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 Adheson, 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)
What’s what

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

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 power. That argument, supported by the diverse nations on our planet, has a major roadblock — not the only roadblock, but the major roadblock — has been the dilemma of waste disposal, referred to in the industry as “clogging 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 Prag as they are in Victoria 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 that magnify pride 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 2 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 proudful 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 not just now.

— 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-related person interested in living on Kirtland AFB or in off-base housing.

DeShane Casillas, marketing representative

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

For Kirtland Family Housing, says that though previous awareness at 232-9595 to apply for active duty members and their families, when base housing occupancy falls below 95 percent Family Housing opens up rental opportunities according to a tiered system.

Currently, base housing is at “third tier,” meaning that leases are open to Sandians and Sandia contractors, DoD 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 unfurnished 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 submit 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
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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 increasing in number, offering full electronic presentation systems to help business productivity.

The rooms have projectors and plasma screens, microphones and speakers, and sometimes touch-screen 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 planned ahead 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 is not just stringing a wire through a wall," says M Manufacturing Information Systems and Technology Dept. 2737 Manger 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. "Large areas such as rooms might give the ‘biggest bang for the buck.’" One installation involved drilling through concrete.

Before you build the building

"If you think about it before you build a building, that is 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 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.”

In August, a contract purchasing agreement (CPA) was placed to prequalify an outside vendor, local or national, to perform up to $25 million of work over five years. "No money is spent until the customer funds a purchase order to designate local or national," says Jim. "This allows us to predefine things like the vendor is required to purchase and construct the system at their location design and manufacturing, and then ship it to Sandia. This trick reduces our on-site install times to weeks rather than months, minimizing the need to disrupt 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 for long-term use with final design is determined to specify appropriate acoustics, lighting, and networks.

In New Mexico, he says the Microelectronics Laboratory is very nice in the Microsystems and Engineering Unit.

"Some customer will then attempt to cut corners and determine what would work best with our strategic management," he says. "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" he says. "I recommend involving Videoconference & Collaborative Technologies in the early 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 be 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) and two in WIF. He also likes the renovated conference room in Bldg. 912, Room 121. There are about a dozen more in offices and private heads.

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, rooms 1002, 1001, and 1007; Building 825, rooms 892/216, 820/3160E; and 823/2279.

More are coming online. The group has handled more than 100 installations 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 Curtis. "It's not just the kids who will be asking questions about natural disasters, gave her experience in developing icons and testing for program bugs always present in any complex software.

Robert Brawitt of Albuquerque-based Architave 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 two hundred," says Susan — be useful to terrorist groups in determining where to attack?

"The software [by itself] is not a checklist," says Sandia manager Jeff Dinnell (6766), whose background is in risk and security assessments. "It's the only quantifiable tool I know of for the food industry," says Frank Busta, director of the National Center for Food Protection and Defense.

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 need to be asked by computer?"

(Continued from page 1)

NWSMU ISO

(Continued from page 1)

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 micro-electromechanical systems that integrate mechanical elements, sensors, actuators, and electronics into devices ranging in size from a micro-sized 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 Rottier, Sandia VP of Weapon Engineering 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 putting New Mexico forward as a national leader in high-tech 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 Offices, 1012, oversees Sandia's relationships with its strategic university partners. It was instrumental in negotiating this MOU with NMSU. Sandia currently has 38 active agreements with universities throughout the U.S. — 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 Sr. Pete Domenici's comments at the Sandia/Los Alamos CINT opening this past summer on the importance to New Mexico and the entire nation of linking science and technology 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 took the opportunity to talk 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 cabbie smelled of income, star 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 possess a broad fund of knowledge of which work was worth watching.

Finally, almost at Foreman’s destination, the cabbie asked Foreman to give him a call if he had heard about the just-announced merger of electronic 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.

“Forever, Honeychild,” the cabbie said, grinning toothlessly into the interior mirror.

When Foreman went in to speak with the sponsors of his Albany trip, and an 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 Nano-Network of New Mexico is chaired by Katie Szczepaniak, who can be reached for more information on the organization at katie@wasatchvm.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.

In-National Sustainability Laboratory

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 US-Mexico 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 developing and demonstrating prototypes that promote and implement economic development efforts within the border region from the Gulf of California to the Pacific, including national security.

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, integrated 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 open source 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 service delivery.

— Barry Hess (4610)

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 need for many administrative tasks. By mainstream, I refer to products available for free download or purchase or free download from reputable, well-known companies (such as Novell), not those randomly developed by questionable characters in basement known companies (such as Novell), not those randomly developed by questionable characters in basement

A: 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 it, although the doorman in viol ation. 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 including speed, running stop signs and other traffic 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 observed the manager of that organization to have it moved.

— Willi 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 ANS President-elect Anasato, and three US senators, Nuclear Regulatory Commission Chairwoman 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 ensure continued 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.

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 Anasato, “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, counterterrorism 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 is 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.
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 Sautto, “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 budget 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 just injected to sustain it, said Sautto. This would be about 500 megawatts of fusion power for hundreds of seconds.

Ed Moses at LANL 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 laser medium in NIF would have to be replaced with a diode-pumped ceramic medium to raise electrical/optical efficiencies considerably to be viable for economical energy production.

The ARIES-SC compact stellerator 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 efficient laser systems 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 IFE.

The home team bats last. Craig Olson describes the 2-inch inertial fusion energy program that extends the single-shot ICF (inertial confinement fusion) capability of Z to a repetitive, high yield power plant scenario for IFE. The extensions include the use of recyclable transmutation lines for transformer driver technology, more compact and efficient than the Marx/water line technology used on ZRAP, 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 services such as call forward, speed dial, and other special capabilities. The changes 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 will only require seven-digit dialing. The familiar 844, 845-, and 284-XXX prefixes will continue unchanged. A new prefix (6-XXX) 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 “9” to reach an outside line.

