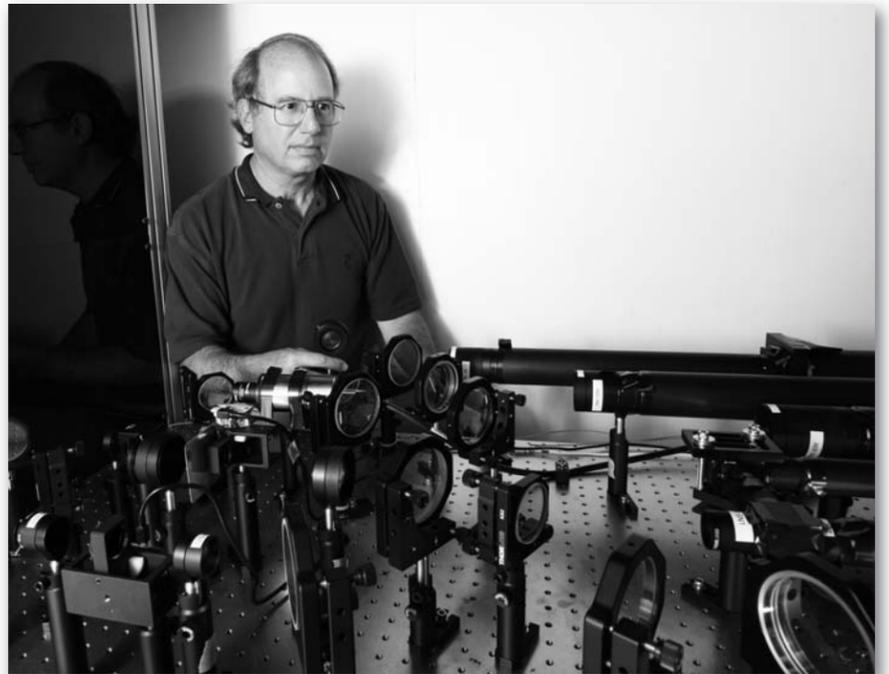
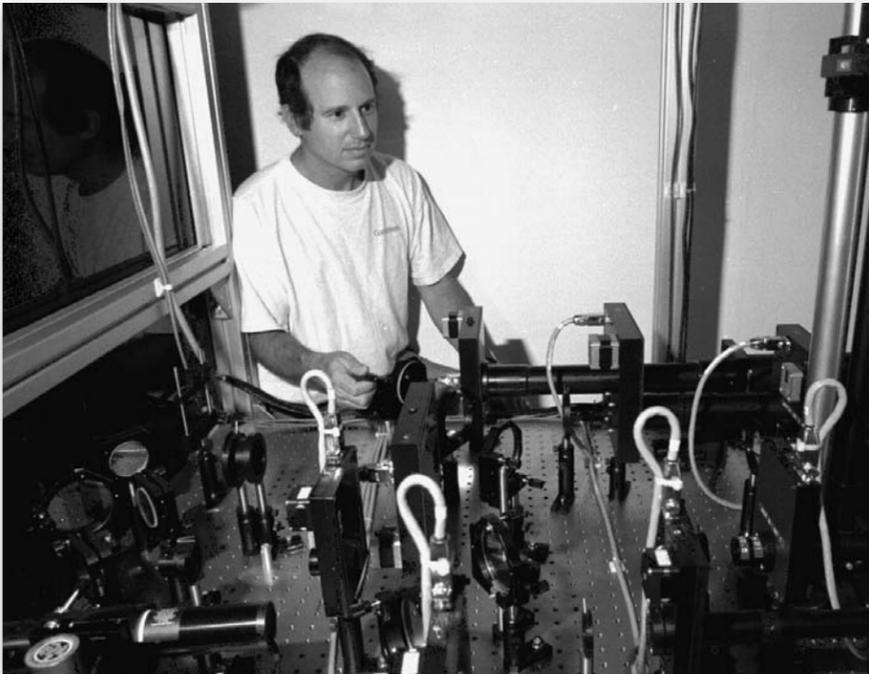
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Lidar déjà vu:

John Goldsmith returns to a highlight of his career



BEEN THERE, DONE THAT — John Goldsmith aligning the optics in the Oklahoma Raman lidar in 1996 (left) and the Darwin, Australia, Raman lidar in 2010 (right).

By Patti Koning

When John Goldsmith (8131) looks back on his 30-year career at Sandia, he's incredibly proud of his work on a Raman lidar (light detection and ranging) system that has been deployed and operating continuously at the Atmospheric Radiation Measurement (ARM) program's Oklahoma site for the past 15 years. This year, he's had the chance to recreate that project.

"The Raman lidar system was one of the most satisfying projects of my career," he says. "Nothing else I've worked on has had this kind of lasting impact on something as important as climate change. So the chance to build a second system was really exciting."

Raman lidar is an active, laser remote-sensing instrument used to measure atmospheric water vapor, a measurement important in studying climate change, as well as temperature, clouds, and aerosol particles. The instrument identifies water vapor by pulsing laser light for billionths of a second, then recording the light scattered back, some of it slightly shifted in wavelength by the molecules of water and nitrogen in the atmosphere.

The raw data is analyzed by automated value-added procedures (VAPs) developed by the ARM program and then made available to scientists across the globe. By comparing the ratio of the water vapor signal to the nitrogen signal, the software is able to strip away variables that would otherwise make the data difficult to interpret.

This data is critical to creating accurate general circulation models for climate study. "Climate scientists need good atmospheric data to initialize and validate these complex computer codes," John says. "The amount of water vapor in the atmosphere and its distribution in terms of space and time is crucial. Much of the dynamics of climate is related to interactions with water in the form of vapor and clouds."

Lidar system launched

The original Raman lidar system was launched in 1995, early in Sandia's involvement in DOE's ARM program, and was expected to operate for 10 years. The system is entering its 16th year of operation, running

over 90 percent of the time with very little operator attention. In fact, John says, the most significant maintenance task is cleaning the window.

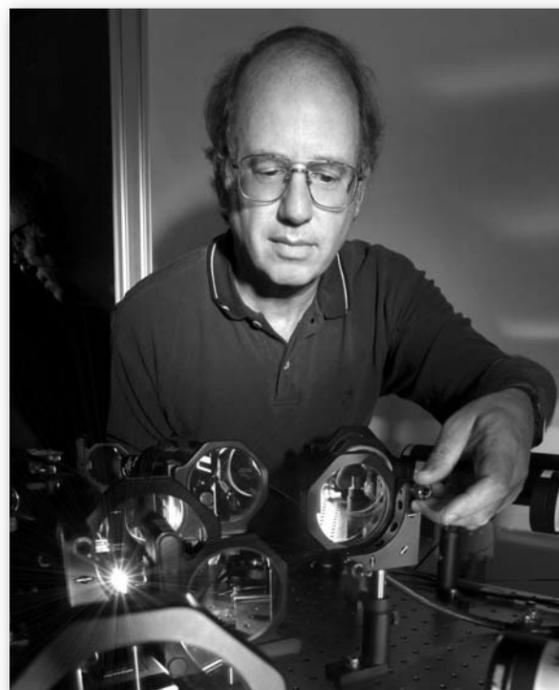
With the success of the original system, there has been significant interest in updating and expanding the capabilities of the Tropical Western Pacific ARM Climate Research User Facility (ACRF) in Darwin, Australia. Recently, the DOE Office of Science allocated funds to Sandia for the capital upgrade of ACRF data collection sites in Oklahoma and Alaska. Sandia also was asked to add Raman lidar to the suite of instruments at the Darwin site (*Lab News*, Aug. 28, 2009).

