A TRULY GRAND OPENING — Jim Walther, director of the National Museum of Nuclear Science & History (formerly the National Atomic Museum), polishes the entry tiles to the museum in anticipation of its grand opening last week. Jim, along with museum staff and scores of volunteers, did hundreds of hours of hands-on painting, hammering, sawing — and polishing — in preparation for the opening of the new facility. The entry tiles are laid out in the pattern of the periodic table of the elements. Sponsorships for each tile are available at $5,000 each. The museum facility is at the corner of Eubank and Southern, near the Kirtland Air Force Base Eubank Gate. For more photos of the museum's opening day events, see **page 7.** (Photo by Randy Montoya)

Six months after sled track accident . . .

Sandia making safety culture strides but has a long way to go

By John German

Nearly six months after the accident at Sandia's 10,000-foot sled track that resulted in a contractor being injured, Sandia has been aggressive in its pursuit of an improved safety culture, according to Infrastructure Operations Div. 4000 VP Mike Hazen.

"We've learned a great deal about ourselves," he says. "But we still have a long way to go."

Operations remain paused for several activities that use energetic materials. Experts from DOE's Office of Enforcement continue to investigate the incident. Several corporate initiatives are under way intended to transform lessons from the accident into meaningful improvements in Sandia's safety performance and culture.

Steps toward instinctive safety

In the meantime, Sandia has taken several positive steps, says Mike. The destination, he says, is "a Sandia culture in which our values and behaviors are focused

(Continued on page 5)

Sandia LabNews

Vol. 61, No. 6 April 10, 2009

Sandia National Laboratories

Managed by Lockheed Martin for the National Nuclear Security Administration

Sunshine to Petrol advances

SANDIA RESEARCHERS working on the Sunshine to Petrol project believe they are only weeks away from having a working device that can recycle carbon dioxide into carbon monoxide, a key building block in making combustible fuels. Initially the invention will split water into oxygen and hydrogen and later will be tested to split carbon dioxide into carbon monoxide and oxygen. In the photo above, researcher Rich Diver makes adjustments to his invention, the Counter Rotating Ring Receiver Reactor Recuperator (CR5, for short), which receives its power from the solar furnace behind him. The CR5 was initially conceived of as a way to separate water into its hydrogen and oxygen components; it was soon realized that the device could also be used to break down CO_2. The technology is expected to go through a series of developmental stages and could be market-ready within 20 years. Read more on **page 4.**

(Photo by Randy Montoya)

Inside

Photo by Randy Wong

and . . .

That's that

Congratulations to Jim Walther and all the folks at the National Atomic Museum, now the National Museum of Nuclear Science & History, for pulling off a near-miracle. With a hard deadline of April 3 to conduct a ribbon-cutting ceremony at their gorgeous new facility, and with an essentially depleted capital budget, Jim and museum foundation President Chuck Loeber rallied scores of volunteers to grab paint brushes, hammers, nails, saws, and power tools to get the museum ready for its close-up. It's a tremendous accomplishment, completed against long odds and in the face of lots of skeptics. The new building is at the corner of Eubank and Southern boulevards near the Kirtland Air Force Base Eubank Gate in Albuquerque and is well worth visiting.

* * *

By the way, remember the Oppenheimer Packard Iris Aboytes wrote about back in January (*Lab News*, Jan. 30)? The car is credibly thought to be the vehicle that conveyed Robert Oppenheimer and others to the Trinity Site test in 1945. The museum was having the car restored by a custom/special effects shop. Well, the car is on display at the museum and it looks great. And here's an aside for Clyde Layne: That back seat looks big enough for a nice nap. (Clyde, you may recall, once spent a night in another of Oppie's cars.)

* * *

Well, I asked for it and I got it; boy, did I get it! A while back, I asked what folks thought of daylight saving time, figuring I'd get a response or two. I got a lot more than that, and the passion of the responses really caught me by surprise. For some people, obviously, I have touched a raw nerve. The first salvo came from Suzi Jensen (10627), who wrote – the all-caps are hers: "I HATE IT!!! I hate that everyone is so grumpy and complains so much; I hate having to change all my clocks and wristwatches twice a year; I hate just when it's getting light for the drive in, poof! time change, and it's dark again. I hate that no one tells my dogs and they don't understand . . . I am totally in favor of leaving the clocks alone all year." Who knew?

I also like this response from Martin Crawford, who works in Radiation Transport Dept. 1341. Says he: "I can now sleep in an hour later on the weekends because the light coming in through my bedroom windows doesn't wake me up as early. This however is offset by the number of chores my wife expects me to do on the weekend because it's lighter later in the evenings." I understand, Martin, I really do. I also like the signature line at the bottom of Martin's email; it says: "There are 10 kinds of people in the world, those who understand binary language, and those who do not." Took me a second to get it, which I guess means I'm in the other nine.

* * *

Okay, brace yourself for another jeremiad: I promised to pass along the following. It was sent to me by someone whom I agreed could remain anonymous. "Fellow Sandians: As you know, the posted speed limit as you exit the gates is 15 mph. With that in mind, please stop: honking, tailgating, shaking your fists, passing me while mouthing words, or flipping me the bird. I'm just trying to obey the law."

For the record, the writer is quite correct; the speed limit as you exit the gates was changed to 15 mph a couple of months ago. Col. Mike Duvall, commander of Air Base Wing 377 and our "mayor," is serious about improving traffic safety on the base and this speed limit is part of that effort. My observation has been that so far, to quote from Hamlet: ". . . it is a custom more honor'd in the breach than the observance."

See you next time.

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

Employee death

Elaine Boyett had a kind and gentle spirit

Elaine Boyett (10627) died March 28. She had been at Sandia almost five years. Elaine was a financial analyst in Dept. 10627, Center 2700's Business Operations Office.

"She was dedicated to always doing the very best she could in her job, even while battling her illness," says her manager, Frank Villareal (10627). "We had a three-day Kaizen event to better integrate department functions. Elaine was so dedicated and determined she participated and contributed, even though she was very ill and shouldn't have been here.

"She was proud of her children and grandchildren. She told wonderful, happy stories about them and their accomplishments. Elaine tenderly nurtured everyone."

Colleague Suzi Jensen (10627) says, "Elaine was very calm and had a good impact on all of us. She was always willing to help me when I needed something. I know she had a lot of other things going on but always stopped to help. We called her our miracle because she was diagnosed in December of 2007 and told she might not make it through the holidays. She came back to work the following July for a few months."

"She was dedicated to always doing the very best she could in her job, even while battling her illness."

— Frank Villareal

"Elaine was a dear friend and coworker," says Angela Ortiz (10627). "She had such a gentle spirit. When she first was diagnosed with brain tumors, she called me at home. She wasn't concerned at all about herself. She wanted to wish me well and let me know that she loved me. She had great faith.

"After a period of time, she was allowed to return to work," adds Angela. "We were delighted to have her rejoin our financial team."

Arba Smith (10627) says, "Angela and I visited Elaine most Fridays. She was truly an individual we wanted to be around."

"It was on a trip to the lake that I discovered the secret of her buttermilk biscuits," says her son-in-law Jon Stearly (1422). "We were in a hurry out the door, and I got one of the last cookies. I, of course, cannot eat a cookie without milk, so I hurriedly grabbed the milk from the fridge, poured it in a glass, and chugged it. About halfway through, I realized it was fizzy. Yep, she kept a container of sour milk in the fridge for biscuits. I don't remember her exact response, but it was a pun that just added to the moment."

"We were all amazed at Elaine's stamina and constant smiles," says Suzi. "She was full of gratitude and set such a high standard for any of us who wanted to complain about anything."

— Iris Aboytes

Sandia LabNews

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

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

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

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LOCKHEED MARTIN

Sandia helps Lockheed Martin achieve diversity success

Lockheed Martin has been recognized by the Association of Diversity Councils for having one of the top 25 organization diversity councils in the nation. The recognition came as part of the First Annual Diversity Council Honors Awards Program. Lockheed was awarded second place. Boehringer Ingelheim USA Corp. placed first.

The awards recognize and honor outstanding contributions and achievements of the nation's top 25 diversity councils, which lead diversity processes in their organizations. Demonstrated results in the workforce, workplace, and marketplace are key criteria.

Results, commitment, measurement and accountability, and communication and education, were the four specific focus areas targeted for independent judging.

"We were glad Sandia was invited by Lockheed Martin to provide application information that supported Lockheed's receipt of this first-time national award," says Rochelle Lari (3552). Rochelle attended the awards ceremony held during the 10th Annual Linkage Summit on Diversity Conference in Atlanta, Ga., March 18.

— Iris Aboytes

Neutron scatter camera hits the road

SHORE 2 SHIP — Last year, the neutron scatter camera successfully imaged a fission neutron source through the hull of an oil tanker by measuring a fission energy spectrum. (Photo by Nick Mascarenhas)

By Patti Koning

Faster, more accurate, portable, and safer — that's been the evolution of the neutron scatter camera. In the year and a half since Nick Mascarenhas (8132) began testing his neutron scatter camera to detect special nuclear material in a variety of real-world scenarios, the instrument has met every challenge and its potential continues to grow (*Lab News*, Sept. 28, 2007).

