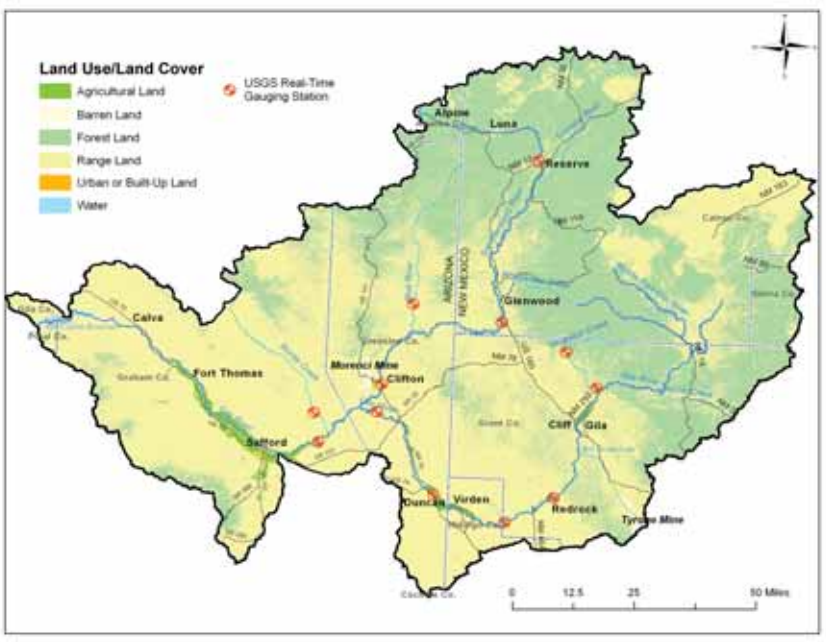
Computer models helping resolve conflicts over water

Collaborative projects explore long-term solutions to water shortages

By John German

Last June, flows in the Rio Mimbres in southern New Mexico were insufficient to meet the demands of farmers. It had irrigators — those whose families have farmed the land along the river for centuries — wondering how they could keep their fields green until fall. Then the rains came.



MAP OF THE GILA/SAN FRANCISCO river basin showing locations of flow measurement stations. Models are helping users determine what to do with additional water allocated to New Mexico.

Another couple of dry weeks and the courts would have refereed a dispute pitting farmers on the "senior ditch" (the senior water rights holders) with upstream farmers and domestic well owners, who likely would have had to severely curtail their water use to allow the downstream users access to water.

The worst did not come to pass last summer, though all agree that at some point the junior rights holders in the Mimbres basin will be ordered to cut back.

A familiar scenario

It is a scenario that is playing out across the western United States, portions of which are in an extended drought, says Vince Tidwell of Geohydrology Dept. 6313.

In several recent cases,

(Continued on page 4)

AN AERIAL PHOTO of the Rio Grande near Albuquerque showing an irrigation canal and nearby urban development. (Photo by Will Keener)

Imagine a world where a machine creates a "virtual you" by modeling how you think and your expertise on a subject. Or one where your car's computer assesses your driving skills and compensates for your limitations.

That's the world Sandia has entered full throttle through its Cognitive Science and Technology Program. *Lab News* writer Chris Burroughs explores this important new field of Sandia research in a series of stories beginning on **page 8.**

Sandia LabNews

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Sandia National Laboratories

Managed by Lockheed Martin for the National Nuclear Security Administration

New tools help Sandians manage, protect unclassified information of all types

By Julie Hall

Like workers everywhere, Sandians are awash in information. We are deluged with memos, project reports, and, of course, emails — ranging in sensitivity from the most benign email about an award received by a coworker to, for some of us, classified national security information.

For many of us, managing the information that falls into the middle of the spectrum — outside the classified realm — is the most challenging. Things like procurement records, "news notes" on project status, and perhaps human resources-type information — often raise vexing questions: Is this sensitive, and if so, how sensitive? Can this information be released to the outside world? How do I properly manage this information?

"We are increasingly challenged by the abundance and diversity of unclassified information," says Chief Information Officer Art Hale (9600). "Yet this information often has a level of sensitivity that makes its protection increasingly important."

> *"We are increasingly challenged by the abundance and diversity of unclassified information."*
>
> **Chief Information Officer Art Hale**

To help members of the workforce manage unclassified Sandia information, the CIO's office, in conjunction with experts in Recorded Information Management, Legal, Human

(Continued on page 5)

Employee Recognition Awards

54 INDIVIDUALS and 69 teams have been honored in the 2007 Employee Recognition Awards program. See individual photos and team citations starting on **page 6**.

Sandia's Information Design Assurance Red Team is hosting a conference in Washington, D.C., focusing on infrastructure security. Story on **page 4.**

Also inside . . .

- Hydrogen research at Sandia goes HYPER with new partnership involving European consortium . . . . . **Page 3**
- Labs hosts Defense Science Study Group . . . . . **Page 3**
- Energy & Water Showcase puts Labs research front and center . . . **Page 5**
- Secretaries of Energy, Defense, and State issue joint document regarding future of US nuclear deterrent and the weapons complex . . . . . **Page 11**
- High school photonics academy named for Art Guenther . . . . . **Page 14**
- Cadets from US military academies get immersed in research during Sandia internships . . . . . **Page 16**

What's what

As I began to put together this column last Friday morning, I could identify with Obi-Wan Kenobi: I felt a great disturbance in The Force. The network was down. No email. No Google. No state of the stock market. Nothing.

It was a frustrating and aggravating reminder of how extensively the cyber world is integrated into our living world. Or an extension of our living world. Or, maybe, an actual component of our living world.

HOWARD KERCHEVAL

The web is our friend, colleague, advisor, teacher, and entertainer, no matter what role we play at work or home. In the role of our group — producing the *Lab News*, *Sandia Daily News*, *Sandia Technology* magazine, and other publications — the web has become indispensable. If we need to check a fact with a researcher, we open the directory and type in the name and get the phone number and, bingo — got it. Need some information about something outside the lab? Google it. Somebody in the group need information you have in an electronic file? Address an email message, attach the info and, as Chef Emeril says, "Bam!"

I don't know what it was like in your office when the network went down for that brief time last Friday, but we were a little like a surprised Linus watching Snoopy streak away with the blanket in his mouth. After the few short years we've had the web, and have become so dependent on it, imagine now trying to work without it.

It's enough to send you to the fridge for a giant bowl of moose tracks ice cream.

* * *

I don't have one of those customized sign-offs for my email messages like a lot of people have. I just type in my name. But people who do have them show a lot of creativity, using fancy type fonts and colors and even illustrations to identify themselves. The folks who use them usually also identify themselves by title or function.

I got one recently that made me wonder. Along with the name, phone number, email address, etc., it identified the sender as a "functional" team lead.

I wondered if the sender had a "nonfunctional" or "dysfunctional" counterpart, or the sender was functional while other members of the group were not. Or if it just meant the sender was the leader of the functional team and that there was a counterpart group that was nonfunctional or dysfunctional.

If the network hadn't been nonfunctional, I probably could have gotten a quick answer.

* * *

As I was coming out of the base post office a few days ago, a UPS guy was going in with a package. It was only one, relatively small package, but when UPS is delivering to the post office, what can that mean?

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

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Sandia National Laboratories

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LOCKHEED MARTIN

Recent Patents

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

Robert Moore (6771) and D. Richard Anderson (6772): Arsenic Removal from Water (Patent No. 7,247,242)

Edward Thomas (12337) and Timothy Draelos (5614): Authenticating Concealed Private Data While Maintaining Concealment (7,237,115)

Clifford Ho (6313): Portable Vapor Diffusion Coefficient Meter (7,229,593)

Richard Schroeppel (5614) and Lillian Snyder (6322): Anonymous Authenticated Communications (7,234,059)

Jason Shepherd (1421) and Scott Mitchell (1412): Method for Generating a Mesh Representation of a Region Characterized by a Trunk and a Branch Thereon (7,219,039)

David Teter (243), Patrick Brady, and James Krumhansl (both 6316): Inorganic Ion Sorbent Method (7,244,359)

Yifeng Wang (6782) and Charles Bryan (6785): Method for Absorbing an Ion from a Fluid (7,238,288)

Nancy Clark (257), Stanley Atcitty, and John Boyes (both 6336): Enhanced Distributed Energy Resource System (7,239,044)

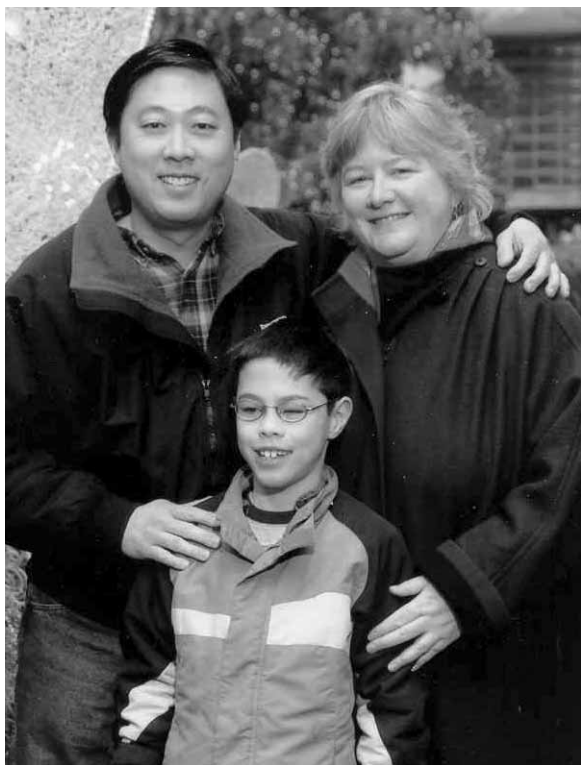
Tim Moy known for providing science, history perspectives

Founding Sandia ACG member drowned saving son

Tim Moy will always be known as the guy people would turn to for unbiased answers about science and history.

"Tim had a profound understanding of technology and how it affected history," Gerry Yonas (700) says. "Tim had an absolutely brilliant way of combining technology, history, and science — past and future."

Tim, 44, drowned Sunday, July 23, while trying to save his son Luke in the surf at Kailua, Hawaii. Tim was attending a professional conference in Oahu.



TIM MOY with his wife Rebecca Ullrich and son Luke.

Tim is survived by his wife, Sandia corporate historian Rebecca Ullrich (9532), and 12-year-old son Luke, who is on the road to a full recovery from the near-drowning in Hawaii.

Gerry contracted Tim to consult on national security issues and emerging threats in the late 1990s. Soon after, Tim helped establish the Advanced Concepts Group at Sandia.

"Tim was a tremendous asset in helping the ACG broaden and deepen our perspective of complex issues," Gerry says. "Tim was always very calm, collected, and thoroughly professional about all of the analysis he carried out in the ACG."

Neal Singer (3651), who helped recruit Tim to Sandia, said Tim was an outstanding member of the ACG. "He was deeply interested in national security and brought a fine mind to bear on subjects of great interest to Sandia," Neal says.

Mark Boslough (1433) would visit Tim in his ACG office and have long conversations about science and history. He also knew him from extracurricular activities.

"Tim's vast enthusiasm and talents as a teacher, researcher, and speaker are well known, but his commitment to education went far beyond these high-profile activities," Mark says.

"Tim was also part of a core group of scientists and educators involved in promoting the proper teaching of evolution in science classes," Mark says. "Sometimes discussions among members would become heated, and it was Tim who was always able to put his politics and emotions aside, be objective, and get conversations back on track with his eternal good humor."

Tim also was an associate professor of history at the University of New Mexico, where colleagues said he wasn't afraid to take a stand. He pushed hard for evolution to be taught in classrooms, lobbying the legislature unsuccessfully to make it a requirement in the state's high schools.

Tim volunteered at Montezuma School with the chess club and PTA, and served as a model father for a number of fatherless kids.

— Michael Padilla

Sandia gets HYPER about hydrogen research

By Patti Koning

A global effort is underway to make hydrogen one of the dominant carriers of energy. Those involved are optimistic that the so-called "hydrogen economy" will become a reality soon. That optimism, of course, is driven by the realization that developing alternative sources of energy is no longer a choice but a necessity.

Sandia is playing a large role in this effort, thanks to its Codes and Standards work for the Department of Energy's FreedomCAR and Fuels Presidential Initiative. This DOE domestic effort has now gone global; late last year Sandia joined a European consortium called "HYPER", for HYdrogen PERmitting.

Working toward a similar goal

Hydrogen Program Manager Jay Keller (8367) says that this international research effort is essential. "We're all working toward a similar goal, of making hydrogen a dominant energy carrier sooner rather than later," he says. "We're better off all working together than alone."

Sandia is involved in two specific work packages for HYPER, one on modeling and the other on barrier interaction experiments.

HYPER has 15 partners from France, Germany, Greece, Italy, the Netherlands, the Russian Federation, the United Kingdom, and the United States. HYPER's research focus is on small (10 kilowatts), stationary hydrogen fuel cells that could be used to provide power to homes. Even though this differs from the FreedomCAR focus on transportation, there is enough overlap for a fruitful collaboration.

Sandia is addressing the science and technology that goes into understanding unintended releases of hydrogen. This work will ultimately aid in developing codes and standards that will suggest how to design and operate a hydrogen fueling station in the safest possible manner. (See the March 31, 2006 issue of Sandia Lab News for more.)

This year DOE has asked Sandia to focus specifically on barriers, most likely a wall, and how they might impact safety. Several HYPER partners are collaborating with Sandia on this barrier work.

"Today everyone considers barriers as a mitigation strategy," says Bill Houf (8757), a principal investigator for Sandia's work with HYPER. "The question we are trying to answer is does a barrier mitigate the effects of an unintended release, or does it create conditions that exacerbate the release?"

"We're all working toward a similar goal — making hydrogen a dominant energy carrier sooner rather than later."

Jay Keller, Hydrogen Program manager

An unintended release of hydrogen at 2,500 psi could result in a 12 foot long jet flame. A barrier would block that flame but could cause unintended detrimental effects, such as a significant and possibly damaging overpressure.

The overpressure, explains Bill, could induce a more dangerous situation than a jet flame. If the overpressure gets high enough it could break glass, damage walls, or shatter ear drums.

Modeling is key to hydrogen research, so a lot of the experimental results will go towards validating models. Modeling is also used to refine tests to maximize use of money and resources.

"We can't test everything. Most of our tests are done for supply pressures of 2,500 to 6,500 psi, but vehicles may be fueled at 10,000 psi," says Bill.

Each partner brings strengths

Along with Sandia, the University of Ulster, University of Pisa, the UK's Health and Safety Executive (HSE), Germany's Forschungszentrum Karlsruhe GmbH (FZK), and Russian's Kurchatov Institute are collaborating on the two work packages. Each partner brings its own strengths to the project.