John describes the system as a "laser lab in a box," housed in a standard shipping container with a window at the top for the laser beam to exit and a telescope and associated optics to measure backscatter radiation. The new system is essentially a carbon copy of the current Oklahoma system, including the many upgrades and improvements that were made over the past 16 years.

"When I was told we needed to get this instrument built and operational in Darwin by the end of this year, I knew it would be a challenge," says John. Fortunately, he was able to work with many of the same players that

"Nothing else I've worked on has had this kind of lasting impact on something as important as climate change. So the chance to build a second system was really exciting."

— John Goldsmith



JOHN GOLDSMITH tweaks the optics on the Raman lidar system that will be deployed to Darwin, Australia, later this year as part of the DOE Atmospheric Radiation Measurement (ARM) program. John did similar work on a lidar system that was deployed to an Oklahoma ARM site in 1996, an effort he calls a highlight of his career.

Sandia California News

contributed to the original Raman lidar system.

Sixteen years ago, Orca Photonics Systems Inc., a small company in Redmond, Wash., built the shipping container laboratory. "The company is still there, even the same guys who built the original container," John says. "They are scientists and they know lidar. They understood exactly what I needed, sometimes better than I did."

For the Darwin system, Orca separated the equipment into two shipping enclosures, one for the lidar and the other for the utilities. The new laser came from the same company, Continuum of Santa Clara, Calif., that supplied the Oklahoma system. For the electronics, John went to Berlin-based Licel GmbH, which he used for an upgrade of the Oklahoma system about eight years ago.

He also credits Lupe Martinez (8514) and others in the project engineering and facilities departments with keeping the project on track. "They've done a tremendous job supporting this project from start to finish," he says. "Getting the right kind of power to run the system while it was here on site was tricky, since Australia runs on 415 volts/50 hertz."

Australia presented a few other challenges. In Oklahoma, the sun is always to the south and thus never directly overhead. Darwin is located in Australia's Northern Territory and sits north of the Tropic of Capricorn, so at certain times of the year the sun is directly overhead.

"If the telescope points directly at the sun, the collected sunlight will do a great deal of damage," says John. "We had to develop a protection system to ensure that the telescope is always covered unless actively opened." A sliding hatch covers the window on top of the container and a second shade is gravity loaded so that it will close automatically if power is lost.

In terms of risks, John says he's most worried about the laser arriving safely in Darwin. It left on Sept. 13 on what he describes as "the slow boat to Australia" and will arrive in mid-November. "If you've been to a port and seen shipping containers, you know it's not done in the gentlest fashion," he explains. "So we put a lot of thought into packing the system to withstand bumps and bangs."

When the system arrives in Darwin, John plans to be the first one to open the container. If all the equipment makes it safely, he'll only have to worry about the saltwater (estuarine) crocodiles commonplace at Kakadu National Park, about 100 miles from Darwin. Not coincidentally, that's where the *Crocodile Dundee* movies were filmed.

Parent Company

(Continued from page 1)

clearing house office lead.

The members of the Clearing House, which began operating in February and was based on a similar practice at Lockheed Martin Corp., discovered the information being sought was already being collected and rejected the request, thereby avoiding increased work for employees, Lopez-Hamby says.

The Clearing House is an example of how Sandia's Parent Company Contribution (PCC) strategy is helping bring best practices from Lockheed Martin into the Labs.

PCC — implemented in fiscal year 2007 — seeks to use Lockheed Martin's expertise in management and operations to increase Sandia's efficiency and effectiveness of operations across all policy areas and strategic management units, says David Goldheim, director of Lockheed Martin Corporation Relations Center 0010.

Improving Sandia's efficiency

Lockheed Martin's strengths in strategic planning, engineering, research and development, business and management processes and procedures, and project management are being used to help improve Sandia's operational efficiency, David says.

"Anyone who is as successful at the private level as Lockheed Martin must be doing it right. Sandia may be able to leverage some of those ideas to bring efficiency to operations, plus bring in new resources and personnel."

— Lloyd DeSerisy, NNSA Sandia Site Office

The PCC Working Group is cochaired by David and Mike Verdecchio, Lockheed Martin's director of quality and mission success. The group reports to Sandia's deputy Labs director and EVP for Mission Support, and the results of Sandia's use of Lockheed Martin's expertise is reviewed quarterly by NNSA and the Governance Committee of the board of directors.

"The thrust of the working group is mostly about making better business processes," David says. "We have customers who have expectations that we will

Five Parent Company Contribution priorities

The Parent Company Contribution strategy had five active priorities for this past fiscal year. They were:

- **Work Planning and Controls**, which involves approaches to safety, security, and environmental standards and incorporation into everyday work.
- **Risk Management**, which involves evaluating risk on projects.

- **Supplier Quality Constructs**, which helps the Labs monitor and validate products from suppliers.
- **Conduct of Management Review**, which looks at the way Sandia processes project information.
- **Business Process Reengineering**, which enables Sandia to benchmark its business processes against Lockheed Martin processes.

provide outstanding science and engineering, but at a cost that is affordable and will meet their needs."

Lloyd DeSerisy, the assistant manager for contract administration and business management for NNSA's Sandia Site Office, says in the past year Sandia and Lockheed Martin have formalized the PCC strategy, and that emphasis is producing results.

"Anyone who is as successful at the private level as Lockheed Martin must be doing it right. Sandia may be able to leverage some of those ideas to bring efficiency to operations, plus bring in new resources and personnel," DeSerisy says.

He says looking at Lockheed Martin's best practices has resulted in changes in quality assurance procedures, employee benefits, information flow, and training efforts.

For the Clearing House, members from divisions, strategic management units, and policy areas across the Labs meet once a week when necessary to consider new or changing requirements and agree on the best way to implement them, says Kathleen McCaughey, director of Responsive NG Product Deployment Center 2700.

"The idea is we vet requirements," Kathleen says. "We agree that we need the requirement and we also agree on the implementation of the requirement. Lockheed Martin was open to letting us understand how they manage requirements."

The Clearing House is new, so it's too soon to have data on how it's working, but Kathleen thinks it will make the Labs more effective and efficient and save money.

Kathleen became involved with PCC as the lead member of the Mission Execution Core Team, when it tried to figure out what core mission policies, processes, and procedures were needed across the Labs.

In April 2009, the team visited Lockheed Martin's Missiles and Fire Control site in Orlando, Fla., (as well as Oak Ridge National Laboratory) to ask about processes and procedures in manufacturing, research,

and development that would help Sandia better execute its mission.

