**Desalination roadmap seeks technological solutions to make brackish water drinkable**

By Chris Burroughs

After one last meeting in San Antonio April 17, Sandia researchers Pat Brady and Tom Hinkebein (6118) are now ready to write a final Desalination and Water Purification Roadmap that should result in more fresh water in parts of the world where potable water is scarce.

The roadmap is the result of three previous meetings — two in San Diego and one in Tampa — and the last held this month where many government agency, national laboratory, university, and private partners gathered to discuss the future of desalination in the U.S. The first roadmap identified overall goals and areas of desalination research. It was submitted to Congress in 2003.

Pat expects the second roadmap to be completed this month when the Joint Water Reuse 6 Desalination Task Force will submit it to Sen. Pete Domenici, R-N.M., chairman of the Senate Energy and Water Development Appropriations Subcommittee, and Congress and eventually the water user and research communities. The task force consists of the Bureau of Reclamation, the Water Reuse Foundation, the American Water Works Association Research Foundation, and Sandia.

The roadmap will recommend specific areas of potential water desalination research and development that may lead to technological solutions to water shortage problems.

"Population growth in the US is expected to increase 13.6 percent per decade [over the next two decades]," says Tom, manager of Geochemistry Dept. 6118 and head of Sandia's Advanced Concepts Desalination Group. "There will be 29 percent more of us in 20 years. Put that together with an unequal distribution of people — more moving to Texas, California, Arizona, and New Mexico where fresh water is limited — and it is easy to see we are facing a challenging water future."

According to the 2003 Desalination and Water Purification Technology Roadmap, only 5 percent of the earth’s water is directly suitable for human consumption. The other 99.5 percent is saltwater or locked up in glaciers and icecaps. As the world's population grows, the increased water demand will have to come from somewhere. Brackish water — water with a salt content — seems to be a natural source, Tom says.

**The future is now for nuclear power, say lab directors**

By Will Keener

Sandia President and Director Tom Hunter joined eight other national laboratory directors or their personal representatives, several key members of Congress, and DOE officials last week in Washington to send a message to Congress and the public about President Bush’s Global Nuclear Energy Partnership.

The message GNEP is important at home and abroad, it’s urgent that the US begin a long-range effort now, and the power of the national laboratory system, working as a team under DOE direction, is available to support the effort.

"We see this as a start," said Tom in an interview with the Lab News. "It’s the beginning of a dialogue to address [public and congressional] questions and to demonstrate that we are working together as a [Continued on page 5]
EMS announces first quarter Excellence Award winners

Winners in Sandia’s quarterly Environmental Management Systems Excellence Awards program are: Rhonda Duches (10243), Laura Rausch (Hensel Phelps Construction), Kory Fortune (Hensel Phelps Construction), David Gibney (HOR Inc.), Bill Hendrick (10824), Jack Mizer (10331), Sherron Humble (2733), Sylvia Saltzstein (2733), Max Saad (2733), Mary Ann Olsen (27191), and Robert Greger (10844).

Awards were given in two categories, Recycling and Green Purchasing.

The nominations represented teams and individuals from across the Labs who contributed to the vision of Sandia’s EMS.

The cumulative, environmentally beneficial results achieved by the nominees are impressive: 13,000 kg of hazardous waste and 63,000 kg of solid waste were avoided; more than 380 metric tons of material was recycled; $140,000 of environmentally preferred products was purchased; and $200,000 in costs was avoided.

About the EMS Excellence Awards

The Quarterly EMS Excellence Award recognizes exemplary advancements by individuals or teams that contribute to the vision of Sandia’s EMS.

Each quarter the EMS core team identifies individuals and teams who demonstrate environmental excellence in two specific categories.

Quarter Dates Categories
One Jan. 1 to March 31 Green Purchasing AND Recycling
Two April 2 to June 30 Procedures and Policy Awareness
Three July 1 to Sept. 30 Risk Mitigation/Environmental Protection AND Waste Minimization
Four Oct. 1 to Dec. 31 Water Conservation AND Energy Reduction

Visit the EMS website at http://ems.sandia.gov for more information about the awards and the nomination process.

Submit your nominations by June 30 for the 2nd Quarter Award timeframe to oasig@sandia.gov.

What’s what

I write this in the absence of my colleague Howard Kercheval, who’s on a two-week vacation to the Caribbean. And not just any vacation, either. Howard, who’s getting close to retirement and doesn’t care who knows it, is a sailor. And he doesn’t care who knows that, either. The double-breasted blazers, the espresso cups, and brass buttons, the skipper seat, and commodore’s cap he usually wears to work are dead giveaways.

Anyhow, Howard just bought — sight unseen but by all accounts a gorgeous tub — a 37-foot blue water sailboat. He got a great deal on it, but it comes with a catch: The boat’s way down south, somewhere near Aruba, and Howard’s retirement home port will be Corpus Christi. So he and a couple of buddies are sailing the boat home. He’s either having the time of his life right about now — or, if the weather’s gone south — having very, very serious second thoughts.

By the way, Howard already owns a 26-foot sailboat, which he keeps up at Cochiti reservoir. So now that he’s in command of a sailing fleet, I guess we’ll have to stop calling him “Captain” and start calling him Admiral Kercheval.

* * *

I just came back from a whirlwind trip to Chicago to accept a bunch of awards from the folks at Ragan Communications on behalf of our Lab News team. Ragan is widely regarded as the nation’s leader in helping corporate communicators do their jobs better. Every year at its big corporate communications conference (500+ attendees this year), Ragan recognizes the best of the best in employee communications. Their awards program is really the gold standard by which other such programs are measured. I say that because, well, because the Lab News was a big winner. Our publication won the award as the best nonprofit employee newspaper in the country. Ragan liked what we do. A lot. In their note accompanying the award, the judges said, “The Lab News simply gets the job done. It’s comprehensive without weighing down its readers and entertaining without being irrelevant. In short, it’s the complete package. . . . Sandia Lab News is the reason why internal communications exists.”

