

Ambitious MEMS-based retinal prosthesis plan aims to give sight to the blind

'A thousand points of light' no longer a metaphor

By Neal Singer

Enabling the blind to see — a task once thought the province of miracles — is the goal of a technical team that includes Sandia, four other national labs, a private company, and two universities.

The idea, funded by a \$9 million, three-year grant from DOE's Office of Biological and Environmental Research (BER), is to create 1,000 points of light through 1,000 tiny MEMs (microelectromechanical systems) electrodes. The electrodes will be positioned on the retinas of those blinded by diseases such as age-related macular degeneration and retinitis pigmentosa. These diseases damage rods and cones in the eye that normally convert light to electrical impulses, but leave intact the neural paths to the brain that transport electrical signals. Eventually the input from rods and cones ceases, but 70 to 90 percent of nerve structures set up to receive those inputs remain intact.

"The aim is to bring a blind person to the point where he or she can read, move around objects in the house, and do basic household chores," says Sandia project leader Kurt Wessendorf (1732). "They won't be able to drive cars, at least in the near future, because instead of
(Continued on page 4)



THE EYES HAVE IT — A prototype of the MEMS-based array that eventually may be inserted into the retina of a blind patient. The design is by Murat Okandan (1749). (Photo by Randy Montoya)

Community observes 9/11



As part of a nationwide observance on Sept. 11, 2002, community volunteers gathered in the rain at Civic Plaza in Albuquerque to read the names of persons who died in the 9/11 terror attacks on the US. Sandian Ron Hoskie and members of Sandia-based musical group Cumulonimbus performed a poem written by Ron for the occasion. See photos and Ron's poem on page 7.

Iraqi threat real, imminent, says former Sandian, UN weapons inspector Jim Lee

'Our man in Iraq' spent 67 days in Middle East nation in 1998

By Bill Murphy

It's been almost four years now since Iraqi strongman Saddam Hussein banned UN weapons inspectors from his nation.

And that, says former Sandia manager Jim Lee, is justification aplenty for the alarm and sense of urgency being demonstrated by the Bush administration regarding conditions in Iraq.

Jim, now at Los Alamos National Laboratory but formerly manager of Accident and Consequence Analysis Dept. 6413, was "our man in Iraq" in 1998 when he served a two-month tour on a UN weapons inspection team monitoring the status of Saddam's nuclear weapons program. (Other teams were monitoring the dictator's chem-bio capabilities.)

Jim puts the current Iraqi situation in a context he's familiar with: "When I was over there, we were looking at a nuclear weapons infrastructure that was mostly built up over a three-year period between 1987 and early 1991. [The Iraqi program actually dated back to the 1970s, but most of the early years were spent in theoretical work. Saddam's failed war bid and the presence of UN inspectors had effectively shut down new nuclear development from 1991 through 1998.] The Iraqis had accomplished a vast amount in that three-
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Sandia, Boeing establish partnership to develop mutually beneficial technologies

By Chris Burroughs

Sandia and the Boeing Company signed an umbrella cooperative research and development agreement (CRADA) Sept. 5 to develop technologies that mutually benefit both.

The signing was part of a visit to Sandia by Boeing senior officials to discuss future joint projects and to tour Sandia facilities.

Signing the CRADA from Sandia were Al Romig, VP for Science & Technology and Partnerships 1000, and Jim Tegnella, VP for Department of Defense (DoD) Programs 15000. Signing for Boeing was Dick Paul, Vice President for Strategic Development for the Boeing Phantom Works R&D unit.

"Sandia technology spans from basic and applied research to systems design and engineer-

ing, to safety and reliability assessments," Al said. "These competencies, so critical to our national security mission, are also key enablers for Boeing's wide range of space, communications, commercial airplane, and integrated defense systems. This

CRADA allows us jointly to capitalize on our unique skills, technologies, and facilities so that we can both more readily succeed in meeting our mission needs and customer expectations."

Boeing VP Dick Paul agreed, saying that this new CRADA will benefit both organizations.

"From the Boeing side, sharing technology with Sandia will help each of us bring new or improved products to market faster and to

employ new manufacturing processes that reduce cycle time and cost while improving the quality
(Continued on page 5)



SANDIA VPs Jim Tegnella (15000, left) and Al Romig (1000, right) sign an umbrella CRADA with Dick Paul, VP of Strategic Development for the Boeing Phantom Works R&D unit. (Photo by Bill Doty)

Labs help public health officials, others with antiterror 'decision analysis' tool 3

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Anne Van Arsdall finds modern relevance in translation of Anglo Saxon text 12



What's What

The earliest indicator of fall at Sandia is not the faint, distant honking of migrating sandhill cranes or even the mayhem around the state fairgrounds in Albuquerque. It's the e-mail note from the department OAA asking what kind of wall and desk calendars you want for next year.

A colleague who'd had a — shall we say, busy — week noted this annual rite as he made his way toward the door late last week, but the only understandable segment of his dark muttering was, “. . . see if they'll order me a calendar with only part of the year on it.”

I don't know what he meant, but I'll ask him when he comes back. If he comes back.

* * *

Sandia/California baseball fans have the Giants, and next year, after two seasons without AAA baseball, Sandia/New Mexico fans will have the — *Isotopes*? Affiliated with the *Florida Marlins*?

Well, it's not so far off the beam for a New Mexico sports team to have a science-based name. The state is identified with serious science, after all — the Manhattan Project, Very Large Array, White Sands Missile Range, Santa Fe Institute, and, of course, Sandia and Los Alamos. *Lab News* Editor and chief unofficial at-Sandia Dodgers fan Ken Frazier, who can spout baseball stats about as readily as science facts and is a regular in the Albuquerque Sports Stadium stands, says he's happy about the sports name. And Labs PR spokesman Neal Singer was bold enough to tell an *Albuquerque Tribune* reporter writing a story about the new name: “The Isotopes will pack a punch.”

Of course, with Ken and all the other to-the-end Dodger fans, there's still that Florida Marlins thing. . . .

* * *

Ever wonder what would happen if, when that e-mail “notification” from TEDS popped up in your e-mailbox and the message said you're due for some training, you ignored it? Then ignored subsequent reminders that you were really out of compliance?

They tell on you; that's what happens. The ubiquitous “they” send a message down the management line letting your manager know. And you finally have to 'fess up and comply.

Being curious journalistic types in the PR group, we've wondered what would happen if we kept on ignoring the notes, including the one from the boss telling us we'd been told on. But we've only wondered; we all have creditors.

* * *

Tired of all your brain-bustin' science work? Got a yen to write? Robert De Niro wants to hear from you. Really. The Academy Award-winning actor and his Tribeca Film Institute partner Jane Rosenthal are looking for “scripts with scientific or technological themes” but no science fiction stories, according to the Associated Press. Story lines should have a scientist, engineer, or mathematician as the leading character, at least one script will be read at next spring's Tribeca Film Festival, and the completed film will be screened at the 2004 film festival.

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

Annette Sobel named brigadier general in Air National Guard

Sandia has a new brigadier general in its midst. Annette Sobel (5907) was confirmed earlier this year as a brigadier general in the New Mexico Air National Guard.

As far as she knows, she's the first female and possibly the youngest person to ever to reach this rank in the state.

The confirmation came after a complicated process that took years to complete. Her nomination to the post was approved by the US Senate and signed off by President Bush.



ANNETTE SOBEL

Annette says the military has been a major part of her life; she spent four years on active duty and for the past 11 years has been a reservist in the New Mexico Air National Guard. She first became involved in the military when she received an Army Reserve Officers Training Corps (ROTC) scholarship while attending Rutgers University as an undergraduate student.

By accepting the scholarship, Annette incurred a four-year obligation to the Army. She deferred her active service while she pursued a medical degree from Case Western Reserve University and did a medicine internship and resident training in family medicine and later in aerospace and hyperbaric medicine. Only then did she go into active service — four years with the Army and the Air Force. After that she joined the New Mexico Air National Guard.

During her military career she served as a flight surgeon, a medical doctor who determines if a person is fit for duty and flight. She was also the first woman commander of Ft. Bragg's medical holding company, a position where she supervised soldiers and ultimately was responsible for all patient pre-hospital care. Also, while at Ft. Bragg she was deployed to Central America and Panama, where she saw how infectious diseases can spread.

As a reservist, she is on duty several weeks and weekends out of the year, taking her Sandia vacation time.

But the military is only one side of her life. Annette is also a medical doctor, flight surgeon, former astronaut candidate, university professor, and Sandia researcher.