"What structures did they put in place? How did they manage it?" Kathleen says.

Lockheed Martin's employees showed the Sandians their information systems, their standards, and how their procedures and processes were structured.

More value from Lockheed Martin

The Working Group also looked at Product Lifecycle Management (PLM), which institutionalizes the business processes and tools required to enable Sandia to manage the total life cycle of its physical, intellectual, and software products.

John Shaw (9711) says their group has had many discussions with Lockheed Martin executives to help Sandia begin to implement PLM, now in its third year at Sandia, and he has seen many ways in which Lockheed's business practices could benefit Sandia. But sometimes Sandia has not followed up on actions after meetings.

"There's nothing bad in our relationship with Lockheed, but there could be more," John says. "If we were more thoughtful in these areas, if we pulled more, I submit that we could get a lot more value from them."

For example, John says one thing he noticed on the trip to Lockheed Martin's Missiles and Fire Control site was the company's intense focus on the customer, including posters of customers and their families at the worksite, and posted metrics on how Lockheed Martin employees are doing.

Each year, the PCC Working Group selects several priorities that will have the most impact on the Labs, David says. An example from the past is Conduct of Management Review, which looks at the way information from the project level reaches Sandia's executives so that the leadership can better determine the health of projects, he says.

"This is a technique for showing the SSO that we are managing our programs in a way that gives them confidence that we're meeting our schedules, meeting our deliverables, meeting our cost objectives, and so forth," David says. "Lockheed has to do this all the time on its programs and has been doing it for many, many years, so there's a lot we can learn from how they do it."

David and Aaron Hamburger (00010), program manager for PCC, encourage Sandians, when writing man-

"The thrust of the working group is mostly about making better business processes. We have customers who have expectations that we will provide outstanding science and engineering, but at a cost that is affordable and will meet their needs."

— David Goldheim, Director
Lockheed Martin Corp. Relations Center

agement assurance reports, to report on ways in which Lockheed Martin has helped them do their jobs better and asked that they keep an eye out for additional areas they believe might be improved through better business practices.

Capturing everything

"When you see an area where Sandia's operational effectiveness can be improved or our costs reduced by patterning some of our approaches after those that our parent company has found successful, let the Working Group know," David says.

Aaron says the Working Group also wants Sandia to take credit for collaborations with Lockheed Martin that are already happening.

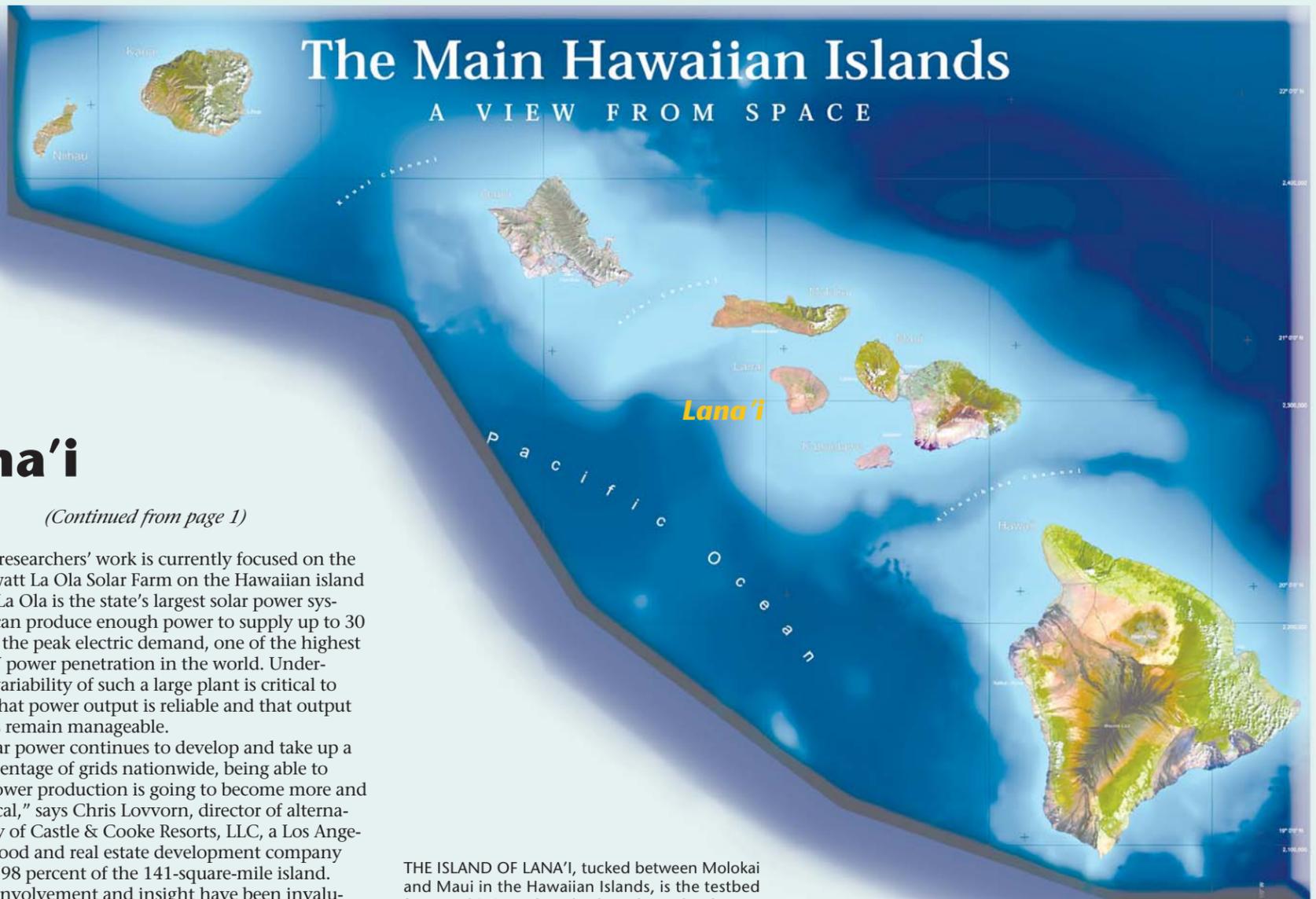
"There are a lot of interactions with Lockheed Martin that occur naturally and we want to make sure we're capturing everything," he says.

With collaborations between the Labs and Lockheed Martin ongoing, David says Sandians can expect to tap into other Lockheed Martin capabilities to take advantage of best business practices — like the Clearing House or PLM — that will lead to increased efficiency and cost savings at Sandia.