For example, Jay points out that FZK's modeling capability will be used to complement Sandia's efforts in understanding the overpressure issue. HSE has large test facilities that will allow consequence and behavior work on a massive scale—what Jay calls the "big bang." Kurchatov Institute has enclosed facilities capable of testing explosive mixtures.

"Europe has been pretty aggressive at pushing hydrogen into their infrastructure," says Jay. "This partnership helps us leverage international activities in science. The energy problem is too important to work in isolation."

Sandia CaliforniaNews

Defense Science Study Group visits Sandia

By Patti Koning

Last month Sandia played host to 15 emerging science and technology leaders as part of the Defense Science Study Group (DSSG). The group met with Div. 8000 VP Paul Hommert, toured the Chemical and Radiation Detection Laboratories (CRDL), participated in a BioDAC exercise, and met with mentors at Sandia.

Paul gave an overview of Sandia, followed by a question-and-answer session. The academics got right into the tough problems — why there isn't more research towards defeating improvised explosive devices — IEDs — and the critical role nuclear power could play as a source of energy.

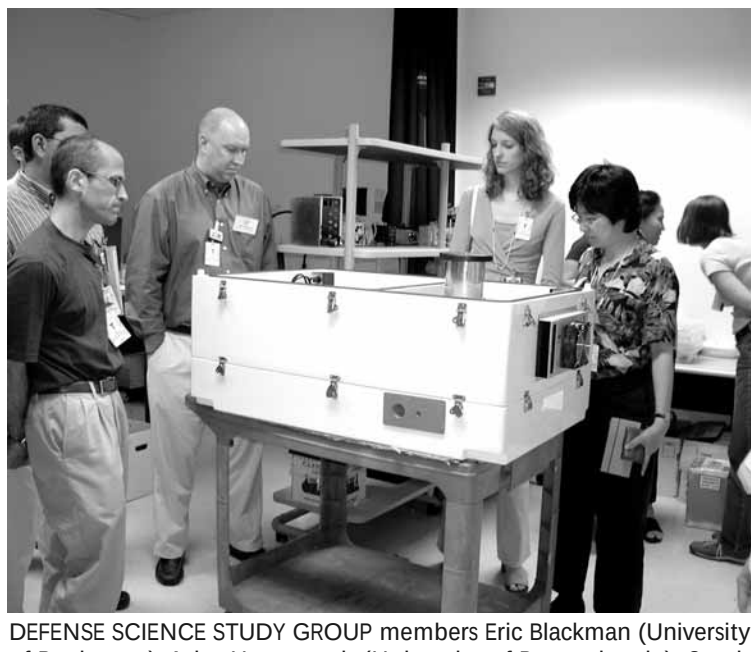
CALIFORNIA VP Paul Hommert shakes hands with Philip Gould, who has served as the director of the Defense Science Study Group since its inception in 1986. (Photo by Patti Koning)

On the CRDL tour, Rajat Sapra (8321) discussed the latest Laboratory Directed Research and Development-funded research in enzyme engineering and synthetic biology for enhancing biofuel production. Ken Patel and Thomas Perroud (both 8324) spoke about their work in the Microscale Immune Studies Laboratory (MISL) Grand Challenge, focusing on the development and integration of an optical-based cell sorter for the analysis of macrophage cells. Bob Crocker (8125) briefed the group on Sandia's biodetection instrumentation programs including the Department of Homeland Security/BioBriefcase, Tenix Unattended Water Sensor, and others.

Ben Wu (8125), Marilyn Hawley (8116), Donna Djordjevich (8116), and Paul Nielan (8116) facilitated the group through a BioDAC workshop that allowed the group to work through a computer-simulated anthrax release in the San Diego area.

DSSG is a Defense Advanced Research Projects Agency (DARPA)-sponsored program of education and study for young professors of science and engineering who have achieved national recognition in their fields. The program seeks to develop strong links with the national security community and introduce DSSG members to the operations and capabilities of the national labs.

"The purpose is to train newly tenured professors so they are qualified to serve on national security advisory boards," says DSSG Director Philip Gould. "This is an investment in the future."



DEFENSE SCIENCE STUDY GROUP members Eric Blackman (University of Rochester), John Hogenesch (University of Pennsylvania), Sarah Lisanby (Columbia University), and Minami Yoda (Georgia Institute of Technology) check out Sandia's BioBriefcase. (Photo by Patti Koning)

The program is conducted over a two-year period with eight sessions that include visits to military bases, defense laboratories, and industrial facilities. The sixth session brought the group to Livermore, where they spent a total of six days at Sandia and Lawrence Livermore National Laboratory followed by three days at the National Training Center in Fort Irwin, Calif.

Paul Cremer of the Department of Chemistry at Texas A&M University was especially interested in visiting Sandia because of its work in chem/bio.

"I didn't know much about national security needs before participating in DSSG," he says. "Now I have an overall global picture."

Water disputes

(Continued from page 1)

Sandia computer models that simulate the complex interrelationships among surface flows, groundwater dynamics, and water demands, rights, and laws are being used to help locals determine which tradeoffs result in the best long-term outcomes.

To develop each model, the researchers work alongside local authorities, water users, and decision makers as part of a process known as computer-aided dispute resolution (CADRe). The project is a joint effort of Sandia, the US Army Corps of Engineers' Institute for Water Resources, and several universities. Its funding, in part, was arranged by US Sen. Pete Domenici, R-N.M.

The models allow authorities to run hundreds of different versions of the future and see the effects of their choices decades away, says Vince. The simulations can be run on a PC, and each run takes 10-15 seconds after the inputs are set.

In the Mimbres basin, for example, models have helped create a "water bank" whereby local users trade credits with each other, not only within the same ditch but across ditches and with domestic well owners. A defined set of trading rules helps minimize conflict.

"It has allowed people to play a water trading game in a virtual environment to find out what will work and what won't work without losing any real water," says Vince.

MAP SHOWING the Gila River basin (gray) and Rio Mimbres basin (black).

The model incorporates a four-mile stretch of the Rio Mimbres, the associated groundwater system, nine acequias, a reservoir, and adjudicated water rights for the basin. Partners in the project include the New Mexico Office of the State Engineer, Mimbres Water Users Group, and the University of New Mexico.

Competing demands

In another project along the Middle Rio Grande Valley in central New Mexico, governments are grappling with the competing water demands of sprawling residential development, agricultural irrigation, and the needs of the endangered silvery minnow.

In 2001 Vince and Howard Passell (6313), with support from Sandia's Small Business Assistance program, began working with the Middle Rio Grande Water Assembly to develop an integrated surface water and groundwater model addressing agricultural, urban, and environmental interests in a three-county region. The water plan resulting from the project was accepted by the state engineer's office in late 2003 as part of a statewide water management plan.

More recently the Middle Rio Grande model was expanded to include 17 river reaches stretching from the Colorado state line to Elephant Butte Dam in south-central New Mexico, plus six reservoirs and three integrated groundwater basins. The plan is available to water managers as a tool to help them home in on regional water solutions.

Partners in the project include the New Mexico Interstate Stream Commission, US Bureau of Reclamation (USBR), Corps of Engineers, and US Geological Survey.

Similar Sandia projects are underway in Arizona, Texas, Oregon, and the Middle East. (See "Where models are helping set water management direction" above.)

Collaborative process

The greatest value of the computer models might be in the collaborative process itself, Vince says. Local decision makers are involved in building a model from the ground up for the specific water resource in question.

"We meet regularly with the stakeholders to discuss what's important for the area, how decisions are made, and what the alternatives are," he says. "When people see how the whole thing is built and how it works, they are more likely to accept its results."

Helping develop the models forces many collaborators to confront inaccurate assumptions about water, he says. With a healthy level of disagreement at the table, participants often begin to understand the perspectives of those they are competing with.

"It forces them to look at water as a system and to deal with its physics," he says. "Without somebody cramming it down their throats, they come to understand the complexities and the need for a multidisciplinary approach."

The project is part of Sandia's Water Program, which seeks to improve the water supply safety, security, and sustainability of US water resources through the development of technologies that create new sources of water, decrease demand through efficiency, and provide decision tools to the institutions responsible for balancing supply and demand.

Other Sandia contributors to the project include: Ray Finley, Tom Lowry, Amy Sun, Len Malczynski, Jesse Roach, Will Peplinski, Geoff Klise, Jim Brainard, Beth Richards, Amy Coplen, Chau Dam, Suzanne Pierce, Marissa Reno, and Alison Williams (all 6313).

Where models are helping set water management direction

As part of a project to allocate water awarded to New Mexico in the 2004 Arizona Water Settlements Act, Sandia worked with several stakeholder groups to develop and test a computer-aided decision tool for the Gila/San Francisco River basin that straddles the New Mexico/Arizona border.

The model is helping authorities put the water to the best long-term use while preserving environmental resources. The effort has generated interest in expanding the model to address water issues in southwestern New Mexico more broadly, says Vince Tidwell (6313).

Partners in the project include the New Mexico Interstate Stream Commission, US Bureau of Reclamation, US Fish and Wildlife Service, environmental organizations, and the Southwestern New Mexico Water Planning Group.

Near Austin, Texas, as part of a cooperative project with the University of Texas funded by the Laboratory Directed Research and Development program, Sandia researchers helped couple system-level models, which allow for rapid analysis, with a spatially detailed US Geological Survey groundwater model to study part of a major aquifer.

Joining the two modeling platforms allowed for collaboration by state and federal agencies and helped involve stakeholders in the decision process, says Vince.

Farther away, on the Willamette River in western Oregon, regulators, resource managers, city government representatives, industry officials, and environmentalists are using the models to devise a system of barter for "thermal credits" whereby heating of river water by communities and pulp and paper mills that use the water is traded for restoration projects that cool water elsewhere along the river, to improve salmon habitat.

The work has an international component as well. Howard Passell (6313) and a team of Sandia researchers are using common water concerns to foster cooperation among governments at international borders, particularly in the Middle East.

"It [the computer water model] forces them to look at water as a system and to deal with its physics. Without somebody cramming it down their throats, they come to understand the complexities and the need for a multidisciplinary approach."

Sandia researcher Vince Tidwell

Infrastructure security against global threats taught at Sandia-hosted conference

Understand your adversaries and defend against them

Critical infrastructure defenders attending a conference this month in Washington, D.C., will learn from government "red teams" and intelligence professionals how to better protect their systems. The Aug. 28-30 conference is hosted by Sandia's Information Design Assurance Red Team (IDART) at the L'Enfant Plaza Hotel.

Multidisciplinary red teams have long helped private and government customers understand how adversaries could harm their systems and missions. Assessments from an adversary's point of view help defenders understand the threat, avoid surprise, and adapt, plan, and train for adversary actions.

For the past two years, IDART has hosted conferences for the government red-teaming community to exchange ideas and foster cooperation. REDTEAM2007 will bring this community together to share its knowledge and experience with government, military, and commercial infrastructure defenders.

As a bonus to attendees, on the last day of the conference Sandia's IDART will present the Red Teaming for Program Managers (RT4PM) methodology, built on Sandia's 50 years of experience conducting multidisciplinary assessments. The process defines a red team's objectives, composition, and approach to match each customer's needs. Sandia has taught the RT4PM course to hundreds of program managers, analysts, decision makers, and commanders.

For further information and registration, see www.sandia.gov/redteam2007. — *Neal Singer*

Energy and Water Showcase to open Aug. 15

Display in Bldg. 6585 highlights long history of Sandia's energy and water research

By Jacqueline Cieslak

Sandia is engaged across a broad front in the nation's quest for solutions to long-standing energy and water challenges. The Energy and Water Showcase Open House, scheduled for Wednesday, Aug. 15, from 1-3 p.m. in Bldg. 6585, will bring information about the Labs' work in these areas together under one roof.

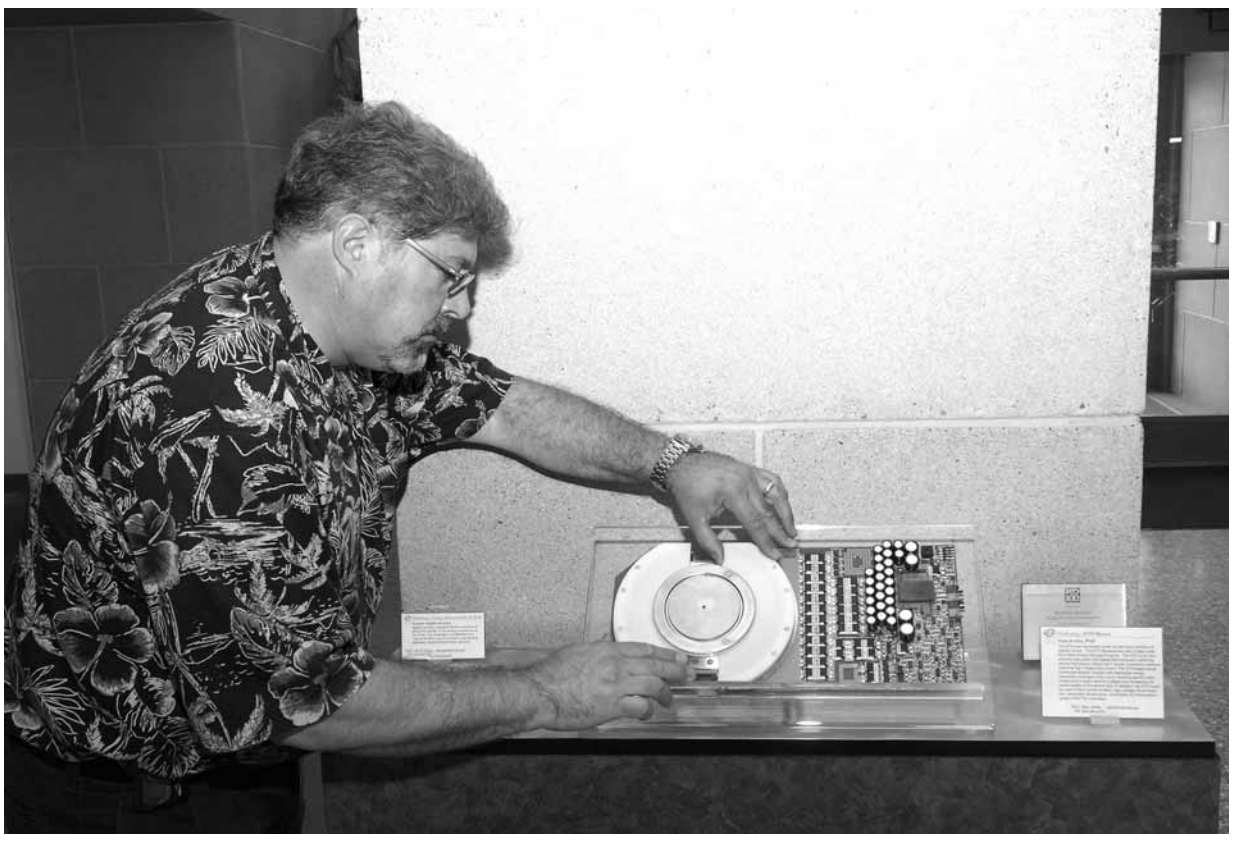
The showcase will display energy- and water-related articles and information including wind blade technology, a revolutionary geothermal drilling tool, boiling water reactor experimentation results of a reactor fuel rod assembly fire, various solar technology apparatus, and much more.