The Ragan judges said a lot more very nice things about us, singling out for special praise Admiral Kercheval’s “What’s what” column, which they call “one of the best columns in internal communications. . . . It’s what communicators everywhere want to do: It tells the truth with no holds barred, and speaks directly to what’s on people’s minds.”

Speaking of singling out great work, three Lab News contributors won individual awards. Iris Ayobyes won two awards of excellence (the top award), one for her light-hearted story on getting an ergonomic evaluation and one for her insightful and moving story about Sandian — and Ukrainian — America’s Bob Hope (1997). Randy Montoya won an award of excellence for his Lab News photo spread on President Bush’s visit last August. And John Geran won an honorable mention (the second highest award) for his news story about how Sandia’s Microfluid Sniffer is being used to great effect by front-line law enforcement personnel.

What goes unsaid is that, in the world of employee and corporate communications, we at the Lab News have it easy: we’re telling stories, in words and pictures, about an extraordinary organization and extraordinary people doing extraordinary things.

Bill Murphy (505-845-0845, MS 0165, bmurphy@sandia.gov)
Retiree Grover Hughes tells it like it was

Design engineer was part of first Sandia contingent at Livermore

Note Retiree Grover Hughes, one of the first Sandians to work at the Livermore site, read Barry Schrader’s recent story about the Labs’ early days in California with some interest (Lab News, March 17). He liked the story, but felt there was more to tell, as he recounts in the following letter.

2006 March 23

Historian, Sandia National Laboratory (sic)

Dear Historian:

My name is Grover Hughes; I am 80 years old, a retiree of the Labs (as of 1986 January) and wish to furnish you with some facts about the startup of our Livermore branch. The explanation as printed in a couple of histories of the Labs, as well as in the recent Lab News issue of 2006 March 17, volume 58, No. 6, does not give the whole story.

In early June of 1955, I was a mechanical design engineer working under Section Supervisor Bill Marsh and Division Supervisor Ralph Wilson. I do not remember our division number; it may possibly have been 1215.

Bob Henderson (a VP at that time, as I recall, but maybe director or other title), asked Ralph to send Bill and myself to Livermore to work with the Livermore UCRL people on a new nuclear device. We went with the understanding that it was an open-ended project, and no one knew what would transpire in the future. We took Chick Farwell, a draftsman, so the original contingent consisted of: Ralph Wilson, division supervisor; Bill Marsh, section supervisor; Grover Hughes (me), design engineer; and Chick Farwell, draftsman.

As planned, Ralph stayed only a few days in order to introduce us around the lab and to get us started working with the Livermore Radiation Laboratory (LRL) people. We were housed at first in the El Rancho Motel on US 50, NE of town. After a week or three, we needed more drafting help, so we were joined by Sandians Woodrow “Woody” Hunt and Dan Alvino. All of us stayed in the motel for the first few weeks, during which time we were joined by our families, then we moved to other housing around and in town. “Town” back then was only about 7,000 people.

We all worked at LRL, on the second floor of a building which was across the street (west) from the swimming pool; I have no idea as to building numbers after all these years, nor if the swimming pool is still there — I very much doubt it. This building was on the north side of East Fine Avenue, not the south, where Sandia was to establish the permanent SLL in 1956.

In about July or possibly August, Bob Henderson came out to tell us that it had been decided to continue our (that is, Albuquerque Sandia’s presence, indeed, to expand it, so that we would become an independent laboratory at Livermore (independent from LRL, not from Sandia, of course). He wanted those of us who were willing to stay on to do just that, but said that those of us who preferred not to stay permanently would of course be allowed to return to Albuquerque, after we had trained replacements to our (and manage ment’s) satisfaction.

In August, September, and October, additional SLA people arrived as replacements for those of us who chose to remain (I was one of those), and we began introducing them to the job and to the LRL personnel with whom they would be working. I recall that Frank Murar and Gayle Cain were among those who came out in October, or maybe a bit earlier. I don’t recall when my old friend and colleague Cliff Selvage arrived — your article said that Cliff “arrived in town six months ahead of the formal starting date,” which would have made it about early September. Your article said that he arrived “along with another Sandian, Grover Hughes.” As I’m trying to make clear, I arrived in early June, three months previously. I am sorry that I cannot recall Cliff as ever living there.

We certainly worked together on the W47/B47 project, as he was the electrical project engineer, and I was the mechanical project engineer. My family and I left Livermore on October 22, 1955. Bill Marsh chose to remain as one of the permanent staff. Woody Hunt came home, I can’t remember about the others — I think Dan and Chick came back, also, but don’t quote me on that. Guess that’s about it . . . Thanks for your interest, and keep up the good work at the Lab News!

Sincerely,

Grover W. Hughes, retiree
ghughes@cei.net 116
Dub’s Way
Booneville AR 72927
(479) 675-9137

Sandia researchers Paul Miles and Lyle Pickett (8362), with post-doctoral fellow Dae Chol (now at Hyundai Motors), and co-authors Dr. Sanghoon Kook and Professor Choongsik Bae of Korea Advanced Institute of Science and Technology (KAIST), received the Society of Automotive Engineers (SAE) Honoring Award for the best paper in 2005.