Labs, NNSA/Sandia Site Office sign annual Performance Evaluation Plan



LABS DIRECTOR PAUL HOMMERT, front left, and NNSA Sandia Site Office (SSO) Manager Patty Wagner, front right, congratulate each other after signing the FY11 Performance Evaluation Plan, the annual document that sets forth the performance evaluation criteria for Sandia's programmatic work and the critical business and operations functions that support the mission. Also on hand to sign the document were Executive VP and Deputy Labs Director for Mission Support Al Romig, left, Deputy SSO Manager Kim Davis, center, and Executive VP and Deputy Labs Director for National Security Programs Jerry McDowell. The Performance Evaluation Plan — the PEP — is developed after extensive negotiations among Sandia, NNSA headquarters and SSO. The FY11 PEP consists of six performance objectives associated with Fixed Fee and five performance incentives associated with At-Risk Fee (the contractually stipulated fee Lockheed Martin receives for meeting agreed-upon criteria). The FY11 PEP was developed using the same principles that guided the FY10 alternate PEP, including a focus on mission results and transparency of management and performance information to Sandia's government counterparts. (Photo by Randy Montoya)



Lana'i

(Continued from page 1)

Sandia researchers' work is currently focused on the 1.2-megawatt La Ola Solar Farm on the Hawaiian island of Lana'i. La Ola is the state's largest solar power system, and can produce enough power to supply up to 30 percent of the peak electric demand, one of the highest rates of PV power penetration in the world. Understanding variability of such a large plant is critical to ensuring that power output is reliable and that output ramp rates remain manageable.

"As solar power continues to develop and take up a larger percentage of grids nationwide, being able to forecast power production is going to become more and more critical," says Chris Lovvorn, director of alternative energy of Castle & Cooke Resorts, LLC, a Los Angeles-based food and real estate development company that owns 98 percent of the 141-square-mile island. "Sandia's involvement and insight have been invaluable in our efforts to meet 100 percent of the island's energy needs with renewable resources."

The effects of clouds on small PV arrays are well-documented, but there is little research on how large-scale arrays interact and function under cloud cover. A small system can be completely covered by a cloud, which drastically reduces its power output, but what's less well understood is what happens when only part of a large system is covered by a moving cloud shadow, while the rest stays in sunlight.

"Our goal is to get to the point where we can predict what's going to happen at larger-scale plants as they go toward hundreds of megawatts. To do that, you need the data, and the opportunity was available at La Ola," Sandian Scott Kuszmaul (6352) says.

The high penetration of PV power on Lana'i, combined with the sun and cloud mix at the 10-acre La Ola plant, provides an optimal environment for prediction and modeling research. Research could not interfere with the ongoing operations of the plant, which currently sells power to Maui Electric Company (MECO),

so Sandia engineers connected 24 small, nonintrusive sensors to the plant's PV panels and used a radio-frequency network to transmit data. The sensors took readings at one-second intervals to provide researchers with unprecedented detail about cloud direction and coverage activity.

A radio-frequency transmission system has the added benefit of being portable. "Currently, a utility company that wants to build a large solar PV power plant might have a lot of questions about the plant's output and variability at a proposed site. Work being done at the La Ola plant is leading to new methods that eventually can be used to answer these questions," says Josh Stein (6352). "These techniques will allow a developer to place a sensor network at a proposed site, make measurements for a period of time, and use that to predict plant output variability."

La Ola was commissioned in December 2008 by

Castle & Cooke and SunPower Corp., a manufacturer of high-efficiency solar cells. The project uses SunPower's Tracker technology. Panels rotate on a single axis to follow the sun, which increases energy capture by up to 25 percent. Since February, Sandia has held a cooperative research and development agreement (CRADA) with SunPower to conduct research on integrating large-scale PV systems into the grid. The CRADA is funded with about \$1 million of combined DOE and SunPower funding and is expected to achieve significant results, which will be disseminated through joint publications over the next two years.



WARD BOWER (6364) is part of a Sandia team that is studying the effects of cloud cover on large photovoltaic installations on the island of Lana'i in the Hawaiian Islands. Here, he checks out a field of PV collectors on the sparsely populated 141-square-mile island.

Protective Force turns 60



(Photo by Randy Montoya)

In 1950, not long after AT&T assumed management of Sandia Corp., a number of functions that had been performed by the US military were taken on by the new lab manager. As part of the transition, Sandia established a plant security division of 150 officers, hired at \$1.46 per hour, to staff the tech area guard gates and towers.

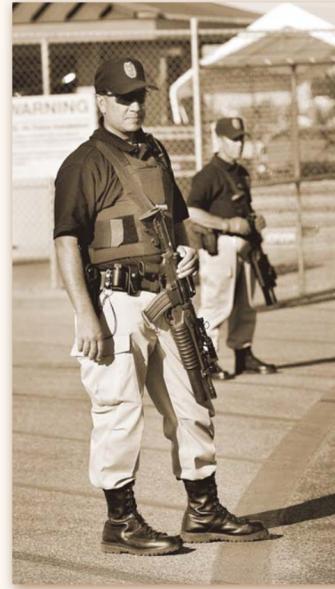
In the succeeding months, the officers took on additional responsibilities, training, and requirements similar to the outgoing military police. The security program evolved over the next 25 years but remained an industrial security-based activity until the early 1980s. Terrorist attacks on US military and civilian targets occurred around the world and concern for protection of nuclear material increased. That threat changed the Protective Force's fitness standards, weapons were changed to fully automatic firearms, and training was intensified.

In 1983, a special weapons and tactics (SWAT) team was formed. By 1995, those teams were highly trained, paramilitary units and no longer just "industrial security guards."

When the US was attacked on Sept. 11, 2001, the Pro Force stood shoulder to shoulder with Kirtland Air Force Base service personnel to keep everyone safe and secure. In the wake of 9/11, security police officers pulled extra duty and were called on to do new tasks.

In 2005, the Pro Force's role changed as Sandia's mission changed. Pro Force is still instrumental in supporting the testing of new technology for other Sandia organizations. In 2008, for example, Sandia Pro Force supported researcher Mark Grubelich (6361) during his testing of a new nonexplosive, less-than-lethal fuel-air diversionary device intended for use by law enforcement and military operations all over the country.

Today, Sandia's protective Protective Force continues to take pride in providing exceptional service to Sandia and the nation, just as it has done for 60 years.



(Photo by Randy Montoya)



(Photo by Randy Montoya)



(Photo by Randy Montoya)



HENAAC Winners

Anthony Medina and Angel Urbina named winners of prestigious awards for Hispanic engineers

Story by Iris Aboytes

Anthony Medina (2500) and Angel Urbina (1544) will receive Hispanic Engineer National Achievements Awards Corp. (HENAAC) awards on Oct. 8 in ceremonies held at the annual HENAAC Awards conference at Disney's Coronado Springs Resort in Lake Buena Vista, Fla. Anthony is this year's Luminary Award winner and Angel will receive the Most Promising Engineer/Scientist, Graduate Degree Award.

HENAAC is a nonprofit organization promoting careers in science, technology, engineering, and mathematics (STEM).

Anthony Medina

Anthony began his career in 1983 as a member of the technical staff in the Firing Sets Department, where he was codeveloper of a novel electronic safing, arming, and firing technology adopted by DoD for conventional weapons. He spent 17 years in Sandia's Monitoring Systems & Technology Center 5700 as a manager, senior manager, and director. Anthony was instrumental in the research, development, production, and launch of more than 50 satellite sensor payloads and one Sandia-produced satellite.