"The showcase is really to make our energy and water technologies visible to our customers and our Sandia colleagues," says Margie Tatro (6200), Fuel and Water Systems director. "Instead of showing people what we do through viewgraphs, we want to show them through real technology."

Technologies from more than 10 organizations from both the New Mexico and California sites will be on display. Docents in the lobby of Bldg. 6585 will provide information and answer questions, and van service from the Steve Schiff Auditorium will shuttle visitors to Bldg. 6585 every 15 minutes, beginning at 1 p.m.

The showcase, which has been in the making for the past two years, will remain on display in Bldg. 6585 after the open house, with displays changing to reflect advances in technology. Margie says she hopes the showcase will bring increased support to the Energy Resources and Nonproliferation Strategic Management Unit, both in the form of sponsors and new ideas from Sandians who have an interest in the energy and water missions.

"I'm convinced that Sandia is an incredibly rich place in terms of technical ideas, and I think if we can bring people to see what we're working on, they can possibly help contribute to our mission," she says.



A BIT MORE TO THE RIGHT — Tom Salazar (6032) puts final touches to a display at the Energy and Water Showcase in Bldg. 6585. The showcase, a series of static displays, highlights several decades' worth of Labs research into energy and water issues. (Photo by Bill Doty)

Tom Salazar (6032) says one of the goals of the showcase is to target a broad cross-section of potential audiences, from the public and private sector, on a technical and nontechnical level.

"Our intent is to educate at the various levels of understanding," he says.

The following organizations contributed to the showcase: Geothermal Research (6331); Energy Systems Analysis (6332); Wind Energy Technology (6333); Solar Systems Dept. (6335); Energy Infrastructure and Distributed Energy Research (6336); Solar Technologies (6337); Geoscience Research & Applications (6310); Geochemistry (6316); Experiments & New Programs (6763); Advanced Nuclear Concepts (6771); Applied Nuclear Technologies (1384); Engine Combustion (8362).

Information

(Continued from page 1)

Resources, Information Security, Classification and Export Control, Cyber Security, Human Factors, and Sandia/California Security Operations, has rewritten and beefed up the policy and guidelines governing information protection at Sandia. The revised policy, "Management of Information Throughout its Life Cycle" (CPR400.2.20), is expected to be published on Sandia's intranet later this month.

The revision contains an expanded Section 4 addressing the protection of unclassified information, a diagram showing how the various types of information relate to one another, and a new process document and flow chart designed to guide employees step-by-step through the process of determining the sensitivity and type of information (Unclassified Unlimited Release (UUR), OUO, Sandia Proprietary, etc.).

The revision emphasizes the need for Sandians to be constantly aware of the sensitivity of the information they are handling and to make a conscious determination of its sensitivity prior to the information potentially leaving Sandia's control, such as when it's included in an email or public presentation. Any information released publicly must go through Sandia's Review & Approval process.

"The overall goal of this revision was to increase our level of assurance that sensitive unclassified information is consistently recognized and properly protected," Art says.

According to Mike Gomez (9601), the project lead for the policy revisions, some important changes to note are:

• The UCI category formerly known as Company Sensitive is now called Sandia Proprietary. The revision formalizes the protection of company-owned information, provides guidance from the Legal organization, and includes examples of government-owned vs. company-owned information.

• The revision establishes consistent terminology for unclassified information groups.

• The revision clarifies the requirements for protecting various types of unclassified information through "minimum requirements" documents. Each section contains references to other resource materials as well as contacts for content-related questions.

Sandians will be able to obtain more information on the policy revision and protecting unclassified information at two presentations planned for later this month. Watch for announcements of presentation dates and times in *Sandia Daily News*.

McFarland talks about radical Islam and threat to US energy supply

Photo by Bill Doty

Robert McFarland, national security advisor to President Ronald Reagan, told a standing-room-only audience at the Steve Schiff Auditorium that radical Islam, with millions of adherents around the globe, aims to conduct economic warfare against the West by attacking Middle East oil resources. The resulting disruption in global energy prices, he asserted, would wreak havoc on the economies of industrialized nations. To minimize the impact such an attack could have, he argued, the US needs to pursue alternative sources of energy much more aggressively than has historically been the case.

McFarland, speaking last month at a Sandia Technology Symposium, cited statistics indicating that most trips in US automobiles are less than 20 miles. If so-called plug-in hybrids using a new generation of super-efficient batteries could be brought into common usage, he said, oil consumption would plummet, along with the corresponding demand for oil from volatile regions of the world.

McFarland praised Sandia for its contributions to ending the Cold War, saying he was "humbled" by the warm welcome he had received at the Labs. "And I've had some experience in being humbled," he joked. "I worked for Henry Kissinger."

54 individuals, 69 teams

2007 Employee Recognition Awards program honors teams, individuals for exceptional contributions

More than 300 Sandians — individuals, team representatives, and their guests — gathered July 21 at the National Hispanic Cultural Center in Albuquerque for the 2007 Employee Recognition Night, Sandia's annual celebration of exceptional service, leadership, technical accomplishment, and teamwork.

This year, the awards honored 54 individuals and 69 teams for their contributions to Sandia's mission success.

Each year, the gala event is built around a theme; this year it was "Surrounded by Stars."

Labs Director Tom Hunter, who served as host and awards presenter, wrote in the awards program that the ERA winners are seen by their colleagues as "strong leaders, dedicated citizens of the Labs, technical pioneers, and outstanding teams.

"Your contributions," Tom wrote, "are part of Sandia's collective, unfaltering effort to provide exceptional service to the nation."

The individual recipients are pictured over the next few pages. A complete listing of team winners and team citations and the names of individual team members begins below, right. Individual citations are on the internal web.

Individual honorees

Not pictured: Kenneth Vitto (5711), Susan Vosburg (4137)

Melecita Archuleta
2736

Richard Baird
9542

Mark Boslough
1433

Theresa Brown
6322

Carrie Burchard
8529

Callie Butler
3331

Angela Cabanillas
5900

Monica Martinez-Canales
8964

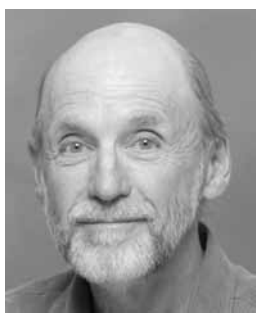
Wendy Clayton
6753

Greta Congable
12420

Beth Dick
2027

John Dillinger
5616

Joshua England
9328


Peter Feibelman
1130

Daniel Fonte
8230

Julia Garner
4848

Team honorees

The 2007 Employee Recognition Awards program, continuing a trend begun several years ago, again this year shows divisions placing a special emphasis on team accomplishments. The teams listed over the next few pages were deemed to have made exceptional contributions to an important program or process. A few representative teams are pictured.

Access Delay Development Team

For demonstrating a novel access-delay technology within a short time frame despite limited resources.

John Smith, James Van De Vreugde, Daniel Yee, Joel Groskopf, Anne Barrows, Stephen Eisenbies, Robert Hillaire, Larry Thorne, Leo Mara, James Ross, Thomas Raber, John Brockmann, Ronald Dykhuizen, Scott Ferko, Charles Greenholt, Christian Hartwigsen, Steven Highland, Patrick Knight, Daniel Lucero, Raymond Page, Brian Patterson, Scott Stafford, Michael Tootle, David Zanni, Bill Swansiger

Advanced Flight Telescope TSU-SA Team

For unprecedented dedication and technical excellence as a team in delivering the AFT Telescope Sensing Unit Subassembly on time while meeting all performance criteria.

Eric Shields, Barry Boughton, Peter Stromberg, Robert Pahl, Edward Winrow, Rosetta Florentino, Derek Anderson, Theodore Salas, Tammy Henson, Molly McCandless, Jane Laflin, Kendall Key, Dave Baiocchi, Harold Radloff, John Cresap, Chris Lanes, Jac Pier, Craig Boney, Bob Crain, Michele Davila, Steven DeBlassie, Anthony Geller, N. Glenn Rackley, Johnny Silva, James Hickman

AM/PM Personnel Moves Process Team

For designing and implementing a process that enables individual office moves to be completed within 2 ½ hours, reducing downtime and allowing for greater productivity.

Ken Keahbone, Leland Byers, Nicole Morgan, Mary Alice Padilla, Gail Hughes, Robert Shinn, Bob White, Patsy Rowland, Dana Striker, Wayne Shirley, Pat Manke, Julie Perich, Gwenn Hampe, Natalie Lopez, William Carpenter

ARC Modeling & Simulation Team

The multi-organizational ARC modeling team accepted the challenge of developing a model/simulation to solve complex physics problems critical for fundamental understanding of neutron generator physics.

Benjamin Cole, Russell Hooper, Matthew Hopkins, Michael Eatough, Edward Barnat, Paul Crozier, Steven Plimpton, Richard Buss, Juan Elizondo-Decanini, Joel Lash, Paul Miller

ASC Software Quality Support Team

Guided the ASC Program in implementing NNSA guidelines for producing quality software in transitioning test-based confidence to computational and simulation-based confidence in the US nuclear stockpile.

Tameka Barrentine, Patricia Hackney, Jennifer Turgeon, C. Michael Williamson, Robert Heaphy, Raymond Trechter, Michael Townsend, Molly Minana, Pamela Harris, Martin Pilch, Timothy Trucano, Paul Yarrington, Susan Moore

ASC Tri-Lab L1 Milestone: Deliver Advanced ASC Physics and Engineering Simulation Capabilities to Support the W76-1 and the W80-3 LEP

The milestone team demonstrated significant advancements in the predictive capability of ASC codes for weapons applications through the application of formal V&V and UQ processes.

Vicente Romero, Martin Pilch, Amalia Black, Michael Starr,

AM/PM PERSONNEL MOVES PROCESS TEAM

Wil Holzmann, D. Gregory Tipton, Thomas Blanchat, Barry Boughton, Alexander Brown, Dean Dobranich, Stefan Domino, Kevin Dowding, Nicholas Francis, Cecily Glissman, Michel Hobbs, Lubomyra Kmetyk, Christine Northrop-Salazar, Tolulope Okusanya, Thomas Paez, Garth Reese, Brian Resor, Daniel Segalman, Laura Swiler, Sheldon Tieszen, Angel Urbina

ATE TVAC IT&L Team

For exceptional teamwork and leadership in the planning and execution of a complex and highly visible test series for a Sandia-developed, space-based national asset.

James Knecht, Robert Mathews, Donald Wilcoxon, Ronald Akau, Patrick Barney, Troy Gourley, Michael Maness, Edward Martinez, John Morasco, Christopher Schumacher, Robert Shirey, Bernard Soules, Michael Vickers, Donald Wilcoxon, James Scott

Audit Backlog Value Stream Mapping (VSM) Team

The Audit Backlog Value Stream Mapping Team identified process and system changes that will effectively reduce the Contract Audit backlog and unallowable cost risk.

Delfinia Salazar, Jo Cunningham, Tazmin Ralph, Marian Armijo, Richard Baird, Jacquelyn Rambo, Jim Green, Patricia Sena, Armani Vadiee

Automated Quasi-Metallize Spray Application (AQMSA) Team

Recognition of the AQMSA Team's development of a lean, low-cost commercial spray application alternative to the current labor-intensive, hand-paint Quasi-Metallize process.

Paul Morrison, Phyllis Rice, Gary Mueller, Sergio Gonzalez, Rosalie Lopez-Spinello, Frank Chavez, Charles Bundy, Maria Galaviz, Maryann Olascoaga, William Pasco, Martha Perez, John Stuecker

(Continued on next page)

Team awards recognize achievement

DEFECT-FREE MANUFACTURING TEAM

(Continued from preceding page)

B61 ALT 356/8/9 SRM Team

For demonstrating exemplary dedication, personal sacrifice and overcoming significant technical and programmatic challenges to meet component and system production deadlines.

Douglas Hodge, William Erikson, Rachel Carson, William Shelton, Neil Sorenson, Duane Richardson, John Lorio, Adam Wadin, Walter Wolfe, Paul Hooper, Thomas Massis, Gerald Knorovsky, Marlene Uribe, Kenneth Gwinn, Thomas Hafenrichter, Phil Hoover, Roger Kite, Vincent Loyola, Frank Paulic, Jeffrey Payne, Donald Potter, Raymond Sanchez, Sara Szarka, Gilbert Theroux, Richard Apodaca

CDM Cost Estimating Tool Development Team

This integrated team successfully developed and implemented the new CDM Cost Estimating tool that is now in full operation.

Richard Berget, Wesley Bruno, Odelia Griffin, Donna Bauer, Richard Baird, Damon Stafford, Leland Clise, Sharon Dobias, Kim Gallagher, Thomas Garner, M. Elena Holland, Kathleen Johns, Tana Lucy, Mary K.C. Phillips, Frederick Salas, Ian Bailey, Rachel Cardona Brown

Center 4500 Rational Unified Process Decision Analysis Resolution Team

The team used a CMMI Level 3 process — Decision Analysis and Resolution — to basis an important Center decision to use Rational Unified Process.

Manuel Ontiveros, Sunita Moonka, David Suyle, Boris Starr, Jr.

Center 6300 Move team

Transforming the face of Sandia's energy image.

Bradford Skinner, Sandra Weaver, Julia Archibeque-Guerra, Mary Alice Padilla, Ana-Marie Mollo, Tom Salazar

Center 6400 Office Administrative Team

For providing outstanding service to the 6400 Center Office during the long-term absence of the Senior Management Assistant, they demonstrated teamwork, dedication, and professionalism.

Jessica Cardoza, Tracy Knowlton, Denise King, Robin Thompson, Judy Sesma, Tayna Freier, Christine Johnson

Clovelly Site SPR Expansion Geomechanics Analysis Team

For completing complex geomechanical analyses on a high-priority DOE SPR project, which were pivotal in site selection, averting a $2 billion investment into a site with unacceptable risk.

Jonathan Rath, James Bean, Brian Ehgartner, Jose Arguello, Jr.

Compute Process Allocator R&D 100 Award Team

The CPA team's allocator is the first to balance individual job allocation quality with future allocations, significantly impacting processing time and efficiency over 10,000 processors.

Kevin Pedretti, Vitus Leung, Cynthia Phillips, Michael Bender, David Bunde

Cyber Forensics Response Team

The team is recognized through the Department of Energy, National Nuclear Security Administration and other agencies as being experts in responding to network cyber intrusions.