The paper covers research on advanced clean diesel combustion strategies conducted over the past two years at Sandia’s Combustion Research Facility (CRF) in collaboration with visiting researchers from KAIST. The Honoring Award is the premier international best paper award in the area of engine and fuels research and has been given annually by the SAE since 1939.

This is the sixth time Sandia’s CRF researchers have won the award since Sandia began engine research in the mid-1970s. Other, company, institution, or university working in the engine/fuels research field during that time period.

CRF engine researchers share ‘best paper’ award

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Bird flu
(Continued from page 1)

deadly 20th-century pandemic was the Spanish influenza of 1918-1919, which killed some 500,000 Americans and 21 million people worldwide.

But the emerging avian flu virus, technically the H5N1 variant, comes with many unknowns, says Larry (see “About the avian flu” at right). It might spread to humans in the bird population, it might combine with a common flu virus and begin to transmit among people. Mutations might render it more or less efficient (virulent) or more or less deadly (pathogenic). Worldwide pre-cautions might blunt its spread. Global air travel might enhance its spread.

So it's too soon to say what we don't know to determine the likelihood of a pandemic,” says Larry. But the consequences of one are too severe to ignore, he says.

Localized response

“The worry is that it could emerge in such a way that it quickly becomes pervasive across the country, or it could spread from several areas,” he says. “A widespread emergence could limit city, country, or it could spread from several areas,” he says. "A worldwide pandemic may be too late, too slow, and too expensive to control.

National preparations

Sandia's preparations include business conti-nuity planning for such possible flu-related events as travel restrictions, high employee-absen-tee rates over a several-week period, imposed telecommuting, and, in a worst-case scenario, shutdown of all but the most essential Sandia sys-tems and infrastructures for days or weeks.

Sandia is not alone. All US federal govern-ment agencies are required to develop pandemic influenza contingency plans. Most companies with a global presence have been planning for avian flu outbreaks since 1998, when the virus emerged in Asia. Many more companies are beginning their planning now.

Sandia's effort is coordinated with parallel efforts at both DOE and Lockheed Martin, Warren says.

“Planning for the spectrum of possibilities is a daunting task, but it is critical that Sandia has a continuity plan specific to public health threats,” he says. "We need Sandians to make themselves aware of national readiness efforts and be ready by pushing it through a semipermeable mem-brane that works at least 10 times better than commer-cial membranes. If they succeed, Tom says, they may have a membrane that removes contaminant.

• Alternative technologies that take advan-tage of nontraditional methods.

• Concentrate management technologies that consider the disposal, volumetric reduction, and beneficial use of the mineral byproducts of desalination.

• Reuse/recycling technologies that look at ways membranes and other technologies might be designed to handle increased contami-nant loads.

• Concentrate management technologies that consider the disposal, volumetric reduction, and beneficial use of the mineral byproducts of desalination.

Pandemic to-do list


2. Understand how a public health event might affect your work. As a Labs-wide plan develops, the Sandia avian flu portal will include continually updated information use-ful for organizational and individual business conti-nuity planning. Managers also will receive instructions for conducting a public health threat communication.

3. Find out how you and your family can prepare. A personal readiness plan spe-cific to a public health crisis is available at www.PandemicFlu.gov (click on Individual Planning).

Desalination
(Continued from page 1)

Tampa, it also is commonplace in other parts of the world. Except for the Middle East, most desalination is done through reverse osmosis. Pat says 43 research areas have been tenta-tively identified and some projects are already underway, jumpstarted with $2 million made available for the preliminary research through a matching grant from the California Department of Water Resources. California provided $1 million and members of the Joint Water Reuse and Desali-nation Task Force contributed $250,000.


The force will be the entity deciding which of the 45 projects get to the top of the research pile,” Pat says. “More money is made available, universities, corporate groups, national labs, and private companies will bid on projects.”

Among the 43 research areas included in Roadmap 2 will be:

• Membrane technologies (mainly reverse osmosis process) that desalinate and purify water

About the avian flu

The H5N1 variant, known informally as the avian flu or bird flu, has been contained primarily among bird populations in parts of Asia, Europe, and the Middle East, and Africa. It has not acquired the ability to spread efficiently from human to human, nor has the virus been reported in the US among birds or humans.

Of the approximately 200 people known to have contracted the virus worldwide since 2003, about half have died. For comparison, the 1918 Spanish flu had a 3 percent mortality rate. The vast majority of those who contracted the virus, however, are believed to have contracted it through close contact with infected birds, not from other people.

The federal government’s response is tied to World Health Organization pandemic alert lev-els, which are in turn tied to current avian flu-related developments around the world.

Sandia’s avian flu portal (www.sandia.gov/ resources/emp-ret/flu/index.html), now avail-able on Sandia’s external web, provides the latest avian flu information from authoritative sources.
team on this. — Richard Domenici, R-N.M., and Deputy Energy Secretary Clay Sell both praised the potential the national laboratory complex brings to nuclear energy research. “DOE and its national laboratories need to develop technology options for our most challenging national problems,” Domenici said. “US energy security is one of our most significant challenges.”

“GNEP demonstrates the enormous role advanced nuclear science and technology can play in making the world a better place,” said Sell. “The national labs are charged with realizing this vision.”

GNEP (see Lab News, March 17, 2006) grew out of a larger plan by the Bush administration, recognizing that there is no single “silver bullet” to resolve US energy problems. Instead, a number of energy options — including nuclear power — need to be explored.

Bush elaborated on his plans for nuclear power in his 2006 State of the Union address, announcing the Advanced Energy Initiative. GNEP is one element of the initiative. It calls for:

- Advanced recycling of spent nuclear fuel to extract more energy content and cut waste-by-products;
- A partnership with other nations to assure minerals fuel would be available and reducing the threat of nuclear weapon proliferation;
- The May 2 assembly of directors (only three were available to attend, and sent stand-ins) gave the leadership group opportunities to present their case to a key group of congressional staff members and the media, and to conduct a series of other meetings.