The neutron scatter camera detects fast neutrons that emanate from special nuclear material to localize the source. Field tests have shown the instrument rejects naturally occurring background radiation that can obscure results from gamma ray detectors. Further simulation and testing have demonstrated the camera's ability to cut through kitty litter, bananas, ceramics, and other sources of natural radiation that might be used to mask a source. Even steel is no match.

FINE TUNING — In this photo illustration by Randy Wong, Nick Mascarenhas tests the neutron scatter camera before deployment. Housed in a trailer with an AC generator, the neutron scatter camera can now be taken anywhere you can drive a vehicle. The illustrative part of the image depicts the elements inside the camera; those elements are actually covered by the casing.

Last year, at the request of the Defense Threat Reduction Agency (DTRA), Nick tested the camera's ability to detect from the shore a source inside the hold of a docked oil tanker. The neutron scatter camera measured neutrons at 20 times higher than background and detected a characteristic fission neutron energy spectrum through the ship's hull. "It was surprising — in less than five minutes we had a beautiful image of the source in the ship," he says. "It was a spectacular result."

Nick and his team, Peter Marleau, Charles Greenberg, and Stan Mrowka (all 8132), and Jim Brennan (8621), have gotten better at analyzing the data the neutron scatter camera generates. The analysis tools can now reduce the size of the image, which is the position of the neutrons emanating from a source. In a sense, the analysis tool gives the neutron scatter camera a better resolution. "A smaller spot size means I can localize the source better," he explains.

Recently, DTRA funded work to increase the number of scintillator-filled cell elements to a 12 by 12 array. The original configuration of the neutron scatter camera consisted of four by seven scintillator-filled cells to record interactions with the fast neutrons.

The scalability of the neutron scatter camera design — which Nick describes as like Lego blocks — makes these modifications simple. By increasing their number and size, the cells have more opportunities to react with the fast neutrons, resulting in shorter dwell times and longer stand-off distances.

In fact, the current configuration of the neutron scatter camera is 10 times more efficient than the version fielded last year. In a recent test conducted at Livermore, the instrument was able to detect a source from a distance of more than 60 meters. "That's huge," says Nick. "At 60 to 100 meters, you go to something that could be put to use in a variety of scenarios."

The camera was also able to resolve two sources simultaneously and a source that was being masked by naturally occurring radiation (in this case, a simulated truckload of 1,000 kilograms of kitty litter). This test demonstrates one of the neutron scatter camera's advantages — it can cut through noise that would overwhelm gamma ray detectors and some neutron detectors.

In addition to field tests, Nick's team has been simulating different camera configurations with more cells and increased volume. "We have not seen the end of this technology's capability," he says. "The predictions of what we could do with future incarnations are pretty impressive. We haven't reached the end of the camera's potential. I think imaging within seconds is feasible."

With faster detection and a longer range, the potential uses for the camera begin to multiply. One of the first field tests for the camera was in-transit radiation detection on cargo ships traveling between Oakland, Calif., and Honolulu as part of George Lasche's (6418) Experimental Limits for In-Transit Detection of Radiological Materials project (*Lab News*, Aug. 17, 2007).

Now, the camera could be suitable for point-of-entry detection and even at unmanned border crossings.

"One of my dreams is to see the camera deployed at a choke point such as the Panama Canal," says Nick.

Another upgrade for the neutron scatter camera was portability, which in this case means it can be moved easily. The original version of the device, housed in a 40-foot sea-land container, was heavy, difficult to transport, and required an external AC power source. It also used a hazardous liquid scintillator that severely limited camera deployment.

Field testing is underway on the "portable" version housed in an 18-foot trailer with an AC generator that can provide power for up to eight hours and uses a safer liquid scintillator. It can be pulled by a pickup truck, versus a tractor trailer in the old configuration.

"The possibility of taking it anywhere you can drive a pickup truck really increases the potential audience for this device," says Nick.

That potential audience has begun taking notice. Working with the business development office, he's begun demonstrating the camera to potential industry partners to a very positive response.

Sandia CaliforniaNews

Water, water everywhere?

While the neutron scatter camera was designed to detect special nuclear material, the ability to image and source neutrons can be applied to many other challenges. Nick Mascarenhas (8132) and Darin Desilets, a Truman Fellow working in Geotechnology and Engineering Dept. 6312, are working on a one-year LDRD to use the device to measure soil moisture content.

Explosive growth in water-scarce regions means that accurate knowledge of soil water content and snow pack is more critical than ever to effective water management. Darin is working to develop a safe and inexpensive method to monitor hydrologic variables and properties at an adequately representative scale.

"Existing technology can be narrowed down to two types: invasive methods, which essentially measure points in the soil, creating the problem of upscaling to the watershed scale; and remote sensing methods, which operate at a kilometer scale where the spatial resolution is too coarse," he explains.

He hopes to develop a method that will fill in the gap in spatial scales by utilizing neutrons that are constantly generated in the ground by cosmic rays, together with the special neutron-moderating properties of the hydrogen contained in water.

"The method is passive, noninvasive, can measure soil water content or snow, and can be implemented at a commercially viable price. Such a tool could be used to predict flash floods, assess the susceptibility of forests to wildfire, forecast spring snow melt, and more efficiently utilize irrigation water," Darin says.

He had promising results with neutron counters, which led him to Nick and the neutron scatter camera. The tests so far have been simple — pointing the camera at the ground to look for wet spots, and up to detect a stock tank filled with water on top of the trailer — but successful.

"We're exploring the science. No one has ever done this before and we need to learn how sensitive the neutron scatter camera is to this application, what are its limitations and drawbacks. It could have a significant impact on water supply issues," says Nick. "So far the results have been pretty interesting."

Liquid sunshine: Labs' Sunshine to Petrol team expects innovative prototype to be working soon

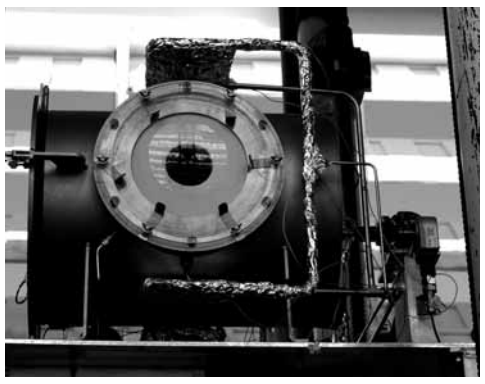
Team figured out way to transform carbon dioxide into carbon-neutral liquid fuels

By Chris Burroughs

Sandia researchers working on the Sunshine to Petrol project believe they are only weeks away from having a working device that can recycle carbon dioxide into carbon monoxide, a key building block in making combustible fuels such as methanol, gasoline, diesel, and jet fuel. Initially the invention will split water into oxygen and hydrogen, and later it will be tested to split carbon dioxide into carbon monoxide and oxygen.

"We have proven the concept in the laboratory in batch mode, but soon expect to do it in our prototype," says researcher Jim Miller (1815), who is working with a large multidisciplinary team to come up with an efficient and affordable way to recycle carbon dioxide and turn it back into liquid transportation fuels.

The prototype device that is on the verge of making history is the Counter Rotating Ring Receiver Reactor Recuperator (CR5, for short), invented by Rich Diver (6337) as a way to break down water into hydrogen and oxygen gases. Jim, working with Rich and Nate Siegel (6337), saw the possibility of using the CR5 to break down carbon dioxide, just as it would water, but into carbon monoxide and oxygen.



DETAIL of Counter Rotating Ring Receiver Reactor Recuperator, or CR5, which is a major component in the Labs' Sunshine to Petrol project.

The CR5 breaks a carbon-oxygen bond in the carbon dioxide to form carbon monoxide and oxygen in two distinct steps. Energy to break down the carbon dioxide comes from sunlight.

"People have known for a long time that theoretically it should be possible to recycle carbon dioxide, but most still think it cannot be made practical, either technically or economically," says Ellen Stechel (6339), the program manager for the Sandia team.

Hence, only a handful of companies and scientists have pursued the process with much vigor.

Ellen named the Sandia process of effectively reversing combustion by capturing and then converting carbon dioxide and water with concentrated solar energy into liquid hydrocarbon fuels Sunshine to Petrol (S2P). She notes the invention and S2P, which is probably 15 to 20 years away from being market-ready, hold real promise of being able to reduce carbon dioxide emissions while preserving options for the domestic production of liquid fuels. The invention will result in fossil fuels being used at least twice.

As an example, coal would be burned at a clean coal power plant. The carbon dioxide released by burning coal would be captured at the source and reduced to carbon monoxide in the CR5. The carbon monoxide would then be the starting point of making gasoline, jet fuel, methanol, or almost any type of liquid fuel.

The prospect of a liquid hydrocarbon fuel is significant because it fits in with the current gasoline and oil infrastructure. After a liquid synthetic fuel is made from the carbon monoxide, it could be transported through a pipeline or put in a truck and hauled to a gas station or, if necessary, to a refinery for further processing. Plus the final fuel product would work in ordinary gasoline and diesel engine vehicles, including vehicles already on the road.

Nate says that while the first step would be to capture the carbon dioxide from sources where it is concentrated, the ultimate goal would be to snatch it out of the air. An S2P system that includes atmospheric carbon dioxide capture could produce carbon-neutral liquid hydrocarbon fuels.

Rich says he hand-built the precision prototype CR5 in a shop at Sandia's National Solar Thermal Test Facility and is now doing final calibration to get a working device.