Jeffrey Heller, Nellie Ward, Jessica Dillinger-Hale, Carrie Black, Douglas Kayatt, Jr., Daniel Chavez, Alex Quintana, Alex Berry, Kevin Nauer, Kenneth Will, Dominique Kilman, Tracey Lamee, Randy McClelland-Bane, Roger Suppona, Eric Thomas, Peter D. Warner

DARPA Navigation Grade Integrated Micro Gyroscopes (NGIMG)

The Sandia/Northrop Grumman NGIMG Team successfully demonstrated a nuclear magnetic resonance-based microgyroscope within 12 months leading to award of a Phase II program.

Kent Geib, Christian Arrington, Victoria Montano, Kelly Neely, Rick Kellogg, John Williams, Darwin Serkland, Jim Hudgens, Gregory Peake, Thomas Swiler, Rusty Gillen, Christopher Apblett, Robert Boye, Jay Brotz, Adam Rowen, Peter Schwindt, Adam Stanford, Jason Verley, Hank Abbink, Thomas Lemp, Carrie Schmidt

DARPA Strategic Hardened Facility Defeat (SHFD) Proposal Team

The SHFD team crafted the winning proposal in response to a DARPA BAA for development and demonstration of an advanced concept for hard-target defeat.

Laurence Costin, Mark Grubelich, Wendy Shaneyfelt, Mark Yee, Douglas Blankenship, Yarom Polsky, David Holcomb, K. Terry Stalker, Phil Chamberli, William Escapule, Arthur Mansure, Sheldon Tieszen

Defect-Free Manufacturing Team

For significant predictive science-based engineering impacts on Pantex and KCP manufacturing processes, completion of a Level II Milestone, and support of AT-3.4.2 in the PEP.

Carlton Brooks, Amy Cha-Tien Sun, Rekha Rao, Lisa Mondy, Anne Grillet, Patrick Notz, Douglas Adolf, Ryan Berry, Jaime Castaneda, Raymond Cote, Richard Givler, Andrew Kraynik, David Noble, Mary White, Kathryn Berchtold, Paul Brooks, Alan Graham, Holly Haines, Bobby Mack, Jim Mahoney, Jennifer Politano, Cindy Welch, Edward Wilkes

Disaster Recovery/Business Continuity Project Team

For creating a comprehensive, integrated Disaster Recovery Program/Strategy for centralized Information Technologies, balancing risk, cost, and practicality against the overwhelming size/complexity of Sandia's IT infrastructure.

Joe Brenkosh, Mike Kutzer, Don Bragg, Linda Garcia, Stephanie Fellows, Mike Gomez, Steve Carpenter, David Chacon, Phil Kuhlman, Chris Morgan, Warren Cox, Jerry Friesen, Mark Gutscher, Cathy Houf, Joel Ammons, Lew Cox, Ali Hadizadeh, Ken Hunkler, Ryan Layton, Peter Laz, Bob Sibik, Greg Stevens

EDA Team

The EDA team completed design changes in a timely fashion for 28 different electronic modules required for the HiFES R&R/Nexus effort.

Richard Wilson, Richard Schaetzel, Gerald Prudencio, John Baney, Andrea Scott, Fred Turrieta, Joel Blend

Electromagnetic Launch and Operation of Naval Countermeasures

A first-ever electromagnetic launch and successful operation of a war-reserve naval countermeasures cartridge that included energetics and fusing, demonstrating payload compatibility with electromagnetic launch systems.

Garyson Kinchen, Charlie Eberle, Janise Baldo-Pulaski, John Jojola, Walter Nickerson III, Edward Vieth, Matthew Aubuchon, Gilbert Gonzalez, Les Basak, Richard DeFelice

Electromagnetics and Plasma Physics ASC Code Developers

For significant and important progress in the development, new applications and transfers of ASC EM and plasma physics codes.

Jennifer Powell, Rebecca Coats, Lorena Basilio, C. David Turner, David Seidel, William Langston, Larry Warne, Michael Pasik, William Bohnhoff, William Johnson, Roy Jorgenson, Joseph Kotulski, Robert Mariano, L. Paul Mix, Jr., David Peters, Timothy Pointon, Filippo Capplino, Brian Grant, Don Wilton

EPIC Application Specific Integrated Circuit Product Team

For outstanding service in the delivery of the EPIC ASIC chipset for use on the HIFES and NEXUS satellite focal plane payloads.

Sarah Everist, Patricia Snipes, Kurt Sandquist, Dana Shaw, Debra Ebbesen, Ronald Grant, Jose Rodriguez, Gregory Dinger, Thomas Gurrieri, Marty Shaneyfelt, Paul Dodd, Adam Brewer, Donald Bradley, David Campbell, Edward Dibello, Randolph Kay, Katherine Myers, Cathleen Reber, Patrick Candelaria, David Cordova, Otho Fogwell, Gerald Hash, Bradley Havener, Kenneth McGuire, Thomas Sanchez, Maurice Serna

Facilities Control System (FCS) Team

The FCS team employed a team approach in order to support the construction, startup and operation of multiple new facilities in 2006.

John Garcia, Dave Bryant, Edward Gore, Michael Swalby, Michael Rocco, Ronald Rymarz, Randy Lanier, James Whatley, David Dobias

Global Security Engagement and International Safeguards Business

This team developed a series of business tools required by a new DOE customer resulting in enhanced trust and rapport and securing organizational mission space.

Marla Clary, Benjamin Bonin, Nora Tankersley

Global Security Programs Technology, Training & Demonstration (TTD) core team

The TTD core team simultaneously conducted a dramatic upgrade of the TTD area and remained fully operational for multiple high-level international projects.

Ruth Duggan, Connie Bodmer, Sally Bangora, Manuel Trujillo, Peter Havey, Faye Monaco

Ground Segment Testing (GST) Team for Sensor Systems in Thermal Vacuum Chamber

The GST Team software engineers' over-and-above efforts supported the Flight Segment hardware engineers during Thermal Vacuum testing of an engineering grade sensor system prototype.

Eric Brock, Todd Ritterbush, David Cunningham, Maikael Thomas, Steven Gardner, Steve Kubica, Timothy Ericksson, Stephen Young, Todd Giles, Judy Beiriger, David Bodette, Ethan Chan, Thomas Loughry, David Miller, Clark Poore, David Strong, Robert Warrick, Guillermo Bonilla

Heavy Penetrator Sled Test Team

For tremendous teamwork that resulted in successfully completing two sled tests at Holloman Air Force Base and meeting a near-impossible schedule.

Ben Welch, Doug Dederman, Eric Klamerus, Jeff Tong,

(Continued on page 12)

Nathaniel Gleason
8114

Robert Hanzlik
5626

Amy Herr
8321

Sherron Hirdman
2733

Gary Hoe
4864

Linda Holle
6037

Tan Chang Hu
9338

Janet Iafonaro
2025

William Jenkins Jr.
12920

Scott Jones
1344

Thomas Karas
12140

Roger Kite
10242

Elmer Klavetter
11501

Douglas Lawson
243

Cognitive Science and Technology Program becomes Sandia initiative

Labs' experience in diverse fields critical in emerging cognitive revolution

Stories by Chris Burroughs

Editor's note: The following story is the first in a series of articles on Sandia's Cognitive Science and Technology Program. Articles in future issues of the Lab News *will discuss various individual research projects underway at Sandia in this growing area.*

* * *

Imagine a world where a machine creates a "virtual you" by modeling how you think and your expertise on a subject. Or one where your car's computer assesses your driving skills and compensates for your limitations.

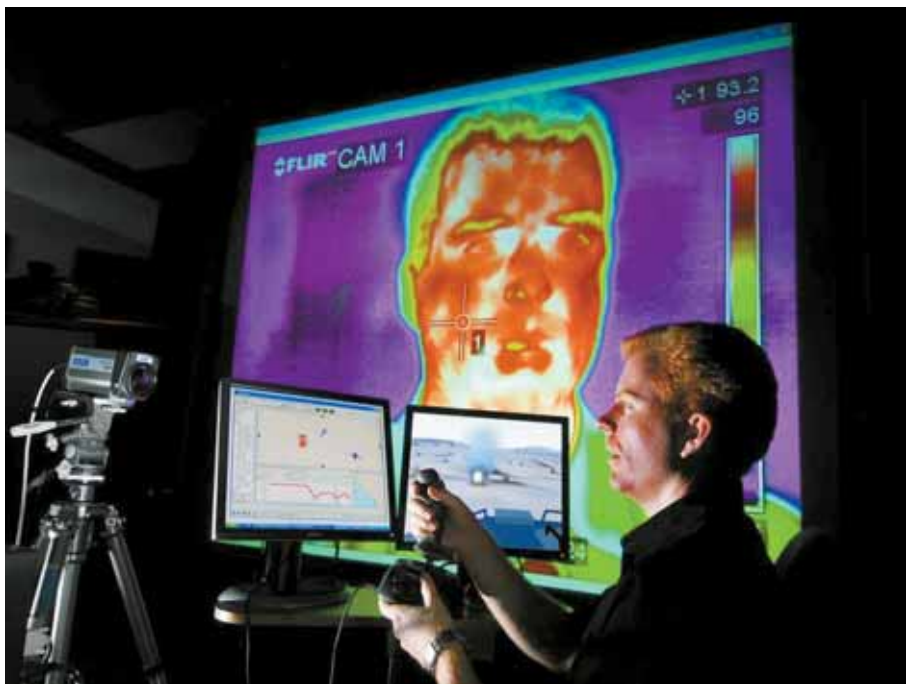
That's the world Sandia has entered full throttle through its Cognitive Science and Technology Program (CS&T).

A revolution is at hand, says Chris Forsythe (6341), member of the Labs' cognition research team. It's not one of just better guns and weapons for national security. Instead, "It's a revolution of the mind — of how people think and how machines can help people work better."

"I believe that a fundamental level, science-based understanding of human cognition will, indeed, revolutionize the world," says Steve Roehrig, director of Energy, Resources, & Systems Analysis Center 6300 and Sandia's CS&T program lead. "Our long-term CS&T program emphasizes teaming with outside institutions to research and apply the spectrum of science underlying human cognition — from neural basics to the integrated brain, to understanding the mind and individual behavior. With an emphasis on national security, Sandia can have major impacts ranging from aiding neural scientists with new technologies and computational approaches to developing cognitive aids for humans on the other end of the spectrum."

Focus on the individual

A large portion of Sandia's program today focuses on the uniqueness of the individual interacting with others and with machines. It involves using machines to help humans perform more efficiently and embedding cognitive models in machines so they interact with users more like people interact with one another. The result is the ability for researchers to take advantage of the basic strengths of humans and machines while mitigating the weaknesses of each.



SANDIA RESEARCHER ROB ABBOTT uses a joystick and plays the role of a student in a training exercise driving an amphibious assault vehicle simulator used by the Navy and Marines. The second monitor is an instructor/operator application called CDMTS. In the background is a thermal image of a student's face used for investigating biometrics to monitor the student in various ways including the level of engagement and focus of attention. (Photo by Randy Montoya)

> *"I believe that at a fundamental level, science-based understanding of human cognition will, indeed, revolutionize the world."*
>
> **Steve Roehrig**
> **Center 6300 director**

Cognitive projects and research at Sandia span the gamut from student training to assisting with Yucca Mountain licensing, from designing "smart" cars to using video-like games to train military personnel, and from determining how neurons give rise to memory to global terrorist threat detection.

Funding for the research has come from the Office of Naval Research, Sandia's Laboratory Directed Research and Development (LDRD) program, DOE, the Defense Advanced Research Projects Agency (DARPA), and other government agencies. The CS&T program also benefits from collaborations with the University of New Mexico, the MIND Imaging Center in Albuquerque, and most recently the University of Illinois at Urbana-Champaign.

Cognition and national security

The initial decision for Sandia to develop cognitive technologies is based on the belief that "there are numerous positive impacts cognitive systems technologies can have on our national security," says Russ Skocypec, senior manager of the Human, Systems, and Simulation Technologies Dept. 6340.

"Everything in the world is becoming more individualized, including conflicts," Russ says. "You see this all the time in Iraq and other places where terrorists are taking their toll. Security threats are more personalized."

Russ believes that today's conflicts are unlike others over in the past century. He says that although all wars are driven by humans, major influences on the outcomes have differed. World War I was a chemists' war, World War II a physicists' war, and the Cold War an economic war. Today, he believes, "we are engaged in a human war that is influenced primarily by individual human beings rather than technology or bureaucracy."

That is why he considers it appropriate for Sandia, a laboratory with national security as its mission, to use its resources to better understand the minds of this country's adversaries, as well as to use machines to enhance the Labs' abilities to recognize patterns, deal with massive amounts of data, solve perplexing problems, and perform complex activities.

(Continued on next page)

Ethics and cognitive research

The new cognitive technologies promise a great future — machines helping people learn faster, better; new ways for experts to share information; and more efficient ways for people to work using machines. But potential danger lurks in the shadows if these technologies are misused or misunderstood.

"We are talking about a whole new level of ethical and legal considerations that may have impacts in ways we can't yet even comprehend," says Wendy Shaneyfelt (6341), member of the cognition research team who began thinking about these issues early in the research.

Russ Skocypec, senior manager of the Human, Systems, and Simulation Technologies Dept. 6340, says he credits staff members, like Wendy, who recognized the potential for ethical and legal concerns.

"They brought their concerns to the attention of management, which has been very supportive of advancing these objectives directly and objectively," he says. "It is our hope to educate ourselves and society early on these issues to mitigate the potential for purely or highly emotional responses later."

Many questions emerge when thinking about these systems, Wendy says. Who owns a cognitive model that represents a human (cognitive agent) and is responsible for its behavior? Can a cognitive agent be licensed? Can a cognitive agent legally act on a person's behalf? How can access to a cognitive agent be controlled? What if a cognitive agent performs a business transaction on behalf of a deceased person? Who is responsible for erroneous information supplied by a cognitive agent? What if a cognitive agent shares personal information it is not authorized to share?

In an effort to be ahead of the game and be prepared with answers before the cognitive revolution reaches fruition, Wendy led a grassroots effort to explore how other emerging and well-established scientific disciplines confronted similar issues and what it would take to develop cognitive systems responsibly.

"We wanted to learn from the experiences that the biotechnology and nanotechnology communities have had as they confront ethical and legal issues in their respective rapidly expanding fields," Russ says.

The result was the evolution of seven ethical principles and guidelines (see below) for the development of cognitive systems.

Working with the cognitive science researchers on her team and consulting with ethicists and psychology professors from the University of New Mexico, a framework was established to provide guidance and practical strategies to proactively address both real and potential ethical issues.

"In general, the principles vary in terms of the specificity of their content," Wendy says. "Some are broad, like respect for persons, while others are more limited in scope — protecting the confidentiality of a research participant's data."