Tom, introduced by Sen. Larry Craig, R-Ill., moderated the congressional staff forum. Tom told the group, “Moving forward with the research and technology development proposed by GNEP is of great importance, it is vital to the national security of all Americans. The partnership is a bold new initiative by the government to put the US in a leadership role with the future of nuclear power.”

GNEP allows the US to address the primary issues of energy and energy supply, an improved climate and environment, from energy production without harmful greenhouse gas emissions, and nonproliferation concerns about better controlling nuclear weapon proliferation.

The lab directors, who have worked for a couple of years to support DOE in this initiative, recognize that although GNEP is long-range and would have impact largely after a couple of decades, it should be started now. “We need to make this long-term commitment,” said Tom. In what he called “spirited” questioning from congressional staff, Tom and other directors emphasized that GNEP is consistent with plans to move forward with the Yucca Mountain repository licensing and to work toward the addition of more light-water or advanced-generation reactors to the current inventory. “It does not in any way detract from those two things,” he said.

Los Alamos National Laboratory Director Robert Kuckuck and Argonne National Laboratory Director Bob Rosner also presented with Tom at the briefing.

“The audience was very engaged, they asked a lot of questions. . . We ran out of time before they ran out of questions,” said Tom. Questions focused on priorities and balance of current nuclear programs as opposed to future concepts, about the waste situation with Yucca Mountain and, about the interest of other countries in participating. (India recently became the first nation to agree to join the partnership.)

“Each of the committees or delegations there had some very informed, significant issues that they wanted to understand better. We see this as the beginning of a dialog,” said Tom.

A news conference later in the day, hosted by Idaho National Laboratory Director John Grossenbacher, rounded out the same themes. Sen. Domenici and Rep. Judy Biggert, R-Ill., opened with comments, followed by Deputy Secretary Sell and Denis Spurgeon, DOE Assistant Secretary for Nuclear Energy.

“In the short term our role now is to maintain the discussions so that the Congress gets its questions answered sufficiently to deal with the president’s proposal in the budget,” Tom said.

Other participating in the day’s events included directors or representatives from Oak Ridge, Savannah River, Pacific Northwest, Lawrence Livermore, and Brookhaven laboratories.

Labs water research looks at all aspects of multifaceted issue

Byproduct cleanup

Even though there is more water to be had in the form of brackish water throughout the world, it will come at a price because of cleanup costs, says Richard Kottenstette (6118), who heads up the jumpstart R&D portion of Sandia’s Advanced Concepts Desalination program. His goal is to identify and pursue technologies near ready for commercialization that can tackle this problem.

The problem of cleanup — what to do with the concentrate resulting from reverse osmosis — is at the top of his list. Concentrate is the salty residual liquid byproduct of desalination.

On the coasts the solution is simple — return the salt and minerals to the ocean. But inland, getting rid of the residual becomes problematic.

Richard and his team are involved in projects that deal with this, as well as related issues. Some include:

- A reverse osmosis project with the University of South Carolina that is investigating better mineral recovery — recovering minerals and leaving less or no salty water behind. The minerals, which have monetary value, can be sold. This will be piloted next year at the Tularosa Basin National Desalination Research Facility in Alamogordo, N.M.
- A method to reuse water that comes from sewage so it is potable. Sandia recently completed a pilot project at the Rio Rancho wastewater treatment plant. “If you use it twice, you double its value,” Richard says. Treated wastewater is typically used to water parks and golf courses, but there is a possibility it could be made as fresh as if it came out of an aquifer. The phosphorous from the waste could be turned into fertilizer.
- A method of removing mineral waste after reverse osmosis and putting it into evaporation ponds. From there the waste could be put into a landfill, placed over a liner that could self-seal if it were breached. Sandia is working with a New Mexico State University graduate student on this project as well as with the Texas Bureau of Economic Geology.

Chris Burroughs

The next step after developing a better desalination method is commercialization.

That responsibility falls to Sue Collins (6118), who works closely with Sandia’s licensing department.

“Our customers and advocates have said repeatedly that the success of commercialization efforts will be measured in gallons of new water produced,” Sue says. “That means accelerating the lab-scale success to pilot-scale and then to the manufacturer and end-user.”

The advantage of having a desalination roadmap, she says, is that it gives her the opportunity to work closely with the end-user and meet their needs.

The successes of the previous year have attracted local advocates to the commercialization efforts. For example, the City of Alamogordo — with funding from the State of New Mexico — is doing complementary testing on a reverse osmosis project at the Tularosa Basin facility. The Alamogordo tests will confirm the economic potential of the mineral byproducts resulting from the Sandia tests on the system.

Also, the State of New Mexico is matching Sandia-funded work at New Mexico Tech. Last year, researchers from the university and Sandia identified enzyme treatments that remove dimy biological buildup from reverse osmosis membranes. These natural cleaners could replace the harsh acid and caustic cleaners used today.

This year Sandia will fund studies at Sandia and New Mexico Tech to determine what small-scale processes can cause the best enzyme treatments. The state will fund New Mexico Tech to perform large-scale tests of the enzyme treatment using a typical reverse osmosis unit with produced water from the San Juan area.

“End-user interest is growing steadily and that is important to our work with the manufacturing community,” Sue says.

