SUSAN CARSON puts food supply safety software CARVER+Shock through its paces.
(Photo by Randy Montoya)

A safer food supply: Sandia and FDA team to make it so

Examining attacks on nation's entire food supply chain from the target's point of view

By Neal Singer

Like Johnny Appleseed of yore, the Food and Drug Administration is planning on scattering computerized food-defense programs across the US early this year so that the country's million or so food processors can better secure their food against possible contamination by terrorists.

A team of Sandians is leading the nearly completed effort to computerize the FDA program so that it can be distributed as widely as possible.

The soon-to-be-downloadable program, called "CARVER + Shock," provides a series of interactive questions. Food-processing employees can learn it in a few hours. The program helps companies of any size determine vulnerabilities along their food-processing chain. It also warns of the attractiveness of each production step to an invader.

"People who used the [initial test, or] beta version said it was easy to use and fun," says David Acheson, director of the FDA's Office of Food Safety, Defense, and Outreach, which funded the work. "You build flow charts by dragging icons onto the screen."

The point is to enable the large number of companies that may be unskilled in risk assessments to make evaluations on their own.

Attacking the jugular

CARVER was originally developed by the US military to evaluate targets to determine which would be most attractive to an adversary. Its current use, computerized under the supervision of Sandia researchers, applies this method to food production from the target's point of view.

"In warfare, the military must attack the jugular of its opponent," says principal investigator Phil Pohl (6766). "Here, we ask the same tough questions, but to identify the food supply jugular and protect it."

Specifically, the CARVER questions follow its acronym to ask how critical, accessible, recognizable, and vulnerable each part of any food process is, as well as the physical effect of an unwanted intervention and how long it would take to recover from it.

(Continued on page 4)

OUTSTANDING!

Every year, NNSA reviews Sandia's performance, issuing a "report card"called the Performance Evaluation Report, or PER. For 2006, the PER rates Sandia's performance as "outstanding." In a letter to employees, Labs Director Tom Hunter said, "This outstanding rating is absolutely wonderful news. It is an unambiguous recognition by our primary customer that we are performing at a very high level." The *Lab News* will have more about the PER in the Jan. 19 issue.

Inside . . .

The certification of Yucca Mountain in a remote Nevada location as the nation's repository for spent nuclear fuel is considered absolutely essential for the future of nuclear energy in the US. Sandia has been assigned by DOE to take the science lead in the certification process. Read all about Sandia's expanded role in Will Keener's stories on **pages 8-9.**

Also inside . . .

Sandia LabNews

Vol. 59, No. 1 January 5, 2007

Managed by Lockheed Martin for the National Nuclear Security Administration

Sandia National Laboratories

Nuclear Weapons team celebrates milestone: ISO certification

By Stephanie Holinka

CONGRATULATIONS — Gene Morrison of BSI, Inc. (second from left) presents Executive VP and Deputy Labs Director for Nuclear Weapons Joan Woodard with a plaque certifying that the Nuclear Weapons SMU has earned ISO 9000 certification. Looking on are Dave Carlson (left) and Chuck Meyers, who were instrumental in the certification process.
(Photo by Randy Montoya)

Members of the Nuclear Weapons SMU, Centers 2400, and 2700 celebrated an important milestone on Tuesday, Dec. 12. The Nuclear Weapons SMU, including its Manufacturing Science & Technology and Neutron Generator Production activities, has been registered by BSI, Inc., North America's leading provider of management systems registration, to the International Organization for Standardization (ISO) 9001:2000 management standard.

This represents a milestone for the Laboratories, and was the result of great effort by team members charged with its undertaking, says Deputy Director for the Nuclear Weapons Program Joan Woodard.

"Usually we are the world innovators, but in this case we needed to steal the best ideas from business in order to honor the critical nature of the work we do," Joan says. "We're in a serious business and the taxpayers of this nation demand this of us.

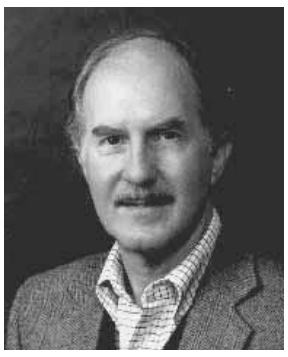
"When you consider the importance and the sensitive nature of our work, can you think of any better reasons to have standardized products, services, and processes? Any better reasons for continual improvement?," she says.

ISO was established in 1947 as a worldwide federation of national standards bodies from more than 140 countries. It promotes standardization of business practices and products as a way to foster

(Continued on page 4)

What's what

In this issue, the sometimes conflicted Will Keener (geologist? . . . journalist? . . . musician? . . .wheat farmer? . . .) resolves that dilemma and writes about Yucca Mountain and Sandia's role as the lead laboratory in that very important project.



HOWARD KERCHEVAL

The clearest practical solution to our country's increasing demand for electricity – but corresponding need to lessen our reliance on foreign sources of oil – is nuclear-powered generation plants. The major roadblock – not the only roadblock, but the major roadblock – has been the dilemma of what to do with the waste, referred to in the industry as "closing the fuel cycle."

Yucca Mountain is seen as the way to close that cycle by serving as a safe repository for spent nuclear fuel, and it's a testament to Sandia and Sandians that this lab was chosen to lead that project. Be sure to read it, on pages 8 and 9.

* * * * *

An observation here.

There's a seemingly inexorable current toward homogenization around the world. It's part of globalization. McDonald's, Pizza Hut, and Kentucky Fried Chicken are as ubiquitous in Beijing or Cape Town or Prague as they are in Wichita or Miami. Cars with Japanese badging are made in Tennessee; US automakers churn out products in Asia and Europe. Take your laptop with you to Argentina or Tahiti or Kenya and you can chat with friends on Skype or listen to the Classic Jazz channel on Sirius radio from New York.

All that considered, it should be noted with pride that Sandia was named the lead lab for the Yucca Mountain Project because it is unique and uniquely qualified for jobs of that magnitude and importance. And Sandia is staffed by Sandians, who are justifiably proud of their institutional heritage. There is only one Sandia National Laboratories in the world and the long line of people who have made it what it is – from Z Division of the Manhattan Project right to today – have always been proud to call themselves, and be called, Sandians.

Others who work in other places and do other things can and should be proud of their own heritage. But for us, it's satisfying and prideful to be a Sandian.

* * * * *

Oh, and if you read this column in the last edition of *Lab News* before the break, and are saying to yourself, "Didn't he say he was retiring?" Well, yes, he did. But he didn't. Still will, sometime. But not just now.

So, sorry Randy: You won't get my office with the window, after all. And the rest of you – you know who you are: The coffeemaker's still here, and forget about that big paper doll with the rainbow assortment of sweaters!

I'm ahead of Governator Ahnold – I *am* back.

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

Walk to Work

Kirtland Family Housing now open to Sandians

Wouldn't it be great to walk to work? That might not be possible now, but if you are looking for a new apartment or house, you can start your search a little closer to the office. Kirtland Family Housing is now open to any base-affiliated person interested in living on Kirtland AFB or in off-base housing.

Deshane Casillas, marketing representative for Kirtland Family Housing, says that though precedence is always given to active military members and their families, when base housing occupancy falls below 95 percent Family Housing opens up rental opportunities according to a tiered system.

HOUSING UNIT at Kirtland Family Housing. Under certain circumstances, Sandians may be able to lease housing there. (Photo courtesy Kirtland Family Housing)

Currently, base housing is at "third tier," meaning that leases are open to Sandians and Sandia contractors, DoD contractors, and DOE employees, in addition to accompanied or unaccompanied active duty members (any service), National Guard, Reserve, civil service, retired military, and retired civil service.

Available units include three- and four-bedroom homes and townhomes, both on base and just off base. Amenities include 24-hour emergency maintenance services and lawn maintenance for unfenced residences.

The rental contracts, which start at one year for on-base and six months for off-base, allow for two "walking pets," with a pet deposit. They also allow roommates, but stipulate one roommate per bedroom.

All residents must pass a background and credit check and must adhere to all base housing regulations. A copy of base housing regulations is available at Kirtland Family Housing.

To be considered for a lease, interested parties must get a referral form from Kirtland Family Housing and pay a $50 nonrefundable application fee.

Interested people should contact Kirtland Family Housing at 232-2049 for more information or to arrange an appointment to see available units.

— Stephanie Holinka

Sandia LabNews

Sandia National Laboratories

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Take Note

Retiring and not seen in *Lab News* pictures:

Randy Jannusch (5733), 22 years.

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TTR vets

Tonopah Test Range to mark 50 years on Feb. 10

Over the years, the Tonopah Test Range has conducted some of the Labs' most vital mission-related work. Were you ever a part of it? Did you ever work there? A celebration of 50 years of success at Tonopah Test Range will be held at the Fiesta Rancho Casino in Las Vegas Feb. 10, 6-10 p.m. The cost will be $39.95 per person. Reservations are required and must be made by Jan. 10.

For more information or to reserve space, contact Mike "Spy" Spychala (2915) at work at 702-295-8357 or mespych@sandia.gov or at home at 702-376-0613 or mespychala@att.net.

Videoconference rooms evolve into collaboration environments

By Nancy Garcia

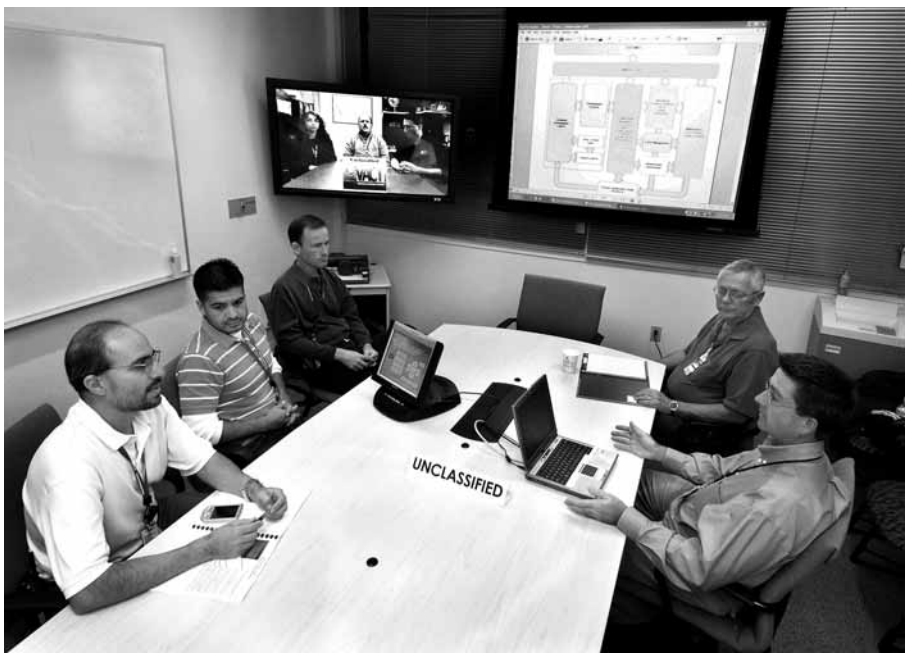
Videoconferencing has grown from the days when it entailed rolling in a TV connected to a camera and a phone. Now Sandia's collaboration rooms are increasingly offering full electronic presentation systems to help business productivity.