While Rich begins tests on this first-generation prototype, other members of the team are experimenting with the reactive materials that make the device work. They aim to better understand the chemistry of the process and to find materials that will work better and longer.

Other team members, using data from ongoing experiments, are developing models to guide future experiments. Their goal is to predict the performance and recommend changes to make improvements to the CR5 as well as the full S2P system

"It's a very exciting team," Ellen says. "We have enough talent and diversity to substantially increase the odds for success in what is a very challenging endeavor."

The team is deliberately assembled from many organizations across Sandia in both New Mexico and California and includes collaborators in a number of universities across the country. The team also incorporates a board of external advisors.

Success, says Ellen, will consist of continuously improved generations of prototypes and S2P systems, a new generation every three years with significant improvements in performance (measured as the amount of solar energy converted into the fuel), greater durability, and reduced cost. With that schedule of improvements, the technology should be market-ready in less than two decades.

"For a concept as new as the CR5 and Sunshine to Petrol, that would be an aggressive schedule," Ellen says. "Indeed, developing a sunshine-driven process that can efficiently, cost-effectively, and sustainably take the products of combustion, carbon dioxide and water, and recreate liquid fuels would be an unparalleled achievement. Surmounting this challenge would go a long way toward solving the intertwined problems of finding domestic substitutes for petroleum and mitigating the risk of climate change."

'Trialogue' focuses on three intersecting perspectives of energy policy

Energy policy must reconcile values across security, economics, and environment, energy leaders assert

By Dawn Manley (8114)

At a workshop convened by Sandia and the University of California, San Diego (UCSD) Sustainability Solutions Institute (SSI), some 25 leaders from academia, government, and the private sector gathered March 18-19 to discuss key energy policy issues and proposed values- and outcomes-based approaches to energy policy.

"Our nation must become clear in defining outcomes that balance national security, environmental sustainability, and economic prosperity goals," says Energy, Security, and Defense Technologies Div. 6000 VP Les Shephard. Les and Charles Kennel, founding director of UCSD's SSI, opened the workshop, which examined three intersecting perspectives of energy policy: security, economics, and the environment.

Three perspectives

The goal of the workshop was to bring together leaders from diverse backgrounds to identify promising areas for energy policy, based on understanding the intersecting issues, assumptions, and priorities from these three perspectives. The "trialogue" surfaced key issues and recommendations for action, including:

- Focus policy on outcomes and values rather than mandating specific technical solutions
- Conduct an assessment of the nation's energy security status comparable to those for environmental and economic security
- Create a distinguished, high-level independent council, patterned after the Council on Foreign Relations, to act as a forum for analyzing and communicating critical issues to energy policy makers and the public
- Develop educational curricula at all levels addressing energy and sustainability, including green vocational-technical programs at community colleges, K-12 educational outreach, and support for national centers of excellence in sustainability solutions at land-grant universities
- Develop tangible messages that engage the public to think about their energy decisions

Recognizing the challenge of bringing together diverse perspectives, Sandia and UCSD engaged Viewpoint Learning and The Public Conversations Project in the workshop design and facilitation. The backgrounds of the participants spanned climate science, engineering, policy, energy regulation, clean technologies, public engagement, national competitiveness, and international security.

UC San Diego Sustainability Solutions Institute

All agreed that the nation is at a critical time and has the opportunity and the obligation to integrate all three viewpoints when setting energy policy.

"There is an urgency in making sound energy policy decisions because they will have a great impact on our country's future economic, environmental, and national security," said participant professor Richard Matthew, director of the Center for Unconventional Security Affairs at UC Irvine.

Workshop participants were enthusiastic about the intuitive integration across the perspectives and plan to further develop these ideas. A more detailed workshop report will be released in the coming months. Sandia and UCSD are committed to building on this dialogue and expanding to include additional partners.

Environmental stewardship, economic prosperity

The UCSD Sustainability Solutions Institute brings the University of California's research and educational excellence to bear in meeting the twin 21st-century challenges of environmental stewardship and economic prosperity. The Sustainable Solutions Institute convenes interdisciplinary teams organized around specific sustainability questions and disseminates the discoveries through conferences, working papers, and focused educational programs.

Viewpoint Learning engages the public and other stakeholders in dialogues designed to improve decision making, understand different viewpoints in depth, and build trust. Viewpoint Learning has applied its innovative dialogue-based methods to a wide range of issues including health care, education, the federal debt, entitlements, foreign policy, and environmental sustainability.

The Public Conversations Project (PCP) is a Boston-based nonprofit that uses dialogue to improve relationships and understanding among groups and individuals on opposing sides of divisive public issues. A small, flexible organization committed to broad impact, PCP has developed an approach that has proven effective with diverse constituents across multiple issues and cultures.

Safety

(Continued from page 1)

on the relentless pursuit of a workplace free of injury" (see "Valuing safety" at right).

He says Sandians will know we're there when safety is institutionalized; when safety isn't considered too complex or cumbersome; when we instinctively take care of ourselves and each other; when we make safety our problem and not someone else's; when we question everything we do and seek critical assurance; when we have a culture of "assured safe" rather than "assumed safe"; when safety is part of excellence; and when we can predict, manage, and prevent accidents.

"That's where we're headed," he says. "That's the ideal state."

Positive indicators

Mike adds that many Sandians are working hard to prove that Sandia's operational excellence is intact.

"We're making a great deal of progress and we should be proud of that," he says.

He points to several examples of an institutional safety culture taking hold. One Sandia organization told a customer that, despite the customer's urgency, a test would need to be delayed until Sandia could ensure its safety. In another case, a peer team refused to authorize restart of an operation because it could not certify that restart criteria were fully met.

Instinctive safety

Here are some activities at Sandia that are part of recasting Sandia's safety culture:

Safety reviews

• The sled track accident resulted in an NNSA "Type B" investigation and a subsequent NNSA report on the accident. The report concluded that the accident was preventable, that Sandia's Integrated Safety Management System was not followed, and that insufficient oversight of operations contributed to the accident.

• The Extent of Condition review, an internal review of Div. 1000 operations, examined the potential for underlying safety conditions and problems similar to those that led to the accident. It found that changes to hazard conditions, complex requirements and documentation, improper delegation of responsibility, and a tendency to rely on administrative controls rather than engineered controls, among other issues, needed attention.

• The Executive Safety Review Board (ESRB), an independent review led by retired US Navy Rear Admiral Walt Cantrell, examined systemic issues in Sandia's safety performance. It found weaknesses and recommended improvements in the areas of leadership, engineered safety, complexity, learning and responsiveness to criticism, and training and readiness of people.

Leadership involvement

• Labs President Tom Hunter held two all-hands meetings with employees in October and December to review progress on safety and outline future steps toward a stronger safety culture at Sandia.

• In October all Sandians spent time discussing safety in their organizations and at the Lab in general. Feedback generated in these discussions, for example, addressed concerns about complexity, which has become a focal point in Sandia's efforts to improve its safety performance. It also pointed to widespread attitudes about safety as an obstacle that indicate the need for cultural change, says Mike.

• In recognizing that lack of management oversight was a contributing factor in the accident, all of executive leadership was held accountable through the performance management process.

Ongoing initiatives

• Corporate Issue 36, an effort to formally track Sandia's progress and improve Sandia's safety culture, is under way. It will also address the findings of the Executive Safety Review Board.

• Energetic materials operations were paused at the Labs in October. Six energetic materials operations remain paused.

• An internal review board comprising representatives from each division, along with other experts, is systematically examining each energetic materials operation against restart criteria defined in Internal Directive 16 (ID016). In its assessments, the ID016 independent review board has not seen firing circuit problems of the type that were a factor in the sled track accident, but it has found significant variability in the implementation of work controls across the lab, among other findings.

• Vice presidents conducted quick looks at their hazardous operations in January to determine if they have a sufficient level of confidence in the safety of their own operations to authorize continuance. Some VPs elected to pause selected operations as a result.

• As a follow-up to the VP-led quick looks, all VPs will formally assess the effectiveness of systems in place to assure safe operations, implement specific improvements, and review their assessments with Chief Operating Officer Al Romig.

• Training programs — such as the ongoing pilot program "Human Performance Improvement: A Cornerstone of Operational Excellence" — are showing promise in helping individuals and groups develop a questioning, critical attitude and approach to "assured safe" operations, says Mike.

Valuing safety

Sandia already has a set of corporate values. So where does safety fit? Div. 4000 VP Mike Hazen says safety is embedded in all of them. Here's how.

Integrity — We are never distracted from doing the right thing by a desire for expedience or agreement.

Excellence — We deliver superior technical and managerial performance. A prerequisite of achieving this performance is that every person involved in Sandia operations is safe at all times.

Service to the nation — We can't serve the nation if our operations are unavailable for use or if Sandia's customers don't trust the Labs' ability to do a job safely.

Our people — We take care of ourselves and watch out for each other every day.

Teamwork — Achieving a safe culture means we value and seek, in ourselves and from our colleagues, a questioning, critical attitude about everything we do.

Slaying the complexity beast is everyone's job

By Chris Miller

We've all encountered it at Sandia. Sometimes it's lurking just around the corner, but more often than not it's planted firmly in front of us, frustrating our every hope for effectiveness and efficiency.

It's the complexity beast, and now is the time to slay it, says Deputy Laboratories Director and Chief Operating Officer Al Romig.