Chris Burroughs
STAR program participant Bennett Grill nets all-expenses-paid trip to Indianapolis

By Iris Aboytes

Bennett Grill, a participant in Sandia’s STAR program, won an all-expenses-paid trip to Indianapolis May 7-14 for competition against 1,400 students from around the world. He took the top prize in the regional science fair competition. Bennett is a senior at Rio Rancho High School.

The STAR program is a research-based, non-residential mentorship program funded by Lockheed Martin Corporation and administered and designed by Sandia. Its goal is to provide highly motivated, high-performing high school students an opportunity to work closely with world-class engineers and scientists in a research-based summer program. The program enables students to gain real-world work experience in a technical field.

After his participation in the STAR program, Bennett spent another semester participating in Sandia’s internship program, where he studied fundamental principles of electrochemistry using electrochemical and analytical analysis.

While at Sandia he worked with William Yelton of Photonic Microsystems Technology Dept. 173. “He focused on understanding fundamental concepts. At lunch, instead of spending time with students his age, he would have a discussion on physics, chemistry, and engineering projects with many staff members in the area.”

The title of the research paper Bennett wrote at Sandia was “Limitation of Cottrell’s equation: Plotting electromechanical diffusion coefficients of potassium ferricyanide and potassium ferrocyanide as functions of temperature and concentration.”

“My experience here exposed him to areas most students would not get until grad school,” says William. “The program works.”

Feedback

Q: This morning (4/5/06) in the parking lot of Building 701 I found myself in a very strange situation. I saw a white truck with government plates sitting in the lane between parked vehicles, and ahead of me (and it) a personal vehicle was pulling out of a parking space. I took that space, and the driver got out of his car and told me that I had to move my car, because he had been planning to park the government vehicle in the space. He said that he was a Sandian, would not give me his name, and threatened to call Security if I did not move my car. I told him that I thought the rule was that these spaces were for private vehicles, and after some discussion (very loud on his part) he said he would put his private vehicle back in the space, but he still demanded that I move my car. I did so, but I think the law is that government plates are not private vehicles and would back forth and save parking spaces is inappropriate (and I had no reason to think that what he was doing was) moved it. As he correct it in demanding that I move my car? (And “demand” is not too strong a word.)

A: It is very unfortunate that this incident was addressed in what appears to be a very aggressive and confrontational manner. Aggressive behavior is unacceptable and inappropriate. If you felt threatened, please report the incident to your manager right away. You and your manager should talk about the situation and report it to the Workplace Violence Team Leader. Sandia has a strict policy on workplace violence: CPR 300.5.4: Workplace Violence Prevention Program. As far as moving your vehicle is concerned, no, you didn’t have to move it. However, you did the right thing by moving it to avoid escalation of the situation. This type of practice is inappropriate. The Sandia Traffic Safety Committee will send out a communication to all members of the workforce, via SDN, that this type of practice is unacceptable and inappropriate. We are still working on the new program and expect to have it completed in the near future.

— Daniel Feng, Chairman Traffic Safety Committee
Weapon Intern Program prepares future stockpile stewards

By Stephanie Holinka

Vern Willian thinks a lot about change. These days, there’s a lot to think about. High-profile programs like the Reliable Replacement Warhead Program will mean major changes for those who work with existing nuclear weapons.

As manager of Weapons Engineering Professional Development Dept. 2916, Vern manages the Weapon Intern Program, which prepares future stockpile stewards for management of the nation’s nuclear stockpile. The program is accepting applications for new Weapon Intern participants for next year’s program.

The NSA’s Strategic Vision document, released in February, outlines a future nuclear weapons complex that is lean, flexible, and able to design robust weapons that could remain in service for extended periods of time. This places incredible demands on future stockpile stewards.

In addition to maintaining the current stockpile, they may someday repurpose existing weapons to suit a changing world while working toward a future when the complex must build and field new weapons.

Responding to ever-changing threats

Sandia’s Weapon Intern Program partners the Lab’s newest stockpile stewards with experienced Sandia weapons engineers. The program trains those who must work with existing weapons systems to respond to the ever-changing threats to national security while maintaining the highest standards for health, safety, and protection of the environment.

That means learning from the past while anticipating the future needs of the nation’s defense services. Vern says the program allows students to build networks within Sandia that they will use in their future work, “something not always easy to do in classified environments.

“It used to take an average of four to eight years to field new weapons. That wouldn’t fly in today’s world. The world is different. The threats to the safety and security of this nation are different...”

Brien Bopp, program manager, Weapon Intern Program

Brien Bopp, program manager for the Weapon Intern Program (WIP), says participants in the program work with retired weapons experts to envision a future responsive infrastructure. “We must plan for the future we think we see,” he says. “Our infrastructure must be flexible enough to make significant changes on short notice.”

Those changes include discovering ways to shorten the timeline from weapon design to weapon fielding. “It used to take an average of four to eight years to field new weapons,” says Brien. “That wouldn’t fly in today’s world. The world is different. The threats to the safety and security of this nation are different, but because we don’t now develop new weapons systems, we must rely on Cold War weapons to defend us in a post-Cold War world.”

One of the most important areas the WIP curriculum now covers is weapons effects. In the past, engineers used nuclear testing to evaluate the civil or military effects of nuclear blasts. This gave engineers and scientists a real-world view. But because the US no longer does all-up tests of its nuclear weapons, it must rely exclusively on subcritical experiments and computer modeling to guarantee the effectiveness and safety of the enduring stockpile.

Because there are no plans to resume nuclear testing, future additions or changes to the stockpile must be made without nuclear testing. Those who come into the nuclear weapons complex today have never seen a nuclear detonation firsthand. That leaves an experience gap that must be filled.