The rooms have projectors and plasma screens, microphones and speakers, equipment racks, and menu-driven control screens. Some offer the opportunity to toggle between classified and unclassified networks.

"Every installation and room is different today," says Jim Berry, manager of Videoconference & Collaborative Technologies Dept. 8947. Behind the scenes, however, installations are now being standardized for efficiency.

One pleased customer involved in several installations was amazed at the complexity of using phone or computer networks for real-time audio-visual transmissions — even though he works in computer software himself.

"It's not just stringing a wire through a wall," says Manufacturing Information Systems and Technology Dept. 2737 Manager Jorge Hernandez. "It's much more than that. We're really calling them collaboration rooms, not videoconference rooms." His director was motivated to expand their capability after seeing how valuable it was for another workgroup to engage with multiple projected images. Jorge assessed which rooms might give the "biggest bang for the buck." One installation involved drilling through concrete.



USERS at various Sandia sites say they love the capabilities of the latest communications technologies in Sandia's collaboration rooms.

Before you build the building

"If you think about it before you build a building, that's the way to go," he advises. "You can pour the concrete the right way."

The technology engineering integration effort is led by Dave Dirks (8947), who set up standards three years ago when he came to Sandia with a background in communications and knowledge management.

"Prior to this process," he says, "room construction was all ad hoc. We need to make sure the systems are interoperable, with an eye toward maintenance, and ensuring a long-term capability. It lowers the total cost of ownership for Sandia. We're building systems that have long-term viability. That's what we think of as our success."

NEW COLLABORATION CAPABILITIES include not just face-to-face videoconferencing resources but also the ability to work together on presentation materials and other documents.

In August, a contract purchasing agreement (CPA) was placed to prequalify an outside vendor, Integrated Media Systems, to perform up to $25 million of work over five years. "No money is spent until the customer funds a purchase order to design or build a system," says Jim. "This allows us to predefine things like the vendor is required to purchase and construct the system at their location doing preliminary testing, and then ship it to Sandia. This trick reduces our on-site install times to weeks rather than months, minimizing the need to limit access to the conference room for long periods of time."

The department manages a $10 million construction budget annually and up to 70 new installations. "It's like building a broadcast studio or movie theater," says Jim, who advises planning ahead before the final design is determined to specify appropriate acoustics, lighting, and networks.

Avoiding pay-me-now or pay-me-later

Jim has found that many customers will request a complex and capable system only to learn they have specified a very expensive design. "Customers are often unaware of the extra quality, security, and safety issues that make building these resources inside Sandia considerably more expensive than they'd be elsewhere," says Jim. "Some customer will then attempt to cut corners by agreeing to vague requirements with a non-CPA vendor. Ultimately this turns into a pay-me-now or pay-me-later experience for the customer. Attempting to save money by allowing others to build the system can actually cost more once you are forced to make the changes necessary to achieve a functional capability."

Twenty public rooms — 10 at each site — are available to schedule online using the conference room scheduler. Booked about 95 percent of the time, they are maintained by Dept. 8947 with funding from the Integrated Enabling Services (IES) Strategic Management Unit.

"We are getting people asking us to manage the rooms for them," Jim adds, "and we want to ensure they know we are available to take care of the rooms once they are built." His department has three-year warranty agreements for rooms they build. Some organizations choose to pay for a service-level agreement that provides preventative maintenance and ensures a priority operational response.

Sandia has about 250 presentation-type conference rooms, with 100 in California, which was considered a driver for establishing videoconferencing. The capability also exists in the Washington, D.C., office, Carlsbad, and home offices of some out-of-state telecommuters. Specially equipped conference rooms are also being set up at Sandia's Yucca Mountain office in Las Vegas.

Overall, the Labs spends more than 8,000 hours a year conducting videoconferences. Most connections take place between sites, with a third of the traffic coming from outside Sandia.

Dave thinks Sandia always needed the capability to collaborate via presentations, to enhance productivity even within the same work group. In fact, Dept. 6030's Cindy Acosta, who was involved in adding audio-visual capabilities in Bldg. 823 a couple of years ago, has found the 40-person-capacity room works well for training and program activities as well as videoconferences to California, Carlsbad, and Las Vegas. Sited outside the Tech Area, Room 2279 also accommodates guests and visitors.

"It was a good investment," she says. "Everything was coordinated well and I'm very pleased with the end product. It seems to be working great. It's very user-friendly and requires little maintenance. We love it."

That flexibility was also accomplished in Jorge's remodel of Room 1030 near the lobby of Bldg. 870, which was one of the first rooms to accommodate users whose disciplines cut across engineering to management. Near the offices of the director and senior managers, its location also makes it ideal for hosting customers and partners. The room was recently approved for switching between classified and unclassified networks.

To accommodate users' differing needs, the room has three projectors, two document cameras, a touch screen, white board, ceiling speakers

Sandia CaliforniaNews

and microphones, and a custom table with six ports for laptops. Related racks of equipment are housed in a gleaming corner cabinet. "We wanted it to look professional," Jorge says. "I think we struck just the right note."

Customers throughout Sandia are discovering the advantages of considering collaborative technologies early in the building process.

David De Polo, manager of Executive Resources Dept. 12115, had good experiences partnering with Dept. 8947 in renovating three executive conference rooms.

'They understand the requirements'

"I recommend involving Videoconference & Collaborative Technologies in the earliest stages of planning," he says, "because they understand very well the requirements for reliable functionality, including connectivity with other sites. They assisted us with reviewing emerging technologies and determining what would work best with IES's infrastructure strategy."

The videoconference services team is getting in early on the design in Bldg. 858, so specifications roll into the facilities design requirements for this microelectronics fabrication complex. Planning for the Weapons Integration Facility (WIF) is just underway, with three dual-use rooms planned and designs taking into account not only the classified and unclassified networking infrastructure, but also such aspects as furniture, lighting, and sound attenuation. There are 15 other rooms in WIF being equipped with videoconferencing and/or collaborative capabilities.

So where are some of the best public videoconference rooms in the corporation?

In California, Dave recommends three rooms in the Distributed Information Systems Laboratory (Bldg. 915): rooms N132, N237 and W133. He also likes the remodeled conference room in Bldg. 912, Room 121. There are about a dozen more in offices and private conference rooms, he adds.

In New Mexico, he says the Microsystems Laboratory is very nice in the Microsystems and Engineering Sciences Applications (MESA) complex. He also likes three rooms in the Manufacturing District, and the following buildings and rooms: Building 701/2001, 825 conference room, 892/216, 802/3160E, and 823/2279.

More are coming online. The group has handled more than 200 projects in the last two years, Dave points out, saying, "The processes are in place if you want to do this."

Food safety

(Continued from page 1)

"Shock" rates the degree to which a specific attack on the food chain would raise public apprehension.

"An attack on a baby food plant would produce more emotional shock than one on a frozen pizza plant," says Sandia researcher Susan Carson (6766), who worked on software that helped develop the questions needed for a one-size-fits-all program. "We factor that in."

Shadowing the FDA staff

The conversion from questions-asked-in-person to questions-asked-by-computer began with Susan and Phil shadowing FDA staff at meetings with industry personnel and writing down the questions asked.

Former Sandian Regina Hunter and son Madison Link, through their Albuquerque-based company Ducks in a Row, also took part in some interviews and then, with Phil and Susan, put together the design interface.

As Hunter colorfully puts it, "How do you reproduce the process of a bunch of guys gassing around the table and put it into a series of questions that needs to be asked by computer?"

(Earlier work led by Hunter on a Sandia code called RAMPART, which asked risk-based questions about natural disasters, gave her experience in developing icons and testing for program bugs always present in any complex software.)

Robert Browitt of Albuquerque-based Architrave Software, who also attended some interviews, put the questions into code. "Sandians have brilliant ideas and I implement them into a usable professional product," he says.

Access by terrorists?

But could CARVER's questions — "more than a hundred, less than 200," says Susan — be useful to terrorist groups in determining where to attack?

"The software [by itself] is not a checklist," says Sandia manager Jeff Danneels (6766), whose background is in risk and security assessments. "It won't tell you where vulnerabilities in a process are. The companies who use it will have to control access to their results. But the only way many stay in business — particularly for the largest — has always been to keep their products proprietary and secret. They'll have to do the same here."

The food-defense project began in longhand, in effect, in response to the federal Bioterrorism Act of 2002, which said the industry should be prepared to defend against any contingency that might arise.

In partial response, the FDA increased its work with the food industry to determine any overlooked vulnerabilities. The joint meetings are time- and labor-intensive; it may take key employees of a given plant several days to discuss food production with an eye to determining the site's most vulnerable points.

Thus, working person-to-person, the agency only was able to reach a limited number of those in the food industry.

Getting a handle on vulnerabilities

"The computerized tool will allow many more industries and states to get a better idea of where their vulnerabilities lie in food processing and manufacturing," says Acheson.

"This is the best thing to come out of Washington in a long time," says David Fish, plant manager of Breedlove Dehydrated Foods, a large nonprofit food processor in Lubbock, Texas. "We're all aware of vulnerabilities in our food chain, even if it's unintentional, like the [harmful E. coli on spinach] that killed several people and sickened hundreds."

"This is the only quantifiable tool I know of for the food industry," says Frank Busta, director of the National Center for Food Protection and Defense, a federally funded consortium of six universities headquartered at the University of Minnesota. "I don't know if it's the be-all-to-end-all. There'll be evaluations of the system as we move forward — what's incidental, what's extremely important — to refine it into a better and better instrument. But the Sandia project to computerize [the questions] should ease its use a lot. This is the first computerized step."

FDA employees Don Kautter and Amy Barringer contributed to the work, as did Cory Bryant, Sarah Davis, and Fred Shank of the Institute of Food Technologists.

Acheson says the FDA is working up a marketing plan to increase awareness of the program, which should be available in late January on the FDA's website at www.cfsan.fda.gov/fooddefense.

"This is the only quantifiable tool I know of for the food industry. I don't know if it's the be-all-to-end-all . . . [b]ut the Sandia project to computerize [the questions] should ease its use a lot. This is the first computerized step."

Frank Busta
National Center for Food Protection and Defense

NWSMU ISO

(Continued from page 1)

economic prosperity. ISO's work results in international agreements that are published as international standards for every thing from manufactured products to businesses processes.

Dave Carlson, chief operating officer of the Nuclear Weapons SMU, explained the importance of standards setting to industry, talking about how standardization of such ordinary things as railroad gauges and screw threads contributed to the ability of industry to innovate.

"ISO standards make a positive difference; not just to engineers and manufacturers for whom they solve basic problems in production and distribution, but to society as a whole."

"ISO standards make a positive difference," Dave says. "Not just to engineers and manufacturers for whom they solve basic problems in production and distribution, but to society as a whole."

Patty Wagner, NNSA Sandia Site Office director, reminded audience members about the standards clauses in Sandia's contract with the DOE, and expressed hope that the internalization of the standards process would allow SSO to "change the way we do oversight."

The NWSMU began the process of ISO certification in 2001, and partnered with an external lead ISO lead auditor and consultant to develop their certification plan.

Chuck Meyers, who led the ISO process, pointed out that the reward for the effort is not really the certificate.

"The real power comes from improving our management system through predictable, repeatable, measured processes that reduce rework and errors," says Chuck.