“I love being in the military. It's challenging and there's a camaraderie like no where else,” Annette says. “I also find Sandia incredible and enjoy every day I'm here.”

When she joined Sandia ten years ago, she started working as a physician in Medical. Within a year-and-a-half she moved to the technical side of the Labs where her work has focused on technology development in support of national security and in the field of human factors/systems development.

Her research has led her to study ways to mitigate outbreaks of dangerous epidemic diseases such as *E. coli* and the emerging West Nile virus and the risk of disease transmission from nonhuman primates, such as mountain gorillas and monkeys. She recently served as program chair of a University of New Mexico-sponsored workshop on unified science and technology for biological threat reduction. Annette is a research professor at UNM.

— Chris Burroughs

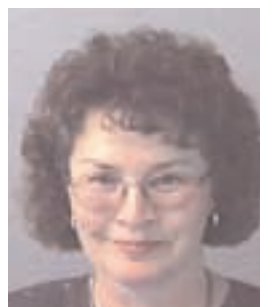
Employee death

Nancy Glenn of Deputy to the Integrated Enabling Services Office 7001 died unexpectedly Sept. 8.

She was 52 years old.

Nancy was an office management assistant and had been at Sandia since 1974.

She is survived by her husband Dickie and son Jeremiah.



NANCY GLENN



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Recent Patents

Christopher Cherry (5932): Penetrating Projectile for Bomb Disablement.

Randy Shul, Stanley Kravitz (both 1763), Todd Christenson (1743), Thomas Zipperian (1740), and David Ingersoll (2521): Apparatus and Method for Fabricating a Microbattery.

Robert Bickes, Jr. (2523), Lloyd Bonzon (2554), Robert Benham (2553), and Floyd Braaten, Jr. (ret.): Explosive Scabbling of Structural Materials.

Steven Rodgers, Jeffrey Sniegowski (both 1749), and Thomas Krygowski: Surface-Machined Rotatable Member Having a Low-Contact-Area Hub.

John Feddema, Raymond Byrne (both 15211), Jon Bryan (15212), John Harrington (12252), and Scott Gladwell (15211): Portable Control Device for Networked Mobile Robots.

Rush Robinett III (6200), Kenneth Groom, John Feddema (both 15211), and Gordon Parker: Pendulation Control System and Method for Rotary Boom Cranes.

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David Raymond (6211) and David Glowka: Drill Bit Assembly for Releasably Retaining a Drill Bit Cutter.

Gilbert Benavides (14184), Paul Galambos (1769), John Emerson (14172), Kenneth Peterson (14171), Rachel Guinta (14172), and Robert D. Watson (11500): Packaging of Electro-Microfluidic Devices.

Sandia researchers help prepare public health officials, others with antiterror 'decision analysis' tool

Simulation program produced by California site's Weapons of Mass Destruction Decision Analysis Center

By Michael Janes

Imagine the unimaginable: terrorists have released a biological agent throughout the San Francisco Bay Area that threatens to harm or kill local residents. As information on the outbreak becomes available, key decision makers and government entities — including public health officials, law enforcement, emergency management personnel, elected officials, and media — must decide when and how to respond. The speed and effectiveness with which they do so may mean life or death for dozens — or thousands — of citizens.

Officials at the local, state, and federal levels are actively addressing this problem, and efforts are well under way to identify effective countermeasures that would reduce the destructive impact of such a scenario. Sandia researchers are doing their part by developing a sophisticated tool meant to assist government officials and others involved in the decision-making process. The program, initially designed for public health officials but to be expanded for other key entities, is a product of the California site's Weapons of Mass Destruction Decision Analysis Center (WMD-DAC).

"If an event like this were to occur, decision makers would have to act quickly and efficiently,



AT SANDIA'S VISUALIZATION Design Center, Dawn Kataoka (8114) describes a prototype tool, based on medical data and computer simulation, for government officials and decision makers to practice responding to a terrorist event. Produced by the site's Weapons of Mass Destruction Decision Analysis Center, the prototype was presented to Benjamin Pimentel (center, front) of the *San Francisco Chronicle*, which recently profiled the project (see: <http://www.sfgate.com/cgi-bin/article.cgi?file=/chronicle/archive/2002/08/19/BU133752.DTL>).

(Photo by Bud Pelletier)

Sandia California News

but without the luxury of having all of the information at their fingertips immediately," says Howard Hirano (8101). "What we're doing is creating the situation ahead of time so that — by playing through various scenarios — the involved decision makers can examine various protection and reaction schemes and figure out what works best under different conditions."

Howard says the program will help answer some of the more pressing questions facing decision makers, from city officials all the way up to the White House.

"How much of an emphasis should we place on building up stockpiles of anthrax prophylaxis? What portion of our investment should go into developing a stronger information network between physicians? And how important are early warning sensor technologies? These are some of the issues that the WMD-DAC program can help address," says Howard.

The hub of the program is Sandia's Visualization Design Center (VDC), a "war room" of sorts that allows users to better comprehend complex issues and situations. The program uses advanced computers, display systems, and software tools that simulate an attack based on real and projected data.

For the Bay Area model, for example, researchers integrate information on symptoms, illnesses, and deaths gathered from local hospitals and coroners' reports to accurately simulate and understand the impact of identifying trends as early as possible. Using this and other data such as air measurements or more detailed physicians' reports, response strategies can be examined and tested. "The idea is that a public health director or other key official can take the information they learn from the simulated event and integrate it into their own emergency plans," says Howard.

This simulation capability is the result of a

six-month "program definition study" — completed in June 2001 — during which team members analyzed new threats and the site's unique capabilities in combating those threats. The researchers determined that a more integrated approach was necessary, one that brought together the perspectives of those involved as they sought to deal with an event that unfolds over days and weeks, having to make decisions along the way with incomplete information. The result was the WMD-DAC, an interactive, multi-player simulation "facility" that presents information in a format useful to decision makers with an underlying — but user transparent — core based on the latest technical knowledge.

Anticipating the next attacks

While researchers were examining the many dimensions and decisions that are fundamental during a biological attack, the events of September 2001 — and the subsequent anthrax scare — added a sense of urgency to the work. Officials with DOE and the Department of Defense, anticipating the next wave of attacks, sought new strategies to protect citizens, and the current WMD-DAC approach was accelerated.

First piloted against a biological attack of the San Francisco Bay Area, the program is now being adapted to address other threats and applications.

"The simulated scenario has really resonated with the physicians and other decision makers we've worked with to date," says Howard. "It's clear they've thought about the problems and decisions they'd be faced with during an attack, and consequently they've helped us to focus on key details and information they will need." Howard says the overwhelming response has been positive, with several officials commenting on the value of the simulation tool in making their jobs more effective during a terrorist event.

Sandia researchers continue to look at additional capabilities that will allow the simulation to address other dimensions and data. One feature currently in the works, for example, is the ability to track a moving population, an important detail for health officials following the spread of contagious diseases such as smallpox. The ability to detect biological agents or other materials soon after they are released — a Sandia capability already far along in the development and testing stage — will also be added in some applications.

Feedback

In California and New Mexico

Formerly represented retirees should see pension changes soon

Q: Earlier this year, it was announced the Sandia retirees would receive a retroactive 15 percent increase in their pensions. Upon contacting Human Resources, I was told the increase applied to "non-represented" employees only. The LLT Newsnotes, 8/5/02, states: "REPRESENTED PENSIONS — Both the MTC the OPEIU have ratified new contracts. The new contracts include pension increases of 24 percent for active represented employees covered under the Pension Security Plan." No increase is mentioned for current retirees. Retirees do not pay union dues. Retirees are not represented by any bargaining unit. I submit that ALL retirees of Sandia are non-represented and should receive the retroactive increase in pension. Employees of Sandia are exhorted to value diversity and appreciate others' contributions, yet we consistently undervalue represented personnel especially after retirement. The pensions of formerly represented personnel are a pittance; all retired personnel should have a right to a decent living. What would a 15 percent increase in a "pittance" cost Sandia? Are we going to do the right thing?