Ethical principles for the development of cognitive systems

- Cognitive system developers will remain knowledgeable about and apply their respective established professional/ethical codes and guidelines as appropriate.
- Cognitive systems developers will proactively consider the intended uses and impacts of their specific technologies, as well as the potential for accidental use, misuse, and abuse.
- Cognitive systems developers will provide inherent safety features to the extent considered reasonably possible to maximize the prevention of accidents, misuse, and abuse.
- Cognitive systems developers will proactively initiate ethical discussions among themselves and support public engagements as these technologies develop.
- Cognitive systems developers will provide human test subjects with a clear understanding of the personal information acquired and how it will be stored, analyzed, and applied.
- Cognitive systems developers will responsibly handle any personal information obtained from test subjects.
- Cognitive systems developers will respect the limitations of a cognitive model as an imperfect representation of a test subject.

Cognitive science

(Continued from preceding page)

While Sandia dipped its toes in cognitive research in the late 1990s, the Labs' real effort in the area started in 2002 when the program won an internally funded LDRD grand challenge. Based in part on the success and path set by the grand challenge in 2005, the former Mission Council — a group that consisted of senior Sandia vice presidents — selected cognitive science and technology (CS&T) as a research focus area for the Labs.

Most people who are well-versed on cognitive issues — like Danny Rintoul, manager of Computational Biology Dept. 1412, whose department has several people involved in cognitive research efforts — believe that the "near-term high-impact effect of cognitive science research would be to enable people to do complex, dangerous tasks in a safer manner."

"This includes, of course, protecting and augmenting the warfighter, but eventually could be used to help people with a broader set of tasks that are not just dangerous, but unpleasant and tedious," Danny says. "In the long-term, the real goal is understanding the inner workings of the mind. This is probably a 100-year goal, but the payoff for this would probably revolutionize human life as we know it."

The largest complex problem

He adds, "Sandia is one of the premier places in the world where disparate groups of researchers have been able to work together to solve large complex problems. Cognitive science is probably the largest complex problem that scientists are considering right now, and our ability to bring together computational scientists, engineers, and neural scientists to tackle this problem is critical in solving it."

Deputy Labs Director for Integrated Technologies and Systems Al Romig says Sandia's move to emphasize cognitive research is "not unlike what we did when we decided to go into biotechnology in 1999."

"Many people believe cognitive science will be a major focus of scientific research and technology development over the next several years," he says. "Just like biotechnology is not the biology of our grandparents, cognitive science is not the science of even your older sibling."

He calls this a "new frontier" that will grow rapidly over the next 10 to 20 years.

"Right now we can't really know what will come out of a radical new area like cognition," he says. "We may not see an impact tomorrow. Ten years from now may even be optimistic. But it's our responsibility to be at the forefront."

COGNITION SCIENCE TEAM AT WORK — (Left to right) Steve Verzi, Justin Basilico, Charlie Gieseler, Chris Davis (2nd row) Jon Whetzel, Russel Waymire, Ann Speed, Patrick Xavier, Zach Benz (right to back) Matt Glickman, Fred Rothganger, Brian Clark, Wendy Shaneyfelt, and Brian Titus. (Photo by Tiana Chavez)

Strategic planning for Cognitive Science and Technology

During the spring and summer of 2006, the cognition team conducted two investigations. The first looked at what cognitive capabilities exist at Sandia.

The second examined opportunities involving the convergence of Sandia's initiatives in the areas of cognition, biotechnology, and nanotechnology. This led to a Cognitive Science and Technology Plan with three technical objectives — a basic science understanding of the human brain, mind, and behavior; improved human performance; and advanced human-machine systems at all scales.

"The plan is at the level of 'send a man to the moon' — beyond the scope of what any one institution can possibly do," Chris says. "It's a synthesis of ideas. Now, our intent is to home in on a few areas in which the labs can make a unique and profound contribution."

Chris says there are two elements to Sandia's

(Continued on next page)

Investigating surety methodologies for cognitive systems

To further study the legal and ethical ramifications of cognitive research, Wendy Shaneyfelt (6341) and David Peercy of Sandia's System and Software Quality Engineering Dept. 12341 established a multidisciplinary team of researchers from Sandia and the University of New Mexico. The team was charged with characterizing a range of actual, potential, perceived technical, and nontechnical risks associated with the development of cognitive systems.

The team participated in a series of workshops and conducted several focus groups to help understand what threats both scientists and the public perceived to be involved in cognitive research. Focus group participants included nontechnical people, such as University of New Mexico professors who had no scientific and technical expertise in this field and a well-educated public from the Albuquerque community; technical people including UNM, The MIND Institute, and Sandia personnel who were researchers in the field of cognitive sciences; and Sandia employees working in the area of surety.

"All participants agreed there was some threat with the cognitive technologies, in particular in the areas of privacy, legal, ownership, and reliability of systems," Wendy says. "This was across the board — something unusual in this type of survey. The concerns of the scientists were not that dissimilar from the concerns of the public."

Based on the findings from the focus groups, the team started looking at Sandia's surety model as a possible way of mitigating risks.

"The model has been dispersed around the world to prevent the mishandling of nuclear weapons," Wendy says. "We wanted to do to the same thing with cognitive technologies to avoid potential future abuses and accidents."

Sandia's surety model — which centers around safety, reliability, security, human factors, quality, and surveillance — has been extensively studied and applied within the Labs' weapon/weapon-related areas as well as for other technologies.

"Our exterior advisory board believed Sandia has a unique ability to utilize surety techniques to help mitigate risks in this field," Russ says. "They strongly encouraged us to apply them."

Cognition, neuroscience poised for major breakthroughs

The fields of cognition and neuroscience are poised for the same major unifying breakthroughs experienced by the physics and biology communities of the last century and a half, says John Wagner, manager of Cognitive and Exploratory Systems Dept. 6341.

JOHN WAGNER

"In physics, complex disparate observations were reconciled based on simple unifying fundamental principles. Examples include electricity and magnetism, thermodynamics and statistical mechanics, and Newtonian dynamics and relativity," he says. "Similarly, the biological revolution started when the extreme complexity and variability of the biological world was unified based on the replication and application of simple rules embodied in the geometry of DNA."

Today, John says, there is some understanding of the brain (neuroscience) and mind (cognitive psychology and behavior) at various levels, but there is no unifying basic understanding of them or the fundamental principles of structure and function that apply to them.

"Seeking this fundamental understanding from first principles, not just empirical observations, helps set the scientific direction for the CS&T program," John says.

Cognition modeling no easy task

One goal of Sandia's cognition program is to create simulated humans that interact with each other, their environment, and with actual humans in a realistic and psychologically plausible manner.

For several years Sandian Michael Bernard (6341) and others have been working with cognitive experts from universities around the country to develop computational models of memory, decision making, reason, emotion, and stress. For example, his group is attempting to computationally represent episodic memory (memory of our unique, personal experiences), prospective memory (remembering to perform an intended action — e.g., pick up some milk on the way home from work), and semantic memory (factual information independent of the specific episodes in which that information was acquired).

The ultimate goal of this effort will be to build the groundwork for human simulation models for a number of applications.

Michael says this is not an easy task.

"We've had to include a variety of aptitudes in the computer framework that are found primarily in humans and other higher primates," he says.

This involves such abilities as "to dynamically respond to both environmental and social stimuli, perceive relationships among characters, have psychological and sociological plausibility, and account for different types of human emotions at various levels."

To create software to accommodate this type of complex data, the team started with building blocks of memory: concept, the most fundamental element of the Sandia architecture; and contexts, meaningful perceptual representations based on recognizable patterns of stimuli.

"One of the milestones for the past fiscal year was to develop initial reasoning algorithms in the form of deductive, inductive, and abductive logic," Michael says.

Deductive reasoning is the process of reasoning in which the conclusion is reached from previously known facts. Inductive is the process of reasoning in which the premises of an argument are believed to support the conclusion but do not ensure it. Abduction is the process of selecting a hypothesis that would, if true, best explain the observation.

Michael says that the ultimate the goal of this effort will be to build the groundwork for human simulation models that can be fielded as next generation modeling and simulation training, behavioral forecasting, and tactics development tools.

JONATHAN McCLAIN (6341) demonstrates use of an EyeTracker system, a way for the computer to know where a person is looking on the monitor screen. It's part of an integrated workstation designed for machines to interpret human cognitive and emotional states. (Photo by Brian F. Clark)

Cognitive science

(Continued from preceding page)

strategic planning for cognition.

"What makes most sense is for Sandia to select areas where we have unique, collective technical strengths, areas that few others in the world can do as well," Chris says. "These include such capabilities as high-performance computing, nanotech, physics-based modeling and simulation, and surety."

The human factor

The other element involves a focus on opportunities where specific national security problems have a human factor.

"As a national security lab, we have a responsibility to apply this emerging science and technology base to provide innovative new solutions to these problems," he says.

In speaking about the importance of understanding the brain, Sandia VP and Principal Scientist Gerry Yonas notes, "Our best role is to harness the power of our computing and modeling, as well as sensors, to assist in the rapidly advancing field of neuroscience for national security applications. Sandia can apply neuroscience to national security problems in a variety of ways — by improving our understanding of brain functions and of the implications of stress, confusion, and ambiguity on decision making, all in an effort to enhance our own performance and degrade the performance of our adversaries."

John Wagner, manager of Cognitive and Exploratory Systems and Simulations Dept. 6341, says the new area of research means "profound opportunities exist for the Labs."

"CS&T's ambitious direction may not be realized for many decades, but the information required for progress is emerging today," he says. "It is reasonable to expect future discoveries will become the Nobel-class achievements for the cognitive and neuroscience communities at large in the years to come."

What is a cognitive system?

The term "cognitive systems" has been used worldwide to identify a variety of programs, initiatives, and technologies. However, so many varied uses have led to ambiguity of meaning. Sandia has established its own definition: "Cognitive systems consist of technologies that utilize as an essential component one or more computational models of human cognitive processes or the knowledge of specific experts, users, or other individuals."

"It is important to note in this definition and in all of Sandia's work in the area of cognition that the human is always part of the equation," Chris says. "Technology might try to take the human out of the system, but the human element never goes away. A machine might be able to do the work 10 humans can do. But a human has to be in the loop — there was a human who designed it, most likely, a human who uses and maintains it, and in the end, a human will probably dispose of it."

To Russ, "the goal is to have seamless and sophisticated unions between humans and computers."

"Extending human cognition in such a way offers people the unprecedented ability to increase their productivity as well as improve the quality of their work," Russ says.

Further research, he says, on how behavior and the mind work together is needed before research can go much farther. Knowledge of the brain is deep in specific areas but much is still unknown, particularly in understanding brain function at different scales and as integrated systems.

John says that cognitive research at Sandia — like most worldwide — is in its infancy. He anticipates that within the next decade research that seems like science fiction today will be a daily part of everyone's lives. The cognitive revolution will be in full bloom.

"Once that happens, the best of both worlds can happen," John says. "If we understand human cognition better, we can work together as a nation to reduce tension, find problems before they turn into armed conflict, and work toward actions that establish and maintain peace worldwide."

Automated knowledge capture

Sandia initiated its cognitive modeling efforts in 1999. It involved many hours interviewing people and reviewing records.

"We realized from the beginning that cognitive modeling may be a wonderful technology, but doing it by traditional methods required too much time and cost too much money for the technology to ever be broadly applicable or to realize its true potential for national security," says Chris Forsythe (6341), member of Sandia's cognition research team. "There was a concern that our technology would only be applied for a handful of exotic applications where cost was not an issue. It was apparent that we had to automate the development and updating of models of individuals."

As a result, research spearheaded into three different research arenas for building models — text-based models, training applications, and machine transactions. These became the basis for building models through "automated knowledge capture."

Text-based models involve taking documents, papers, and emails and looking for information, including key words and word patterns — anything that might provide insight — to what a person is thinking or interested in. This also gives researchers the opportunity to look at changes across time. When they see new key words emerge, something might have changed. Heading up this effort is Travis Bauer (6341).

Training applications, headed by Robert Abbott and Elaine Raybourn (both 6341), are another major part of automated knowledge capture. Sandia has been working with the US Navy to develop a tool that can be part of its aviation training exercises. This involves building a model that can record students' actions during training exercises. Computers monitor large numbers of people at once, detect when someone is doing something inappropriate, and bring it to the attention of the student or instructor.

The machine transactions segment of automated knowledge capture uses sensors to gather information about how a person drives. This information is put into a computer model. While a person is driving, the computer can detect when the driver is in a demanding driving situation (e.g., entering a high-speed roadway or preparing to pass another vehicle). This recognition allows the car to delay nonurgent communications such as cell phone calls until the driver can better handle the extra activity. Leading the machine transitions research are Chris and Kevin Dixon (6341).

Upcoming stories in augmented cognition series

- Sandia researchers help to make cars smarter
- Sandia models how people use analytical thinking to solve problems
- Sandia works with Army to use video game-like technique to train soldiers
- Sandia works on project where nanoelectrode arrays are injected in an animal's brain to provide data concerning neuron activation
- Sandia researches brain injury
- Yucca Mountain certification process uses Sandia cognition program software

Validation and verification play important role

Tied closely to the development of cognitive computer models are the validation and verification techniques to ensure the models are correct.

That's where Tim Trucano (1411), validation and verification expert, steps in. He is in the early stages of developing ways to make sure the cognitive models are working as they should.

"I work on developing methods to generate and use information that allow cognitive modelers to validate their models," says Tim, who has spent many years working with the NNSA Advanced Simulation & Computing Program.

He and his team, consisting of George Backus (1433), Alex Slepoy (4014), Laura McNamara (1433), and Scott Mitchell (1412), are seven months into a Laboratory Directed Research and Development (LDRD) project. They are attempting to create a validation methodology that "makes sense for cognitive and group interaction modeling," Tim says. In particular, they are researching mathematical methods and computational procedures for scientifically comparing cognitive models with empirical observations as part of the validation process.

Ultimately they hope to develop a verification and validation strategy for the CS&T program, as well as specific insight into one or more projects.

US National Security and Nuclear Weapons: Maintaining Deterrence in the 21st Century

Editor's note: Last week the secretaries of Energy, Defense, and State issued a joint document outlining the role of nuclear weapons as a deterrent in the 21st century strategic environment. Because the document addresses issues related to the future of the nuclear weapons complex and discusses the potential role the Reliable Replacement Warhead could play in modernizing the nation's nuclear weapons arsenal, it is of fundamental interest to Sandians. The document, reprinted here in its entirety, was released to Congress, the news media, and the public. The electronic version of the document is available at the NNSA website at www.nnsa.doe.gov/docs/factsheets/2007/NA-07-FS-04.pdf.

(Subheadlines have been added by the Lab News.)

* * *

A principal national security goal of the United States is to deter aggression against ourselves, our allies, and friends. Every American administration since President Truman's day has formulated US national security policy in much the same terms, making clear to adversaries and allies alike the essential role that nuclear weapons play in maintaining deterrence. Sustaining US deterrence policy has required decades of dedicated service from the men and women of our armed forces, skilled representation by America's diplomats, and painstaking, often dangerous work by America's nuclear scientists, engineers, and technicians. The extension of a credible US nuclear deterrent has been critical to allied security and removed the need for many key allies to develop their own nuclear forces.