"We need to run this laboratory in a more business-like way, and that means eliminating the inefficiencies and simplifying our processes," Al said at the April 2 Spring Manager Forum, held this year at the Albuquerque Marriott Pyramid North. Most of the Labs' managers attended the forum.

Newly created graphics projected onto two large screens during the presentation depicted the complexity beast as a green monster with horns and blue scales running down its back. Chuckles ensued as managers watched a cartoon image of Al dressed in armor in a failed attempt to single-handedly slay the complexity beast.

SLAYING THE COMPLEXITY BEAST is more than a one-person job, says Labs Chief Operating Officer Al Romig. The frame above is from a brief cartoon shown at the Spring Manager Forum.

The point being, as Al highlighted at the climax of his presentation, that "slaying the complexity beast is the mission of all of us. It takes a village."

Al noted that Sandia's complexity beast takes many different forms, with the burden falling heavily on first-level managers. Witness the number of emails that fill up one's inbox on a daily basis, including repeated email reminders about required training due for staff members; duplicative reporting requirements; processes that require a dozen or more signatures on a document before it's approved . . . and the list goes on.

Besides being annoying, such duplication can also lead to problems. For instance, Al said he received a document in which his would be the 19th signature approving its contents. "By the time it gets to you, you think, well surely one of the 18 people who signed it before it got to you read it." The tendency, therefore, is to forgo reading it and "trust" that it's okay.

A complexity Sandians have repeatedly been guilty of creating, Al said, is the tendency to create hundreds and sometimes thousands of patches in off-the-shelf software. Then when the software creator issues updates, it won't work on the now-customized Sandia software.

It's now up to Sandians to slay the very beast that we created, Al said.

"Don't create new things that are more complicated than they have to be. We need to systematically go through our processes at all levels and ask, are we making this more complicated than it should be, and this includes every one of us," Al said.

Later in the day, Joe Polito (9000) said the Labs is beginning to systematically study how to simplify its processes. Sandia will address the problem by implementing better business practices designed to reduce waste and increase efficiency through greater standardization. Part of that includes analysis of how managers spend their time, from performance review and filling out reports, to having to seek program funding.

Div. 5000 VP Jerry McDowell cautioned that as Sandia seeks greater standardization it should not jeopardize the need for flexibility and creativity to respond effectively to its customers.

Communicating in tough times more critical than ever

Local auto dealer Don Chalmers says he understands the need for transparency and open communications with his employees, especially when the going gets tough.

DON CHALMERS

The guest keynote speaker at the Spring Manager Forum, Chalmers said the tough economy has forced him to lay off about one-third of his workforce. He owns two dealerships — Don Chalmers Ford in Rio Rancho, and Chalmers Ford Lincoln Mercury in Santa Fe. Chalmers is also chairman of the board of the Greater Albuquerque Chamber of Commerce.

Paraphrasing from his 75-minute talk, Chalmers made the following points:

Tell employees the truth. We tell them the truth often. But also tell them the vision so they have hope and they know that what they are working for is worthwhile, and that they are in control of what they are doing and their performance affects the outcome.

When it comes to bad news, you have two choices:

You tell them the truth and then they know what's going on and they appreciate and respect you. And at least one of them may even have a solution to the problem.

Or, you don't tell them the truth and they still know what's going on, or what they don't know they fill in the blanks, and that usually means they assume the worst. And then they don't respect you and you can't tap into a possible solution that one of them might have.

And when there is progress we pat them on the back and cheer them on. We celebrate.

High-level DHS delegation visits briefed on Labs work

DEPARTMENT OF HOMELAND SECURITY Deputy Assistant Secretary for Infrastructure Protection, National Protection and Programs Directorate James Snyder, left, is briefed by Pablo Garcia (6320) on capabilities of NISAC, the National Infrastructure Simulation and Analysis Center. The briefing occurred during a visit by a DHS delegation. Other DHS officials on the visit, cohosted by Center 8100 Director Jill Hruby, included Brandon Wales, director, Homeland Infrastructure Threat and Risk Analysis Center, DHS; Tommy Brown Jr., deputy director of HITRAC Risk Analysis, DHS; Dean Checknita, chief, NISAC Branch; and Bruce Edwards, deputy chief, NISAC Branch. (Photo by Randy Montoya)

Environmental Management System honors eight with awards of excellence

By Chris Burroughs and Katrina Wagner (4131)

Sandia's Environmental Management System program has honored eight projects and individuals across the Labs with awards of excellence for their efforts at managing environmental risks and being good stewards of the environment. These awards, presented by Div. 4000 VP Mike Hazen, are part of the annual EMS Excellence Awards program.

"We received 19 excellent nominations, demonstrating that environmental excellence exists throughout the laboratory and is not just the domain of Center 4100," says Jack Mizner (4131), who coordinated the 2009 EMS Excellence Awards program. "The final award winners show true commitment to including environmental considerations as part of their jobs."

The awards, he adds, recognize those achievements by individuals whose job scope does not specifically include the word environmental. In fact, those with that job description were deliberately excluded from leading a team or being recognized for work they already do.

In the four years the program has been in existence, more than 120 teams have submitted nominations.

In total, the 19 team and individual nominations for 2009 demonstrated the following results:

• Recycling nearly 2.4 million pounds and 750,000 cubic feet of materials

• Avoiding the generation of 27,000 pounds of solid waste, 400 cubic feet of radioactive waste, and 520 cubic feet of mixed waste

• Reducing annual consumption of electricity by 830,000 kilowatt hours of electricity and 5,400 gallons of water

• Reducing greenhouse gas emissions by 1,300 metric tons

These initiatives represent a cost savings and cost avoidance of more than $1 million per year.

The 2009 Excellence Award recipients are:

Greg Valdez (6323) in the category of Energy Reduction/Water Conservation. The entry title was "Bldg. 1008 Bicycle Champion." Greg is a bicycle commuter dedicated to sharing his passion for saving energy through alternative commuting with other members of the workforce. Not only does Greg ride a bike to work, he has gone above and beyond by purchasing a bike for his coworkers to use to get around the site. He supports and encourages new bicyclists to ride to work by providing a bicycle patch kit and extra helmets for anyone to use. In nonworking hours, Greg gives lessons and guidance to new riders on places to ride around the city. Greg also is engaged in a larger effort to bring bicycle lockers and other alternative transportation incentives to Sandia.

Nanomaterials Sciences Dept. 1112 in the category of Risk Mitigation/Environmental Protection. The entry title was "Mitigating a Potential Future Liquid Helium Shortage Problem." Dept. 1112 completed an upgrade to its SQUID (Superconducting Quantum Interference Device) magnetometer to retrofit the existing liquid helium dewar with a new EverCool dewar to capture and recondense liquid helium (LHe) boil-off. Helium costs have been steadily rising due to rapidly dwindling supplies of this nonrenewable, hard to extract and capture gas. This retrofit has a five-year payback, reduces the need to purchase and manage 2,600 liters of liquid helium, and saves $45,000 annually. In addition, it helps protect Sandia from supply shortages in future years at the helium supply reserve in Amarillo, Texas.

Sandia Decontamination and Demolition (D&D) program in the category of Waste Minimization. The entry title was "Pollution Prevention Measures Implemented in D&D Projects." The decontamination and demolition (D&D) program at Sandia/New Mexico emphasizes pollution prevention techniques when razing old and outdated buildings. In FY08 the D&D program removed a 40,000-square-foot, single-story laboratory building and a 92,400-square-foot, three-story office/laboratory building. Using waste minimization, reuse, recycle, and buy green concepts during the execution of these projects, more than 1,100 tons of materials and 5,000 tons of concrete were recycled, the generation of 520 cubic feet of mixed waste was avoided, and $650,000 in waste disposal costs were eliminated.

Landfill Waste in the category of Waste Minimization. The entry title was "Minimized Landfill Waste by Reuse of DI Water Tanks and Fume Hoods." About 1,400 cubic feet of solid waste was diverted from the landfill when two 1,000-gallon polypropylene tanks and five fume hoods were reused. Their reuse has resulted in an almost $50,000 savings in waste disposal and purchase costs. In addition, the innovative idea to reuse the de-ionization water tanks as rainwater harvesting units will help to conserve approximately 5,400 gallons of water.

Neutron Gen Value Stream Dept. 2712 in the category of Waste Minimization. The entry title was "Personal Protection Equipment in C2700." Dept. 2712

(Continued on page 8)

Titles of the other 2009 nominees and their categories include:

Energy Reduction/Water Conservation category:
- Bldg. 856 Energy Use Reduction
- Bldg. 880 Energy Use Reduction
- Sandia's Essential Role in Tribal Energy Development
- Hawaii Clean Energy Initiative

Waste Minimization category:
- The 3 Rs at Sandia Shipping and Receiving Department
- E-Invoicing Saves Money and Paper
- Lockheed Martin Today

Recycling category
- P2 Tent Recycling at Reapplication
- Metal and Concrete Recycling at Sandia/New Mexico Rocket Sled Track Test Facility
- Tech Library Reduces its Footprint, Physically and Ecologically
- Nuclear Surety Training

Earth, Wind and Sun symposium set for July 21-22

Sandia's Environmental Management System (EMS) program will host the second annual Earth, Wind and Sun symposium July 21-22. It will feature speakers, booths, and workshops on how to green buildings, homes, and sites; conserve energy and water; and reduce the environmental impact of transportation.