A: In February of this year, Sandia announced that NNSA had approved a comprehensive package of pension, medical, and life insurance

changes for non-represented employees and retirees covered by the Retirement Income Plan (RIP). The 15 percent ad-hoc increase granted to RIP retirees differed from prior Sandia improvements in retiree benefits because it was not designed to address changes in the cost of living. Instead, this increase was based on the change in the pension formula that was approved for active non-represented employees. Sandia has followed a similar process with its union-represented employees and formerly represented retirees by first negotiating benefit changes for active union members and then using the outcome of those negotiations as a basis for developing a package of changes for retirees covered by the Pension Security Plan (PSP). We completed contract negotiations with all three unions representing employees at Sandia in August 2002, and we have fashioned a proposal of benefit changes for PSP retirees that is very similar to those already applied to the non-represented retirees in the RIP. Sandia's Board of Directors and NNSA must approve these changes, and we are currently arranging to present this package for their review. — *Ralph Bonner (10310)*

Retinal prosthesis

(Continued from page 1)

millions of pixels, they'll see approximately a thousand. The images will come a little slowly and appear yellow. But people who are blind will see."

The plan is to use a tiny camera and radio-frequency transmitter lodged in the frame of a patient's glasses to transmit information and power to modules placed within the eyeball. The modules will be linked to retinal nerves that will send electrical impulses to the brain for processing.

Dean Cole, a biomedical engineer who directs the project at DOE's BER office in Washington, D.C., says, "We felt that blindness is a devastating problem and that the modern conjunction of materials science with micro- and nanotechnologies in our multidisciplinary national labs offers

possibilities for advances, where before people had hit brick walls."

The Sandia approach is to attach

a MEMs chip on the retina — within the vitreous humor of the eyeball — made of LIGA and surface micromachined silicon parts. (LIGA, a German acronym for lithography, electroplating, and molding, makes small parts of metal, plastic, or ceramics.) The idea is to directly stimulate some of the nerve endings within the retina to produce images good enough to read large print and to distinguish between objects in a room.

A difficult but doable realm

"Compared to the elegance of the original biological design, what we're doing is extremely crude," says Kurt. "We are trying to build retinal implants in the form of electrode arrays that sit on the retina and stimulate the nerves that the eye's rods and cones formerly served."

The size of cones and rods, as well as nerve connections, are in the micron range — a difficult but doable realm for scientists used to working with micromachines.

"We'll use a crude, shotgun approach that fires groups of nerves. In the long run, of course, we'd like to stimulate each individual nerve," says Sandia's Mike Daily, Manager of Integrated



Microsystems Dept. 1738.

Goals of the project increase from 10-by-10 electrode arrays for fiscal year 2002 to 33-by-33 arrays for FY2004.

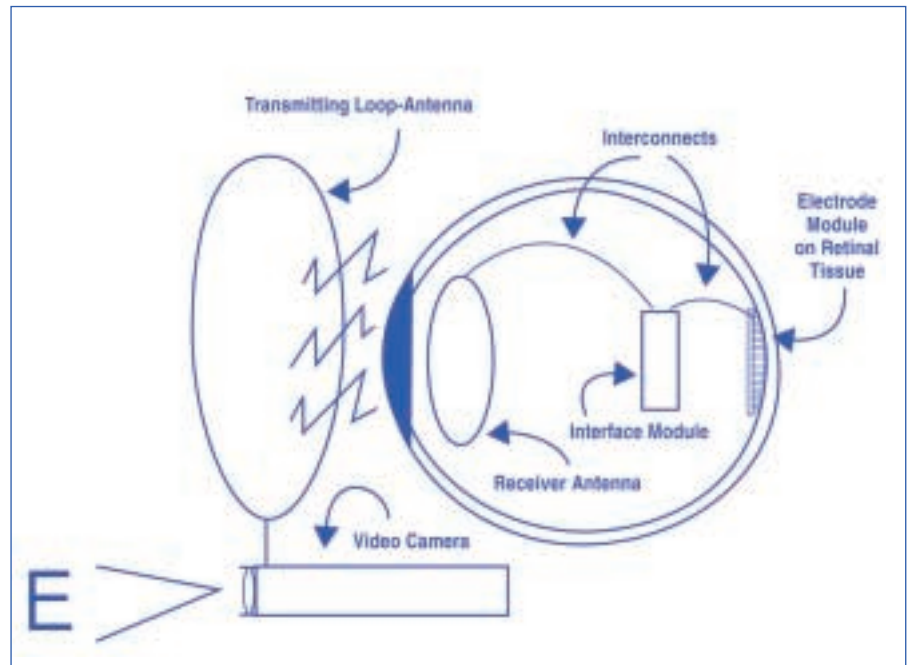
The project started with work at Johns Hopkins University under medical doctor and researcher Mark Humayun. When Humayun began the Intraocular Retinal Prosthesis Group at Doheny Retina Institute at the University of Southern California, the project moved with him. Teaming with Eli Greenbaum at Oak Ridge, the pair visited a number of national labs. Like Johnny Appleseeds of ideas, they tossed out seeds of thought and ultimately arranged to have each lab work on a different aspect of the electrode array/retina interface.

Said Humayun, "There is a considerable amount of advanced technology literally on the shelf or already being used for defense purposes that we could use to help solve blindness and greatly propel forward the entire field of medicine."

Other national lab tasks include:

- The lead lab, Oak Ridge National Laboratory, will manage the multilaboratory effort as well as test the various components developed by the other labs;
- Argonne National Laboratory will investigate the viability of diamond-based electrode arrays and biocompatible coatings;
- Lawrence Livermore National Laboratory will experiment with rubberized electrode arrays; and
- Los Alamos National Laboratory will model and simulate neural paths to and from the retina to the brain.

USC personnel will implant the devices and test their medical effectiveness. Second Sight,



HOW IT WILL WORK — A drawing of a retinal prosthesis implant shows the imaging camera at bottom (possibly situated on frame of glasses), transmitting power and information via loop antenna to modules within the eyeball. Ultimately, the modules will be connected to retinal nerves, where electrical stimulation will be processed by the brain.

located in Santa Clarita, Calif., will commercially produce the finished system. North Carolina State University in Raleigh leads the development of the *in situ* medical electronics.

Progress, but far more still to be done

An early prototype built by Second Sight was inserted in a human patient's retina on Feb. 19 at USC University Hospital's outpatient surgery center. The 4x5 millimeter prosthesis had 16 electrodes arranged in a 4x5 array. But far more remains to be done.

Says Mike, "Integrating microdevices into the human eye is incredibly challenging because of the need for high-reliability operation over decades in a saline environment. BioMEMs interfaces and biocompatibility issues drive much of the effort, particularly in the packaging of the microsystem." ('Packaging' refers to sealing and securing a microdevice in place and linking it electronically and physically with its environment.)

Counterintuitively, the rods and cones of the retina lie beneath nerves, not above them, which makes it slightly easier to connect directly to the nerves.

"The tissue housing the nerves is relatively clear. We're investigating which electronic waveforms will best stimulate these nerves," says Kurt. One problem, he says, is that "If we excite a nerve with electrons, we don't know exactly how that compares to the electrochemical response of light on a healthy retina."

There are other issues, he says. For one, the retina can't handle much pressure. Thus Sandia favors spring-loaded electrodes that ensure good electrode contact with minimal force. Also, protein fouling can mess up delicate interfaces intended to transmit electrical impulses. Other problems include biocompatibility — the problem of rejection of alien matter by the body — and long-term reliability.

The project, underway since October 2001, is expected to identify the most promising implantation technologies. "The question is, who's going to engineer the best system that works in the real world?" says Mike.

Over a five-year period, says Dean Cole, the project will begin with goggles and move in the direction of corneal implants, aiming if all goes well to prepare five patients for the procedure before the project's end. After that, he says, "The FDA will say they want 100 patients for long-term studies and DOE will get out and leave the project in the hands of industry."

Two hundred thousand eyes in the US are blinded each year by macular degeneration, primarily in the elderly. One baby in 4,000 demonstrates retinitis pigmentosa.

Sandia is receiving \$400,000 each year for its part in the research, which is led by Kurt and co-inventors Murat Okandan (1749), David Stein (1748), and Michael Rightley (1745).

Iraqi threat

(Continued from page 1)

year period. Now, it's been almost four years since the inspectors were ejected. When you look at how fast they moved from '87 to '91, that should be a very sobering piece of information. So, is it possible they've made advancements — major advancements in their nuclear program since then? I'd have to conclude, based on what I saw, that 'Hell yes it is.'

When Jim spoke to the *Lab News* in 1998 (*Lab News*, Oct. 23, 1998) about his UN tour of duty, he emphasized that Saddam's nuclear program wasn't an ad-hoc fly-by-night operation: The evidence on the ground proved conclusively the program was a full-blown, Manhattan Project-scale effort.

Saddam had invested billions of petrodollars into his bid to become a full member of the nuclear club.