ANTHONY MEDINA

Currently Anthony is the director of Energetic Component Realization Center 2500, where he manages the research, development, design, and production of critical nuclear weapon components. The center also leads metrology science for the entire nuclear weapons complex.

"It is a great honor to receive this recognition from HENAAC," Anthony says. "I owe much of my success to Sandia for giving me the opportunity to work on interesting, important, and rewarding programs throughout my career."

Anthony grew up in Taos, N.M., but spent much of his time working on his family's cattle ranch in Black Lake, six miles south of Angel Fire. Ranch life meant hard physical work and long days.

Anthony's parents, Felipe and Anita, stressed the importance of education first. Each of them was the first child in their respective families to receive a college education. Anthony and his five siblings all earned college degrees.

Anthony received his Bachelor of Science in electrical engineering from New Mex-

ico State University, and his Master of Science in electrical engineering from Stanford University through Sandia's One Year on Campus program.

Angel Urbina

Angel has spent 12 years at Sandia developing methods for modeling physical phenomena using various modeling approaches, such as artificial neural networks and nonphenomenological models. He has developed and implemented methodology for uncertainty quantification and model validation of complex systems.

"I am honored to be recognized by this prestigious HENAAC award," Angel says. "It is truly a team award and is shared by all who have been my inspiration and support."

Born in El Paso, Texas, Angel was raised by his mother, Rosa, his grandmother Ana, and grandfather Angel. Angel describes his family as having very humble beginnings but a hard-working nature. Angel's grandfather assumed the role of a father figure for him. "My 'father' always spoke calmly, never raised his voice, but always commanded respect," says Angel. "He taught me by example."

Ana is the pillar of strength and the driving force behind Angel's education. Raised in a family of 11 and living in poverty, Ana's strong personality was necessary for survival as she strived for a better life. She believed that education and perseverance were the only ways to reach greatness.

With the help of Sandia, Angel recently received his doctorate. His 85-year-old grandmother was present to witness his PhD ceremony. "Her belief in the power of education to change lives and her trips to my high school teachers so long ago paid off," Angel says.

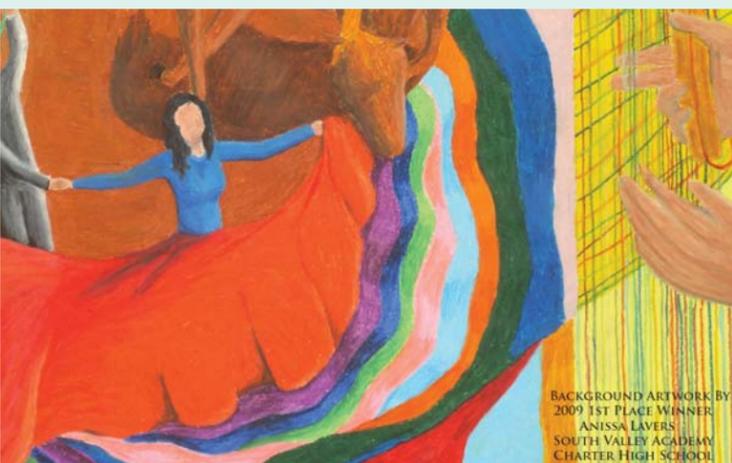
Both honorees are involved in helping students. Anthony works with the NMSU Alliance for Minority Participation to help recruit minority students into pursuing a technical education. Anthony has also hosted a Hispanic Roundtable Forum for new hires and serves as Sandia's campus executive to NMSU.

Angel is involved in teaching schoolchildren the joys of math and science through his participation in the New Mexico MESA Program (Math, Engineering and Science Achievement) and Sandia's MANOS program. This year Angel added a new module to the program, earthquake engineering. He hopes it becomes a standing module for the next 10 years.



ANGEL URBINA

Celebrating Hispanic heritage



Music. Food. Fellowship. Fun. All with a focus on celebrating Hispanic heritage. Sandia's Hispanic Leadership and Outreach Committee on Oct. 5 at the Steve Schiff Auditorium hosted a celebration of Hispanic heritage that attracted several hundred Sandians. In remarks for attendees, Labs Director Paul Hommert reaffirmed Sandia's ongoing commitment to diversity and, noting that 21 percent of the Sandia workforce is of Hispanic heritage, observed that Hispanics serving at every level in the Labs have contributed to Sandia's mission success throughout its 61-year history. In the photo above left, members of Mariachi Arriba Sabinas create a festive atmosphere; other musical entertainment included Freddie Chavez & Sal Garcia and the Abel Lucero Band. At right, Paul stands with winners of the annual Youth Art Contest (the image at left is a detail from last year's winning art). The day's activities also included a salsa/cultural dessert tasting contest. Food was provided by Cervantes Restaurant.

Hispanic Heritage Month recognizes the contributions of Hispanic Americans to the US and celebrates Hispanic heritage and culture. The observation, started in 1968 as Hispanic Heritage Week, was approved by President Lyndon Johnson; it was expanded by President Ronald Reagan in 1988 to cover a 30-day period starting on Sept. 15 and ending Oct. 15.

Red Sky/Red Mesa supercomputer wins Oracle green award

Sandia/NREL's Top 10 supercomputer also tops in energy efficiency

By Stephanie Holinka



IN THIS PHOTO from April 2010, Rob Leland (1400), right, discusses the capabilities of the just-dedicated Red Mesa supercomputer with Div. 9000 VP Joe Polito, left, and NREL Director Dan Arvizu. The supercomputer has just won a "green" award from Oracle. (Photo by Randy Montoya)

Sandia's Red Sky/Red Mesa, listed by Top500 Supercomputing Sites as the 10th fastest computer in the world, has been selected as one of 15 winners of Oracle's Enable the Eco-Enterprise award.

"Red Sky/Red Mesa is the most eco-transparent [energy-efficient] compute platform Sandia has deployed to date," says John Zepper, senior manager in Computing Systems & Technology Integration Dept. 9320. "The reduction in power and water consumption combined with the reduction in carbon footprint makes Red Sky/Red Mesa one of the most energy-efficient compute platforms."

Red Sky/Red Mesa is a collaborative effort involving

Sandia, the National Renewable Energy Laboratory (NREL), and Oracle/Sun. Oracle brought together vendors that incorporated several innovative technologies and products, including the Emerson/Liebert XDP Units, APC Power Distribution Units, and Cooligy for the Glacier Door and the optical fiber connect.

The Red Sky/Red Mesa cluster deployed several technological innovations that result in a greener system, but the most noticeable improvement is what you don't feel in the room: freezing room temperatures.

"Normally," John says, "when you go into an old computer room it's cold because the entire room is kept cold to prevent computer processors from overheating. With Red Sky/Red Mesa, the systems deliver the cooling directly to the processors."