A decades-long, bipartisan partnership

Above all, maintaining a credible deterrent has required a decades-long, bipartisan partnership with Congress. Some in Congress have recently expressed the view that we lack a coherent nuclear weapons strategy that provides the direction and rationale for the post-Cold War US nuclear force structure. To address these concerns in more depth, a detailed report will follow this summary paper. The report will lay out the data and methodology used to determine our nuclear weapons force structure, outline knowledge points for measuring progress in transforming our nuclear stockpile, and dispel a number of myths that have grown up around US nuclear forces.

It is the policy of this Administration to achieve an effective strategic deterrent at the lowest level of nuclear weapons consistent with our national security and our commitments and obligations to allies. In 2001, President Bush directed that the United States reduce the number of operationally deployed strategic nuclear weapons from about 6,000 to 1,700-2,200 by 2012 — a two-thirds reduction. Corresponding reductions in the nuclear stockpile will result in the lowest level since the Eisenhower Administration.

Several factors have permitted these dramatic reductions from our large Cold War nuclear arsenal built and maintained from the 1950s to the 1990s. For several decades, the Soviet Union represented a large, intractable, ideologically motivated adversary; its fall has allowed us to reassess our nuclear force requirements. In 2001, the President also directed the transition to a new set of military capabilities more appropriate for credible deterrence in the 21st century. This "new triad" of strategic capabilities, composed of non-nuclear and nuclear offensive strike forces, missile defenses, and a responsive national security infrastructure, reduces US reliance on nuclear weapons while mitigating the risks associated with drawing down US nuclear forces.

However, other contemporary factors lead us to conclude that nuclear weapons will continue to be required for the foreseeable future. The future security environment is very uncertain, and some trends are not favorable. Rogue states either have or seek weapons of mass destruction, including nuclear weapons, and the risk of future proliferation cannot be ignored. The future direction that any number of states may take, including some established nuclear powers with aggressive nuclear force modernization programs, could have a dramatic effect on US security and the security of our allies. We seek to assure our allies that the US nuclear arsenal continues to serve as the ultimate guarantor of their security, thus obviating any need for them to develop nuclear weapons of their own. Indeed, the nuclear weapons programs of North Korea and Iran underscore the importance of US security guarantees to key allies around the world. Credible US nuclear capabilities and our security commitment to allies remain an indispensable part of deterrence and an important element in our effort to limit proliferation.

A responsive nuclear infrastructure

The Administration believes that an operational force between 1,700 and 2,200 strategic warheads, while much smaller than our Cold War arsenal, still provides sufficient capability to achieve these goals. This force will demonstrate to allies and adversaries alike that the United States has the necessary means, and the political will, to respond decisively against aggression and the use of weapons of mass destruction.

The current plan preserves options for future administrations to make additional adjustments in the US nuclear force posture as changes in the international security environment warrant.

We are at a critical juncture that requires the US to invest now in the capabilities needed to maintain a credible deterrent at the lowest level of nuclear weapons. Without assuming serious risk, further reductions in the total stockpile are only achievable with a responsive nuclear infrastructure. Without a responsive nuclear infrastructure, the United States must continue to manage the technical risks associated with an aging stockpile of Cold War-era nuclear weapons, and the geopolitical uncertainties of the years ahead, by maintaining a sizable inventory of reserve weapons to support the operationally deployed force. This is an increasingly expensive and potentially risky approach to stockpile stewardship. Successive efforts at extending the service life of the current inventory of weapons drives these weapons farther away from the original source data derived from underground nuclear tests, and risks incorporating or accruing technical changes that could, over time, inadvertently undermine their reliability and performance.

Refurbishing older weapons difficult

The skills and technologies needed to refurbish and maintain these older weapon designs are increasingly difficult to sustain or acquire. Furthermore, some of the materials employed in these older weapons are extremely hazardous. Moreover, it is difficult to incorporate modern safety and security features into Cold War-era weapon designs.

Finally, as the United States continues to observe a moratorium on underground nuclear testing, it becomes increasingly difficult to certify the existing stockpile of weapons.

To address these issues of sustainability, safety, security, and reliability, and to achieve a smaller yet credible nuclear deterrent force, the United States needs to invest in the Reliable Replacement Warhead (RRW) program. Pursuit of this program is critical to sustaining long-term confidence in our deterrent capability — especially as the US reduces its nuclear forces, the total number of weapons in the stockpile, and the size of the nuclear weapons infrastructure. RRW is a replacement warhead — it will help reduce the size of the nuclear stockpile and will not provide new military capabilities. Instead, RRW will make US nuclear weapons safer and more secure against unauthorized use by incorporating state-of-the-art security features that cannot be retro-fitted to older weapons. RRW designs will provide more favorable reliability and performance margins than those currently in the stockpile, and will be less sensitive to incremental aging effects or manufacturing variances.

Reducing likelihood of nuclear tests

Thus, RRW will allow the United States to manage the risks and challenges of the 21st Century while reducing the likelihood of returning to nuclear testing to certify reliability. Over time, RRW will enable the United States to transition to a smaller, more responsive nuclear infrastructure that will enable future administrations to adjust the US nuclear stockpile as geopolitical conditions warrant. RRW is key to sustaining our security commitment to allies, and is fully consistent with US obligations under the Nuclear Nonproliferation Treaty — including Article VI.

Without Congressional support for the Reliable Replacement Warhead program we are concerned for the long-term ability of the United States to sustain its strategy of deterrence, meet its security commitment to allies, and pursue further reductions in nuclear weapons without assuming additional risk. Delaying progress on RRW will force the United States to maintain a large stockpile of nuclear weapons and sustain it through increasingly costly and risky Life Extension Programs. Delays on RRW also raise the prospect of having to return to underground nuclear testing to certify existing weapons.

Transforming & reducing nuclear forces

Maintaining a credible deterrent has required a decades-long, bipartisan partnership with Congress; this partnership will be no less critical in the future than in the past.

Over the next two decades Congress will make many decisions, including decisions on RRW, that will help determine how fast and how far the United States can go in transforming and reducing its nuclear forces, nuclear stockpile, and nuclear infrastructure to make them smaller, safer, more secure, and more appropriate to managing the risks and challenges of the 21st century. We must make progress toward creating a nuclear weapons infrastructure that can respond quickly and effectively to emerging threats and to technological surprise. This will assure our ability to maintain deterrence over the long term, and enable future reductions in both the operationally deployed force and the overall nuclear weapons stockpile. The sooner Congress authorizes and funds transformative programs like RRW, the sooner the United States and its allies can realize the benefits this approach holds for maintaining a credible and effective deterrent with the lowest possible level of nuclear weapons.

Thomas Loughry
5531

Richard Lucero
6753

In Mccann
9514

Jack Menako
5919

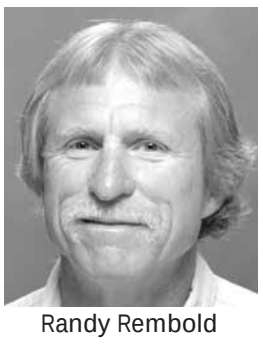
Carla Moncayo
10501

John Mounho
10544

Michael Padilla
3651

Norm Padilla
5353

William Peters
10241


Randy Rembold
5736

Daniel Sanchez
10263

Kathleen Sauer
4232

Jeffrey Scheffer
5425

Jerry Smith
9328

Jerome Stofleth
5434

William Stygar
1671

Katherine Sutton
5711

Steven Thornberg
1825

Jeffrey Tsao
1120

Robert Urias
4864

Joanne Volponi
8321

Gloria Zamora
12124

Team honorees

(Continued from page 7)

Bob Franssen, Bruce Kistler, Steve Buck, Linh Thai, Scott McDonald, Tim Shelton, Ron Carr, Paul Booker, John Andersen, Ming Lau, 'David Faucett, Jerry Fordham, John Foster, Mark Higuera, Rigoberto Ledezma, Felipe Reyes, Judith Sylva

High Energy Density Laser Welding Characterization and Modeling Team

For significant advancement of the physical understanding and modeling of a highly dynamic laser welding process and completion of a complex Level 2 Milestone.

Mario Martinez, Jerome Norris, Peter Duran, R. Allen Roach, Charles Robino, Danny MacCallum, Mark Reece

MOCK HE TREATMENT TEAM

Integrated Stockpile Evaluation Team (ISE)

The ISE Team developed a novel approach for responsible stockpile stewardship. ISE was successfully adopted by NNSA through its Surveillance Transformation Plan.

Cheryl Rivera, Siviengxay Limary, Kathleen Diegert, Sheryl Hingorani, Suzette Beck, Janet Sjulin, Colette Bristol, Bernard Gomez, Daniel Sherman, Todd Sterk, Jeffrey Braithwaite, Jerry McClellan, Ronald Hartwig, John Arfman, Jr., Jason Bowie, Heather Brown, Ronald Hahn, Jeanne Lewis, Gary Nordyke, Elizabeth Parker, Robert Paulsen, Jr., William Reutzel, Ronald Sauls, Dawn Skala, Rena Zurn

Integrating Pollution Prevention into SNL/NM Site Operations

The pollution prevention group of the Environmental Planning Department reaches out broadly to help line organizations integrate pollution prevention into their site operations.

Sylvia Saltzstein, Diana Goold, Jeffery Miller, Sherron Hirdman, Margie Marley, Kristin Klossner, Ralph Wrons, Matt Shain, Doug Vetter, Samuel McCord, Morgan Gerard, Miguel Atencio, Matthew Brito, Corey Campbell, David Castillo, Mark Crawford, Christopher Evans, Larry Hatcher, Phillip Rivera, Lucille Roybal, Sharon Sanders, Dwight Stockham, Mary Bultmann, Ron Chapman, Gary Tilley

JAEIC FISMAT Analysis Team

Through technical excellence, diligence, and community culture, the JAEIC FISMAT Security Team delivered a landmark, national-level study assessing the security status of foreign fissile materials.

Ike Izenberg, Ernestine Morris, Patricia Buckles, Kimberly Herrmann, Eugene Taylor, Jeffrey Martin, Robert Follis, Charles Craft, Peter Collins, Rubel Martinez, Lara Adams, John Franklin, Linda Konkel, Anna Nichols, Ann Smith, Brian Stallard, Ron Andree, Ona Bailey, Perry Gore

Light Initiated High Explosives (LIHE) W76-1/Mk4A Impulse Test Team

The LIHE team culminated an extensive test-capability-development effort by conducting two successful explosive-impulse qualification tests on a W76-1 test unit.

Edward Mulligan, Anthony Gomez, David Wackerbarth, W. Gary Rivera, Tony King, Patrick Hunter, Todd Simmermacher, Christian O'Gorman, Brad Boswell, Timothy Covert, Larry Dorrell, Daniel Dow, Randall Mayes, Mike Skaggs, John Liwski

Lockheed Martin Shared Vision Program Team

Focusing on "Operational Excellence," this team provided outstanding value/impact to critical national security customers, as indicated by 45X program investment growth ($0.3M to $15M/yr) in 10 years.

David Goldheim, Glenn Baird, Kevin Murphy, Paul Smith, Earl Stromberg, Bruce Thompson, Carol Ashley, Dorothy Stermer, Rita Betty, Deborah Payne, Paul Smith, Scott Reed, Nathan Golden, Kevin Abshire, Hongyou Fan, Linda Cleland-Ortiz, Robert Cranwell, Madelynne Farber, John Jackson, Kerry Kampschmidt, Tom Fowler, Andy Green, Jack Hammond, Mary Jo Heckart, Michael Long

Mock HE Treatment Team

For the safe and effective treatment of a problematic mixed waste, meeting a NMED imposed deadline and resulting in savings to Sandia.

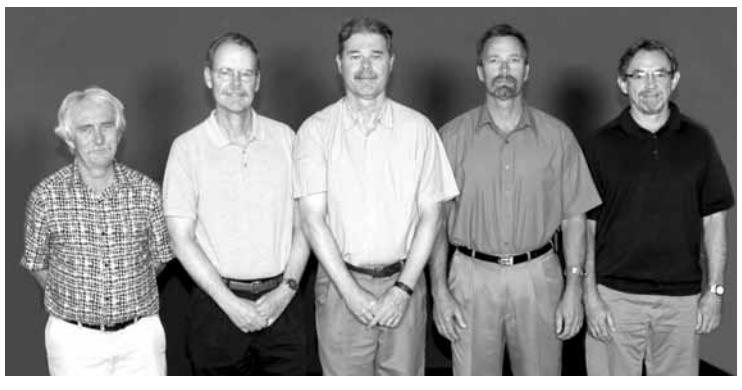
Luis Amezcua, James Thompson, Michael Spoerner, Eric Dinsmore, Pamela Schorzman, John Pieniazek, Phyllis Peterson, Diana Muller, Linda Gonzales, Michael Vallejos, Dann Meyer, Ed Finley, Chris Eckstein, Jay Farr, Bill Bixby, Howard Seeley, Pamela James-Lipponer, Gary Bender, Martin Brennan, Susan Carson, Mark McNellis, Patrick Murphy, Leland Phillips, George St. Clair, John Longley

Navy Analysis Team

The Navy Analysis Team, tirelessly and with great devotion, applied a rigorous analysis methodology to evaluate the system effectiveness of US Navy strategic weapons facilities.

(Continued on next page)

Theresa Brown, MEMS louvers team win Lockheed Martin NOVA awards


THE SANDIA MEMS Variable Emittance Louvers Delivery Team has been named a recipient of a Lockheed Martin NOVA award for 2007 in the teamwork category. In the individual category, Theresa Brown (pictured on page 6) won for her full spectrum leadership in the NISAC program. The NOVA awards were established in 1995, upon Lockheed Martin's formation, to recognize outstanding contributions to the corporation's mission and business objectives.

Team honorees

(Continued from preceding page)

Michael Itamura, Laura Whittet, Liz Jaramillo, Liz Affeldt, Brady Pompei, Vernon Koonce, Mark Murton, Rich Grochowski, Andrew Walter, James Rivera, Dean Dominguez, Pamela Dawson, J. Dixon Patrick, Dale VanDongen, John Wharton, Dianne Cannon, Kim Ice

Nuclear Weapon Transportation Safety Analysis Team

In recognition of outstanding performance successfully developing and defending the safety basis for offsite transportation of nuclear explosives.

Nazir Khaul, John Hancock, Toni Molina-Horn, Frank Antonich, Joseph Howard, Mark Mundt, Robert Waters, Marcus Billings, Lih-Jenn Shyr, Steve Thompson, Kenneth J.R. Padilla, Larry Schoff, Richard Aguilar, Ricardo Beraun, John Clauss, Gerald Crowder, Stephen Dwyer, Robert Gross, David Harding, Robert Kalan, Stuart Rogers, David Adair, Wendy Baca, Vince Dandino, Jemes McCarrick

Numerical Modeling of High-Power Fiber Lasers

For developing state-of-the-art numerical modeling and simulation tools to advance the development of next-generation fiber lasers and amplifiers.