Today, Jim notes, the key people and the key know-how are still available to Saddam. "His [Saddam's] nuclear weapons chief is still there and he knows how to put a bomb together. Do I have specific intelligence about their nuclear weapons program? No. But I saw what they were able to accom-

plish before in less than four years and it was impressive."

For all of its successes and strides in 1987-91, the bottleneck for the Iraqi program was getting enough fissile material for a bomb. That's not unlike the experience of the Manhattan Project; the huge facilities in Oak Ridge and Hanford were created to produce weapons-grade uranium and plutonium, respectively. As some historians have only half-jokingly put it: the physics is easy, the industrial infrastructure is hard.

"They [the Iraqis] tried a lot of different approaches [to producing fissile materials]" Jim says. "My guess is that at this point, they probably would have decided to go with a gaseous centrifuge technique. . . . I would guess that at this point, the quantities of [fissile] materials needed are not available, but if they had 100 kg of the stuff, I think they could produce a Trinity-type bomb within months."

Jim doesn't want to speculate on whether Saddam has been able to obtain weapons-grade materials on the black market.

"If I had any information on that," he says, "I'd be briefing the President right now."

Jim says he doesn't think the current focus on Iraq and the threat it poses is overblown.

"I think the President — politics aside — is dead-on right about this. What would be the effect of a 20-kiloton bomb going off in mid-town Manhattan? That's something you don't want to contemplate. I read the papers and listen to the talking heads, and what I'm hearing fits exactly with what I knew. In my opinion, there is a true risk, a very substantial risk, in letting Iraq continue down this path."

"I read the papers and listen to the talking heads, and what I'm hearing fits exactly with what I knew."

Boeing CRADA

(Continued from page 1)

and performance of our products and services," Paul said. "It's a win-win situation for everyone."

The new umbrella CRADA paves the way for Sandia and Boeing to do business together, allowing them to add project-task statements without having to negotiate terms and conditions on each one. Technical work under this CRADA will be divided into separate and independent projects.

Negotiating the CRADA on the Sandia end were Victor Weiss (1323), Rusty Elliott (1500), and Duane Landa (1316), with Pam Duran (1323) processing the documentation.

"The potential scope of projects is broad and encompasses the wide variety of technologies at Sandia," Jim said. "Each project must provide value to the industry parent and help maintain or expand the technology base vital to the Department of Energy's mission and the DoD."

Concentrating solar power technology

The initial tasks will deal with concentrating solar power technology, headed up at Sandia by researchers Chuck Andraga and Scott Jones and Manager Craig Tyner (all 6216), who are working in conjunction with Boeing project engineers Mike McDowell and Bob Litwin.

The project objective is to establish a Boeing-Sandia partnership that will combine the strengths of each organization to make Concentrating Solar Power (CSP) a success. This relationship will include a broad range of CSP technologies, including power towers, solar troughs, and concentrated photovoltaics. The project will focus on the development of key demonstrations, risk-reduction testing, and economic/system analyses.

"CSP is poised for rapid growth in the renewable energy market, and the infusion of new technology and processes will facilitate reductions in capital and operations and maintenance cost, enabling CSP products," said Craig.

"Teaming with Sandia on this CRADA will help accelerate progress toward our goal of developing CSP systems for generating clean, renewable electric power sources for consumer use," said Litwin.

Later, more projects may be added in several technical categories, including materials and process science; modeling and simulation; sensors, tags, and associated electronics; microsystems science, technology, and components; logistics and supply-chain management tools; intelligent systems and robotics; manufacturing technologies; test techniques and facilities; pulsed power/directed energy sciences; safety; network and information security; signals processing and analysis; energy systems; and security.



A SUNNY FORECAST FOR SOLAR — In anticipation of CRADA-related solar research with Boeing, Energy staff survey the heliostat field at Sandia's National Solar Thermal Test Facility. From left to right are J.J. Kelton, Doug Brosseau, Kye Chisman, Mike Edgar (all 6215), Scott Jones, and Chuck Andraga (both 6216). (Photo by Randy Montoya)

Boeing CRADA excites Sandia solar group

Researchers to jointly work on power towers, space solar power for satellites, more

Researchers in Sandia's solar group are excited by the new energy the Boeing/Sandia umbrella cooperative research and development agreement (CRADA) brings to their research. Their work is the first that falls under the new CRADA.

"We will be moving ahead in several areas that Sandia has been interested and involved in for several years," says Craig Tyner, Manager of Solar Thermal Technology Dept. 6216. "Because of the Boeing CRADA, we will be able to take our research to a whole new level."

One of the first areas Sandia and Boeing will jointly be working on is a power tower in Spain, called Solar Tres. Sandia was previously involved in building three other solar tower projects in the US — the experimental testbed at Sandia south of Albuquerque, Solar One in Barstow, Calif., and a molten salt retrofit of Solar One, called Solar Two. The previous endeavors were demonstration and development plants. Solar Tres will be three times larger than Solar Two and will be the

"Because of the Boeing CRADA, we will be able to take our research to a whole new level."

first truly commercial power tower plant that will be hooked up to the electric grid.

"Sandia's role with Solar Tres will be consulting, system analysis, and component testing," says Scott Jones, who leads the power tower and system analysis groups in Solar Thermal Technology Dept. 6216.

Boeing project engineer Bob Litwin says that Solar Two produced 10 megawatts of power and had three hours of thermal storage. In comparison, Solar Tres will produce 15 megawatts of power and have 16 hours of thermal storage, which will mean the tower will be able to produce power 24 hours a day. The Solar Tres project is expected to begin in early 2003.

"Sandia will look at improving the receiver system of Solar Tres and working on ways to optimize the entire solar plant," Litwin says.

Another project to be part of the CRADA will be helping Boeing design and build distributed solar systems — small solar concentrators that can be used for village power or for water pumping. Distributed solar systems "make electricity where you use it, generally in off-grid locations," says Chuck Andraga (6216), who has been working with these types of systems at Sandia for 18 years.

He expects to work with Boeing and have a prototype "very quickly" and ramp up quickly to commercial level. Farther in the future is joint work on thermal energy storage for solar troughs and in space solar power for satellites and space stations.

"Boeing has made a decision that solar power is an attractive energy source," Craig says. "Our job is to help make them successful."

— Chris Burroughs

Senate passes Global Pathogen Surveillance Act of 2002, patterned by Labs scientist/physician Al Zelicoff

By John German

Congress has passed a bill — and earmarked \$150 million toward its implementation — that a Sandia scientist helped redirect and rewrite.

On Aug. 1 the US Senate voted unanimously to adopt the Global Pathogen Surveillance Act of 2002, Senate Bill 2487, which in part calls for the establishment of an online network through which doctors around the world can quickly report and obtain information about unusual symptomatic observations and disease diagnoses among their patients.

The goal is to provide a faster and more pervasive method of monitoring epidemics as they emerge so nations hosting illegal research on biological pathogens can be confronted. Such a system would have the added public health benefit of quickly identifying disease outbreaks not related to bioterrorism or biowarfare.

Current systems oftentimes rely on slow and belabored paper-based reporting procedures through public health officials, an approach that discourages doctors from reporting symptoms and that could delay public health responses to acts of bioterrorism.

The bill sets aside \$150 million over two years (FY2003 and FY2004), in part to begin equipping hospitals and clinics in developing nations with the computing and communications equipment needed to give local doctors access to such a network.

Patterned after RSVP

The online surveillance system proposed in SB2487 is patterned after Sandia senior scientist Al Zelicoff's (5320) longtime cause, the Rapid Syndrome Validation Project (RSVP), and not coincidentally.

Al testified in March 2002 before the Senate Foreign Relations Committee on SB2487's precursor

bill (*Lab News*, March 22). He told members of the committee that the bill, as then written, was inadequate because it supported measures that, "while superficially appealing, were not of much utility in addressing the desperate need for worldwide, near real-time surveillance."

Several committee members agreed with Al's assessment, and after the testimony one of the bill's co-sponsors, Sen. Joe Biden, D-Del., asked Al if he would be willing to work on the bill. The committee staff sent Al a draft a few days later.

Syndrome-based surveillance

Al says he rewrote major portions of the bill, "daring to even go so far as to introduce the notion of 'syndrome-based' surveillance as the centerpiece, urging that little money be wasted on shiny laboratory equipment."

In other words, he says, "I was making the case for a strategic shift in the way public health surveillance is done around the world."

RSVP was not identified by name in the rewrite, he says.

The full Senate accepted the bill with Al's language mostly intact. The full text of the bill is available at <http://thomas.loc.gov/home/thomas.html> (search for SB2487 under the "Public Laws by Number" link).