Red Sky/Red Mesa's direct-cooled system uses the Glacier Door combined with the Liebert XDP pumping system for efficient cooling. This process has reduced chiller plant consumption tons cooling by 37 percent, water consumption by 5.4 million gallons per year, and chiller plant energy consumption by 77 percent.

Data center efficiency is measured by power usage efficiency (PUE), a measure determined by dividing the amount of power entering a data center by the power used to run the computer infrastructure within it. PUE is expressed as a ratio with overall efficiency improving as the quotient decreases toward 1.

Sandia and its partners set out to build a computer platform that achieved a PUE of 1.7 or better. The Red Sky/Red Mesa facility has achieved a PUE of 1.27 with 2,275 kW total facility equipment power and 1,794 kW total IT equipment power. Red Sky/Red Mesa achieves this even though the facility housing the supercomputer also houses additional enterprise computing equipment.

The Red Sky/Red Mesa cluster deployed several tech-

nological innovations that result in a greener process.

Red Sky/Red Mesa has reduced its carbon footprint 3.5 times, compared to its predecessor.

In addition to the machine itself, Sandia has instituted other process-based changes to the corporate computing infrastructure to green the data center. A new automated Facilities Management System allows for on-the-fly changes to equipment operational conditions and environmental conditions, increasing operational efficiency.

The Red Sky/Red Mesa high-performance computer cluster installation team also participated in a pilot diversion effort to keep packaging foam #4 LDPE (low-density polyethylene) from being disposed as solid waste. Thirty cubic yards of foam material, weighing between 200 and 300 pounds, was diverted from landfills. Concurrently, all packaging material used in the transport of the Red Sky/Red Mesa system components were recycled, where feasible.

NREL uses the Red Mesa cluster to perform complex molecular dynamics modeling and simulations to develop biofuels that can be used in place of fossil fuel. NREL also uses Red Mesa to help design future biofuel-friendly combustion engines. The system supports work sponsored by DOE's Office of Energy Efficiency and Renewable Energy.

The Red Sky/Red Mesa platform dramatically reduces the time required to simulate complex fuel models, from four to six months to just four weeks, allowing researchers to accelerate the pace at which they can address these complex problems. Its speed also reduces the need for laboratory and field testing, allowing for energy reduction far beyond its data center walls.

The award was presented on Sept. 22 during the Oracle OpenWorld conference in San Francisco, Calif.

US research preeminence faces global challenges

Sandia researcher and ACS president-elect Nancy Jackson presents facts, observations, conclusions

By Neal Singer

Drawing on statistics, scientific expertise, and personal interactions, American Chemical Society president-elect Nancy Jackson (6726) presented a talk Sept. 13 that stopped just short of hair-raising on the declining leadership margin of the US on the world technical/scientific stage. She also discussed the current administration's actions to remedy that problem and how researchers could contribute.

Developing countries around the world, but specifically in Asia, have made investment in science and technology the cornerstone of their future prosperity, funding buildings, equipment, and education to produce more scientists and engineers, she said.

"The elevated position the US has enjoyed for many years in R&D will inevitably erode, not necessarily from any decline on our part, but because the rest of the world is quickly and determinedly catching up with us," Nancy said. "Parity is only a matter of time." Taxes and government subsidies support the efforts of other nations.

Nancy's experiential base derives in part, she said, from being cofounder, technical lead, and travelling representative of Sandia's Chemical Security Engagement Program — "little sister to Sandia's biosecurity program," as she described it — which began with few funds and now receives approximately \$7 million annually.

(The ACS — Nancy's other eye on science — is the largest scientific society in the world, with 162,000 members publishing 38 professional journals.)

She visited researchers in professional societies, universities, and industries in Southeast Asia, Africa, and the Middle East, speaking "researcher to researcher."

What she found was that "The global landscape of S&T shifted after 9/11," she said. "We closed our doors to international students. Their enrollments dropped in the US and haven't yet been fully restored."

These students went to other countries to study, and now remain there rather than in the US.

Moreover, better communications and travel have led to increased collaborations between US scientists and those in other countries, improving global competence.

China, which has set research priorities on, among other areas, wind, solar, water, and biology, has doubled its scientific papers over the last decade in a variety of hard-science areas as well, including material science. The country has risen from 1.8 percent to 11 percent of ACS published papers from 2000 to 2009, Nancy said.

She related how the Chinese, after partnering with

Woods Hole research lab to learn about deep-ocean exploration with the famous *Alvin* submersible, "have now gone two miles below the surface in the China Sea and planted their flag there, which didn't make surrounding countries very happy."

India's scientific papers too have increased, doubling since 2000, she said. The chief area of study was agricultural engineering, but organic chemistry rose eight percent. "Their middle class has grown and is almost the equal of the US," she said, giving the improvement a human face: "There are more cars on the road, more pollution, and fewer beggars visible — perhaps pushed out of sight — in the big cities."

The US, she said, is still the leading R&D country, both in papers and in "impact" factors (the number of times a paper is referenced by other papers, considered a mark of its importance). "President Obama has gone further than any other president [in supporting scientific research] but we could go a lot further," she said, commenting that in the total world funding of R&D, the US's percentage of research funding dropped from 1996 to 2007, while it rose in Asia and the Pacific Rim areas.

"All of Asia is catching up with us in research funding, not just China or India," she said.

Social hindrances are also lessening. In Saudi Arabia, prohibitions stopping women from participating in science do not exist at King Abdullah University of Science and Technology — a new university with no history of discrimination to alter.

Meanwhile, US progress in research is hampered in part by security requirements that create classified research environments that restrict the flow of ideas, by peer review panels that favored older, more established researchers, and by industries that leave the US for foreign residence.

Such moves not only harm the immediate US economy but, in creating jobs elsewhere, leave fewer job prospects for new US graduates.

In turn, US science students, responding to reduced job possibilities, are less keen to study those branches of science leaving the country, like computational research. "This not only affects our economic well-being but our

"The elevated position the US has enjoyed for many years in R&D will inevitably erode, not necessarily from any decline on our part, but because the rest of the world is quickly and determinedly catching up with us."

— Nancy Jackson, President-elect American Chemical Society



national security as well," she said.

And, she said, "As biochem firms close down research, a biology bachelor's degree is today's English degree."

ACS members now have the highest unemployment rate in the organization's history, she said.

"Multinational [corporate] interests and national interests are not the same and we need to act accordingly," she said.

She concluded on a positive note, reporting that when she attended the second Federation of African Chemical Societies meeting in January 2009, she heard the question asked: "What do developing countries want from the US regarding R&D and science and engineering?"

"Someday," a participant responded, "the US will realize energy is a problem and when they do, they will do the research and lead us out of this."

"People want us to lead," she said, "with our values — entrepreneurially and scientifically, not with our military. In science, a rising tide floats all boats."

The problem, she responded to a questioner, is that "when we go to legislators and ask for funding for science, we seem self-serving. The same people have gotten funded for 25 years. We need to do our own housecleaning. The Obama administration and Secretary Chu want more bang for their buck. Either we scientists do something ourselves, or it'll be decided for us."

The unclassified parts of the national labs, she said, should be very involved in research. "[Unlike universities,] we have a team environment and big equipment to work with."