That gap is, in part, being filled through specialized coursework such as the new Weapons Effects Class. The class was developed and is taught by Harold Walling, a former Sandian and current professor in New Mexico Tech’s mechanical engineering department. The class provides detailed information about nuclear weapon effects at a classified level.

The Weapon Intern Program is accepting applications for its Fall 2006 program, but all Weapon Intern Program classes are open to anyone in the nuclear weapons complex with a Q clearance and a need-to-know. The calendar is available in the Weapon Intern Program’s section of Dept. 2916’s website.

About Sandia’s Weapon Intern Program

Note: The information here is adapted from the Weapon Intern Program website.

Sandia’s Weapon Intern Program was created collaboratively by a broad range of experts from Sandia and the greater nuclear weapons community. WIP began in 1998 as an effort to accelerate the transfer of critical weapons knowledge from retiring scientists to the next generation of stockpile stewards. The program merges both the history and current mission of the nuclear weapons program. The Weapon Intern Program prepares participants for critical leadership roles in the nuclear weapons program. The program also aims to make students aware of the partnerships required to deliver a weapons product and the complexity associated with weapons processes, design considerations, and tradeoffs in weapons design.

It endures to ensure continuity of the knowledge and understanding of the nuclear weapons program by the participating engineers and technicians.

WIP uses a blended learning approach: project assignments, mentors, and laboratory work. The program provides an educational experience that is combined with coursework and classroom instruction that bolsters learning processes. In addition, the program allows research time to investigate nuclear weapons issues using Sandia resources as well as DoD resources. Over a one-year period, nuclear weapons experts teach science-based stockpile stewardship tools, processes, and techniques used to keep the stockpile safe, secure, and reliable in the absence of underground nuclear testing. WIP participants acquire a broad understanding of the nuclear weapons program and gain the necessary skills to assume stewardship of the enduring stockpile.

College credit: Transfer WIP credits for credit towards a master’s degree

The Weapon Intern Program is structured such that up to nine (9) elective credit hours are transferable to New Mexico Institute of Mining and Technology (NM Tech) that can be applied towards a master of science degree in engineering mechanics. NM Tech degree enrollment requirements can be found on the NM Tech website, www.nmt.edu. Enrollment in NM Tech for degree or credit hours is optional.

Seminar series

Two seminar series, Science Foundations and Sandia Principles, are part of the curricula. The Science Foundations series features invited Sandia speakers discussing the latest science projects and research and development initiatives, such as the winners of the R&D 100 Award. The Sandia Principles series features active and retired weapons engineers whose experience, lessons learned, the Sandia culture that developed the weapons, or technical summaries that span a career to include rules of thumb and knowledge developed through experience.
DHS turns to Sandia for tech transfer help

By Mike Janes

When the Department of Homeland Security (DHS) realized at its launch that it needed to establish a consistent and productive technology transfer mechanism, it sought guidance from the laboratories it operates.

Whether one measures it by contract generation, numbers of CRADAs, revenue generated through business development, or numbers of licenses, DHS found that Sandia is a top performer among the national laboratories.

Specific examples bolster Sandia’s reputation of excellence in partnerships with industry: the Labs’ longstanding relationships with Goodyear and Intel; its role in establishing and delivering on the largest CRADA ever (the Extreme Ultraviolet Lithography CRADA with a microelectronics consortium); the extensive licensing of risk assessment methodologies that enable public utilities to assess vulnerabilities and protect critical infrastructures; and the commercialization and deployment of various homeland security technologies.

Now, nearly two years after DHS first asked Sandia to assist the Labs in playing an ever-greater hands-on role in helping shape the department’s commercialization planning and technology transition efforts, particularly as they relate to federal laboratories.

The aim is to get homeland security technologies developed by the DOE labs deployed in products supplied by industry and available to end users who need them the most, while at the same time ensuring that technology transition strategies are developed at the outset when new technologies are conceived.

“Our goal has been to provide information analysis, ideas, and alternatives to DHS,” says Denise Koker (8529), business development manager at Sandia’s California site and the commercialization lead for the Labs’ Homeland Security and Defense (HSD) strategic management unit. “They can then use that information to create appropriate processes and mechanisms for achieving technology transfer.”

Adds Ellen Stechel (6220), who is assigned to the DHS Office of Research and Development after being rehired by Sandia after working in industry for nearly seven years: “In the past, the labs and their funding partners may have been quick to develop a technology without considering the technology lifecycle, which needs to take into account whether there is a customer, or whether it might eventually run into issues of affordability, reliability, manufacturability, usability, or serviceability. That’s where technology transition strategy and planning comes in.”

DHS, says Denise, has an unusually challenging responsibility to not only direct research and development through its Science and Technology directorate, but also to ensure that products from specific technologies are rapidly available for deployment to emergency responders, border agents, airport personnel, and other end users. Whereas the federal government creates a market through large procurements, industry is more likely to adopt new technologies that meet the product requirements. However, for many products with homeland security applications, the federal government is not the purchaser or the end user.

“The Department of Defense is often its own consumer of products adopting R&D it funded,” Denise points out. “DHS, on the other hand, has to worry about promoting adoption by manufacturers and end users after developing the technology. It’s a great deal of extra effort on an additional burden for them, and one with which we are lending a helping hand.”

Commercialization is an element of a broader effort in which Sandia is helping DHS’s Office of Research and Development establish technology transition processes for the lifecycle of technology development, from basic research through deployment. Ellen is assigned to DHS/ORD, working within the Office of Science and Technology to provide options for making technology transition planning integral to all program execution plans.

“Commercialization should not be a disconnected task or an afterthought, but rather part of an overall transition strategy that is consistently wrapped into program development from the start,” says Ellen.