The bill also calls for improved epidemiology-related training and laboratory equipment for developing nations and gives preference to governments that agree to provide early notification of epidemics and allow international organizations to investigate suspicious outbreaks.

About the bill Biden said, in the *Congressional Record* (Aug. 1), "Disease surveillance . . . can quickly alert doctors across a region that a suspicious disease outbreak has occurred. Epidemiological specialists can then investigate and combat the outbreak. And if it is a new disease or strain, we can

begin to develop treatments that much earlier. . . .

"In short, the more information shared under pathogen surveillance, the better protected the world is against surprise bioterrorist attacks and rapid natural epidemics. . . . We cannot leave the rest of the world to fend for itself in combating biological weapons and infectious diseases if we are to ensure American security."

Bill co-sponsor Sen. Jesse Helms, R-N.C., added, "I am particularly proud of the provisions of SB2487 that address the glaring need for syndrome surveillance. . . .

"Let me close with the astute words of Dr. Alan P. Zelicoff, Senior Scientist, Sandia National Laboratory [sic], as stated during his testimony before the Foreign Relations Committee," Helms added.

"When all is said and done, should would-be perpetrators of bioterror know that the effects of their attack would be blunted if not eliminated, they might well re-think their strategy in the first place. A multinational cadre of clinicians and nurses, exchanging up-to-the-minute information, is our single best defense, and we have the resource — now — to so equip them. All that is required is a policy shift emphasizing and strengthening this linchpin capability."

Unexpected success

Adds Al, "Somebody wake me up . . . I must be dreaming. Never did I expect my rewritten version of the bill to meet with such approval (as it is so technical in nature, is so iconoclastic as viewed by the public health community, and because it has its own funding line) nor to get funded at such a generous level."

SB2487's funding appropriations will be routed through the Department of State in consultation with the Department of Health and Human Services and Department of Defense.

Buildings to square off in Labs-wide energy-saving contest beginning Oct. 1

Calling all kilowatt counters: Beginning Oct. 1, your building's power proclivities might be tracked, quantified, and analyzed.

If your building's energy habits are deemed exceptional as compared to those of other Sandia buildings, you and your neighbors could be rewarded.

If not, well . . . you are the weakest link.

The rules

Beginning in October (DOE's Energy Awareness Month), members of the Energy Management Program will share metered monthly electricity consumption tallies from buildings participating in the contest with representatives of each of the buildings.

For your building to participate, a building representative *must enter* by contacting one of the contest co-sponsors below, or by attending a Sept. 25 information session at Sandia/New Mexico (see box below).

At the end of each quarter, each participating building's monthly per-square-foot electricity consumption for the previous three months will be compared to that building's "baseline" per-square-foot consumption from the same three months in

FY01.

The percentage change (in kilowatt-hours per square foot) will be compared to other buildings. The person entering your building in the contest will receive the building's electric use figures as well as estimated cost savings following each quarter.

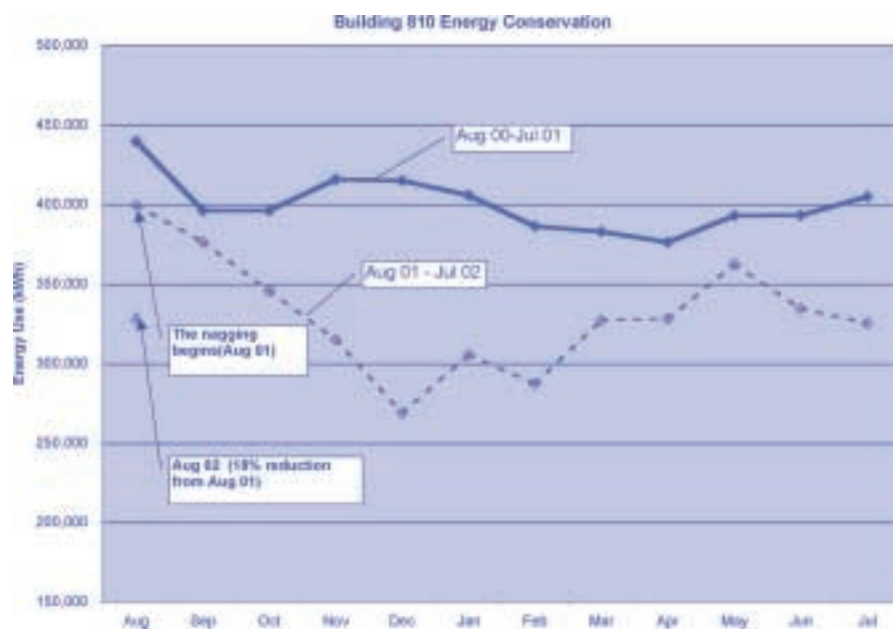
(Note: Some Sandia buildings are not individually metered and will not be able to participate as buildings in this contest. See your building manager or contest sponsor for details.)

The spoils

Buildings achieving significant quarterly reductions will be placed into categories — the 5% Club, 10% Club, 15% Club, and Overachievers Club, for example — and their building numbers and consumption reductions will be publicized in the *Lab News*.

Occupants of buildings with significant reductions will be rewarded with prizes ranging from coffee mugs (quarterly) to a building-wide feast at the end of the contest. Occupants in the buildings with the top overall reductions will be awarded the larger prizes. (Exact prizes are yet to be determined.)

For information about ways to save energy in your labs and offices, refer to the last three issues of the *Lab News*, or attend the Sept. 25 special



WATTS ON YOUR MIND? Here's an example of what energy awareness efforts in one building can accomplish. The top, solid line represents Bldg. 810's electricity consumption for the one-year period beginning Aug. 1, 2000. By August 2001, the Bldg. 810 Energy Nag had begun nagging his coworkers, and the dotted line shows the corresponding reduction in Bldg. 810's energy consumption during the following year — a one-year savings of almost \$44,000 in power bills. The triangle shows Bldg. 810's total electricity consumption for August 2002, an 18 percent reduction from August 2001. To achieve the savings, the Energy Nag and 810 building operator Bob Washington (10844-5) worked together to raise awareness and optimize the HVAC system's operation. "Major kudos goes to Bob Washington and the Energy Nag," says Malynda Aragon (10823), who provided the graph.

information session.

To enter your building in the contest, or for information about the contest or saving energy, contact energy contest co-sponsors Malynda Aragon (10823) at 844-1288, Kristin Klossner (3124) at 844-9977, or Ralph Wrons (10823) at 844-0601. Sandia/California employees can contact Howard Royer (8512) at 294-2635.

— John German

All energy 'gadflies' invited to Sept. 25 info session at SSA

All current and potential energy "gadflies," and anyone interested in energy-conservation opportunities at Sandia, are invited to a special information session on Wednesday, Sept. 25, 3 to 5 p.m., in the Steve Schiff Auditorium Lobby. Members of Sandia's Energy Management Program will provide snacks and drinks and answer questions. Posters, stickers, and other energy-saving promotional materials will be available, as well as tips on how to encourage others in your building to save energy. If you can't attend but need information, contact Malynda Aragon (10823), 844-1288, or Ralph Wrons (10823), 844-0601.



Sandian Ron Hoskie (10842, holding paper), in photo at left with fellow Cumulonimbus band member Dave Fein (1744, playing flute) wrote this poem and recited it to the accompaniment of the Cumulonimbus Native American-style music group, made up of Sandians, at the noontime Sept. 11 one-year anniversary observance at Albuquerque Civic Plaza. Also performing but not pictured was Cumulonimbus member Greg Hassig (2564).

A SPECIAL KIND OF WARRIOR

Within the heart of a warrior, there is strength
 Deep in the soul of a warrior, there is power
 Beneath the skin, there is a waiting fighter
 A contender which lies, hidden underneath
 All of a given energy, from the Great Spirit above

Within the warrior, there holds his heart
 Truly a place for love, and a drive to protect
 It holds his strong individual leadership
 Also a place which nestles his very feelings
 And . . . the heartbeat of victory!

For within a warrior, there comes the strongest power
 As the dark moon dances —
 As he hears the ghostly calling
 Echoing thunder, against a shadow-filled sky
 He is a warrior, for it lies thick within the heart

As Fire Fighters, Law Enforcement, EMTs, Paramedics,
 Military, and the seemingly average Everyday Person
 They fight for families, friends, and saving lives
 The courage is within them and the strength is there
 For these things are within A SPECIAL KIND OF WARRIOR!
 — Ron J. Hoskie
 ©2002

Sandians join community in commemorating 9/11

Photos by Randy Montoya



STEEL BEAMS FROM THE WORLD TRADE CENTER were displayed at Albuquerque's Civic Plaza on the one-year anniversary of the terrorist attack that destroyed the twin towers.