The subtheme of this year's event will be "Institutional Transformation to Sustainability," a topic important to the economic and environmental health of the country, says Jack Mizner (4131) who is involved in Earth, Wind, and Sun planning.

The 2009 event is cohosted by Sandia and Kirtland Air Force Base (KAFB) to take advantage of synergies and inspire friendly competition to reduce both institutions' ecological footprints. As part of the event, the University of New Mexico, City of Albuquerque, and KAFB will engage in discussions with Sandia to meet future challenges and to overcome barriers to major institutional change.

Jack says this year's Earth, Wind and Sun event will also feature participation from decision makers, possibly including members of the New Mexico congressional delegation staff and senior leaders from DOE and the Air Force, as well as technical experts from Sandia and Kirtland and recognized national leaders.

"Our goal is to make this a flagship event for local, DOE, and federal communities and increase participation to 1,500," Jack says. "By leveraging expertise and influence we not only educate and inform, but develop and implement achievable solutions to transform institutions and infrastructure to more secure, sustainable, and responsible operations."

Sandia to celebrate Earth Day April 22

By Chris Burroughs

Sandia will celebrate Earth Day April 22 with events ranging from a talk by a landscape designer to a variety of booths encouraging people to put a little "green" in their lives. The theme of this year's event is "Every Little Bit Counts."

"We called it that because we believe environmental changes can be made in small increments," says Jack Mizner of Environmental Planning Dept. 4131, who is leading Sandia Earth Day 2009 efforts. "People can make small and better choices at home or work. Every little bit you do helps, whether it's taking a cloth bag to the grocery store instead of using plastic bags or recycling."

He says the purpose of the event is "to make people more aware of how important it is to protect our natural resources and reduce greenhouse gases to protect and preserve our environment for future generations."

Earth Day will begin with a talk by Judith Phillips at 10 a.m. at the Steve Schiff Auditorium. Phillips is a landscape designer who prefers working with native and xeric plants because she says they are beautiful, conserve water, and support wildlife. She has written five books and numerous articles encouraging people to garden with a passion for the high desert. She also teaches an arid-adapted plants class in the Landscape Architecture Department at the University of New Mexico.

Immediately after her talk until 1 p.m. attendees can visit 16 displays at a tent outside the Steve Schiff Auditorium that promote good environmental practices.

Booths will include:

• Earth, Wind and Sun promo — On July 21 and 22 Sandia will host the second Annual Earth, Wind and Sun event. The booth will provide more information on the event (see story above).

• FoodPrint NM — This organization promotes development of carbon-neutral infrastructure for food production, distribution, and storage.

• Habitat for Humanity of New Mexico — Habitat's goal is to increase production of affordable housing for low-income families throughout New Mexico.

• US Green Building Council — The New Mexico Chapter of the US Green Building Council is a local nonprofit with a mission to transform the built environment through education, collaboration, and outreach to promote environmentally responsible practices that are economically and socially beneficial to the community.

• Sandia Employee Recreation Program (SERP) — SERP is a Sandia organization that offers outdoor rental equipment, bus passes, and more solutions for reducing your footprint.

• City of Albuquerque Open Space Division — This organization works to acquire and protect the natural character of land designated as major public open space. These lands comprise more than 28,000 acres in and around Albuquerque.

• New Mexico Environment Department Recycling Exhibit — This exhibit will provide valuable information for New Mexicans on how to live an environmentally sustainable life.

• 2700 Green Team — The Org. 2700 Green Team will have a booth that focuses on energy conservation, recycling, and all things green.

• Sandia's Environmental Management Systems Department (EMS) — This Sandia department seeks to achieve environmental goals by continuing the cycle of planning, implementing, evaluating, and improving processes.

• P2 & Recycling: Leading to Zero Waste — P2 is an organization that promotes supporting and envisioning new ways every day to employ the concepts of "going full circle."

• Energy Management — This booth will promote brightening the Earth by conserving energy, not wasting energy.

• New Mexico Solar Energy Association — This organization is dedicated to promoting solar energy and related sustainable practices. NMSEA was one of the first organizations in the country to seek methods and ideas on how to use renewable energy and how to empower people through education about these issues.

• Environmental Compliance Coordinators — The compliance coordinators promote and encourage environmental compliance awareness both at home and at work.

• Green Grid Roofs, Weston Solutions — A green roof is a roof substantially covered with vegetation. Green roofs improve the energy performance of buildings, reduce storm water runoff, and contribute to a healthier environment.

Giveaways will include reusable grocery bags, organic cotton baseball caps, compost bins, mouse pads, and more. The BBQ on Wheels will be there for lunch.

More information can be obtained at www-irn.sandia.gov/esh/earthday.

NATIONAL MUSEUM of Nuclear Science & History Director Jim Walther at opening ceremonies for the new facility.

YEARS IN THE MAKING — Albuquerque Mayor Martin Chavez, left center, Sandia President and Labs Director Tom Hunter (right of Chavez), and other dignitaries join museum director Jim Walther (in tan suit right of center) and museum foundation president Chuck Loeber (beside Jim) to officially open the new National Museum of Nuclear Science & History.

It's official: New museum opens its doors

Photos by Randy Montoya

It was a labor of love several years in the making and the realization of a vision that was born even longer ago. The National Museum of Nuclear Science & History, which until now was known as the National Atomic Museum, opened the doors to its new facility last week. Its original home, a high-bay hanger on Kirtland Air Force Base, became unviable after the 9/11 attacks led to tightening base access. The museum moved to temporary quarters in a leased building near Old Town in Albuquerque, but that was always considered a short-term arrangement. Museum Director Jim Walther and the National Atomic Museum Foundation nurtured a long-term vision of finding a permanent home.

The new location at 601 Eubank Blvd. SE in Albuquerque includes a 30,000-square-foot building and 12 acres of exterior space. For the first time in more than seven years, the public will be able to view the historic aircraft, nuclear missiles, and other large artifacts belonging to the museum, as those items have been moved from their location on KAFB to the new site. The museum will continue to present nuclear history, power, medicine, weapons, uranium mining, energy, and radiation in its major exhibits and will remain a Smithsonian affiliate.

LIVING BY THE CODE — Navajo Code Talker Albert Smith greets Sandia Labs Director Tom Hunter during opening ceremonies at the new National Museum of Nuclear Science & History. Behind them is a model of the Fat Man atomic bomb that was dropped on Nagasaki, Japan, to effectively end World War II.

DID YOU SEE THIS? — The National Museum of Nuclear Science & History features many interactive exhibits designed to engage and challenge visitors young and old.

VISITORS GATHER outside the National Museum of Nuclear Science & History on a bright April morning to celebrate the long-anticipated opening of the new facility.

Group long-term care insurance available for retirees, spouses, too

Note: The following information was provided by the Sandia Benefits organization and the John Hancock Insurance company. It provides information about the new long-term care insurance coverage that is now available for Sandia employees, retirees, and spouses.

Why should you be concerned with long-term care issues? Think about the following questions:

• What would you do if you became disabled and needed care at home or in a nursing home for an extended period of time?

• Would you be able to afford long-term care expenses?

• Would the financial or caregiving burden fall on your family?

• Do you want to stop worrying about needing help someday with activities of daily living, like bathing or getting dressed?

• Do you want a way to manage the costs of long-term care?

• Do you want to help preserve more of your financial assets for yourself and your family?

Long-term care insurance may be the answer. You can help protect yourself and your family by applying for coverage in the Sandia Group Long-Term Care Insurance Plan. Eligible retirees and their spouses may apply for coverage at any time by providing proof of good health.

What is long-term care insurance?

Long-term care insurance offers important coverage that is generally not fully covered by government programs like Medicare or Medicaid. (In California, Medicaid is known as Medi-Cal.) Medicaid eligibility is complex and varies by state. Contact your local Medicaid office for complete information.

If you need care someday — at home, in a community setting, or a nursing home — because of an accident, illness, or the effects of aging, the Sandia Group Long-Term Care Insurance Plan can help offset the high cost of this care.

Could you afford to pay $1,000 a week for nursing home care? Without long-term care insurance, you could be writing a check for this amount each week (per Harris, Rothenberg International: Study of average costs of nursing homes and assisted-living facilities in the United States, July 2002). At this rate, savings and investments could be depleted in a matter of months. Long-term care is expensive, and few of us can afford to face it alone.

The Sandia Group Long-Term Care Insurance Plan can help provide protection against the high costs of long-term care that can result from the effects of aging, illness, or a serious accident. It provides coverage for care received in your home, an alternate care facility (California refers to this as a residential care facility), or a nursing home.

* * *

If you have any questions about the plan or would like to request an enrollment kit, call the John Hancock Customer Service Center at 1-800-932-4304 Monday through Friday between 8:30 a.m. and 6:30 p.m. Eastern Time. The TTY number for the hearing impaired is 1-800-255-1808. You can also visit the Sandia Group Long-Term Care website at http://sandia.jhancock.com (username: sandia; password: mybenefit).

For more information call John Hancock at 1-800-932-4304 or visit the Sandia Group Long-Term Care website at http://sandia.jhancock.com (username: sandia; password: mybenefit). Note: The information on this page provides a brief summary of some of the features of the Sandia Group Long-Term Care Insurance plan. Some plan features may vary by state. More details about the plan provisions and exclusions are included in the enrollment kit.

Frequently asked questions about long-term care

Q: What is long-term care?