To this end, DHS has funded Sandia to aid them with several tasks. First, beginning last June, Jill Michaus (8529) went on temporary assignment to DHS, which Denise calls a “critical effort that put her directly on the front lines.” She and Denise conducted a benchmarking study, now documented in a report to DHS, comparing how other agencies conduct technology transfer and analyzing how alternative mechanisms and solutions might meet DHS needs.

DHS will soon be making decisions and implementing various technology transfer policies and processes. Ellen is serving as a consultant to a Science and Technology-wide team that will be finalizing technology transfer guidance, assessment tools, and policies and procedures.

Sandia’s BROOM among technologies to serve as pilot project

The Sandia DHS liaison team has been immersed in aiding DHS with exercising tech transfer processes and mechanisms by carrying out specific commercialization projects. In November, Denise Koker (8529) and Jill Michaus (8529) helped DHS develop the broad strategy for the pilot program, which focuses on three key homeland security technologies important to the department.

Denise and Jill’s contributions included a detailed process for selecting the most appropriate technologies, a step-by-step commercialization planning model to be used throughout the pilot project, and the identification of clear objectives and outcomes, briefing the various DHS executives on the plan the Labs had received. “We’re anxious to test new pathways to commercialization, which may include the use of new contract types, penetrating new markets, and working with other federal agencies to leverage investments and meet multiple goals,” she says.

One of the three technologies selected by DHS for the Commercialization Pilot Program was Sandia’s own BROOM (Building Restoration Operations Optimization Model), with Jane Ann Lamph (8750) now leading the commercialization effort. (Lennie Klebanoff had been the key DHS/ORD technology transition figure until returning to his technical position in Dept. 8757.) Jill, meanwhile, is taking on the other two pilots — Idaho Rapid Transit. Jane Ann says she hopes to capitalize on the relationships that were forged. “This is an opportunity for a transition manager is a ‘contact sport’ that, by definition, involves a lot of briefings, demonstrations, and a great deal of personal contact with potential business partners,” she says, “Hope fully, that plays into my strengths.”

Denise and Ellen Stechel agree that the long-range goal is to contribute to making the technology transition process second nature for DHS/Science & Technology whenever it concieves of new projects and Technology needs.

“Our goal has been to provide information analysis, ideas, and alternatives to DHS. They can then use that information to create appropriate processes and mechanisms for achieving technology transfer.” — Denise Koker

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Jane Ann Lamph (8750) now leads the commercialization effort of the BROOM technology, taking over from Lennie Klebanoff (8757).
Betty Boop hits the gym with the Betty Boomer's

By Iris Aboytes

You know something is wrong when you think you're in good shape and an older man with an oxygen tank can pedal a bike better than you.  I started doing aerobics at Sandia for several years.  I thought it was pretty good shape but decided it was time to try something different.  Save my knees, firm up the body? An overview? Yes, I need it all. So I hit the gym.

Did you know about target heart rate? To burn fat you need to be at a particular level.  Cardio requires a different cross.  Tennis working best.  What that means is it's best to vary your exercise regimen.  Some aerobics, walking, and playing soccer all use different muscles and they all need to be worked.  Therese, the exercise specialist at the gym, asked me, "What would you like to get out of your workout?" I said: "I'd like to look like Angelina Jolie minus the pregnancy and have the energy of a five-year-old. Do you think I've come to the right place? ... OK, OK, I'd like it if my triceps were firm instead of limp appendages and I'd like my quads to be long and lean instead of being all bunched up looking for a place to belong."

"That can help with," she says. "Follow me.

I see recumbent bikes, treadmills, elliptical machines (they look like aerobics machines in a Star Wars movie—intimidating to me). Holding on to the handles, you swing as you are in suspension on the pain. Try to imagine my coordination in trying to get on and stay on one. I decide I don't need whatever it is willing to afford me.

One of the most popular pieces of equipment is like a stepper but you are sitting down stepping and moving your arms. It doesn't offer enough excitement for me.

There are machines for the front of my arms, the back of my arms, my legs, and my shoulders. The variety is overwhelming. If you are ever given a choice, do not go on the machine that works the front and back of your legs. You might make the same mistake I did and work the wrong parts. Also the machine that is for hip abductors does not work instantly.

"That'll keep you powered."

I hit the recumbent bike. I'm in trouble. When a program I want to follow is burning, strengthening, or cardio, for how long, and how hard do I want to work? When I am figuring this out (I don't have my glasses on) I notice a gentleman sitting on the bike next to me. He pushes buttons, sits back and listens to his iPod. Before I even start he is cycling like a pro. Did I mention he was breathing with the aid of an oxygen tank? (His knowledge of the engine of the machines, his determination, and his physical fitness make him my role model. I want to have his energy. If he can do it, so can I.)

My workouts are great. I do weight-bearing on the treadmill and cardio on the recumbent bike. I use all the weight machines for muscle building, strengthening, and flexibility.

There are some side effects. Be prepared to get backtalk from your quads ("Don't even think of going in there") and your triceps and biceps ("Hold your own water bottle"). I have not decided what course of action to take with them. I am open to suggestions.

But guess what? I'm not shrinking. I can touch my toes. I giggle with the best of them, and I feel like I could maybe by that elliptical machine. What about my heart? I imagine it beating powerfully as it keeps the cholesterol away from my arteries. Oh, I almost forgot, I don't have the energy of a five-year-old, but I have energy to run through sprinklers and create my own rainbows. I would like to climb an apple tree, but there isn't one around.

Sandra's Fitness Classes

Sandia Health, Benefits, and Employee Services (HBE) provides a variety of classes for participants of all levels. The main goal of the physical fitness classes is to help Sandians safely start and maintain a fitness regimen.