Sandia's own business development college opens with three-tier program

Classes, electives, seminars prepare staff and managers for new business realities

By Will Keener

"The future is not fixed...we live in a world of possibilities." — Joseph Jaworski, Synchronicity: The Inner Path of Leadership

Margie Tatro named it the "College of Business Success" and sees it as a way of turning possibilities into realities. It's an apt title for a new business development approach that is already making a positive contribution to the Labs' future.

So, what is the College of Business Success? It is a partnership between Sandia's Corporate Training Development and Education organization (3020) and Energy and Transportation Security Center 6200, with benefits to the whole Labs. It's a multi-year, three-tier program for staff members and managers. It involves required classes, electives, monthly business development seminars, lunchtime clinics and discussion groups, coaching, a newsletter for participants, and outside reading.

Seen by its key developers as the culmination of several years work at Sandia in business development, the college reflects the impact of a new business reality, explains Margie, 6200 director. "I prefer the term "business success," because it includes not only marketing, but delivering results."

Margie's first goal is to continue to increase business with existing customers, while diversifying her customer set to new "nontraditional" customers. "Doing both simultaneously has been a struggle, I think partly because some folks see these two activities as competing. The college will allow people to learn and practice sound business approaches to support existing and new customers."

Adjusting to changing times

Times have changed and conditions are right for the college, says Dave Menicucci, of Photovoltaic Systems R&D Dept. 6218. He is serving as lead developer on the project for his center. During the Cold War, Sandia's mission was well understood and unchallenged, he explains. Now it is evolving. There are many customers instead of one. New legislation encourages work with industry and other agencies. Stable budgets have given way to budgets under constant pressure.

Other labs are becoming increasingly competitive with Sandia in many areas, Dave notes. "We are becoming a different lab, and it occurred to me that we needed to start doing things differently — adapting some of the best business development practices from the private sector to Sandia's unique situation."

Dave's background in private industry, where "every staff member is expected to have business development and customer relations skills," caused him to begin to go after outside funding sources in the 1990s. His successes, coupled with the realization that change was descending on Sandia, led to discussions with colleague Beth Richards (6218) and to a proposal for a new training curriculum and a pilot program to test it.

It also led him to Kathleen Schulz of Science and Technology Business Development Dept. 1314, who has used her own private-sector experience to

develop Sandia's current Corporate Training Business Development Curriculum and is co-leading the pilot with Dave.

"We've been doing business development courses for about seven years now and interest has been growing," says Kathleen. The effort with Center 6200 is much

more integrated, she says, and is the culmination of a trend.

"The trend I've seen is from individuals from different parts of the Labs attending open classes to managers or VPs asking me to tailor an integrated program (classes, seminars, coaching) for their organization. Their goal is to develop a select cadre of people who are effective at developing business for their organization."

Kathleen and Dave began a year ago to identify appropriate courses and resources already in existence, find and fill curriculum gaps, and work out an outline for the pilot. In its present form, the college has three tiers.

Business Development 101

The first is a kind of Business Development 101, suitable for all Sandians. It will be aimed at developing a common understanding of Sandia business development issues and some basic business development skills. The introductory class in this tier, suitable for all Sandians, may take the form of a video or short course. The introductory session will cover the basic process for developing business, the role of various individuals in that process, and Sandia's unique business development requirements and constraints. The second tier is more of a bachelor's degree education in business development. Tier three is seen as advanced, or "graduate level" training. Tier three will result in "Master Pro-

"We've been doing business development courses for about seven years now and interest has been growing."

gram Developers" who can pursue high-consequence deals or serve as in-house mentors for other Sandians. For more information on the three tiers, consult the 6200 Website: <http://www.csu836.sandia.gov/organization/div6000/ctr6200/info/Success/cobsuccess.htm>

The pilot class — geared for the tier-two level — includes 12 staff members and managers from the 6200 center. All were selected by managers based on qualification statements written by each applicant. These statements address individual goals and potential uses for the training.

"If you look back you can see earlier efforts in program development bubbling through our history, says Char Wells, manager of Sandia's corporate training effort (3020). "This is the one to take us to the next stage. We think we are primed and ready to provide support across the labs."

While it is difficult to see how the college might impact the governance initiative, "The curriculum certainly puts us in a position to support it," Char says. "As we move to govern ourselves, we certainly need to be smarter about how we present ourselves to the external world."

Training staff members will be making follow-up evaluations "to see if we have done what we said we were going to do," says Char.

"I don't think that everyone wants or needs to be an expert in these concepts," says Margie. "However I feel that our organization will benefit from more people knowing the basic terminology, philosophy, and processes that support business success." Metrics that measure revenue growth, customer satisfaction, and other success factors are already in place in Center 6200, she explains.

"If people are interested in providing input as to their own organization's needs, I would welcome their calls," adds Kathleen. "This pilot program has been heavily weighted to Center 6200's needs. Obviously, we want to figure out what tweaking may be needed in order to make this program useful Labs-wide. I'd love to hear from anyone who is interested in providing input."

Learning how to be responsive to customers

Developers of the College of Business Success see its merits in improved business development with both traditional and nontraditional customers and in internal collaborations.

Last year, for example, some of Sandia's satellite experts in Center 5700 needed engineering support and asked Center 6200 for assistance. "For a number of reasons, our center wasn't able to respond in an appropriate timeframe, and the opportunity was missed," says Margie Tatro (6200). Understanding that some customers operate in timeframes of weeks or months, instead of years, is a lesson that is more and more important, she adds.

Sandia's Energy and Critical Infrastructures business unit has had success in building 'nontraditional' customers aimed at creating a truly multiprogram laboratory, she notes.

"Now we need to accelerate our ability to provide these customers exceptional service in their timeframes."

By partnering with Sandia's Corporate Training group, Margie hopes that Sandians will see the value of both improved relations with traditional and nontraditional customers and of internal collaborations.

Her example turns out to have a happy ending, she adds. "Recently we were offered a second opportunity to help and we are committed not to disappoint them again."

Five Sandia organizations earn New Mexico's Green Zia Award

Ed Williams, Manager of Fleet Services at Sandia (10849), has a few choice words for New Mexico's Gov. Gary Johnson: "Thanks. We couldn't have done it without you."

Ed is one of several Sandians who will meet the governor Sept. 25 to receive a "Green Zia" award from the state. His message is that without the feedback from the program, many of the improvements in fleet services would probably have not been made. "It's an oft-told story," says Ed. "While winning the award is welcome and exciting, it's secondary to the discovery process of getting there."

This year five organizations at Sandia won recognition from the program, which encourages

them to develop an environmental management system to ensure continuous improvement. Considerations for the awards include efficiency, waste reduction, energy conservation, employee involvement, community interaction, and environmental compliance. Selected members from each team will attend the award luncheon in Santa Fe.

In recognizing Fleet Services at the Achievement Level, judges praised the group's avoidance of some \$31,200 per year in waste disposal costs and a reduction in total waste generated.

Also winning at the Achievement Level were:

- Sandia's Environmental Restoration Program (Depts. 6131, 6132, 6133, 6134) for a pollu-

tion prevention program strongly incorporated into its processes. Since 1997, this program has saved more than a million dollars by reducing waste volumes.

- The Labs' Material Science and Technology Center (14100) for applying pollution prevention tools. In the center's machine shop (14181 and 14186), wastes have been reduced by 35 percent during the past seven years. Chemical tracking and waste minimization efforts reduced the number of chemicals and cleaning solvents used by 50 percent. Coolant recycling has cut disposal of waste coolant in half.

- Custodial Services (10848-4,5,6,7) for elimi-

(Continued on next page)

Leadership Academy said to be changing the way Labs leaders lead and think

Participants call it the 'best training program' ever attended

By Chris Burroughs

A two-year-old Sandia leadership training program, Leadership Academy, is changing the way Labs leaders lead and think.

"The Academy was one of the best training programs I have ever participated in," says Wendy Bechdel, Manager of Nuclear Weapons SBU Business Office Dept. 10003 and graduate of the first class. "It provided us with the opportunity to take some risks, be a bit vulnerable so that we could learn more about ourselves, and hopefully grow with this new awareness."

The six-month Academy offers managers and other leaders in Division 10000 and now in Sandia's Integrated Enabling Services (IES) organization the opportunity to learn about themselves as leaders, the business of the Labs, the business of the IES, and how to develop future leaders. The first six-month class was launched in November 2000 with 21 managers from 10000. Two classes have graduated and a third begins next month.