Gene Morrison, BSI's Regional Vice President for the West USA, came from Chicago to present the registration certificate and warned the group that this was only the beginning of their journey. "You have established a foundation."

Other groups at Sandia have gone through the certification process of ISO certification including Telecommunications Operations Dept. 9334, International Contracts and Import Export Control Dept. 10257, Manufacturing Enterprise Departments 14181, 14186, and 14111 and the Material Processing and Coatings Laboratory.

NMSU, Sandia formalize partnership

Sandia and New Mexico State University recently signed a memorandum of understanding to broaden and make more strategic the relationship between the two institutions.

Research efforts will focus on addressing national objectives, leveraging the technical expertise and laboratory facilities between both institutions, and strengthening employment opportunities for NMSU students at Sandia upon graduation.

Specific areas of potential collaboration include investigating technologies and methods to improve energy and water reliability and security, and developing optical-based detectors than can be used in applications as varied as sensing planets and stars for astronomical research, to sensing objects in low-light environments for homeland security.

An additional area of collaboration includes the creation of new antenna technologies that can be used in wireless systems for commercial and government communications networks. The MOU will seek development of microelectromechanical systems that integrate mechanical elements, sensors, actuators, and electronics into devices ranging in size from a micrometer to a millimeter; and improving the design of microelectronic circuits used in a wide variety of electronic systems.

"This agreement is another example of Sandia's commitment in working with various colleges and universities throughout the state and the country," says Steve Rottler, Sandia VP of Weapon Engineering and Product Realization and Chief Engineer for Nuclear Weapons. "Specifically, this agreement will provide expanded research interactions between Sandia and NMSU researchers in areas that will benefit the State of New Mexico and the nation."

"A strong partnership between NMSU and Sandia National Laboratories is an essential element in pushing New Mexico forward as a national leader in high-technology development," said NMSU Dean of the College of Engineering Steven P. Castillo. "We are pleased to be working with a world-renowned laboratory and hope that this partnership will contribute to the state's growing technology industry as well as provide future opportunities for graduating engineering students to stay in New Mexico."

The University Research Office, 1012, oversees Sandia's relationships with all of its strategic university partners. It was instrumental in negotiating this MOU with NMSU. Sandia currently has 19 active agreements with 15 different universities throughout the US. — *Michael Padilla*

The road to industrial nanotechnology is paved with surprises

Cities get creative in marketing high-tech business environment; even the cabbies are in on the game

By Neal Singer

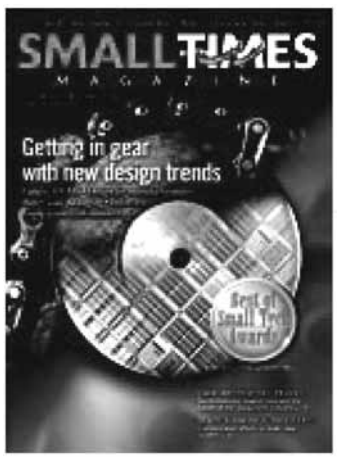
Note: The Lab News*, motivated by Sen. Pete Domenici's comments at the Sandia/Los Alamos CINT opening this past summer on the importance to New Mexico and the two giant labs of bringing nanotechnology expeditiously to market, was there to listen as David Foreman spoke at 7 p.m. Dec. 5 on the Central New Mexico Community College campus.*

David Foreman — editor-in-chief of the business-development-focused, nano-MEMS magazine *Small Times* — tried to interpret the growing but still-hazy commercial future of micro-nano to 30 members of the Nano-Network of New Mexico, a loosely connected group of nanotech entrepreneurs presumably interested in market possibilities.

Foreman spoke in general terms about the industrial difficulties of mixing nano and micro technologies, described the accordion-like variations in venture capital financing trends, and contrasted the usual high-road description of nanotechnology's possibilities with its most visible outputs (stainless pants were one, he said).

While the insights were somewhat general, Foreman told a very specific anecdote about the extent of one city's support of its nanotechnology enterprises.

Foreman related that having spent a night unexpectedly in an unpleasant motel — cinder-block walls, bad lighting, no hot water — he was in a foul mood when he arrived for a speaking engagement the next day in Albany. He felt a little better when a cabbie who resembled Jerry Garcia, the deceased lead singer of the Grateful Dead, picked him up.



As Foreman described it, the cab smelled of incense, sitar music played on its speakers, and the cab driver, who had a long beard, was toothless. Foreman soon decided to relax in the unexpected setting to forget the miserable night before, but then was astonished to hear the cab driver — an apparent holdover from the technologically simpler 1960s — tell him interesting tidbits about the nanotechnology work going on in Albany. Foreman noticed that the more apparent his interest, the more the cabbie talked. The man seemed to have a broad fund of knowledge of which work was worth watching.

Finally, almost at Foreman's destination, the cabbie asked if Foreman had heard about the just-announced merger of electronics giants Fairchild and Honeywell.

Foreman sat up. No, he said, he certainly hadn't.

"Know what they named the new company?" the cab driver asked.

Foreman shook his head.

"Farewell, Honeychild," the cabbie said, grinning toothlessly into the interior mirror.

When Foreman went in to speak with the sponsors of his Albany talk and repeated his amazing experience, his host shook his head. "He wasn't supposed to tell you that story," he said.

According to Foreman's host, the city of Albany pays its cab drivers to learn and then talk about nanotechnology so that the very first impression of business visitors is that Albany is a high-tech place.

"It was a lesson in the creativity [that local-area] people will use to accomplish their goals," Foreman commented.

The state is Number 4 in the magazine's rankings of nanotechnology hubs. New Mexico is number 3, behind California and Massachusetts. Maybe it's the green chile.

The Nano-Network of NM is chaired by Katie Szczepaniak, who can be reached for more information on the organization at katie@wasatchvc.com.

Sandia formalizes agreement with Bi-National Lab

A memorandum of understanding was signed Dec. 15 between Sandia National Laboratories and the Bi-National Sustainability Laboratory at Santa Teresa, N.M., to formalize the relationship between the two institutions.

Signing were Sandia Vice President J. Leonard Martinez and BNSL CEO Paul Maxwell.

Sandia's assistance presently comes in the form of technical help for existing programs, interest by line organizations in the BNSL's MEMS cluster concept, and possible workshop presentations, says Gary Jones (9113), who serves on the BNSL's advisory board.

This formal teaming is intended to help launch the commercialization of technology developed by Sandia and affiliated researchers at the US-Mexico border region. The intent is to combine technical, economic, and legal expertise on projects that include microelectromechanical systems (MEMS) packaging and manufacturing, advanced materials for petroleum processing and environmental/water technologies, and other areas conducive to border research.

The MOU provides the foundation on which the BNSL and Sandia, a national security lab, can further their respective missions and focus on activities that will be of benefit to national security and the border region.

The BNSL was created from ideas originating at Sandia's Advanced Concepts Group.

According to its website, the mission of the Bi-National Sustainability Laboratory is to "Create bi-national, collaborative partnerships focused on emerging technologies and to promote and implement economic development efforts within the border region from the Gulf of Mexico to the Pacific Ocean, thus yielding a sustainable, technology-based economy."

— Neal Singer

Feedback

Why doesn't Sandia use widely available open source productivity software? . . . and, yet more complaints about carpool parking space abuses

Q: *Why doesn't Sandia utilize mainstream open source software in common office applications? Various Linux operating systems are developed to be user friendly and even potentially mimic a Windows environment. Productivity suites such as OpenOffice are available that would fill the needs of many administrative tasks. By mainstream, I refer to products available for inexpensive purchase or free download from reputable, well-known companies (such as Novell), not those randomly developed by questionable characters in basements around the world.*

I believe this option would be a valuable resource in cost savings and alternate security options over the currently favored Windows/Office arrangement.

A: The question you pose is interesting, and certainly one that is garnering more and more interest around the laboratory. You will be happy to know that Sandia is in the process of ramping up efforts to explore open source alternatives and to identify areas where a cost savings could be realized by the laboratory. There are some promising open source alternatives for some niche areas in the enterprise.

With regard to your mention of the area of productivity tools, the answer is not readily attainable. Where a cost savings might be realized in the actual cost of software licenses, other costs associated with this decision are negatively impacted. These include productivity, employee training, retraining of some support staff, and collaboration with external entities, most of which continue to operate in the Windows environment.

In addition, it is often the case that when looking at an open source replacement in an enterprise environment, one must delve deeper into the actual cost of supporting the software in the enterprise. Often, costs to purchase automated upgrade capabilities, automated security patching capabilities, and other support costs are not included in the shrink-wrapped version of the software. These services are essential to scale the software to run in the enterprise.

There are several recent examples of entities approximately the size of Sandia that have delayed or cancelled efforts to convert their enterprise to open source due to the issues mentioned above.

However, CIO Ken Washington has made it a point to include open source analysis in the strategic planning of IT services at the laboratory.

— Barry Hess (4610)

* * *

Q: *This is probably my third time writing to you for concerns about carpooling and motorcycle parking. There must be a building or office that gives an employee exemption status allowing them to park in carpool spaces without placards or old placards (white). As for the motorcycle parking, there has been an EZ-GO parked in the motorcycle parking behind the cafeteria for the entire week of 10/9/06 and I have yet to see security anywhere around let alone ticket either vehicle which is in violation. During lunch, it isn't uncommon to see a government truck, contractor's truck or EZ-GO parked in a carpool spot while the occupants go inside and have lunch.*

It is obvious that though we have been told that Security was going to start ticketing violators, it has yet to happen. Why have rules if they aren't going to be enforced?

A: Because of recent changes in DOE policy Sandia's Protective Force will no longer be able to write tickets for "parking regulations to include speeding, running stop signs and other traffic safety violations." We are currently perusing different approaches to enforce the parking problems. As for the EZ-GO being parked in the motorcycle parking area, we have identified the organization that owns the cart and have contacted the manager of that organization to have it moved.

— Willie Johns, Traffic Safety Committee

Bringing nuclear-derived electrical energy to developing nations without increasing weapons proliferation danger

Varieties of nuclear fusion possibilities also discussed at ANS meeting

By Neal Singer

The American Nuclear Society, on the first day of its winter meeting, held this year in Albuquerque, addressed two major problems — how to distribute nuclear-derived electrical energy throughout the world without increasing the spread of nuclear weapons, and how to move beyond nuclear fission to nuclear fusion (see "Nuclear Fusion for power" below) as another major power source.

The first discussion, led by Sandia Director and meeting co-chair Tom Hunter, LANL Director and meeting co-chair Michael Anastasio, three US senators, Nuclear Regulatory Commission Chairman Dale Klein, DOE Assistant Secretary for Nuclear Energy Dennis Spurgeon, and a variety of others, examined solutions to the problem of maintaining control over nuclear material while attempting to spread its benign product — electrical energy — worldwide.

One approach to do this, speakers indicated, would be to have nuclear reactors in countries of every size — a chicken-in-every-pot approach — but with fissile material produced only in a few countries. Its disposition and transport would be carefully monitored and recorded. Thus, an increase in nuclear-driven electrical energy would be available worldwide with no increased nuclear weapons threat and no increase in greenhouse gases.

"It will take a global framework of all nations committed to control of nuclear technology to establish control over fissile material," Tom said.

"The US must have the capability to establish cradle-to-grave oversight of nuclear material," said the DOE's Spurgeon.