The long distance call procedure will change. Any call outside of the local Albuquerque calling area will require seven-digit dialing with no need to dial “9” to reach an outside line. The home team bats last. Craig Olson describes the 2-inch inertial fusion energy program that extends the single-shot ICF (inertial confinement fusion) capability of Z to a repetitive, high yield power plant scenario for IFE. The extensions include the use of recyclable transmutation lines for transformer driver technology, more compact and efficient than the Marx/water line technology used on ZRAP, and a thick-liquid wall chamber. This path to fusion energy may be relatively rapid and relatively inexpensive, Olson speculated.

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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 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 managed? 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 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 specialist 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)
Sandia takes lead role in developing post-closure assessment of Yucca Mountain nuclear waste repository

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 team is forging ahead, Andrew said in a recent Las Vegas news interview. Following a January 2006 announcement in Washington that Sandia would be the DOE’s lead laboratory for Repository Systems, Andrew and other managers at Sandia have nine months to develop and put a transition plan in place. “That was a vital step for us to put our business and management systems in place,” Andrew says. “But we didn’t get a lot of time to work with the real world, so during the first few weeks we had some expected — and some unexpected — bumps. These are real things we have to modify to accommodate unique project requirements.”

Jim Huber (4530), Jerry Leck (4520), and John Zappor (4520) 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.”)

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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 will do it,” Tito says. “This is a project that was already underway when we took it over, and the site is very stable right now.” Tito also allows discussions outside of email discussion boards and provides a document versioning and a change management exhibit. Sandia’s familiar training program, TEDS, will also be used in Las Vegas, along with the addition of several specially designed scientific and technical experts.

Kathryn says, “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.

“We have a significant number of foreign nationals and that is challenging for our networks,” John says. “We are trying to use our existing systems where possible, rather than duplicating or reinventing the wheel.”

Sandia is responsible for the performance assessment technical basis 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.

“Many of the workforce’s calculations show that the project actually involves contributions from more than 600 people, or members of the workforce,” Andrew says. “As an example of the work involved, consider the project’s application to the information technology issues that will hold the spent fuel rods beneath Yucca Mountain. The large containment system will be accessed 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 specialists.

“Many of the supporting data and models developed over the years by numerous participants are then integrated in a total system performance report,” Tito says. “It’s akin to a rope made up of different strands, each participant working independently, but made to work together.”

Sandia is working with the complicated regulatory and scientific and technical aspects of the project, as well as with the complex and often conflicting demands of DOE and the NRC. “A lot of effort is put into making sure that we don’t just deliver a report,” John says. “We have to ensure that our report is defensible and is credible to the public.”

Sandia will unveil a new computer network at the site this month. In addition to deploying the Sandia common operating environment, Sandia will be drafting 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 are a lot of changes to the project.”

Also helping on the IT team are: Steve Gossage (4336), Susan Satchinger (4321), John Chirca (4500), and John Elmore (4520), and additional staff across Sandia networking, desktop, 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 LAST MANAGEMENT TEAM and its legacy functions include: Tito Banano, Licensing; Frank Happ, Facilities, Environment, Health & Safety; Linda White, Operations, Technology Assessment; Andrew Orr, Program Director; Tom Mieie, Disruptive Events; Robert Childs, Human Resources; Key Shaum, Technical Support; Ron Shinwe, Quality Assurance; Peter Swift, Chief Engineer; Jeff Mares, Operations Deputy; and Doug Weaver, Test Coordination.

Tailoring Sandia IT systems for the Yucca Mountain effort

Sandia’s ‘determined and dedicated’ Yucca Mountain team up and running

The new era of Sandia’s Yucca Mountain Project office in Las Vegas (6780) and its staff of about 175 had spent the weekend moving into or reoccupying 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 (DOE/CRWM).

The team included new employees and veterans of Bechtel (HPC/CR/ contract), a number of relocated Sandians from Albuquerque, employees of Los Alamos and several other national laboratories, and a core staff of office workers 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, Orrall launched into his talk — the official introduction of Sandia’s new lead laboratory. “This is the third time in the history of the DOE program we have a new entity of this size and scope,” Orrall says. “This is a major milestone.” At meeting’s end: “Our position is that it has to be done and that we will do it,” Tito says. “This is a project that was already underway when we took it over, and the site is very stable right now.” Tito also allows discussions outside of email discussion boards and provides a document versioning and a change management exhibit. Sandia’s familiar training program, TEDS, will also be used in Las Vegas, along with the addition of several specially designed scientific and technical experts.

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

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 evidenced 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.
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 Sunila 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 benefitting 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 scientific, technology, and engineering foundations and to jointly develop and implement “strategic program areas that enhance” Sandia’s broad missions in national security.

The difference between resident and nonresident tuition at UT is significant. For example, an undergraduate engineering student carrying a 12-hour course load would pay $4,216 per semester, compared to $11,031 for a nonresident. Resident tuition for a liberal arts major is $3,815 versus $10,182 for nonresidents. UT’s total undergraduate academic costs rank seventh of 12 peer institutions for 2006-07, according to the university’s website.

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 Hudskamp (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 one 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 maintaining a 4.0 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.

Nominations sought for ERA awards

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.

Nominations forms with detailed instructions will be available from Sandia’s internal Web home page at www irm.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 127 individuals will receive corporate Employee Recognition Awards.

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