The idea of the Leadership Academy was born during an early morning working breakfast at the Owl Café a couple of years ago where Frank Figueroa, VP for Business Management & CFO Div. 10000; Berweida Learson, 10000 Human Resources Representative; and Barbara Hoffman, Level II Manager of Provider Relations Dept. 7020, were discussing how best to implement the division's strategic plan.

"One part was to develop people," Frank says. "We came to the conclusion that it had to be done through the leaders. Most people stay at or leave a place because of the people they work for."

A team consisting of Berweida, Georgianne Smith (3000), and Bruce McClure (12650) researched leadership training programs and came up with one that they thought had great potential. Based on a system that Sandia/California had adopted a decade ago, it used a model of leadership that focused on five leadership practices: challenge the process, inspire a shared vision, enable others to act, model the way, and encourage the heart.

The team developed a program consisting of six modules, presented in two-, three-, and four-day sessions over a period of six months. Barbara notes that the module "The Leadership Challenge" introduces the five practices and serves as the "cornerstone of the Academy."

In a later module, the participants enter "the looking glass," where facilitators from outside Sandia take them through a four-day business simulation and feedback session, providing insights into each person's leadership style, strength, and development needs.

In other modules, the five leadership practices are explored in-depth with opportunities for the participants to choose behaviors and actions

to practice and develop when they return to their workplace. Participants have "homework" in the form of practicing certain behaviors on the job. They are also required to keep journals and participate in networking teams.

New and seasoned managers are all encouraged to attend the academy.

"One of the most powerful parts of the program is when directors and vice presidents visit the class and talk candidly about their experiences in becoming the leaders they are today," says Berweida. "We ask them to tell us what attributes they think are important to being a leader. We want to better understand how leadership practices and attributes translate into extraordinary results in organizations."

As important as the discussion of leadership from the distinguished guest presenters is their discussion about the organizations that they represent.

"Sixty percent of the program is focused on the business of the Laboratories," Georgianne says, "And the vice presidents, directors, and program managers have had a strong impact on the class in sharing their visions of their organizations, their accomplishments, and the challenges that lie ahead."

Another program benefit, says Wendy, is the networking that accompanies it.

"We met new people, we learned from each other, and developed relationships that we can rely on for years to come," she says.

Frank says that he was in the first class of the Leadership Academy and gave it high marks.

"It's a great program that develops great leaders, and like anything worthwhile, it takes a lot of personal commitment," Frank says.

Managers in the IES organization interested in participating in the Leadership Academy should contact Berweida at 845-8714.

Comments from graduates of Leadership Academy



WENDY BECHDEL

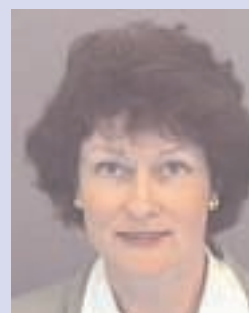
"I would recommend this program to every manager here at Sandia, not only for all managers to become better leaders, but to also recognize and develop these attributes in all Sandians. No matter what our job classification, each of us has an opportunity to lead, to help others understand, and have pride in their contributions and to make Sandia an awesome place to work." — Wendy Bechdel, Manager, Nuclear Weapons SBU Business Office Dept. 10003



CHUCK MAHERAS

"The Leadership Academy was a great experience for me. As a relatively new manager, it allowed me to learn a great deal about my own strengths and weaknesses as a leader, provided a roadmap, if you will, to improve these skills, and provided a network of close colleagues who are willing to help me along my journey. Learning the business of the Laboratories as well as learning from the leadership lessons of our senior management team was a great opportunity provided by the Leadership Academy. I would highly recommend this experience to all managers as a tool for growth and continuous improvement."

— Chuck Maheras, Manager, Compensation Dept. 3052



MARLENE KELLER

for thoughtful communication and creative

"The Leadership Academy was a very worthwhile experience. We learned from each other, encouraged one another's bold visions for Sandia's future, and developed trusting relationships. Those relationships are forming the basis

problem-solving. We feel more like one team serving one (multisite) lab." — Marlene Keller, Business Manager, Nonproliferation & Materials Control SBU



BRENDA DELAURENTIS

"The Academy was very worthwhile; we learned a great deal about the difference between managing and leading an organization. Based on co-worker input, we were able to focus on areas of improvement tailored to our specific needs. Most important, obtaining a better understanding of our Laboratories missions will enable the IESO [Integrated Enabling Services Office] organizations to be more responsive to our customers' requirements. I have been at Sandia nearly twenty years, and have had the opportunity to visit various facilities, but I was amazed at some of the recent changes. The individuals who spoke to our group had so much passion around their areas of expertise that it was contagious! I have been to the National Atomic Museum many times, but I will never look at the displays in the same way again." — Brenda DeLaurentis, Manager, Payroll Services & Financial Training Dept. 10502



BRUCE CRIEL

"The Leadership Academy was very worthwhile, and I would highly recommend it to others. The academy gave me the opportunity to learn from, and develop relationships with, people with whom I otherwise wouldn't necessarily interact. The camaraderie we developed as a group allows me to call my fellow academy members with questions and concerns, as well as with congratulatory words for their successes. We were able to meet with vice presidents and directors from throughout the labs. They shared their views of leadership and discussed how they developed into the leaders they've become. They reviewed their successes, and candidly shared lessons learned from situations that didn't turn out as they hoped." — Bruce Criel, Pension Fund Manager, Dept. 10310

Green Zia

(Continued from preceding page)

nating hazardous waste from cleaning operations in 480 Sandia buildings in New Mexico. These groups also reduced chemical purchases by 88 percent with an improved chemical inventory control, improved overall efficiency, and went from 71 lost workdays in 2001 to zero so far this year.

Sandia's Neutron Generator Production Center (14400) earned the Green Zia's Commitment Level award, which is the first step in the state's program. The organization's efforts to reduce waste chemical bulking and compaction of personal protective equipment were praised. This makes Division 14000 the first at Sandia to have two centers receive Green Zia recognition.

If your organization is interested in participating in the Green Zia program in 2003, contact Stacy Richardson (284-3983).

Members of Mexican institute visit Sandia, US Indian reservations to see solar energy installations

By Chris Burroughs

In a visit coordinated by Michael Ross (6218), four people from the National Indigenous Institute in Mexico recently toured solar energy installations at homes and businesses on the Navajo Nation and Hopi Reservation.

"They came to see what they might be able to do for electrification projects in remote areas of Mexico, which are much like part of the Navajo reservation in the US," says Michael, program manager for Sandia's Renewable Energy Program in Mexico. "The tours of photovoltaic installations were important so that the group might decide whether renewable energy as a source of electricity could be integrated into their future projects."

Prior to touring Indian country, the visitors saw distributed energy, photovoltaic, and solar thermal test facilities at Sandia and the renewable energy installations at the Southwestern Indian Polytechnic Institute in Albuquerque. They also visited the home of Miriam (14172) and Duane Hilborn on Laguna Pueblo lands. Their home is totally powered by a combined photovoltaics/wind power system (*Lab News*, Nov. 17, 2000).

Sandia provides technical assistance to tribes in the US using photovoltaic and other renewable energy technologies and is a partner with the US Agency for International Development in numerous renewable energy activities internationally, including Mexico.

The visitors went to the Navajo Nation where they saw a slide presentation outlining a program in which the Navajo Tribal Utility Authority (NTUA) leases photovoltaic systems to tribal members whose homes are off the electric grid. They toured homes on the Navajo Nation — mostly in the Kayenta District — where the NTUA, with the help of Sandia, has installed photovoltaic systems at private residences to furnish electrical power (*Lab News*, June 30, 2000).

Individual photovoltaic systems, which harvest the energy from the sun and convert it into electricity, are the only way many of the people in Indian county can have electricity because the cost of stringing wire over parts of the reservation's rural terrain is prohibitive. To date the NTUA has installed more than 200



AT HOME WITH PHOTOVOLTAIC SYSTEMS — Miriam Hilborn, second from right, talks to visitors from the National Indigenous Institute in Mexico about the photovoltaic system she and her husband Duane use to electrify their house on Laguna Pueblo lands. Their home is totally powered by a photovoltaic/wind system.

640-watt photovoltaic systems at remote homes on the Navajo nation.