The process, supported by DOE and the Department of State under the GNEP (Global Nuclear Energy Partnership) program, also would bring America back into the business of building nuclear power plants — an industry that has languished in the US over the last three decades, though the US still has more working nuclear power plants than any other nation, several speakers said.

"The nuclear deterrent has been an enormous contributor to peace," said Tom, comparing the relative lack of bloodshed in the second half of the 20th century to the carnage of two world wars in the first half. Now, he said, "as a companion in an energy portfolio that includes solar, wind, and other technologies, there is extensive work needed . . . in the fields of nuclear plant improvement, nuclear safety, nuclear detection, and nuclear waste management."

DIV. 6000 VP LES SHEPHARD (right) was a panel member on a discussion about nuclear energy and nonproliferation, one of several topics addressed during the recent American Nuclear Society meeting in Albuquerque. Labs Director Tom Hunter, a co-host for the meeting, was also a speaker and member of a panel. (Photo by Bill Doty)

GNEP attempts to create a path around the well-understood problem that while nuclear-generated electrical energy is a good thing, some actors may be intent on using the civilian fuel cycle for illicit purposes. GNEP's goal is to continue to assure that civilian nuclear energy remains the most difficult path to illicit weapons development.

"There's no technological silver bullet that can be built into a reprocessing plant that will stop a country from converting it to proliferation use," said Spurgeon in an overview speech. "GNEP's plan [on the other hand] will reduce over time the excess stocks of processed uranium and deny access to fissile materials of nuclear mass."

Spurgeon advocated fuel recycling, promoted advanced nuclear reactor development, and suggested that international fuel cycle monitoring could be achieved by new bilateral or existing multilateral arrangements. Enrichment and reprocessing technologies could both be used in countries that are developed supplier states.

Said LANL Director Mike Anastasio, "There are pressures on our allies to develop [nuclear] weapons themselves as others proliferate. There are lowered barriers to technology transfer from rogue states."

"Yet," he said, in connection with the GNEP program, "there's a growing sense by the public of the value of nuclear energy. International safeguards are extensive, provided through IAEA, DoD, DOE, and sometimes directly by the labs." For example, counterterrorist agencies monitor nuclear materials moving around the world.

"Like any technology, nuclear technology has matured greatly," said Tom. "Its improved safety speaks well of industry and regulatory structures."

In an effort to intellectually decouple nuclear power and nuclear weapons, Spurgeon said, "Preventing the spread of commercial technologies doesn't stop the spread of nuclear weapons."

Former Sen. J. Bennett Johnston of Louisiana, who attended the meeting, said the new plan would require a method "to help small countries with nuclear power problems, since a nuclear problem anywhere is a problem everywhere." Johnston noted that one of the most critical US issues is the necessity of rebuilding the US global nuclear supply industry.

Sen. Pete Domenici, R-N.M., telecast from Washington, told the conference audience that the times now are on "the cutting edge of the renaissance of nuclear power, alive and kicking, for the world."

Nuclear, he said, is "doing very strongly around the world, with Japan, China, and India ordering power plants. [Meanwhile] America sits here in a strange position for us, with — until recently — nothing going on. With passage of a bipartisan act, there are now 31 planned applications for new nuclear power plants, and extensions requested on older plants. There's a feeling of a new nuclear power horizon."

Sen. Jeff Bingaman, D-N.M., in the same telecast, mentioned new authority for loan guarantees, as well as production tax credits for power produced from new reactors, in the recently passed Energy Act.

Nuclear fusion for power

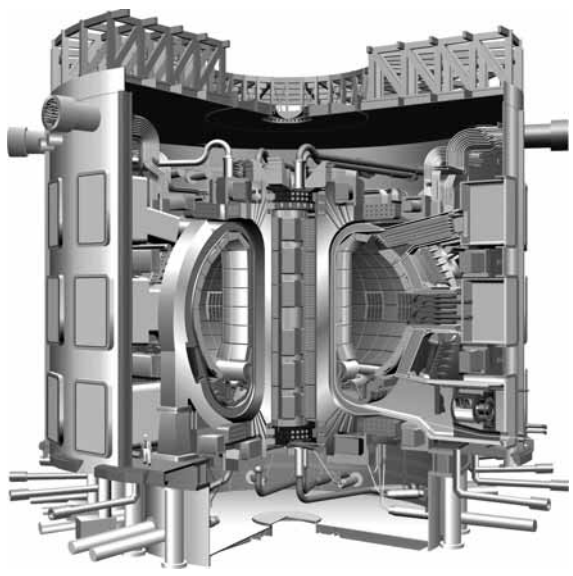
What's the current state of the art in fusion quest?

By Neal Singer

The afternoon of the ANS meeting (see story above) also featured the start of the 17th topical meeting on the technology of fusion energy, led by Sandia Senior Scientist Craig Olson as the session's General Chair and Gary Rochau as the Technical Program Chair.

Because fusion technologies are not yet mature, presentations that briefly demonstrated five alternative methods unavoidably resembled something of a fashion show, with one hopeful (fusion) model following the next. The series included major players like the $12 billion international ITER project (magnetic confinement of an ionized gas), Lawrence Livermore National Laboratory's currently $3.1 billion National Ignition Facility (laser beams compressing a pellet either directly or by generating X-rays to do the job), and Sandia's Z machine (electrically generated X-rays compressing a pellet), as well as darker horses like the ARIES-CS power plant study and HAPL programs. The Z machine, modified from an earlier version called PBFA at a cost of $12 million 11 years ago, is currently undergoing a $60 million modernization.

Standard-bearers of the different methods were all in the same room, instead of speaking only to those researching the same project.



ARTIST'S RENDERING of ITER device in cross-section. (Published with permission of ITER)

An advantage of this format for onlookers was that standard-bearers of the different methods were all in the same room, instead of speaking only to those researching the same project, in rooms as separate as the alternative universes of string theory.

The ITER international project — formerly known as the International Thermonuclear Experimental Reactor, the acronymic explanation now vanished for marketing reasons — was described by David Campbell; the US ITER effort out of Oak Ridge was described by Ned Sautoff. What was clear from the talks is the immense difficulty of coordinating so many scientists from so

(Continued on next page)

Fusion

(Continued from preceding page)

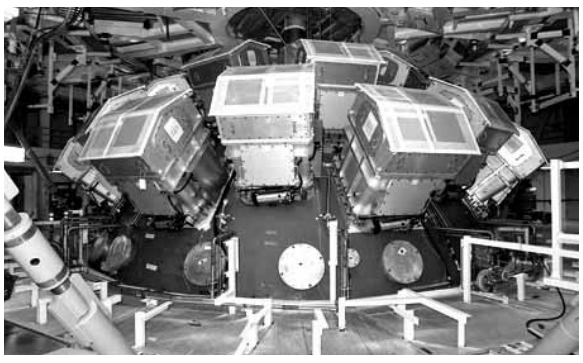
What was clear from the talks is the immense difficulty of coordinating so many scientists from so many countries on so large and expensive a project [ITER].

many countries on so large and expensive a project. There were uncertainties about "international need dates" for US components, and uncertainties about the contents and availabilities of internationally provided component specifications and requirements.

Said Sautoff, "There are design baselines, procurement agreements, code standards, and host regulations by which we must abide. There are uncertainties about the drivers of US cost linked to subcomponents of other parties. There are questions about responsibilities for costs if the regulatory environment by the host (France) gets worse."

Also, he said, there are cultural problems. For example, he said, "Contingency funds common in the US are not looked upon favorably by European politicians [who see them as a potential boondoggle]."

Still, other scientific projects have faced such problems, if not on so massive a scale. The recently funded project is still clearing its construction site and putting in roads and utilities, with "an ambitious goal of first plasma by 2016" and ultimate result of producing 10 times more power than injected to sustain it, said Sautoff. This would be about 500 megawatts of fusion power for hundreds of seconds.



NIF target chamber. (Photo courtesy LLNL)

Ed Moses at LLNL described **encouraging progress on NIF**, with a small number of the ultimate 192 laser beams operating. Driving toward fusion energy, the flashlamp-pumped neodymium glass lasing medium in NIF would have to be replaced with a diode-pumped ceramic lasing medium to raise electrical/optical efficiencies considerably to be viable for economical energy.

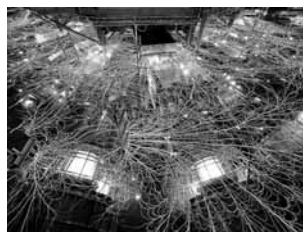
ARIES Compact Stellerator
(Image courtesty of U of Wisconsin System)

The ARIES-CS compact stellarator would be a power plant similar in size to advanced tokamak power plants, but a two to three times reduction in currently projected size is needed. The manufacturing of complex shapes and geometries is expensive and difficult, the speaker noted, leading one questioner to wonder whether the method was not a deadend.

The HAPL (High Average Power Laser) program, which uses repetitive efficient lasers to produce fusion, got a spirited, positive description from John Sethian of the Naval Research Laboratory. This laser inertial fusion energy (IFE) program uses direct drive, rather than indirect-drive with a "hohlraum." The HAPL program is investigating both electron-beam-pumped krypton fluoride lasers and diode-pumped solid-state lasers as efficient repetitive drivers for laser IFE.

HAPL is a coordinated, focused multilab effort to develop the science and technology for laser inertial fusion energy. (Photo courtesy UCSD)

The home team bats last. Craig Olson described the **Z-pinch inertial fusion energy program** that extends the single-shot ICF (inertial confinement fusion) capability of Z to a repetitive, high yield,



SANDIA'S Z machine
(Photo by Randy Montoya)

power plant scenario for IFE. The extensions include the use of recyclable transmission lines; linear transformer driver technology, more compact and efficient than the Marx/water line technology used on Z/ZR; and a thick-liquid wall chamber. This path to fusion energy may be relatively rapid and relatively inexpensive, Olson speculated.

Much has been written about Z in the *Lab News*. In its unrenovated version, it produced neutrons — evidence of fusion — three years ago, and new improvements, slated for completion in mid-2007, should produce more spectacular results.

Labs embarks on phone system upgrade

By Erin Gardner

The Sandia/New Mexico telephone system is being upgraded to improve service and enhance system maintainability. The upgrades will change the way Sandia phones are used, including the way phone numbers are handled.

As a result of the system upgrade, there will be a new way to access telephone system services such as call forward, speed dial, and other special capabilities. The change will largely affect analog phone users (i.e. those using Nortel and Panasonic phones) who need to request services by making specific entries on the telephone keypad. There should be minimal impact on ISDN phones (Lucent/AT&T and Tone Commander phones) since most services are accessed with a single feature button on the phones. These changes will affect faxes and modems if call forward, transfer, and similar capabilities are used.

Generally, the upgrades are intended to make Sandia phones look like any other phone on the national telephone network. Thus, calls between Sandia phones still only require seven-digit dialing. The familiar 844-, 845-, and 284-XXXX prefixes continue unchanged. A new prefix (283-XXXX) will be added shortly for new lines. Local calls to the Albuquerque area will require just a seven-digit call with no need to dial "7" to reach an outside line.

The long distance call procedure will change. Any call outside of the local Albuquerque calling area will require an area code and phone number (1+10-digit dialing). This includes Los Alamos and Sandia/California, which could formerly be called with a standard seven-digit number. The goal is to make Sandia telephones work like home phones. Users should not have to stop and think which phone they are using and remember how to dial a call.