Arlee Smith, G. Ronald Hadley, Roger Farrow

NWSMU ISO 9001: 2000 Team

The NWSMU ISO 9001:2000 team created a management system that meets an international standard.

Timothy Cohen, Julie Kesti, Meghan Moore, Gay-Ming Moy, Karen Marlman, Dexter Boone, Jeanne Evans, Allison Kane, Frederic March, Judith McKinney, Charles Meyers, Kathleen Schultz, Bobbie Williams, Rick Rios, Sonny Sahi

Onsite Transportation Documented Safety Analysis and Technical Requirements Document for Hazard Cat3

This team successfully developed a DSA and TSRs for the onsite transportation of Hazard Category 3 material.

Gabriel King, Paul Homan, Bonnie Shapiro, Francine Vigil

Packaging Recycle and Transfer Team

Significant reductions in cost, waste, energy, and water are realized by recycling packaging and using a simple cleaning process.

Victor Baca, Antonio Silva, Eileen Rios, Patricia Hebert, Regina Jaramillo, Joseph Trujillo, Cynthia Kajder, Riyaz Natha, Eugene Tenorio, Lenore Partridge, John Sayre, Toby Garcia, Carleen Bardwell Shirk, Fred Clark, Anne Lacy, Benjamin Moya, Lorraine Sena-Rondeau, William Silva, David Tarango, Jessica Weems, Terrance Witt, Bill Givens, Roland Kelley, Stacy Kubasek

PII Response Team (PIIRT)

On three occasions, on short notice, PIIRT notified coworkers, retirees and survivors of exposure to PII. The team informed and consulted 300+ individuals in establishing protective measures.

Dora Lovato-Teague, Andrea Rael, Lupita Serna, Ramona Cordova, Mark Davis, Kelly Thoesen, Kelly O'Bryant, Janice Gauna, Ellen Howard, James Stephens, Julian Sanchez, Melissa Eakes, Judy Jewell, William Knowles, Jannifer Levin, Victor Lovato, Timothy Madden, John McAuliffe, Kathy Silva, Holly Smothers

Program Infrastructure Recovery Implementation (PIR) Team

The 5059 business team, Center 5900 management team, DS&A business office, and CFO organization successfully developed, implemented and disclosed the PIR allocation process.

Richard McLendon, Judy Jones, Dorit Tesfay, Samuel Felix, Veronica Argo, Maryanne Heise, Jeffrey Kallio, Ami Peterson, Mario Pino, Linda Ristvet

QASPR Cryogenic Test Development Team

The team developed and demonstrated use of a new cryogenic for the cooling system at Sandia Pulsed Reactor to look at early-time transient damage in semiconductor devices.

Robert Fleming, J. Kyle McDonald, Edward Bielejec, Jonathan Campbell, Edward Parma, Jr., Milton Vernon

Reliable Replacement Warhead/CA Design Team

For successfully completing three integrated reentry vehicle designs considered pivotal for moving the Nuclear Weapons Complex into the future.

Jeff Tong, Jennifer Chan, Alfredo Morales, Scott Faas, Daniel Levy, Jeremy Cornwall, Janson Wu, Paul Mark Booker, Phillip Bryson, Steven Bunn, William Rorke Jr., Peter Van Blarigan, Anna Williams

Reliable Replacement Warhead (RRW) Component Fabrication

Team was successful for the fabrication of classified high rigor/high consequence pieces of hardware and assemblies to support the RRW Hydrodynamics test at LANL.

Dominic Pohl, Kraig McKee, Phil Aragon, Mark Kumpunen, David Calkins, Clarence Esquibel, Terrance Smith, Philip Eslin, Mark Forster, Richard Miller, Kurt Tomlinson, Aaron Otzenberger, Johnny Montano, Ronnie Albers, Jose Barela, Johnny Casias, Jr., Mathew Donnelly, Charles Hill, Frederick Hooper, Gregg Jones, Jonathan Lee, Teresa Maynard, Walter McLain, James Pankey, Thomas Togami

RRW-1/NM Design Team

In recognition of exceptional service and personal commitment to the development of the innovative yet highly modular conceptual design for RRW-1.

Joel Wirth, Jerry Adams, Eddie Hoover, Melissa Schooley, Ronald Pedersen, Thomas Togami, John Sichler, Monica Eylicio, Whitney Lacy, Dennis Helmich, William Chambers, Robert Bradley, Thomas Denman, David Greene, Judd Rohwer, Michael Sjulin, Colin Smithpeter

ROBO ASIC Team

The ROBO team designed Sandia's most complex ASIC and met project needs in spite of an aggressive schedule with little margin for error.

Bradley Gabel, Daniel Savignon, John Vonderheide, James Walkup, Judy Jones, Tom Mannos, Ronald Espinoza, Stephen Babicz, David Dell, Brent Meyer, Kevin Nichols, Michael Holmes, Ephraim Arquitola, Richard Berget, William Cavanaugh, Rita Gonzales, Vivian Kammler, Chad Lackey, Russell Mikawa, Sean Pearson, Kerry Sturgeon, Karen Tatum, John Teifel, Kathleen Wilkel, Jeanne Green

Safeguards Control and Communications System (SCCS) Modernization Team

This team addressed repeated findings with SCCS (Sandia's Mission-Critical Intrusion Detection System) by designing and implementing a novel solution under budget and ahead of schedule.

Daniel Stump, Walter Smith, Robert Barbera, Jr., Martina Baldonado, Robert Dooley, William Gallegos, Joseph Gullick, Larry Millington, Wallace Widerkehr, Tim Cochrane, Greg Snider

Sandia/CA 50th Anniversary Event Team

For dedication and enthusiasm in the planning and implementation of an outstanding event to honor and celebrate 50 years of exceptional service.

Ken Ball, Pat Falcone, Lizeth Lafferty, April Cunningham, Chuck Oien, Norma Calderon-Zablocki, John Ellison, John Goldsmith, Ron Stoltz, Jennifer Hallstrom, Mindy Hutchings, Gregg Andreski, Herman Armijo Jr., Edward Cull Jr., Donald Hardesty, Michael Janes, Theresa Price, Sheryl Stewart, Mary Stoddard, Anne Yang, Walter Bauer, Chuck Hartwig, Joe Lewis, Steffan Schulz, Daniel Strong

SANDIA STAR TEAM

Sandia STAR Team

For the STAR Team's dedication and commitment to establishing partnerships and ensuring excellence in the orientation of new Office Management Assistants in Division 8000.

Deanna Agosta-Lazares, Lee Anna Koitmaa, Jeanie Lee, Cindy Kuffner, Gigi deCastro, Pat Burkhart, Kim Sandoval, Noel Richamon, Melanie Steadman, Donna Blevins, Kelly Doty, Jennifer Bamberger, Ann Stayton

Sandia Contractor Review & Evaluation Team

Process and System Improvements due to your Team Member Dedication and Contributions to the Sandia Contractor Review and Evaluation (SCORE) Program

Michelle Davila, Maria Armijo, Margeri Martinez, M. Louise Britton, Daniel Stafford, Lynne Adams, Marie Myszkier, Gary Romero, Karen Archibeque, John Beitia, Cynthia Caton, Victor Chavez, Ian Cheng, Perry D'Antonio, Bertha Denman, Jennifer Galasso, David Gibson, Lilia Marquez, Angela Martinez, Andrea Romero, Melanie Tapia, Craig Hansen

Sandia Energy Management Team

This team strives to implement programs which will reduce energy consumption, increase water conservation, reduce greenhouse gas emissions, and support renewable energy use at SNL.

Jack Mizner, Miquel Atencio, Lucille Roybal, Erika Barraza, Sharon Sanders, Mary Bultmann, Isabel Martinez, Christopher Evans, Anthony Baca, Israel Martinez, Norman Wasson, Lynnwood Dukes III, Morgan Gerard, Michael Rocco, John Garcia, David Rabb

Sandia MEMS Variable Emittance Louvers Delivery Team

This team delivered the first fully qualified, operational MEMS device for a spacecraft within the time and budget constraints.

Frank Loudermilk, James Allen, Harold Stewart, Jerome Jakubczak II, Edward Syckoff, Seethambal Mani, David Sandison

Sensor Dart Team

For exceptional dedication, creativity, synergy, and shared responsibility in completing the DARPA Sensor Dart project.

David Toledo, Hung Nguyen, Mark Howard, Mark Yee, Jeremy Giron, Patrick O'Malley, Michael Bukaty, Rebecca Campbell, Maricela Pimentel, William O'Rourke, Daniel Gallegos, K. Terry Stalker, David Gardner, Jonathan Van Houten, Edwin Chamberlin, Raleigh Bates, David Craft, Lonnie Diehl, Robert Fogler, Simon Hathaway, Jason Krein, Dale Lipke, Randal Lockhart, Jason Millard, Robert Williams

Spartan Rocket Motor Controlled Burn Team

For scaling and executing a prototype explosive ordnance disposal technique in support of the US Army rocket demilitarization program and reducing Sandia's onsite explosives inventory.

Raymond Peabody, Martin Jinzo, Steven Yesner, Charles Eberle, Matthew Heine, Charles Jensen, Sarah Mahoney, Gregory Scharrer, Gregory Shelmidine, Roger Smith, Caesar Echeverria, Chance Hughs, William McKinley, Stephen Polisar, Martin Valdez

Strategic Petroleum Reserve — 1 Billion Barrel Expansion Team

For completing the high-priority DOE project — Strategic Petroleum Reserve Site Selection and Assessment — to guide the future development of the Reserve.

Jonathan Rath, James Bean, Anna Snider Lord, Brian Ehgartner, Jose Arguello, Jr., Christopher Rautman, John Duffield, Karl Loff

TAVS (Telemetry Analysis and Visualization Suite) Development

For exceptional creativity and responsiveness in developing a user-friendly interface for the analysis of Flight Test Surveillance data.

Gary Ashcraft, Tamera Bravo, Wesley Crownover, Eden Tadios Belinda Garcia, Shawn Garcia, Dennis Mowry, Adam Peters, David Pinto

Technical Team Responsible for Achieving Sandia/Rockwell Collins MiniSAR Development Partnership

For achievement of a milestone event — the creation of a Sandia/Rockwell Collins partnership to develop and produce a fieldable version of Sandia's MiniSAR system.

Freddie Heard, Nikki Angus, Robert Bugos, Armin Doerry, Dale Dubbert, John Fuller, David Harmony, Michael Holzrighter, Richard Hurley, Peter Karnowski, Joe Lucero, Michael Pedroncelli, George Sloan, Daniel Sprauer, Bernd Strassner, April Sweet

Truman Fellowship Team

The team developed and implemented a process for recruiting and selecting some of the best young scientists and engineers to the newly developed Truman Fellowship Program.

Roberta Rivera, Yolanda Moreno, Kimberly Ross, Ronald Loehman, Patrick Brady, Lyndon Pierson, Juan Abeyta, C. Jeffrey Brinker, David Chandler, Marie Garcia, David Gartling, Drew Parsons, Larry Rahn, Anita Renlund

Vulnerability Assessment (VA) Team

The VA Team performed a number of critical analyses in support of activities within TA-V and TTR, and in support of Sandia's nuclear material de-inventory efforts.

Jose Salazar, Anthony Aragon, Paul Keller, Mark Smith

W76-1 MC4702 Region 3 High Voltage Module Encapsulation

For exceptional teamwork, dedication, and technical achievement in successfully addressing a Class D producibility encapsulation process for the W76-1 Region 3 High Voltage Module.

Patrick Smith, Howard Arris, Manuel Trujillo, Douglas Adolf, Clifton Briner, Albert Hart, Marc Polosky, Mark Stavig, Robert Winters, Brad Baumgartner, Tim Chandler, Steve Condron, Mike Gerding, Brad Pearce

W76-1 Stronglink Product Qualification Team

The W76-1 Stronglink Product Qualification Team supported the fabrication and testing of hardware for the MC4710 ISL and MC4711 TSL which resulted in acceptable QERs.

Todd Hinnerichs, Kenneth Eras, Jennifer Lindblom, Mary Gonzales, Carl Rhinehart, Michael Dvorack, Jeffrey Dabling, Jamey Bond, Aaron Ison, Benjamin Garnas, Ray Thornton, Robert Boney, Henry Apocada, Susan Camp, Kelvin Diaz, Kelly Klody, Dennis Kuchar, Timothy Locke, Jared McLaughlin, Michael Plowman, Christopher Sorensen, Kenneth Strasburg, Patricia Barthelmes, Arin French, Ken Varga

W78 Structural Dynamics Model — DART Pilot Project

The W78 Structural Dynamics Model Team created the first full-system simulation model using the DART toolset, exhibiting teamwork and collective dedication to achieve their goals.

Thomas Carne, Cathy Alarid, Rick Garcia, Amy Rice, Darryl Melander, Howard Walther, Mark Lobitz, Sean Brooks, Jon Manuel, Ramon Pacheco, Michael Borden, Robert Clay, Zachary Dorosh, Edward Hoffman, Wilbur Johnson, Daniel Sherman, Robert Whiteside

Weapons Evaluation Test Laboratory Relocation Team

The WETL team successfully completed the relocation of the Weapons Evaluation Testing Laboratory (WETL) while performing all required testing and completing all Level II milestones for FY06.

Jeffrey Jarry, Stephen Artho, Paul Beachamp, Wendel Clements, Rhonda Fraser, Edilverto Fuentes, David Gibson, Thomas Hieb, Brandon Hill, Linda Hubbart, Larry Kuykendall, Frank Love, Dean Martin, Rene Ramirez, Keith Snyder, Steven Spinhirne, Gerald Thomason, Jon Walker, Mark Watkins, James Kannolt

Yucca Mountain Transition Team

The Yucca Mountain Transition Team successfully assembled/implemented the business processes, PM, and technical expertise to successfully support the Yucca Mountain Project as Lead Lab.

Rebecca Jaramillo-Contreras, Michelle Barela, Katherine Rivera, Randolph Shibata, Dorean Archuleta, Tami Burroughs, J. Delene Cox, Anthony Fasulo, Steven Gossage, Francis Hansen, M. Kathryn Knowles, Michael Maurer, Stanley Orrell, Charles Pechewlys, Timothy Spears, Joann Tamashiro, Palmer Vaughn, John Zepper, Randy Lang, Mel Marietta, Mike McGowan, Jack Tillman, Raymond Shaum, Cynthia Huber, Peter Swift

2006 Diversity Maturity Model (DMM)Assessment Response Team

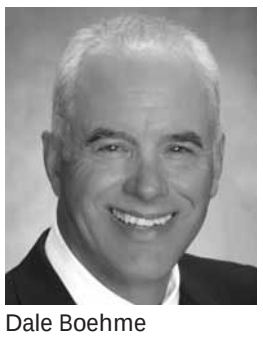
A team of multitalented and multitasked collaborators who demonstrated dedication, expertise, and passion in implementing a "systems approach" to Sandia's 2006 DMM assessment submission.