The talk, attended by approximately 60 Sandians, was also streamed live to California and is available for viewing in its entirety at <http://tiny.sandia.gov/n8uld>.

Mileposts

New Mexico photos by Michelle Fleming
California photos by Randy Wong



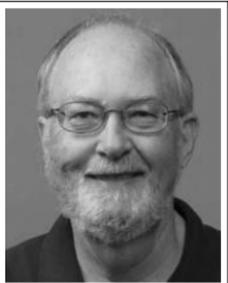
Jim Berry
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Leonard Connell
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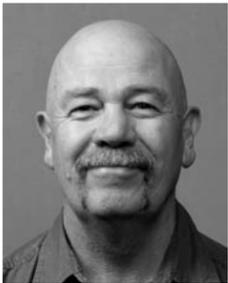


Denise Koker
30 8520



Charles Shirley
27 9343

Recent Retirees



Isidro Molina
30 1656



Barbara Roberts
30 3333



Yvonne Vallejos
30 10669



Sandra Lormand
25 8945



Brent Meyer
25 2622



Isaac Shokair
25 8123



D. Craig Wilcox
25 5761



Elizabeth Dees De Sanchez
20 4211



Marta Vera Leon
20 8526



Edwina Lopez
20 10657



LeRoy Whinnery
20 8223



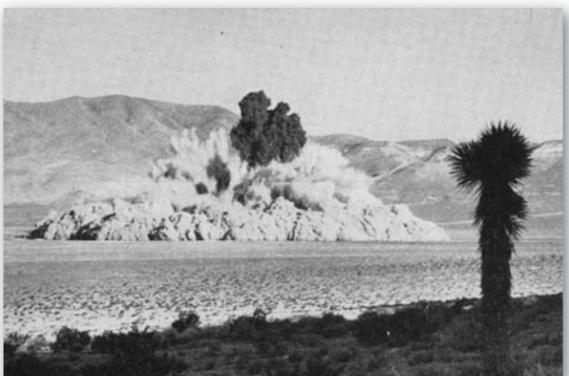
David Aldridge
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Oct. 4-22, 2010



50 years ago . . . One million pounds of TNT, buried in the Nevada Test Site, ripped a gaping crater on the desert floor when detonated Oct. 13. The giant blast of conventional chemical high explosive was the largest of its type ever exploded in the US. The test, called "Scooter" was part of a series of high-explosive



Dust clouds swirled 500 feet into the air above the Nevada desert when 1 million lbs. of TNT was detonated for Operation Scooter. It was part of the Plowshare program.

tests being conducted by the AEC to obtain information on cratering effects. The study is part of the Plowshare program of peaceful means of nuclear explosives. From this study, scientists hoped to obtain information on the relationship between energy yield, depth of burial, and the crater size resulting from the explosion. The crater was about 350 ft. in diameter at its widest point. Roughly cup-shaped, the crater's deepest point was about 80 ft.

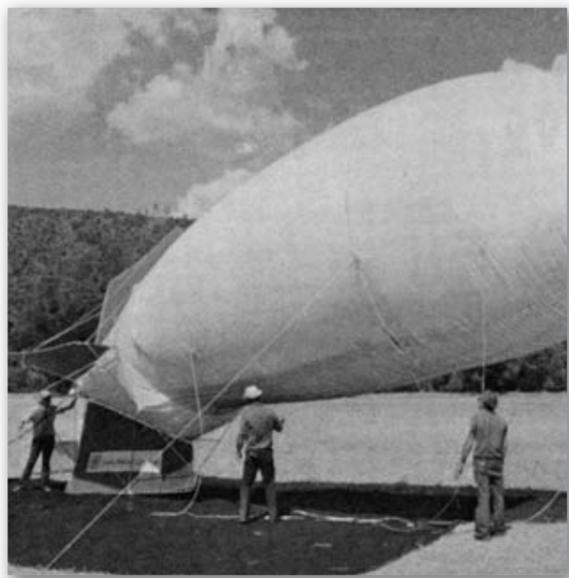
40 years ago . . . Fifty Sandians, participating in a test readiness exercise in the Pacific, came home recently after a successful launch of a Thor booster with a high-altitude test vehicle from Johnston Island. The launch is part of the national program authorized by Congress in 1963 after the nuclear test ban treaty was signed. In the program just completed, no nuclear components or explosive warheads of any kind were used. Primary payload of the high-



Thor booster is readied for launch from Johnston Island.

altitude test vehicle (HATV) was a simulated device. In addition, the HATV carried a stellar X-ray experiment provided by Lawrence Radiation Laboratory, which scanned stellar X-ray sources.

30 years ago . . . Sandia National Laboratories will conduct five scientific experiments in Lake County, California, involving a tethered balloon to study how air pollutants travel at night in mountainous terrain. The experiments are part of DOE's Atmospheric Studies

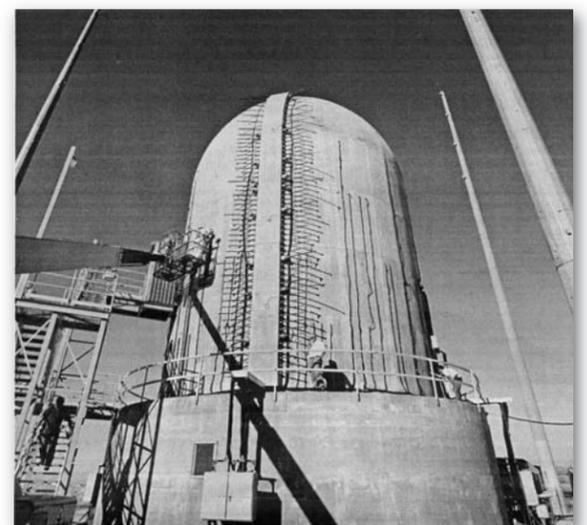


The inflation of the tethered balloon used in DOE's Atmospheric Studies in Complex Terrain (ASCOT) is almost completed.

in Complex Terrain (ASCOT) research program. Experiments will focus on the dispersal of inert tracer gases released at various points in a selected valley to mimic air pollutants, and on measurements of temperature, humidity, wind speed, and wind direction through which the behavior of the tracer gases may be understood. Wind dispersal of air pollutants is relatively well understood over flatlands, but dispersal is more complex and less understood in mountain valleys.

20 years ago . . . DOE is planning two programs to study global climate change. The first is called ARM (Atmospheric Radiation Measurement), a program to develop better climate models by achieving a more detailed physical understanding of atmospheric processes, especially the interaction of solar radiation with clouds. The other DOE program is called CHAMMP (Computer Hardware, Advanced Mathematics, and Model Physics). Its goal is to speed up climate calculations by a factor of 10,000. This increase in throughput could be used to reduce the size of cells in the grid or increase the complexity of the models.