The upgrades are also designed to improve the responsiveness of the "9-1-1" system. One of several agencies (Sandia, Kirtland Air Force Base, or Albuquerque city services) could respond to an emergency call depending on the location of the emergency. The new system routes emergency calls to the appropriate emergency responder based on location information stored in the system for each line. This is especially important to off-site Sandians, such as Sandia Science & Technology Park offices, where emergency calls must be directed to Albuquerque emergency services without an intermediate intervention by the Sandia Emergency Operations Center. The need to remember to dial the "7", then "9-1-1" to reach Albuquerque emergency services is eliminated. Users should not notice any differences in handling on-site emergency calls.

Changeover to this new dialing system is scheduled to begin early this year and continue until the middle of 2007. Changeover will be done in groups; the entire laboratory will not be changed to the new system in a single move. Each group will be notified before their phones are changed to the new system, and instructional materials about using the new system will be provided. The old dialing system will continue to work as it has always done and should be used until users are advised they are moved to the new dialing system.

Information and instructions for using the new dialing scheme, as well as a FAQ list, will be published soon on the Network Systems Design and Implementation Dept. 4334 webpage.

Feedback

EXTREMELY frustrated reader bemoans United Healthcare service, responsiveness

Benefits team says it's working with UHC to identify, correct problems

Q: *I have had horrible service from our new health care insurance managers, United Healthcare. I have spent hours and hours on the phone attempting to resolve issues, which took only minutes with our old managers, Mutual of Omaha.*

Why was this switch in health care insurance managers made? If it was for cost savings, I sure hope that the savings were significant because the degradation in service has also been significant and EXTREMELY frustrating.

Is there any chance that Mutual of Omaha will/can be re-awarded our contract in the near future?

A: The change from Mutual of Omaha to UHC came about as a result of a competitive bid process. Using the procurement best value approach (which is based on both technical capability and price) UHC won the contract. In addition to cost savings (both lower administration fees and better network discounts), UHC offered better reporting capabilities, an integrated approach to care management, member access to resources/tools such as NurseLine, member access to specialty programs such as the Cancer Resources Services Program, and member access to their Premium Designation Network providers who have demonstrated quality and efficiency. The Benefits Department recognizes that the transition to UnitedHealthcare (UHC) has been a challenge for our employees and retirees. Both Sandia and UHC are working hard to identify the operational issues and resolve them as quickly as possible. Our joint goal is to ensure that the plans operate efficiently.

— Linda Duffy (0333)

THE MILLION YEAR GUARANTEE

Sandia takes lead lab role in developing post-closure assessment of Yucca Mountain nuclear waste repository

Sandia's 'determined and dedicated' Yucca Mountain team up and running

SANDIA'S YUCCA MOUNTAIN TEAM gathers for an all-hands meeting in Las Vegas. Project Manager Andrew Orrell is near center of photo in the bright blue shirt. (Photo by Chris Pflum)

It was the first Tuesday in October and Andrew Orrell worried that it was going to be a tough audience. The senior manager for Sandia's Yucca Mountain Project office in Las Vegas (6780) and his staff of about 175 had spent the weekend moving into or readjusting to space in three buildings in the Summerlin area of Las Vegas. Now they were assembling for their first official all-hands meeting with Sandia as the lead laboratory for repository systems under the DOE Office of Civilian Radioactive Waste Management (OCRWM).

PROJECT MANAGER Andrew Orrell addresses his team during a recent Lead Lab all-hands meeting. (Photo by Chris Pflum)

The team included new employees, veterans of Bechtel SAIC (the project's M&O contractor), a number of relocated Sandians from Albuquerque, employees of Los Alamos and several other national laboratories. It also included a core of Labs employees in Las Vegas who were already at work on the mammoth project in Sandia's previous role as one of several research institutions supporting the project.

Looking out at the expectant faces, Orrell launched into his talk — the official inauguration of Sandia's role as lead laboratory. "The idea was to simultaneously introduce the management team, discuss Sandia culture and our business systems, and review management expectations and the current status of our effort to prepare the license application," Andrew says.

At meeting's end: "It was clear our workforce is a determined and dedicated group. I got a lot of feedback saying they appreciate the importance of the mission we have and they like the empowerment they get from Sandia and our management team."

New era

With that, a new era at Yucca Mountain was off and running. Says Andrew, "It's an excellent mix of people spanning Yucca Mountain, WIPP, and nuclear industry experience, with individuals from Sandia, subcontractors, and other national labs in staff or lead management roles. We created a team with the intent of bringing the right people to the right job in a way that's largely transparent as far as who the actual employer is."

Although the current effort — to provide a defensible license application to the Nuclear Regulatory Commission by 2008 — may be as fraught with challenge as previous efforts, the new team is forging ahead, Andrew said in a recent *Lab News* interview.

Following a January 2006 announcement in Washington that Sandia was to become the OCRWM's Lead Laboratory for Repository Systems, Andrew and other managers at Sandia had nine months to develop and put a transition plan in place. "That was very useful for us to put our business and management systems in place," Andrew says. "But we didn't get a lot of time to exercise these systems in the real world, so during the first few weeks we've had some expected — and some unexpected — bumps. These are mostly things we have to modify to accommodate unique project requirements."

Cindy Huber (4538), Jerry Esch (4520), and John Zepper (4320) are working on the information technology transition issues for the site, including a shared systems agreement with Bechtel to bridge the gap until early this year, when Sandia's own network will be fully operational. The large workforce, distributed around the world, needs a collaborative cyber environment, now nearing completion. (See 'Tailoring Sandia IT' on this page.)

"We were able to reach back into the corporation and get the systems and support we needed to make the Las Vegas office a full-fledged office for Sandia," says Andrew.

License application

Can Sandia manage the delivery of a "credible and defensible" license application for Yucca Mountain to the NRC by June 30, 2008? "Our position is that it has to be done and that we can do it," says Andrew. "There are numerous technical and political challenges besetting the project, as there have been in the past, but there is a strong sense we can, we have to, and we will do it."

Sandia is responsible for "about half" of a 7,000-page license application. The application has a preclosure design, engineering, and operations section, which is the responsibility of Bechtel-SAIC. The long-term performance section, called the post- closure performance assessment will be Sandia's contribution. The term "post-closure" spans the time when Yucca Mountain operations cease, in 50 years or so, up to one million years out.

Recent regulation changes have pushed the post-closure timeframe from 10,000 years to one million years. "The license application and underlying technical basis must take into account all of the significant physical processes that could affect the repository system for a long, long time," says Andrew.

To do this requires the documentation of technical analyses, field data, testing, and modeling/simulation work — all integrated into a final product called the post-closure performance assessment. Sandia's business and management systems underpin the entire technical effort, providing quality assurance, project management, and other support functions.

The performance assessment technical basis effort, managed by Kathryn Knowles (6781), is supported by hundreds of workers from Sandia, subcontractors, other national labs (principally Los Alamos, Lawrence Livermore, and Lawrence Berkeley national laboratories), the US Geological Survey, consultants, and universities. Andrew's rough "member of the workforce" calculations show that the project actually involves contributions from more than 600 people, or about 350 full-time equivalents.

As an example of the work involved, consider the project's approach to the waste packages that will hold the spent-fuel rods beneath Yucca Mountain. The large corrosion-resistant steel containers will be exposed to an evolving environment, with thermal, chemical, and hydrological aspects. Researchers need to assess and predict how long these containers will last before they corrode and what the consequences of breached containers might be.

"Kathryn and her team have to take into account the nominal environment as well as possible disruptive events such as volcanic or seismic activity," says Andrew.

"This requires multidisciplinary expertise involving math and science, engineering, software, field and lab testing, as well as business systems and quality engineering specialties," Kathryn says.

"All the supporting data and models developed over the years by numerous participants are then integrated in a total system performance assessment, which tells us if we comply with the regulations the NRC has set. It's very analogous to what we did at WIPP; and that's one of the reasons we have been asked to manage here," Kathryn says.

Once all the performance assessment work is done, it must be captured in the license application document. Tito Bonano (6783) has the job of compiling the license application safety analysis reports. "The license application, and its defense in licensing hearings before the NRC, will be the culmination of three decades of technical work," Tito says.

"We are working closely with our counterparts at DOE and Bechtel," Tito adds, "to produce a license application that is truly credible and defensible in a rigorous and demanding regulatory environment."

"We know the work and we have the most relevant management experience in performing and managing work to support the regulatory process," Andrew says. "There are many talented technical people available, but few have managed a repository process of this type. DOE has asked Sandia to assume this responsibility and we look forward to successfully bringing that experience to bear on the project."

Tailoring Sandia IT systems for the Yucca Mountain effort

John Zepper, Jerry Esch, and Cindy Huber have accepted a real information technology challenge: working with the new Las Vegas office to adapt corporate systems to the demands of Sandia as lead laboratory for the Yucca Mountain Project.

"We are trying to use existing systems where possible, rather than duplicating or reinventing the wheel," says John, senior manager in Computing Systems and Technical Integration Dept. 4320.

The site at Las Vegas has presented numerous challenges to the leaders and staff working on the project.

"The Las Vegas site is a lot more collaboratively based and we have to move our existing applications into that collaborative environment," says John. Cindy, a technical staff member from Enterprise Database Administration Dept. 4538, has been traveling to Las Vegas weekly for the past several months. She acts as the forward point, working to understand the site's IT requirements. The rest of the team then works to deploy those requirements in existing or new IT systems.

TOBY LaFAVE, a Sandia contractor, works on Las Vegas office network. (Photo by Tim Spears)

The team is adapting SharePoint to allow researchers to collaborate on scientific documents and share information, says Cindy. It also allows discussions outside of email using discussion boards and provides a document versioning and a check-in/check-out function. Sandia's familiar training program, TEDS, will also be used in Las Vegas, along with the addition of some specially designed scientific courses.

"People must be appropriately trained to do the quality work needed to support the license application," says Cindy. As a result, multiple classes designed specifically for Yucca Mountain will be added.

To allow the Las Vegas staff access to Sandia business policies, the team created a special category, allowing Yucca Mountain staff access to the business rules, but restricting other data. "We have a significant number of foreign nationals and that is combined with the fact that we have 200 staff members in Las Vegas, a sizable workforce in Albuquerque, and another 300 to 500 at other labs, colleges, and institutions. All of them need access for the work they need to do," says Cindy.

The team is addressing various configuration management applications, project management software, and a new Lead Lab Connect Website (deployed to show Sandia's presence as lead.) Sandia is working on an analysis of an existing technical data management system and will submit a proposal to redevelop that system next year.

The team is working on a new people management application to help cope with extensive reporting requirements at the site required by DOE's Office of Civilian Radioactive Waste Management. Another proposal addresses a video conferencing capability, critical to the collaborations that are hallmarks to the project. "As our Sandia IT presence here expands, people are contacting us regularly with new requests for IT support," says Cindy.

Sandia will unveil a new computer network at the site this month. In addition to deploying the Sandia common operating environment, Sandia will be staffing three to four full-time desktop support positions in Las Vegas. "The schedule is happening very quickly," says John. "It's a very tight schedule and there's a lot to be done."