A: It is the kind of care you may need when you are no longer able to take care of yourself. Long-term care provides supportive services for an extended period of time in a place best suited to your needs. That's different from acute care, which is medical care provided for a short period of time to treat a certain condition or illness.

You can receive long-term care in a nursing home, in your own home, or in an adult day care center, and other types of care facilities may be covered. The mix and levels of care vary with different policies. Long-term care includes services such as:

• Skilled, intermediate, and custodial nursing home care

• Therapy ordered by a physician and provided by a registered nurse or other qualified health care professional

• Assistance with the activities of daily living, such as bathing, eating, or dressing, provided by formal or informal caregivers.

Q: When might I need long-term care?

A: You might need long-term care at any age, for a variety of reasons. Long-term care may become necessary when you need help or supervision from another person in performing activities of daily living, such as bathing, eating, or dressing, that requires supervision for the protection of yourself or others. You may require such care because of an accident or illness. Or you may need long-term care services due to the effects of aging.

Q: How much does long-term care cost?

A: Long-term care costs can be very high. The current average annual cost of nursing home care is $66,000 but costs can be higher depending on where you live. A visit from a home health care aide averages $18 an hour. Assisted-living facilities cost an average of $26,000 a year. And, like everything else, long-term care expenses are expected to rise.

Q: Won't my other health care plans cover these types of expenses?

A: No. While health care plans cover a wide range of services, they are designed to pay for acute care costs, not long-term care expenses. Although most health benefits may pay for doctor visits or hospitalizations, they will probably not pay for home health aides or extended nursing home stays.

Q: But doesn't Medicare cover long-term care?

A: Medicare provides limited coverage for skilled nursing care following a hospitalization or extended nursing home stay, but only if the care is provided in a Medicare-approved facility. (Such approved facilities comprise less than half of all nursing homes in the country.) However, many conditions requiring long-term care services do not require hospitalization; Alzheimer's disease is a good example.

Q: Do Medicare supplement plans cover long-term care?

A: No. Medicare supplement plans (also called Medigap policies) are designed to pay some or all of Medicare's deductible and copayments. These policies follow the same coverage guidelines as Medicare and generally cover only Medicare-approved services, not long-term care.

Q: To what extent does Medicaid cover long-term care?

A: Medicaid — a joint federal and state assistance program — pays for a large share of the nation's nursing home expenses. However, the purpose of Medicaid is to provide assistance to persons with very low incomes, few assets, and high medical bills. To qualify for Medicaid benefits, you must meet stringent financial conditions and "spend down" your personal assets. (Qualification requirements vary by state.) Income limits may apply.

Q: What is care coordination?

A: A valuable feature of the Sandia Group Long-Term Care Insurance Benefit is care coordination services. Care coordinators are registered nurses knowledgeable in the field of long-term care. They work with you and your family to find the care that is right for you and to help you use your plan benefits wisely.

As part of our care coordinator services, your care coordinator will:

• Assess your long-term care needs

• Recommend the appropriate type of facility or care provider for you

• Advise you of available community resources that may provide additional support

• Help you access provider discounts

You are under no obligation to follow any recommendations your care coordinator may make. If care is required, the final decision concerning the care you receive will be made by you and your family. In some instances a local nurse or other professional (such as a physical therapist) may meet with you at your home or care facility to help evaluate your condition and care needs. Such assessments are paid for by John Hancock.

Environmental awards

(Continued from page 6)

drastically reduced the amount of personal protection equipment (PPE) used for its everyday operations in the Bldg. 870 labs. This was done by switching to reusable smocks instead of using one-time use bunny suits and cutting by 50 percent the pairs of gloves and boots worn. Waste produced in the labs from PPE is treated as radioactive waste and is disposed of as such. More than $150,000 in annual savings was realized in purchase and disposal fees.

Satellite Payload Development Dept. 5335 in the category of Recycling. The entry title was "Department 5335 Recycled-Content Lab." Dept. 5335 opened a new electronics laboratory with almost 100-percent recycled, environmentally friendly purchased, or green products. This was done by obtaining lab benches, workstations, and storage cabinets from Reapplication, equipment such as a thermal test chamber from other labs that no longer needed them, and stocking chemicals entirely from the Chemical Exchange. Substantial costs and time were saved using these products. The laboratory continues day-to-day operations using as many recycled and reclaimed consumables as possible.

Colin Hallahan, Cindy Wright, and Green Team in the category of Recycling. The entry title was "Bldg. 10700's Green Team." Colin Hallahan (10508) and Cindy Wright (10507) implemented a "Green Team" for Bldg. 10700 to coordinate recycling efforts at their off-site building. They recycle aluminum, plastic, white paper, and mixed paper generated by more than 100 members of the workforce. Their recycling efforts will decrease carbon dioxide equivalent emissions by 2.7 tons annually. If the program were to be adopted by all off-site buildings, emissions savings would total nearly 23,000 metric tons. The Green Team is going the extra mile to minimize waste and conserve natural resources at Sandia.

Mixed-paper recycling in the category of Recycling. Mixed-paper recycling at Sandia began as a pilot program but quickly became a full-fledged program thanks entirely to the tireless efforts and dedication from the pioneer building champions. While there have been many more champions coming on board as the program has matured, this award is specifically to recognize the champion pioneers of the mixed-paper recycling program. Due to the dedication of each champion since the program's introduction, there has been more than a 50 percent increase (nearly 4,000 tons) in mixed paper recycling per month.

Missing the paperwork deadline can now result in badge disablement

By Stephanie Holinka

As we all know, security clearance reinvestigations are a fact of life at Sandia and also a DOE requirement. Some employees and contractors are missing the deadline to complete their reinvestigation paperwork, which can now result in an interruption or termination of badge access.

"Temporarily disabling the individual's badge for not responding to the DOE reinvestigation requirements has always been the policy," says Samantha Flores, manager of Personnel Security Dept. 4233, "but now it's being enforced."

To begin a reinvestigation, the Sandia Clearance Office distributes an initial notification to the individual, which allows 15 calendar days to complete the e-QIP process and return the required hardcopy forms to the Clearance Office. If the individual fails to return the packet within 15 calendar days, the individual and his or her manager will receive reminders.

After 30 days from initial notification, the individual and manager are notified that access has been temporarily disabled until the reinvestigation paperwork has been completed. (Note: For contractors, the second notification is sent to the individual and the Facility Security Officer rather than the manager.) If the individual fails to respond to reminder notices, e-QIP access may be terminated and must be reinitiated by the Clearance Office/Visitor Control, which can cause further delays.

If you're out of the office for reasons such as a special assignment, medical leave, extended travel, etc., you must notify the Clearance Office/Visitor Control to negotiate an alternative reinvestigation due date.

If you plan to retire during the fiscal year your reinvestigation is due, submit a copy of the HR rep notification to the Sandia Clearance Office, which will alleviate the reinvestigation requirement. Send to Joanne Trujillo (New Mexico), MS-1475, or Theresa Price (California), MS-9113.

If you have questions, contact Joanne Trujillo at 284-2554 or jmtruji@sandia.gov in New Mexico or Carol James at 294-2061or cdjames@sandia.gov in California.

Want to know more? Check out the Sandia Clearance Office website at www-irn.sandia.gov/security/program/clearances.

Sandians Kathleen Holt-Larese, Becky Krauss, Rochelle Lari receive 2009 YWCA Women on the Move awards

By Iris Aboytes

Kathleen Holt-Larese (6772), Becky Krauss (11000), and Rochelle Lari (3552) received Women on the Move Awards at the Albuquerque YWCA annual luncheon.


KATHLEEN HOLT-LARESE

Kathleen was nominated by Kevin McMahon (6772). Her citation highlighted her work as past president and current philanthropy chairwoman for Executive Women International. She coordinates events and projects with schools and organizations to help provide books and encourage children to learn and enjoy reading.

Her volunteer involvement includes working with Kiwanis to partner with community organizations to bring unique and fun projects to La Cueva High School's Key Club. Kathleen also organizes the annual Big Brothers Big Sisters Halloween Carnival for more than 200 matches through support from the City of Albuquerque and Sandia for Make a Difference Day.

"I am elated to be recognized with such amazing women from Sandia," says Kathleen. "Sharing the recognition with so many women who have done so many great things is truly an honor. I am so glad Sandia recognizes the hard work of women and shares the values of an organization like the YWCA."

Becky Krauss was nominated by B.J. Jones (3030), Wendy Bechdel (10680), Pam Catanach (3652), and Chief Operating Officer Al Romig. "Becky is an advocate for the empowerment of women across the Labs. She is the executive champion for Sandia Women's Action Network. She consistently reaches out to women to encourage them to reach their full potential and to be visible in a traditional male-dominated industry," her citation reads.


BECKY KRAUSS

"I am honored to have received this award," says Becky. "It is my privilege to support, promote, and empower women at Sandia."

Rochelle Lari (3552) was nominated by Sandia's Diversity Council and B.J. Jones. Rochelle's citation highlighted her work in diversity. She leads Sandia in the development of strategies, initiatives, and tactics in areas of culture change, awareness, organizational effectiveness, metrics management, diversity communications, and community interactions. Rochelle also provides diversity and communications training sessions to Peanut Butter & Jelly Family Services.


ROCHELLE LARI

"Receiving this award is certainly an honor and having the opportunity to serve others is definitely a lifetime privilege," says Rochelle. "I am pleased to have a place at the table with people who demonstrate the ability to listen with their hearts and speak with grace and dignity while giving themselves permission to live life with passion and compassion."