10 years ago . . . Sandia has spun off a private company, MEMX Inc., to commercialize Labs-developed microsystems technology. The first prototype solid-state microcavity lasers to operate in the ultraviolet (UV) range, with the capability to generate the white light most prized for indoor lighting, have been demonstrated by scientists at Sandia working with colleagues at Brown University in Rhode Island. **Almost 200 researchers attended a special workshop** recently on one of the most widely used products created at Sandia — the CHEMKIN suite of software for combustion and chemical process modeling. **A Sandia test pushes a scale-model nuclear power plant containment vessel to, and beyond its limits.** Sandia engineers pumped nitrogen gas into a quarter scale concrete model of a nuclear power plant containment vessel very gradually increasing the gas pressure until the structure failed. The primary goal of the test was to generate data that would validate computer codes the NRC uses to predict how much pressure full-scale PCCVs could tolerate in nuclear power plants. Another goal was to show that



QUARTER SCALE PCCV — The 70-foot-tall, 35-foot-diameter structure is the largest nuclear reactor containment vessel model ever tested to failure.

existing PCCVs at power plants in Japan and the US would perform their safety functions reliably in an accident. **The first hydrogen-fuel-cell-powered vehicle developed for underground applications** was unveiled at MINExpo™ International 2000 in Las Vegas, Nev. The 4.5-ton mining locomotive is being equipped with a Sandia-designed power plant and fuel storage system in place of a battery pack. The locomotive is manufactured by RA Warren Equipment Ltd. of North Bay, Ontario.

United Way and the Community Fund bring help to our community

United Way of Central New Mexico's Community Fund helps agencies in Bernalillo, Sandoval, Torrance, and Valencia counties.

The Community Fund supports 102 programs that work to strengthen families, provide education, eliminate hunger, prevent family violence, and serve seniors and the homeless.

Sandians represent 50 of the 300 community volunteers who serve on Community Fund panels to ensure that Community Fund gifts reach where they are most needed.

Presbyterian Ear Institute and Cuidando Los Niños are two of the many Community Fund agencies.

Story by Iris Aboytes

Presbyterian Ear Institute

Presbyterian Ear Institute Oral School was founded on the belief that many children with hearing loss can develop the ability to listen, learn, and speak. Presbyterian provides an educational program where children with hearing loss learn to communicate using spoken language.

The team of professionals on campus includes oral deaf educators, speech-language pathologists, early

Presbyterian is accredited by the North Central Association of Colleges and Schools and the New Mexico Children, Youth, and Families Department. The New Mexico Standards and Benchmarks along with Performance Standards and Benchmarks for 3- and 4-year-old children are integrated into the school curriculum.

Presbyterian provides help to community members of all ages who have a variety of communication disorders, including articulation delays, expressive and receptive language delays, cleft lip and palate, fluency disorders, and language disorders related to Down syndrome and other developmental disorders.

Phil was born prematurely and failed his newborn hearing screening. At age 2, he was not talking but his hearing loss was still undiagnosed. When Phil was 4, he was clearly struggling to produce intelligible speech and language. He was finally diagnosed with a significant hearing loss and received hearing aids. He entered kindergarten in a public school classroom where he received speech-language and physical-occupational therapy. In 2006, with further evaluation, he was referred for speech-language services at PEI. Phil is now reading at the same level as his hearing peers.

Cuidando Los Niños

Cuidando Los Niños (CLN) was established by volunteers as a nonprofit organization in 1989. The volunteers saw that many homeless parents had very young children with them. They understood the parents could not get housing, employment, and education without child care. To meet this need, the group focused on providing high-quality, therapeutic child development through the structure of an independent not-for-profit organization.

In 1991, the Family Support Program was mobilized to assist parents in their efforts toward family indepen-

dence and stability. As the children were being provided educational, nutritional, and therapeutic services, the parents became involved in classes and activities for their own development as parents, wage earners, and advocates for their own families. Play therapy was added in 1994 to help children traumatized by neglect and abuse or by the uncertainty of their homeless experience.

A pediatric health clinic for the children was established in 1999, and in 2005 under partnership with the



Albuquerque Healthcare for the Homeless, the clinic expanded to provide health care for all members of the families participating in the CLN program.

The organization is a strong proponent of the Housing First model that emphasizes the idea that families should be helped to exit homelessness as quickly as possible. To accomplish this goal CLN maintains a network of partnerships with other community organizations. Seventy-four percent of the families who finish the CLN program become rehoused and stabilized.

A young mother lost her housing after her baby was born. She worked part time and got child care help from a friend, but couldn't save money. She needed a full-time job to rent a place to live, but full-time child care cost almost \$600 per month. She couldn't afford both.

"When I heard about the free child care offered at Cuidando los Niños, it seemed too good to be true," says the young mother. "And they had transportation." She had finally found a way to go back to work and rebuild her life. She took budgeting and parenting classes offered by Cuidando. "The teachers love my son and he loves them," she adds. "The family support staff have been my confidants and advisers."



childhood educators, special educators, audiologists, and otologists. The team also enlists the service of other providers such as occupational and physical therapists and vision specialists.

Children enrolled are between 2 and 8 years old. Two-year-olds attend half days, four days a week. All other children attend a full-day, weekly program. Presbyterian also provides a half-day summer program.

Be part of the chain reaction ECP campaign runs Oct. 4-22



STARTING A CHAIN REACTION — Just as dominoes, placed just so, will cascade together in a choreographed chain reaction, so it is with charitable contributions to Sandia's Employee Caring Program: Each dollar given through ECP starts its own chain reaction in the community. Here, Eric Miller (851), in foreground, and Jeana Brosseau (11000) design an elaborate pattern as part of the Domino Dare, a domino design and knock-down contest intended to spark a chain reaction of interest and excitement about the 2010 ECP campaign at Sandia/New Mexico, which runs Oct. 4-22. Nine teams from Sandia and Kirtland Air Force Base competed in the Domino Dare. As the dominoes fell, teams representing Divisions 1000 and 5000 were declared cowinners for their elaborately engineered constructions. (Photo by Randy Montoya)

The Community Fund has three main areas:

EDUCATION

Strengthening families: Family and child advocacy, legal assistance
Building independence: Emergency services; literacy and learning programs
Supporting education: Specialty schools and preschools; out-of-school-time education support

INCOME

Assisting people with disabilities: Services to children and adults
Sheltering neighbors: Shelter for children and families; homelessness services and housing
Serving seniors: Senior services, including legal assistance

HEALTH

Preventing family violence: Empowering victims of violence and domestic violence shelters
Eliminating hunger: Food assistance for individuals and families
Promoting healthy lives: Cancer support services; access to health care; therapy for children and families; mental health care

Did You Know?

Corporate Cornerstones pays for all United Way administrative costs. One hundred percent of your donation goes to where you want it.

Sandia is a Cornerstone company. This year Lockheed Martin raised its contribution to \$100,000 to the Corporate Cornerstone.

Giving is a personal choice. ECP is one of the best ways to ensure that your money goes where it is needed most in the community. The most important thing is that your money goes to the community. You decide how.

If you donate to the Community Fund and are not satisfied with a particular agency that receives funding, United Way will refund the entire portion of your gift to that agency.