Amy Tapia, Rochelle Lari, Roberta Rivera, Lori Carroll, Elizabeth Gonzales, Margaret Harvey, Julian Sanchez, Manuel Ontiveros, Charline Wells, Maria Armijo, Richard Alexander, Rebecca Burt, Michael Clough, Karen Gillings, Arthur Grimley III, Kenneth Holley, Robin Jessen, Barbara Jones, Charles Meyers, Mary Nation, Johnnina Ortega, Polly Owens, Anna Schauer, Kimberly Adams, Ileana Bulcan

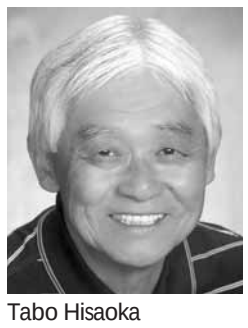
Mileposts

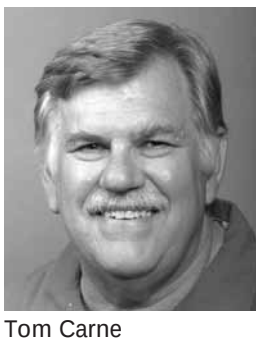
New Mexico photos by Randy Montoya
California photos by Randy Wong

Allen Salmi
35 8367


Dale Boehme
30 8248

Recent Retirees


Tabo Hisaoka
46 8514


Tom Carne
30 1525

Peter Chauvet
30 12336

Winalee Carter
25 8511

Ed Saucier
25 9531

Rita Shortman
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Sam Cancilla
20 9324

Tony De Sousa
20 8239

Jerry Friesen
20 8963

Toff Garcia
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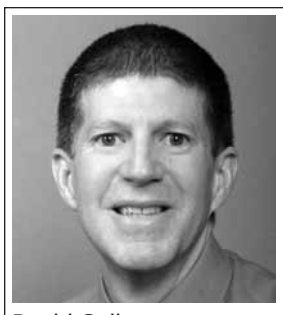

David Gallegos
20 5533

Joselyne Gallegos
20 9510

Julie Hall
15 3651

Nancy Martinez
15 5525

Laura Owens
15 5055

Susie Rodriguez
15 3522

Richard Fye named APS Fellow

The Council of the American Physical Society (APS) has elected Richard Fye as an APS Fellow. Richard received a PhD in physics from the University of California (UC), San Diego, followed by postdoc work at UC Santa Barbara. He became a Sandia staff member in 1993. At the time he went on long-term physical disability leave, he was in Dept. 1425 with supervisor Grant Heffelfinger. The department has since grown to become departments 1409, 1412, and 1435.

"Election to APS Fellowship is recognition by your peers of your outstanding contributions to physics," states a letter from APS Executive Officer Alan Chodos. Richard's nomination came from the Division for Computational Physics. The citation and general award information appear on the APS website.

At Sandia, Richard worked on numerical approaches for highly correlated electron systems, materials modeling, computational biology, and multiscale material simulation methods. In this work he collaborated with researchers now in departments from Center 1400 and departments 1814, 6338, and 6771; UC Santa Barbara; and Mount Sinai Medical School.

Richard has been ill for a number of years, but is still working toward and hoping for a full recovery.

Sandia-supported academy at West Mesa High School renamed Arthur Henry Guenther Photonics Academy

Popular program honors memory of longtime champion of science and math education

Something pretty special has been going on at West Mesa High School for the past several years. The school, on Albuquerque's West Side, has a photonics academy — sponsored by Sandia — that introduces kids to the math and science skills they'll need as they pursue careers in fields related to optics and photonics.

The academy, the only one of its kind in the western US, has just been named the Arthur Henry Guenther Photonics Academy. The facility was dedicated to Guenther in recognition of his early support and ongoing passion and long association with the academy. Present at the dedication were students and faculty from West Mesa High School, representatives from Sandia, the New Mexico congressional delegation, the Albuquerque mayor's office, a photonics industry group, and members of Guenther's family.

ARTHUR GUENTHER sits among some of his many students at the academy.

Guenther (his thousands of friends around New Mexico and in the international photonics community called him Art) died in April. During his career, which included jobs at Los Alamos National Laboratory and the Air Force Research Laboratory, Guenther was internationally recognized as a laser expert, served as science adviser to three New Mexico governors, and was an energetic champion of education.

Guenther worked closely with Sandia and others to help start the West Mesa academy, which he was convinced would provide New Mexico students with skills that would prove valuable in the workplace. He was right: According to OP-TEC, the National Center for Optics and Photonics Education, the photonics and optics industry is seeing a burgeoning demand for qualified technicians and engineers nationwide. Photonics and optics jobs include application of cutting-edge uses of lasers, optics, fiber optics, and electro-optical devices in diverse fields of technology,

Dominique Foley Wilson (1012), who represented Sandia at the dedication ceremony, helped West Mesa launch the academy in 2000 as part of the Labs' critical skills development program. The purpose of the academy, she says, is to develop a pipeline for photonics technicians and technologists with the skills needed to enter the local workforce. Since its launch, more than 50 graduates of the program have been hired in related fields.

The academy, Dominique says, guarantees math and science proficiency among its students and offers courses that coordinate with photonics offerings (leading to an associate degree) at Central New Mexico Community College.

The photonics academy — now the Arthur Henry Guenther Photonics Academy — has proven to be an extremely popular option for West Mesa students. Dominique says there are currently more than 200 students enrolled in the program with a waiting list of kids who want to get in.

Dominique says Sandia — by design — has been less involved in the academy over the past year or two than it was when the program was first launched. The idea of programs like the academy, she says, is that they become self-sustaining, a threshold West Mesa's photonics academy has met.

Dominique recounts a conversation she had with an individual who as a student had been mentored by Guenther, subsequently graduated from New Mexico Tech and entered the workplace as an engineer — with help from Guenther.

"There were three things that summed up Art Guenther," the former student told Dominique. "New Mexico. Technology. And education. I can't think of a better tribute to him than having the photonics academy dedicated in his memory."

Military academy cadets gain technical experience at the Labs

By Jacqueline Cieslak

When Air Force Academy cadet Austin Bergstrom graduates next spring as a physics major, he'll go on to work as a pilot in the US Air Force, but that doesn't mean he'll be done with science.

"Hopefully, eventually I can get back into the science community," he says. As one of four cadets who interned at the Labs this summer, Austin has hopes for an eventual career in science after his military duty. His five-week internship was the first opportunity he'd had to gain professional technical experience in science.

The nation's military academies and Sandia have worked together in the past to provide experience for interested cadets, but before this summer it hadn't been done in many years, according to Lt. Col. Rick Yaw (0513). Rick, who taught at West Point prior to working at Sandia, helped facilitate internships for the cadets.

"These students often grow up into national leaders, either in the Defense Department or in science and technology," Rick says. "It's in the Labs' best interest to educate them on what we do to contribute to defense technologies, and it's in their best interest to know what Labs science can do for them as defense leaders."

While Austin was from the Air Force Academy, the other three cadets were from the US Military Academy. Cadets Brian Czarnecki and James Johnson worked at Sandia/New Mexico, while Cadet Korey Cook worked at Sandia/California. All four spent one week in May and four in June at the Labs before heading off to do military training for the rest of the summer.

"We expected to be treated like tourists," James says. But he and Brian, both nuclear engineering majors, found that to be far from the case while working for Thomas Haill (1641) on ALEGRA code simulations.

"They treated us really well and they showed a lot of interest in developing us," Brian says. "[Thomas] really dove deep into the physics and made sure we understood everything."

Thomas, who has worked with both undergraduate and graduate students at the Labs before, says the two cadets far exceeded his expectations based on his previous work with undergraduate interns.

"These two cadets were very bright students," he says. "They caught on extremely well to the concepts I was trying to teach them. It's a testimony to both of these individuals and the education and training they had at West Point." Like Rick, Thomas says this is an opportunity for Sandia to maintain its positive relationship with the military.

The cadets say their personal experiences this summer will translate into their military training, both during the remainder of the summer and in the following years.

"It's not necessarily that what we do at Sandia will directly affect our training, but it will enhance our ability to think critically as officers," Brian says.

James agrees "The military in general is becoming more technically advanced, and the skills we learned here help us see the importance of technology in our future roles as officers," he says.

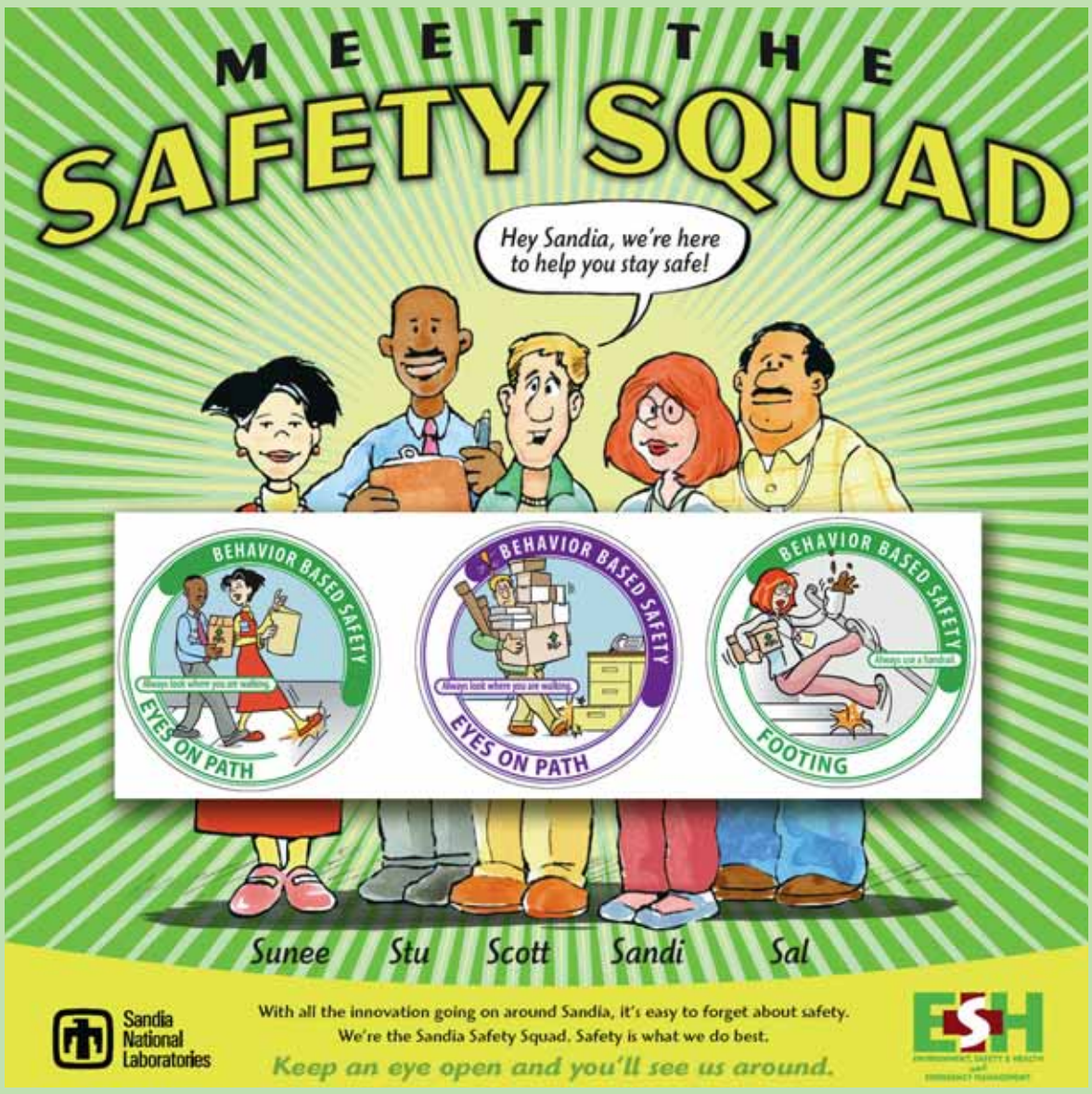
All three Sandia/New Mexico cadets say they may consider coming back to Sandia later on in their careers. Immediately after school, James will become an infantry platoon leader and Brian as an armor officer.

For now, the cadets plan to focus on their training and education as they enter their senior year. They recalled a quote from ancient Greek historian Thucydides that they felt was particularly applicable this summer: *The nation that makes a great distinction between its scholars and its warriors will have its thinking done by cowards and its fighting done by fools.*

With continuing positive interactions between the military academies and the national labs, that scene is likely something we'll never witness, Rick says.

WORKING IN THE LAB — Air Force Academy cadet Austin Bergstrom gets hands-on experience in how science is done during his recent internship at Sandia. Bergstrom was one of four military academy interns who spent several weeks at the Labs this summer. (Photo by Jens Schwarz)

The Safety Squad is coming



ES&H and Emergency Management are introducing the Sandia Safety Squad, cartoon characters intended to represent the Sandia workforce and address in a lighthearted way the various safety-related issues Sandians encounter daily. The goal of the Sandia Safety Squad is to remind Sandians about the work-related risks they face and to provide reminders on how to keep safety first "so that we all go home in the same condition as when we came to work," says EM Senior Manager Bob Brandhuber.

Sandians will be seeing the Sandia Safety Squad — Scott, Sunee, Stu, Sandi, and Sal — appearing around the Labs in posters and in safety stickers like those shown above, says EM communications coordinator Debi Angeli. "They'll be faced with various safety-related situations and will come to rely on one another to remember safe work practices and behaviors. Look for them in the coming months, and in the meantime, please remember to keep safety first."

(Poster and sticker designs by Michael Vittitow)

Feedback

Gate 6 turnstile hard to operate; South Valley gate closes too early

Q: *Why are the turnstiles for Gate 6 so difficult to operate. I have arthritis and can hardly push my way in or out.*

A: In response to this feedback question, Technical Security Systems (TSS) checked the Gate 6 turnstiles and they are properly set within required tolerances. Because of other safety concerns, the turnstiles cannot be loosened. However, if the turnstiles are difficult to use due to medical reasons, the bypass "swing" gate located adjacent to the Gate 6 turnstiles may be used as an alternative. To use a bypass gate, you must first go to the Badge Office so your badge can be added to the Bypass Gate Access List. — *Scott Ashbaugh (4240)*

* * *

Q: *Can the South Valley Gate closing time be extended to 6 p.m.? It would make it consistent with the closing time for the Carlisle and Eubank gates and make it easier on those of us who don't always get to leave right on time and therefore miss the 5:30 p.m. closing.*

A: I checked with the KAFB Security Forces and, unfortunately, they cannot keep the gate open longer. To extend the hours on the South Valley gate would require a change to the contract the base has with the civilian security forces. The amount of traffic using the gate is not sufficient to warrant the extra cost. — *Ed Tooley (10855)*