Cancer Awareness Month

'I might not be here today if I had waited'

In 2008, Sandia spent more than $1 million for the treatment of breast cancer. Analysis of the Labs' health care plan data shows that just 72 percent of those who should be screened annually are actually receiving a mammogram. As part of HBE's observation of Cancer Awareness Month, a mobile mammogram screening service (like the BloodMobile) will be on-site in New Mexico for four days in late April and early May. Preventive mammograms are paid at 100 percent through the health plan so this screening will be free to employees. HBE Cancer Awareness Month event details are available at http://hbe.sandia.gov

By Linda Lovato-Montoya (3654)

Rewinding my life of 12 years ago, I distinctly remember that day when the skies were a radiant blue, the trees were a rich, emerald green, and it was quiet and still outside. I felt as if I had seen the sky and trees for the very first time. It was that day I was told I had breast cancer.


LINDA LOVATO-MONTOYA

After a double mastectomy, chemotherapy, radiation, and six surgeries, I am a breast cancer survivor. Sure, I am a survivor because I followed my physicians' recommendations, but I also used my inner strength to stay on track mentally, emotionally, and spiritually.

If you are a breast cancer survivor, know someone who is, or are fortunate enough not to have travelled this path but want to have control of your body and future, the following story might be useful to you.

I was about 24 years old and had already been on a follow-up plan with my doctor for a couple of years to regularly check on a small lump that seemed to have a mind of its own. This lump would appear and then hide. It would grow and then shrink. When I saw my doctor's wrinkled forehead and concern in his look, I became uneasy and a bit worried. Given my family history with cancer, she suggested I have a "……gram."

When we think of the word "cancer" something happens to many of us that doesn't allow us to hear. I thought I heard my doctor say "manogram" or was it a "momogram." I was hoping it was some kind of new test that involved grams. I was wrong. I had to go for my first mammogram at 25 years old. I was too young to start those tests. I had heard about this boob tube machine and how getting ready for the exam was like putting silly putty on a cookie sheet.

The results were great! The mammogram didn't indicate anything to be concerned about. I immediately became a supporter of mammograms. I continued to have regular evaluations and even went back for more mammograms.

One day at the click of the mammogram taking another picture, my life changed. I was diagnosed with breast cancer at the age of 37. Breast cancer can strike with a vengeance, making you stop in your tracks. I stopped. I cried. And, then I moved ahead to attack what had attacked my body (*Lab News*, Oct. 31, 2003).

Had it not been for the boob tube, I might have not known about my breast cancer until it was too late to fight. It was the mammogram that gave me the jump start to saving my life. I have been in remission for seven years.

Here is something that can save your life. Use it.

Mammography can show changes in the breast up to two years before a patient or physician can feel them. Current guidelines from the US Department of Health and Human Services (HHS), the American Cancer Society (ACS), the American Medical Association (AMA), and the American College of Radiology (ACR) recommend screening mammography every one to two years for women aged 40 years and older, and every year for women age 50 years and older. (New Mexico Cancer Plan 2007-2011)

Cancer Awareness Month Activities

April 15 — 11:30 a.m.-12:30 p.m., Steve Schiff Auditorium: Dr. Marianne Berwick from the University of New Mexico Cancer Center will discuss incidence, risks, and genetic involvement for screenable cancers; recommendations; and reliability of preventive screenings.

Cancer Prevention Support Health Fair

April 15 — 11 a.m.-1 p.m. in the Steve Schiff Auditorium lobby: Health educators and resources from the community, including People Living Through Cancer and UNM Cancer Center. Stop by for information on skin health, recommendations for preventive screenings, cancer support resources, and tips for good living. HBE is bringing Assure Imaging Women's Wellness to host a mobile mammography clinic. Mammograms can be scheduled. Locations, dates, and schedules at http://hbe.sandia.gov.

Top six diagnosed cancers in New Mexico

- **Prostate cancer** is the most frequently diagnosed non-skin cancer in New Mexico. Prostate cancer accounts for approximately 31 percent of newly diagnosed cancers.
- **Lung cancer** is the leading cause of cancer-related deaths among both men and women. Lung cancer accounts for 11 percent of new cancer cases and nearly one-fourth of all cancer deaths in the state.
- Approximately 1,100 women are diagnosed with invasive **breast cancer** in New Mexico each year. Breast cancer accounts for one-third of all cancer cases in women.
- **Colorectal cancer** is the fourth most frequently diagnosed cancer in New Mexico, behind prostate, breast, and lung. Colorectal cancer is the second-leading cause of cancer deaths in the state, behind lung cancer.
- Approximately 320 new cases of **melanoma skin cancer** are diagnosed in New Mexico each year. Nearly one in four patients diagnosed with melanoma is under age 45. Melanoma is one of the most commonly diagnosed cancers among young adults.
- Eighty women in New Mexico are diagnosed with **cervical cancer** each year. It represents approximately 3 percent of all new cancer cases in New Mexico.

(New Mexico Cancer Facts & Figures 2007)

2007-2008 cancer facts and figures, American Cancer Society, USA

- Each year about 240,000 new cases of breast cancer are diagnosed (one every 2.5 minutes)
- Nearly 40,000 women die from breast cancer each year (one every 13 minutes)
- Four of every 10 women don't get annual mammograms
- Breast cancer, when detected early, can be cured
- Early detection gives women new options for breast-conserving therapy
- More than two million breast cancer survivors are alive in the United States today

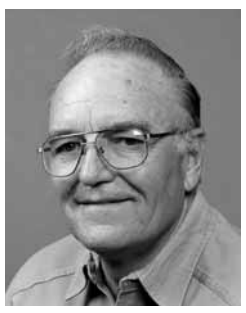
Mileposts

New Mexico photos by Michelle Fleming

Ellen Lemen
30 6325

Jose Lopez
30 2138

Clinton Boye
25 1720



Charles Valerio
25 4844

Chrissy Casias
15 3

Chris Miller
15 3651

Employee Car Show

An employee car show will be held concurrently with Family Day, May 16, 9 a.m. to 3 p.m. in the street just east of Hardin Field. All Sandia employee and contractor vehicles, including customs, restored vehicles, trucks, race cars, and motorcycles are welcome and will be accepted. There will be no judging, but entrants will receive a paper memento acknowledging their participation.

Questions should be addressed to Reggie Tibbetts (4234) or Matt Torres (4211) at 844-5244. To enter, mail your entry to Reggie Tibbetts (MS1345) or email your entry to rftibbe@sandia.gov.

Registration deadline is May 11.

(cut on dotted line)

To: Reggie Tibbetts, MS 1341

Sandia Family Day

Car Show Entry Form

Name: _____

Org.: _____ Mail Stop: _____

Phone: _____

Vehicle make and model: _____

_____ Year: _____

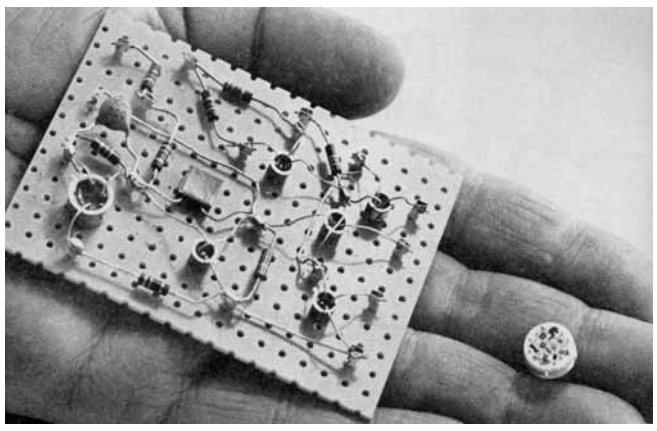
The content here is taken directly from back issues of the *Lab News*.

50 years ago . . . Sandia reactor construction starts soon. Estimates are that the Sandia Engineering Reactor Facility (SERF) will be in operation early in 1961. At that time SERF will be used as a radiation environmental test facility for the study of the effects of radiation upon materials. In January 1958, Stearns-Roger Manufacturing Company, Denver, Colo., was awarded the contract for architect-engineering of the SERF by the Atomic Energy Commission. Sandia Corporation will provide the reactor core, the reactor pressure vessel, and associated controls and cooling equipment. It is anticipated that the SERF will operate on a round-the-clock basis with a duty cycle of 80 percent with only short periods of inactivity for reactor maintenance and fuel changes. **The Motion Picture Division, 4765, has moved** to its new location in Bldg. 863. Most of the old equipment was moved as well as several large pieces of new equipment that needed to be installed and tested. The new equipment includes an automatic color film processing machine that turns out 35 feet of both 16 and 35mm processed color film per minute. Other new equipment includes a simultaneous sound track and film editor, a 16mm printer, three new movie cameras, a reduction printer that converts 35mm to 16mm, an animation stand and a "hot title" press. The Motion Picture Division each month produces about one and a half training and documentary films for the Military Liaison organization, 5300, as well as processing data film shot by field test photographers of the Optical Measurements Division, 5216, and Field Operations Division, 5214.

ARTISTS CONCEPT of the Sandia Engineering Reactor Facility in Area III to be completed in July 1960 at an estimated cost of $1.8 million.