Also helping on the IT team are: Steve Gossage (4336), Susan Sackinger (4343), Tim Spears (4334), Phil Cox (4329), and additional staff across Sandia networking, desktop, server, cyber security, application, and database organizations, with involvement from application development groups in Division 6000 as well.

Stories by Will Keener
Lead Lab logo by Nanci Easter

THE LAS VEGAS MANAGEMENT TEAM and its key functions include: Tito Bonano, Licensing; Frank Hansen, Performance Confirmation and Experimental Strategy; Cliff Howard, Engineering Systems; Kathryn Knowles, Performance Assessment; Stephanie Kuzio, Natural Systems; Jerry McNeish, Total Systems Performance Assessment; Andrew Orrell, Program Director; Tom Pfeifle, Disruptive Events; Patrice Sanchez, Business Operations; Ray Shaum, Technical Support; Ron Stevens, Quality Assurance; Peter Swift, Chief Scientist; Jack Tillman, Operations Deputy; and Doug Weaver, Test Coordination.

62 Sandians move into Distinguished, Senior ranks

Divisions announce DMTS, DMLS, DTNG, DASA, Sr. Scientist/Engineer appointments

Sandia's special appointments represent employees from all areas of the Labs' operations: Senior Scientist/Engineers, Distinguished Members of Technical Staff, Distinguished Members of Laboratory Staff, Distinguished Technologists, and Distinguished Administrative Staff Associates. Sixty-two Sandians were honored with special appointments in 2006.

According to Corporate Process requirement documents, "Placement in the Distinguished Level signifies a promotion to the highest level of the Technical Staff, Laboratory Staff, Technologist, or Administrative Staff Associate Ladder. This level is different from the other levels in that it is subject to a 10 percent population limitation to preserve the distinction of the level."

Traditionally, one of the Labs' key "total rewards" incentives has been the quality of the folks who work here. Being able to offer prospective employees the opportunity to work with the most highly regarded people in their fields is a powerful recruiting tool. The individuals pictured here represent the world-class quality of the Labs workforce at its best.

Appointments offer alternative career paths

Employees selected for the new levels have been recognized with a special plaque and a nonbase salary award, in addition to this special mention in the *Lab News*.

The Distinguished and Senior levels are part and parcel of the Integrated Job Structure (IJS) goal of providing multiple career paths for employees. The IJS's dual-track structure — management and staff — makes it possible for employees to advance in salary, prestige, and recognition without following a management track.

As has been its tradition for many years, the *Lab News* presents photographs of Sandians who have received special appointments this year.

DMTS — Distinguished Member of Technical Staff
DMLS — Distinguished Member of Laboratory Staff

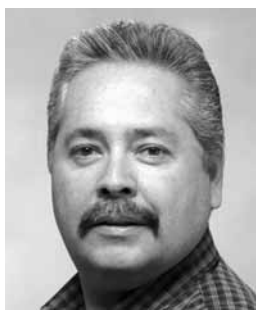
Janet Ahrens (6753)
DMTS

Charles Andraka (6337)
DMTS

DASA — Distinguished Administrative Staff Associate
DTNG — Distinguished Technologist
Sr. Sci/Eng — Senior Scientist/Engineer

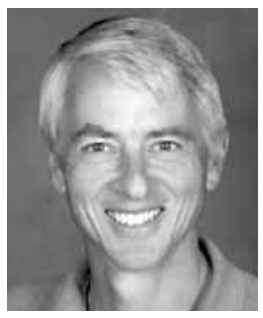
Carol Ashby (11501)
DMTS

Tad Ashlock (5724)
DTNG

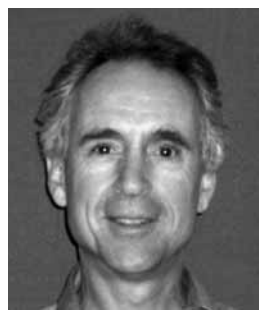


Lonnie Atencio (4241)
DTNG

Tom Atwood (5711)
DMTS

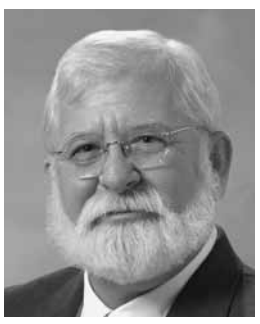


Robert Barlow (8351)
DMTS



Richard Beauheim (6712)
DMTS

Dante Berry (2123)
DTNG



Martin Carr (5932)
DMTS

Sheila Carr (4544)
DMTS

Manuel Contreras (2123)
DMTS

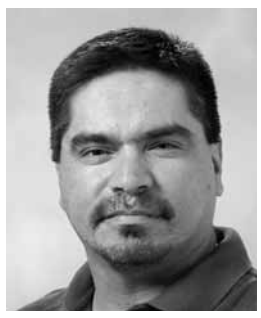
Wayne Einfeld (6364)
DMTS

William Engleman (2996)
DTNG

Kenneth Eras (2617)
DMTS

Scott Faas (8244)
DMTS

Rhonda Fraser (2953)
DASA



Christopher Gallegos (5353)
DTNG

Richard Garcia (5050)
DMLS

John German (3651)
DMLS

Russell Goebel (4324)
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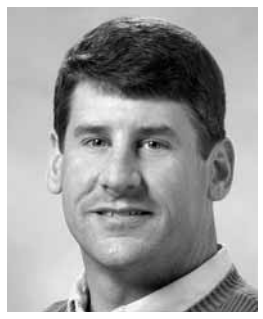
Gilbert Gonzalez (5434)
DTNG

Steven Goods (8758)
DMTS

Robert Graham (2542)
DTNG



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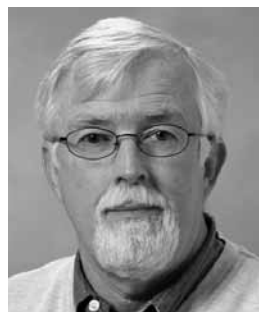
DMTS



Arthur Grimley III (12117)
Sr. Sci/Eng

62 Sandians move into Distinguished, Senior ranks

Divisions announce DMTS, DMLS, DTNG, DASA, Sr. Scientist/Engineer appointments


Charles Grosso (12830)
Sr. Admin


Ann Gutierrez (6030)
DASA


Ed Henry (5932)
DTNG


Yvonne Hodges (12126)
DASA


Cynthia Huber (4538)
DMTS


Dean Jones (6323)
DMTS


Gene Kallenbach (5935)
DMTS


Jeff Kern (5712)
DMTS


William Kerschen (5923)
DMTS


Loula Killian (6032)
DASA


Dahv Kliner (8368)
DMTS


Timothy Knewitz (12117)
Sr. Admin


Rick Kominek (5746)
DMTS


Kurt Kunzler (2663)
DMTS


Carla Lamb (10800)
DTNG


Rochelle Lari (3512)
DMLS

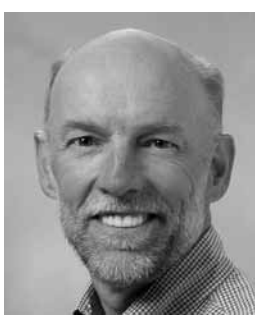

Laura Latoma (4242)
DASA


Nancy Linarez-Royce (10314)
DMTS

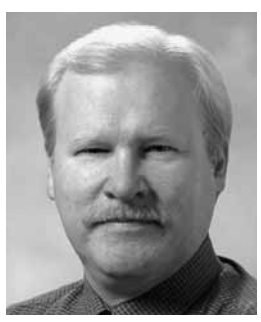
DMTS — Distinguished Member of Technical Staff
DMLS — Distinguished Member of Laboratory Staff
DASA — Distinguished Administrative Staff Associate

DTNG — Distinguished Technologist
Sr. Sci/Eng — Senior Scientist/Engineer


Saundra Lormand (8944)
DMLS


Thomas Mayer (6316)
DMTS


Kevin Murphy (9104)
DMTS

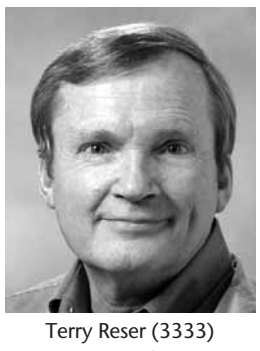

John Naegle (4336)
Sr. Sci/Eng


Judy Neff (5924)
DMLS


Rick Ormesher (5354)
DMTS


Hans Papenguth (2522)
DMTS


William Plummer (4225)
DMTS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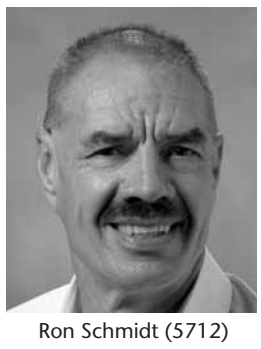
DMLS


Ron Schmidt (5712)
DMTS


Georgianne Smith (3550)
DMLS

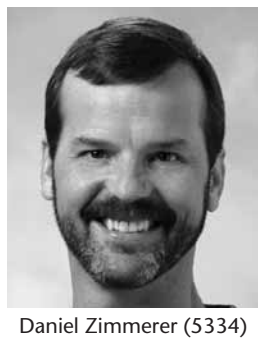

Amy Tapia (3652)
DMLS

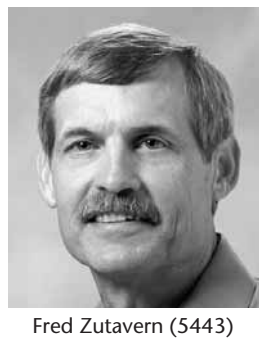

Bruce Thompson (6342)
DMTS


Mary Beth Tidwell (10534)
DMLS


Palmer Vaughn (6783)
DMTS


Joyce Zamora (4312)
DTNG


Daniel Zimmerer (5334)
DTNG


Fred Zutavern (5443)
DMTS

Digging his roots: Sandia retiree Ron Hill named a fellow of American Society of Genealogists

Retiree Ron Hill has been elected a fellow of the American Society of Genealogists. The Society consists of a maximum of 50 fellows, elected on the basis of their genealogical writings. Since retirement, Ron has published three genealogical books and fifteen papers in national genealogical journals. Additionally, he was awarded the Jacobus Prize, a prestigious genealogical award, for his book, *The Tumultuous Achym/Fulford Relationship*.

"I have been busy," Ron says.