"The staff from the National Indigenous Institute visited several of these installations and had the opportunity to talk with homeowners, as well as with NTUA electricians and management," Michael says. Installations made by NativeSUN, the Hopi solar enterprise, were also highlighted on the tour.

Michael adds that they were particularly interested in the fact that the photovoltaic systems provided by the NTUA and NativeSUN allowed people to do crafts at night — an economic benefit that can be promoted in Mexico. Solar allows both lighting for a longer creative

work day, plus electrical power for tools used for some crafts.

Michael says he anticipates a partnership to grow from the visit of the staff of the institute. Other Sandians who facilitated parts of the tour included Sandra Begay-Campbell (6219), Debby Tewa (6219), and Connie Brooks (6218). Sandra and Debby are Navajo and Hopi, respectively.

"Feedback from the group was favorable, and they left New Mexico and Arizona with a full complement of information for making decisions about the integration of solar electricity into an energy mix for their programs," Michael says.

Favorite *new* photo

The best years of our lives: Don't believe it? Ask Leo Klamerus



Leo Klamerus retired from the Nuclear Waste Management Department at Sandia in 1992. In this photo he is shown, obviously enjoying retirement, with four beautiful young women on his arms. The four are all Miss America contestants for the year 2001. From left are Miss Missouri, Jennifer Hover; Miss New Mexico, Marta Strzyzewski (by the way, also a contract employee in Sandia's Computational Initiatives Dept. 15311; *Lab News*, July 27, 2001); the happy looking guy in the middle is Leo; then Miss Nebraska, Christina Foehlinger; and Miss Mississippi, Becky Pruett. These festivities took place Aug. 17 at the wedding of Leo's niece, Miss Missouri, in Tulsa, Okla. Leo sends greetings to all his friends at Sandia and says that life really can't get much better than this. Leo and his wife Jan (retired from Sandia's Information Systems Development Department in 1998) recently built a new home at Lake of the Ozarks, Mo. Quips Leo, "I am the luckiest guy in the world. I've got a beautiful wife, a lake full of fish, cold beer in the fridge, and as this picture shows — pretty girls all around me. It can't possibly get better." Jan concurs: "It is unfortunate that in some situations retirement means twice as much husband on half as much income, but with Leo and me each day is a brand-new excursion and is eagerly anticipated. You might say that both of us are as happy as two pigs who, on a hot summer day, just found a brand new mud puddle." Jan and Leo (whose son Eric works in Dept. 6428) send their best wishes to all at Sandia.

Anne Van Arsdall, tech writer and medievalist, publishes book about medieval medicine

By Bill Murphy

The rest of the world (let's be honest with ourselves here) has a well-cultivated — and totally off-base — image of Sandians as this cookie-cutter bunch of pocket-protected computer jocks.

We know better. Even if we happen — strictly as the result of purely rational analysis, you understand — to favor 25-cent pocket protectors over \$5-to-clean ink stains; even if we *have* grown to love the sleek lines, the low hum, and the two-toned empowerment of multi-teraflops computers; even if we peruse hot news from the American Physical Society proceedings as we walk to the employee cafeteria — even so, we know that we are anything but a cookie-cutter bunch.

Take for instance Anne Van Arsdall. By all outward appearances, the very embodiment of the Sandian of public perception. All business. Brainy. Talented. Capable. (Okay, she doesn't wear a pocket protector — usually.) Yep: pure, unadulterated, cookie-cutter Sandian.

But under the skin beats the heart of . . . Anne Van Arsdall, medieval herbalist.

Anne, a technical writer and editor in Telecommunication Operations Dept. 9334, is on a roll. She has just earned her doctorate in English through the University of New Mexico's Institute for Medieval Studies. Her dissertation, *Medieval Herbal Remedies: The Old English Herbarium and Anglo-Saxon Medicine*, has been issued by New York publisher Routledge Press. And in the modern writer's equivalent of making the cover of *Rolling Stone*, her book is available through Amazon.com (Price, \$90; Amazon.com sales rank: 1,666, 579 . . . but still!).

Medieval Herbal Remedies is Anne's translation of an Anglo-Saxon medical reference used by healers in Western Europe from the fifth century until well into the Renaissance. The book, a listing of 185 plants, the uses for each, and remedies that could be concocted with them, was originally recorded in Latin. Only later — in about 1000 A.D. — was it translated into Anglo-Saxon vernacular. That's the text Anne worked from. She is convinced that the original book — scanty as it is on precision in the herbal remedy recipes and akin to what you might find in a home-made cookbook — is intended as a mnemonic aid for healers who would have done most of their learning in a hands-on, learning-by-doing fashion.

"The descriptions [in the text] are terse. What I wrestled with [during the translation] was 'How did people use these terse, imprecise texts for guidance?' It occurred to me that we do something similar here at



ANNE VAN ARSDALL relaxes with a copy of her new book. (Photo by Randy Montoya)

Sandia. We have lots of documentation about our weapons work. Granted, it's not terse, but even so, we bring back our retired weaponeers to pass on their knowledge one-on-one. We have a weapons intern program. We recognize that in all learning, there is a vital hands-on aspect that goes beyond the documentation. These texts are the same way. My guess is that they are some master healer's personal favorite remedies. He would have written these down in a sketchy way because he already knew how to make them."

And what might these remedies be used for? What were the typical complaints in medieval man and woman?

"Well, it's almost like our TV ads," Anne says. "You find concerns about snake bites, insect bites, belly aches, itchy scalps, and of course, 'Lord, let me be more sexy.'"

During her work on *Medieval Herbal Remedies*, Anne grew the herbs mentioned in the texts; she took a class in herbology, and she worked with New Mexico *curanderas*, healers who use herbs in their work.

And she's written a chapter for a new book, *Looking for Cures in Ancient Texts*. Some researchers think these old texts might provide the clues for a next generation of pharmaceuticals.

But how in the world (one might ask) does a tech writer at a 21st century weapons lab become wrapped up in medieval medicine, of all things?

"My lifelong interest has been the Middle Ages," Anne says "It started when I saw my first cathedral — Notre Dame in Paris. It hooked me. And later, I became interested in herbs; I've always grown herbs. So this subject was just a natural for me."

Anne lived what might be considered a cosmopolitan childhood: her father a military attaché at exotic postings, high school in Paris — and not an American school for diplomats' kids, mind you, but a real French convent school and a Left Bank high school where she learned French by "total immersion," as she recalls it.

She took undergrad and master's degrees at the University of North Carolina at Chapel Hill in Germanic languages, of which Anglo-Saxon is an early surviving example. Don't get her going — or do, actually — about the unique blend of Germanic and Romance languages that is English. And listen to her passion about the period in Europe from 400 A.D. to 1000 A.D. As she describes it, conditions in Western Europe read like something from the scrolling titles of *Star Wars, Episode DCXII:*

"It was an unsettled time.

The Empire [Rome] had collapsed.

The world was in flux.

The Church was just taking shape.

Laws were just being formulated.

There were no kings

But only tribal leaders.

Forests crowded every farm

And armed bands roamed the countryside. . ."

In other words, in post-Roman Europe a new world was being created, and that, to Anne is a subject worthy of study, of passion.

"I'm kind of split," Anne says. "At work, I'm Anne the technical writer. At home, I'm Anne the medieval herb woman."

Yep, a typical Sandian.

Air Force presents highest honor to fallen hero



AIR FORCE CHIEF of Staff Gen. John Jumper presents the Air Force Cross to Teresa Cunningham, widow of pararescueman and hero Senior Airman Jason Cunningham. The presentation ceremony took place Sept. 13 at Kirtland Air Force Base in Albuquerque. Cunningham, a Carlsbad, N.M., native, was killed in combat during Operation Anaconda, a major campaign to dislodge Al Qaida and Taliban fighters from their cave hideouts in eastern Afghanistan. Cunningham continued to provide vital medical aid to fallen soldiers even after receiving wounds that would prove fatal. The Air Force Cross, the service's highest honor, has been awarded to 22 enlisted airmen since the award was established by Congress in 1960.

(Air Force photo by Keith Wright)

Sandia's Take Our Sons to Work Day 2002

Date: Thursday, Oct. 10
 Sponsor: Human Resources Div. 3000
 Registration: 7-9:30 a.m. (TTC),
 Badge Office after 9:30 a.m.
 Opening session: 8-9 a.m., Steve Schiff
 Auditorium, Technology Transfer
 Center (Bldg. 825)
 Format: Job shadowing
 To volunteer: Linda Stefain (3341),
 844-4608

Look for upcoming teaser on Sandia's home page for link to Son's Day Web site for information and registration forms.

Janet Carpenter