NEW AUTOMATIC COLOR PROCESSING machine. Once controls are set for the machine, its operation is automatic as it processes 35 ft. of film a minute.

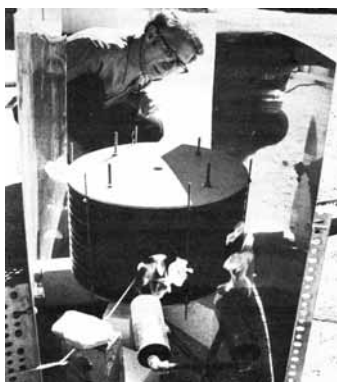
40 years ago . . . The newly created Thick-Film Hybrid Microcircuit Laboratory has been assigned the responsibility for setting up the facility and developing a thick-film technology. Thick-film circuitry differs from earlier-developed thin-film circuitry not so much in physical thickness of the circuits as in the methods to apply the circuit material to the substrate (a ceramic wafer). Thin-film circuit materials generally are deposited either chemically or in a vacuum while the thick-film process utilizes silk screen printing, followed by firing in a high temperature furnace. **A "super safe" switch** that cannot be accidentally or prematurely unlocked by shock or vibration has been invented by Charles Sandoval (2325). The solenoid-actuated device has the additional advantage of being simpler, less expensive, and more reliable than other locking mechanisms with simpler features.



THE BREADBOARD CIRCUIT (left) was reduced to the miniature component next to it through silk screening and oven firing.

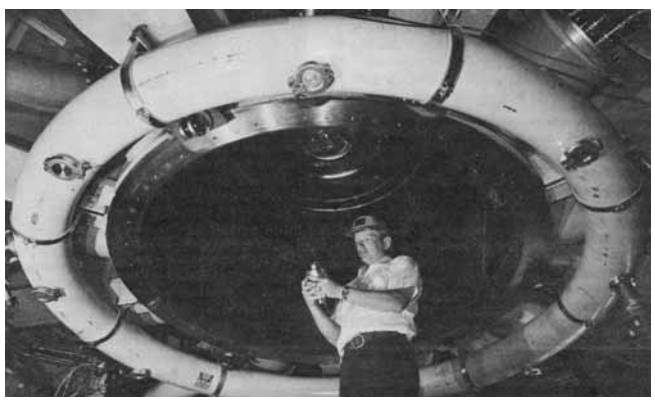
NEW COMPUTER — A Univac 1100/82A computer is now operating in Sandia's Computing Center in Bldg. 880. The system has dual CPUs, one million words of main memory, four billion bytes of mass storage, dual consoles, 12 tape drives, three high-speed printers, and other peripheral equipment.

30 years ago . . . DOE has been awarded a patent for a fire-resistant nuclear fuel shipping cask. Inventors are Marvin Moss (5842) and Dick Heckman (2151). The cask was designed so that the fuel-generated heat inside the radiation protective cylindrical cask could be dissipated while protecting the integrity of the container from an accidental fire outside the cask.



MARVIN MOSS (5842) examines test setup of a fire resistant nuclear fuel shipping cask. Torches, foreground, simulate heat of a high temperature fuel fire.

20 years ago . . . Sandia research and development efforts during the Intermediate-range Nuclear Force (INF) Treaty negotiations helped define the US position that the treaty should allow continuous monitoring. Those efforts led to the design and production of US inspection devices installed to monitor a Soviet missile plant at Votkinsk. Sandia's Technical On-Site Inspection (TOSI) facility was developed for testing concepts for verifying the treaty while it was still being negotiated.



FAST GAS VALVE and supersonic injection nozzle that Rick Pielman (1273) holds are part of the gas-puff system used to produce soft X-rays on Sandia's Saturn accelerator. Rick is standing beneath the center of Saturn.

Saturn produces world-record X-ray yield – Record-breaking X-ray yield first reached in the fall with Sandia's Saturn accelerator has given researchers a new capability for the nuclear weapon program. With imploding plasmas as the X-ray source, Saturn has several times produced more than 500 kilojoules of X-ray energy in a single burst lasting 40 billionths of a second. No laboratory X-ray yields approaching that much energy in so short a pulse have been reported elsewhere.

10 years ago . . . A new way of seeing designs and data is making a debut at the Labs. Sandia/California's Visualization Design Center was showcased recently to DOE and tri-lab officials. In the center, people are partially surrounded by a curving wall screen, similar to an IMAX theater, to view computer visualizations of designs and data. The visualizations can be shared with people at other locations through collaborative tools and videoconferencing. A similar facility went on-line in December at Sandia/New Mexico.

ON THE SCREEN — An image depicting the mechanical assembly of colocated detonator stronglinks. (Photo by Linda Hadley)

Giggling Springs turns up the heat

Project utilizes geothermal spring for space heating

HOT STUFF – Located in Jemez Springs, the water at Giggling Springs is rich in calcium, magnesium, potassium, iron, and silica. (Photo courtesy of Giggling Springs)

Story and photos by Michael Padilla

Saving 60 percent on monthly utility bills is no laughing matter for Giggling Springs, a natural hot springs pool in Jemez Springs.

That savings is part of the outcome of a New Mexico Small Business Assistance (NMSBA) Program project conducted by Rich Jepsen (1534), a specialist in fluid and thermodynamics.

Rich was contacted by Tanya Struble, co-owner of Giggling Springs, after hearing about the NMSBA program from members of a spa association. The association had met to discuss cost-savings opportunities, plumbing challenges, environment department standards, and new technologies.

Since Giggling Springs' water is rich in soluble minerals, heating buildings at the spa using conventional plumbing hardware had been troublesome. Mineral deposits can build up in plumbing, leading to high maintenance costs.

After discussing the project with owners, Rich proposed a heating exchange system that transferred heat without transferring spring water. He measured flow rates and temperatures from the hot spring to strike a balance between heating the outdoor pool and providing heat to cabins at the spa.

While Giggling Springs' geothermal water maintains a temperature of 130 degrees, most existing heat exchange systems operate efficiently at much higher water temperatures, typically above 180 degrees. An additional difficulty was being able to capture enough heat for both the therapeutic pool and the cabins.

The new heating system allowed Giggling Springs to use its 130-degree water to heat both the outdoor pool and the buildings on the site.

"This project was a great example of using Sandia expertise to help a New Mexico small business design a system that is not 'off-the-shelf,'" says Rich.

Struble says the project cost about $18,000, a sum she expects to see recovered in five to six years.

Check out Rich's work by visiting Giggling Springs in Jemez Springs and check out www.GigglingSprings.com. For more information on Jemez Springs, see www.JemezSprings.org.

(Photo courtesy of Giggling Springs)

GIGGLING SPRINGS – Clockwise from top left, the quaint Giggling Springs office and gift shop; tubing laid out for the project; Giggling Springs pool; Rich Jepsen (1534) works on the heating exchange system; Tanya Struble shows the mechanical box.

(Photo courtesy of Giggling Springs)

The hot springs energy characterization and heat exchanger design:

- Measures hot springs flow rate and temperature.
- Calculates energy balance for both continuing hot springs pool heating needs and space heating for the resort.
- Includes a custom plate heat exchanger to interface with hot springs and radiant heating system.
- Connects the heat exchanger and validates the design with a mock test using thermocouples and flow meters.

Sandia assists 224 small businesses in 2008

Sandia assisted 224 small businesses in 2008 with projects ranging from helping an environmental company to assisting Nambe Pueblo create a water model.

This was Sandia's eighth year of helping small businesses through the New Mexico Small Business Assistance program, thanks to a tax credit act passed by the New Mexico Legislature.

The program allows Sandia to receive a credit against the gross receipts taxes it pays each year in exchange for providing technical advice and assistance to New Mexico small businesses. During 2008, Sandia submitted nearly $2.4 million in tax credits.

There are few requirements for small-business participation — mainly that assisted companies must be for-profit New Mexico small businesses, and that the help is otherwise not available for a reasonable cost through private sources.

In addition to highlighting its Giggling Springs project at a recent event at the Albuquerque Aquarium, Sandia also featured the Rio Nambe Leverage Project and the Four Corners Leverage Project.

Rio Nambe Leverage Project

Mirabal Farms with Povi Ovei Farms, Rose Trujillo, Gloria Trujillo

As the governor of Nambe Pueblo and a farmer, Ed Mirabal understands the water management challenges that farmers face, including controlling costs and using their water share without wasting or under-using natural resources. Pueblo farmers approached NMSBA seeking a method that would calculate the amount of water farms divert from surface sources to support crops. Jim Brainard (6311) worked with the pueblo to calculate water usage rates and develop a model for a system-wide water management. The new model includes all agricultural, residential, and commercial uses and calculates the amount of water used and the amount returned to the ground.

Four Corners Leverage Project

Biosphere Environmental Science and Technologies with McDonald Enterprises, Inc., Hands on Safety Service, Intermountain Painting

Biosphere Environmental Science and Technologies (B.E.S.T.) operates several projects related to water supply and water use systems. While designing a reverse osmosis system to desalinate water produced from oil and gas production operations, B.E.S.T. found that chemicals and minerals in water from a natural gas well could reduce the effectiveness of the filtration membranes in the reverse osmosis system. The company needed a pretreatment system to increase the life of these membranes. Sandia employees Allan Sattler (6312) and Malynda Cappelle (6721) teamed with B.E.S.T and other companies to test the performance of a new pretreatment and reverse osmosis system for untreated produced water.