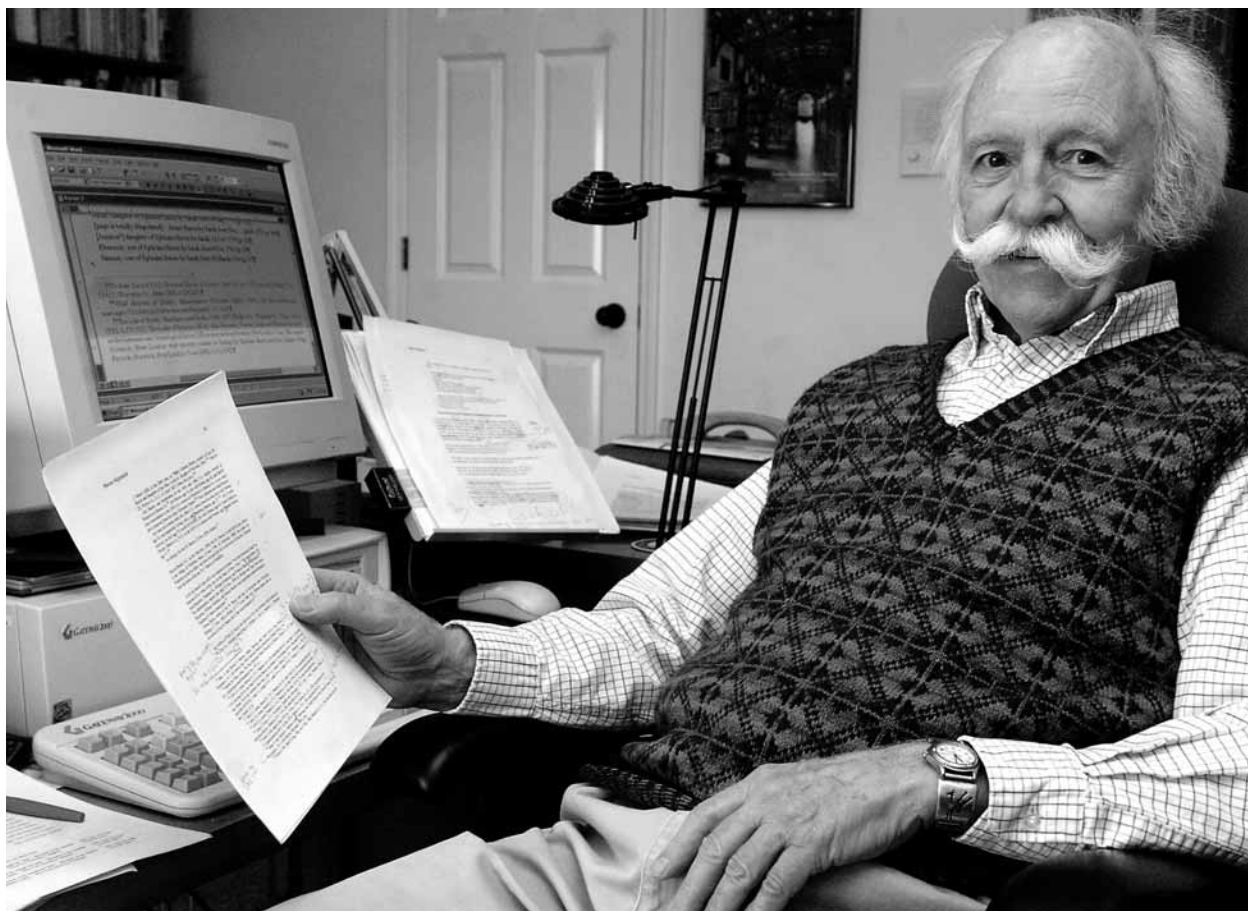
Ron, who during his years as a physicist at Sandia was quite adept at unraveling mysteries, has become equally adept at puzzling out the mysteries of his own heritage.

Has Ron discovered any particularly interesting ancestors during his 35 years of research?

"You bet!" he says. "Nicholas Hill, my ninth great-grandfather, married Rose Bull in London, 1573. Her father, John Bull, a citizen and mercer of London, was appointed comptroller of the Royal Mint in 1560. He and the assaymaster, one William Humphrey, pulled off the first robbery of the Mint in 1565. The investigation of the robbery is documented in State Papers Domestic. John returned the £400 — that's £200,000 in today's money — but languished in the Tower of London until his death in 1567."

Then there was one Thomas Achym, Ron's ninth great-grandfather, circa 1601.

"On learning his steward had renewed one of his leases in the name of the sheriff of Cornwall," Ron recounts, "Achym chased his steward out of the parish on horseback and killed him with his sword. He fled to France, and the sheriff confiscated all of Achym's property.



RON HILL has been researching his family background for 35 years. (Photo by Mike Vogt, Idaho Press-Tribune)

While in France, Achym discovered a plot on Queen Elizabeth's life. He wrote to Lord Cecil, warning of the peril [Ron actually has a photocopy of the letter] and mentioned his predicament. Buller, the sheriff, was forced to return Achym's goods, Achym was pardoned, and returned to his estates. Thomas Achym married a sister of Sir Francis Fulford of Great Fulford in Devon. The Fulfords have a royal line from Thomas of Woodstock, youngest son of Edward III."

Closer to home, Ron says, his grandmother Carrie (Denison) Hill is a descendant of William Brewster of the Mayflower.

"One of the joys of historical research," Ron says, "is that one never knows what surprise awaits right around the corner."

— Bill Murphy

Feedback

Does GPA count for more at Sandia than years of experience and professional accomplishments?

Q: *Why are grades someone earned 10 years ago more important than the work performance during the last 10 years?*

In the last several years, Sandia has decided that unless someone has an undergraduate GPA of 3.2 or better, they cannot be hired unless the Executive VP is willing to make an exception to our self imposed GPA rule. Many of these individuals attended graduate school and excelled, earning a GPA that well exceeds our self-imposed graduate school GPA of 3.5.

I know of several cases where we have had individuals working as LTEs for up to six years doing essential laboratory work. During these six years, these individuals have performed in an exemplary manner. Their line managers have felt that they would be excellent Sandia employees. However, when the line managers request that they be hired as a regular Sandian, their VP is unwilling to take an exception to the Executive VP. The work they are performing still needs to be done. In one case, the employee was told that after a break in service they could be hired as a contractor to continue doing their work. How sound is this business decision?

In other cases, Sandia has had the opportunity to bring in people with 15 years of experience performing work that is essential to the lab. Again, because this person did not meet our self-imposed undergraduate GPA rule, a hiring package could not be offered without an exception from the Executive VP.

I completely understand the use of this type of screening tool for individuals who do not have any work experience and therefore no track record. To use this as a screening tool for someone who has been in the working world with an excellent work track record seems arbitrary. There are some people who have 4.0 GPAs who make lousy employees.

I know several Sandians who today would not meet the self-imposed GPA rule. These individuals are high performers. Some are currently managers or project managers of multimillion dollar projects. In today's environment they probably would not have been hired. Has anyone evaluated the performance of the individuals currently at the Labs with GPAs below 3.2? Is there a problem with their performance? Is this the driver of our GPA rule?

I understand that we are trying to hire the best and the brightest. Are there any documented studies that show that an undergraduate GPA is really a good measure of selecting the best and the brightest? Could we be closing the door to some very talented people? I wonder if Bill Gates or Steve Jobs would meet our hiring requirements.

A: Because Sandia is tasked by the Federal government, thereby the citizens of our country, to address technical issues of increasingly great importance to our national interests, it is imperative that Sandia acquires the human talent to meet this ever-growing responsibility.

Sandia is assessed by the funding agency on the quality of our hires. One measurement of this assessment is GPA. Academic excellence is generally indicative of various attributes valuable in the workplace; i.e., work ethic, professional maturity, leadership potential, and commitment to excellence. Similarly, Sandia's reputation for superior technical work is of utmost importance to its external customers. This reputation is a result of a rich history of technical excellence by highly qualified and dedicated Sandia employees.

Because Sandia is committed to continued education of its employees, hundreds of thousands of dollars are spent annually in support of the One-Year-on-Campus, Special Masters, and the Doctoral Studies Programs. Again, it is important that the employees participating in these programs evidence their ability to first be accepted into the top graduate schools in the country and second successfully complete the program, providing a return to Sandia and the DOE on that investment.

Your statement that a number of employees with less than the corporate minimum GPA requirements are already very successfully performing essential work to the Labs is very true. There are candidates with skills and experience who also may not meet the GPA requirements, but because of their considerable professional background are very desirable to mission projects. It is for those reasons that an exception process is available to line managers to seek approval to hire.

— BJ Jones (3500)

Recent Retirees

New Mexico photos by Michelle Fleming

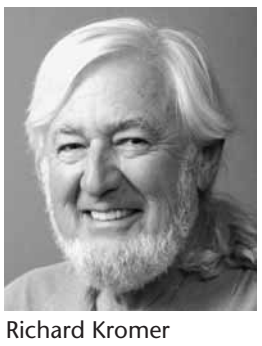

James Kobs
44 5743


Richard Rogers
42 10510


Ken Varga
39 2613


Ruth Varga
25 4232


Dan Talbert
41 5413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Douglas Smathers
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Marcus Bunting
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Paul Hatch
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Kathleen Hatch
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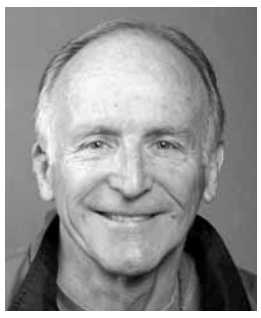
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Roger Goode
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Robert Hardy
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Jim Van Den Avyle
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Bill Camp
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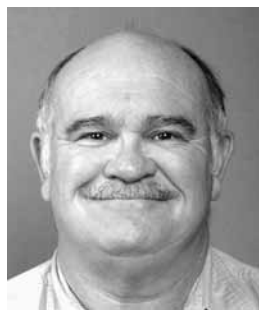
Robert Cox
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Randy Swier
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Al West
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Celestino Casaus
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John Lanoue
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Robert Axline
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Thomas Hinkebein
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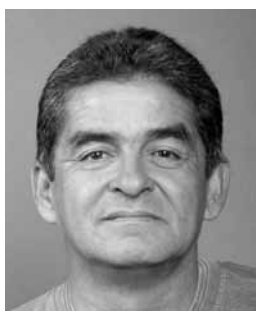
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Dennis Bolton
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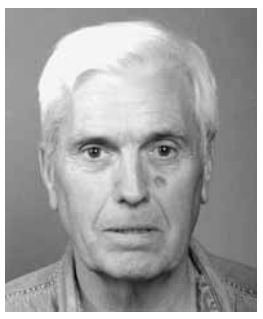
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Paula McAllister
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Merle Benson
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Lee Dubes
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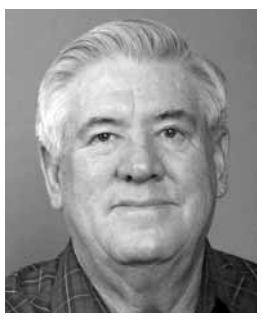
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Lewis Roach
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John Macha
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Olin Bray
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Don Flores
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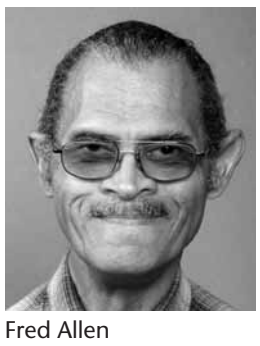
Fred Allen
16 2993

Mileposts

(More Mileposts on next page)

New Mexico photos by Michelle Fleming


Daniel Stump
15 4241


Patrick Xavier
15 6344


Steve Yesner
15 5020

Mileposts

New Mexico photos by Michelle Fleming


Randall King
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Douglas Weaver
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Raymond Decker
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Carolyn Bucklen
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George Davidson
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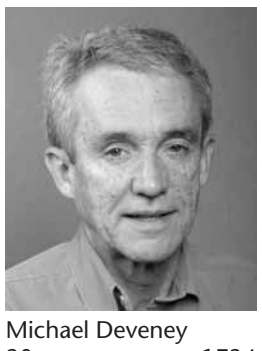
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John Fuller
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Richard Heintzleman
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Richard Knudson
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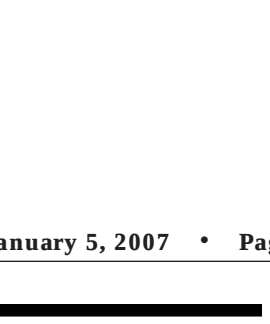
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Mark Rumsey
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David Sealey
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Kathryn Sedlacek
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Dixie Harvey
25 6765


Paul Smith
25 10861


Robert Watson
25 11501


Red Jones
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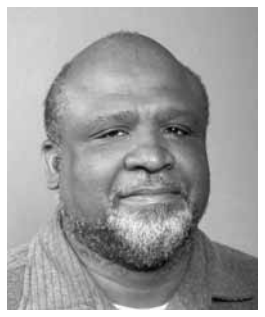
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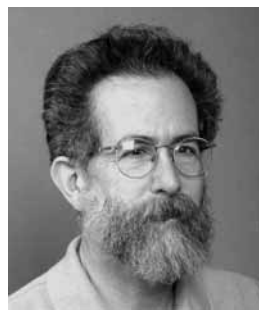
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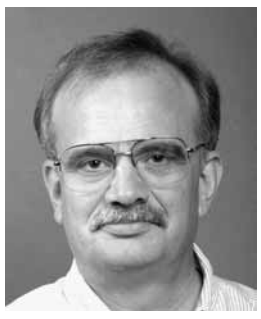
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Paul Vianco
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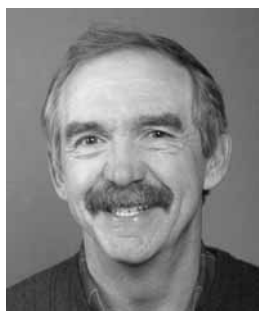
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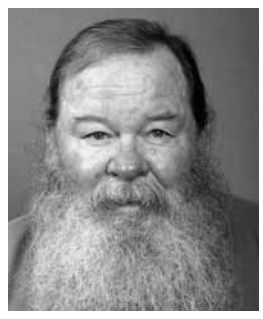
Warren Lewis
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Walter Lucero
15 4211


Larry Luna
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Jim Miller
15 1815


Miriam Minton
15 6442


Stephen Montague
15 5624


Dwight Stockham
15 6790

In-state tuition benefit has some Sandians, dependents saying 'Hook 'em Horns'

MOU with UT makes Sandians eligible for resident rates

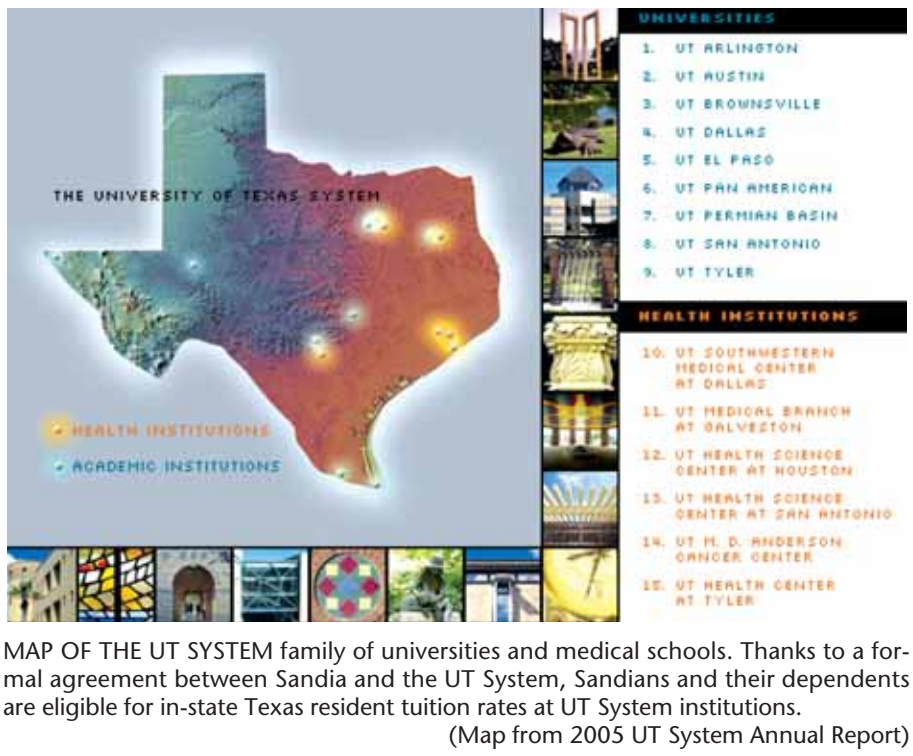
By Julie Hall

New Mexico native and college freshman Natasha Moonka is now a Texas Longhorn, thanks to an agreement between Sandia and The University of Texas System that makes her eligible for resident tuition rates. After thoroughly researching and applying to a number of schools, Natasha chose UT-Austin for its "rigorous academia" and the out-of-state tuition waiver.

"The in-state tuition is probably the reason I am at UT. My parents made me apply because of the waiver, but the decision to accept was all mine," says Natasha, daughter of Ajoy Moonka (2740) and Sunita Moonka (4519). "I figured you can't really beat a deal like this with a school like UT."

About a dozen Sandians and dependents of Sandians are currently benefiting from the tuition waiver established through a memorandum of agreement between Sandia and The UT System. The MOU, which became effective in September 2005, makes Sandia employees and their families (spouses and children) eligible for the in-state tuition rate at any of The UT System's nine university campuses and six medical schools. Prospective students must still apply for admission to their campus or institution of choice.

The MOU also calls for UT to conduct an independent peer review process for Sandia's science, technology, and engineering foundations and to jointly develop and implement "strategic program areas that enhance" Sandia's broad missions in national security.



MAP OF THE UT SYSTEM family of universities and medical schools. Thanks to a formal agreement between Sandia and the UT System, Sandians and their dependents are eligible for in-state Texas resident tuition rates at UT System institutions.
(Map from 2005 UT System Annual Report)

THE UNIVERSITY OF TEXAS-EL PASO Undergraduate Learning Center. UTEP is one of many UT System schools for which Sandians qualify for in-state tuition. (Image from 2005 UT System Annual Report)

By comparison, resident tuition for the same number of hours this fall at the University of New Mexico was $2,167.

For Lauren Huelskamp, daughter of Bob Huelskamp (6722), the tuition benefit played "a large role" in her decision to attend UT-Austin's McCombs School of Business.

"The McCombs School of Business is ranked number five in the nation so I jumped on the opportunity to go there and save money for the future by paying in-state [tuition]," Lauren says.

Still in her first semester, she plans to major in accounting and Spanish, with a minor in international business. Her roommate, Katie Corbett, also has a nonresident tuition waiver through her father David Corbett (2900).

While Anna Tachau says her parents "were grateful" she chose a UT school, her decision was based solely on researching and visiting the campus and various other schools. Her father is Rob Tachau (1512).

The happiest students

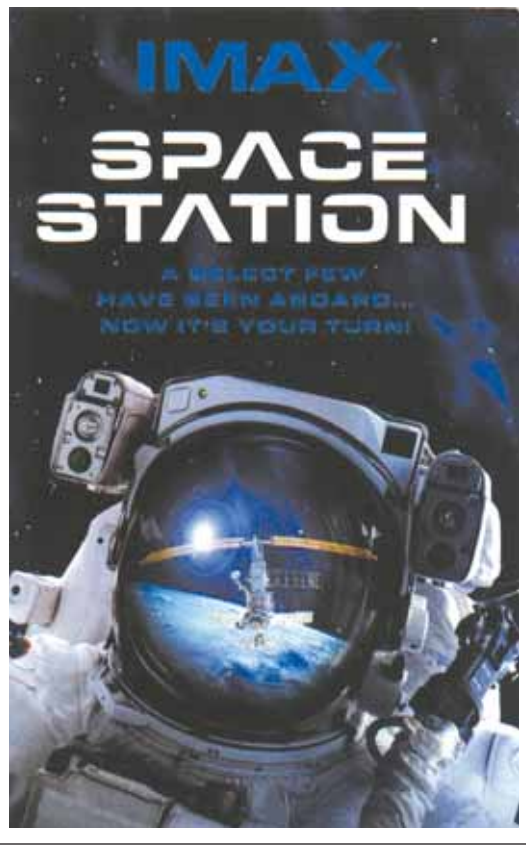
"UT seemed to have the happiest students and for civil engineering, it's the third or fourth best school in the country," she says. In addition to majoring in civil engineering, Anna intends to continue her Chinese language studies for a minor and complete a business foundation certificate at UT-Austin.

Several Sandians are also attending UT-Austin through the One Year On Campus or Sandia Doctoral Studies programs. While Sandia picks up the tab for their tuition, the waiver saves their sponsoring organizations money.

Students don't have to physically attend class to take advantage of the benefit. Many UT System campuses offer online courses and certain degree programs through UT TeleCampus (www.telecampus.utsystem.edu/), says Roberta Rincon, research and policy analyst with The UT System. However, students must be admitted to one of the UT System institutions to enroll. Tuition for UT TeleCampus courses varies depending upon the university hosting the course, but would be at the resident tuition rate for Sandians and their dependents, she says.

For more information on the MOU, how to receive the tuition benefit, and for contact information, visit url.sandia.gov/up.

Thunderbirds to show popular Space Station *IMAX movie narrated by Tom Cruise*



THUNDERBIRDS

The Coronado Thunderbird Club (Sandia's retiree organization) is hosting a showing of the IMAX movie *Space Station*, the filming of which was sponsored by Lockheed Martin. The film, one of the most popular IMAX movies of all times, includes fantastic views of earth and space and is the story of the birth of the International Space Station.

The free showing will be Jan. 8, 2 p.m. at the Mountain View Club on Kirtland Air Force Base. Pat and Dori Helms, Thunderbird members, will show the movie and share the story of their daughter, Astronaut Susan Helms, a member of the Expedition 2 crew to the space station. She is prominently featured in the second half of the movie. Susan was with NASA from 1990 to 2002 and is a veteran of five space flights, logging 211 days in space, including a spacewalk of eight hours and 56 minutes, a world record. Today Brig. Gen. Susan Helms is the commander of the 45th Space Wing at Patrick AFB, Fla.

Call Genelia Boenig at 836-6977 for more information.

Nominations sought for ERA awards

Exceptional service
Leadership
Technical excellence

Nominations for individuals and teams in the annual Employee Recognition Awards program will be accepted Jan. 9-29.

The ERA program recognizes excellence in four categories, three for individual nominees — technical excellence, exceptional service, and leadership — and one for teams whose exceptional achievements are critically enabled by teamwork and model the value of people working together toward a common goal.

Nomination forms with detailed instructions will be available from Sandia's internal Web home page or at www-irn.sandia.gov/era/07era.htm. The website will be available Jan. 9.

Each division has an ERA Coordinator that is also listed via the link above.

Any current, regular Sandia employee may nominate individuals or teams. A separate nomination form must be submitted for each individual and team nomination. A combined total of 122 individuals and teams will receive corporate Employee Recognition Awards.

ERA individual winners and designated representatives from winning teams will be recognized at the Corporate Employee Recognition Night Banquet, Saturday, July 21.