Approximately 20 classes are held each week. Classes are held before and after work hours and during the lunch hour for convenience at the workplace. A variety of class formats are offered to both encourage the beginning exercise participant and challenge existing participants.

On the average 860 participant transactions are seen through Preventive Health group exercise classes per month. The qualified HBE staff and exercise physiologists encourage employees to use local fitness facilities to augment what they are doing on site.

To find about classes, contact Sandra Health, Benefits, and Employee Services (HBE) at 674-1200.

Employee Health and Fitness Day

Check out Dr. Clevergen's blog as he addresses Health and the High Cost of Keeping It: http://hbeupdate.custhelp.com/cgi-bin/hbeupdate.cfg/php/enduser/docServe.php?2=12rcblog

Sandra honored in first-ever MOVE UP Awards

Sandian Felicia Duran (6861) and Sandia contract Jeff Porter (5743) were honored in the first-ever Albuquerque Mayor's Office of Volunteerism and Engagement MOVE UP awards. The awards encourage employees to volunteer for their service to others and to the community.

Felicia has volunteered with Hands On Science Outreach, Premier Soccer Academy, Junior Achievement, the Juvenile Diabetes Research Foundation, and the International Racquetball Federation World Senior Championships, all while pursuing her PhD.

Jeff has volunteered with Sandia Health, Benefits, and Employee Services (HBE) for 400 hours and recruited more than 35 volunteers to help Presbyterian Disaster Relief Services rebuild homes for more than 20 families on the Gulf Coast of Mississippi.
Have we become just another government consulting firm?

Q: I was gratified by the candor with which the recent Feedback question about the normalization of benefits with industry was addressed, but I have a related but more fundamental concern that I believe needs to be addressed in tandem with that question. My concern is that in our quest to make private industry our benchmark, we have sold our soul when it comes to our mission and distinctive character as a national laboratory. In short, over the last five years or so we have become just another government consulting firm: we are no longer a national laboratory.

Let me make my case. During the first decade of my career at the Labs, research and publication were valued activities by management. Project leaders would allocate work time to allow staff to write up project results for conferences and journals, and when a paper got accepted it would be announced at a department meeting. But over the last five to seven years the culture has changed, gradually, imperceptibly, like boiling a frog. Now publication is merely tolerated and even tacitly discouraged because it takes time away from program deliverables or business development work. The expectation is that conference papers and journal articles, if written at all, should be written as a labor of love on one’s own time. Managers make statements like, “Anyone can get anything published somewhere” and “research is not real work.” During a recent job interview I was floored when I was asked, “Has your PhD corrupted you into wanting to do research?” I can’t imagine that state of affairs when I was asked, “Has your PhD corrupted you into wanting to do research?”

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Video Services Dept. 3653 won nine awards and received two honorable mentions in The Videographer Awards competition. The Videographer Awards is an annual international awards program that honors individuals and companies in the video production field. It turns the klieg lights on video professionals who are raising the standards of the industry and gives winners and their clients the recognition that their work is highly regarded by their peers.

Manager promotions

New Mexico

Tom Nelson from PMTS, Directed Energy Laser Applications Dept., 5444, to Manager of the department. He was hired in 2000 and has since worked in directed energy programs. The specific programs Tom has been involved in require technology expertise in femtosecond lasers, linear and nonlinear spectroscopy, pulse propagation, materials interactions, laser development, and optics.

Tom has a BS from DePaul University and an MS and PhD from the University of Illinois Chicago Campus.

Danny Beets from Team Leader, Engineering Support Dept., 1385, to Manager of the department.

Before he joined Sandia in 1994, Danny had 11 years of experience in the Naval Nuclear Propulsion Program and three years of experience as a manager in technical support at Brunswick Nuclear Plant, a commercial nuclear power station.

When he joined Sandia, Danny began as a radioactive waste engineer in Radioactive and Mixed Waste Management Dept., 10339. He became the facility supervisor of the department in 1996.

In 1997 he became the reactor operator and instrumentation and controls subject matter expert on the Tech Area 5 Annular Core Research Reactor in Nuclear Reactor Facilities Dept., 1381.

Danny has a BS in electrical engineering from Auburn University.

Video Services takes home nine awards in prestigious national videographer competition

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The Videographer Award of Excellence is given to entries deemed exceptional. Video Services received awards of excellence for: “Recruiting DVD 2005,” “State of the Labs 2006 Show Opener,” “The Weapon Intern Program Presents the Graduating Class of 2005,” and “Video Sandia — The Crack-O’Dile Hunter.”

The Award of Distinction is presented for projects deemed outstanding.

Video Services received this award for: “NWSMU All Hands,” “The Royalty Awards 2005,” “Sandia Corporate Overview 2006,” “Video Sandia Safety First — Have a Plan,” and “Video Sandia — Jerry Is Mad.”

Honorable Mention is awarded to projects that exceed industry standards. Sandia winners were: “Weapon Intern Program 2005 Show Opening Montage” and “Video Sandia — Safety Rodeo.”

Photo by Amanda Montoya, age 12

Shocked... don’t be!

Shock... don’t be!

Injury and fire hazards include: • Unsupported equipment and/or oversized objects • Choked off outlets • Defective or worn, frayed, or cut cords • Faulty or misused equipment • Improper ventilation • Cleaning, repairing, arranging

Helpful Reminders: • Impact cords, equipment, and outlets regularly • Avoid trip hazards, as well as access roads and avoid in use traffic areas • Use extension cords only temporarily • Use equipment on/off switches or move possible plug out of the way

For Sandia Safety Training Resources visit: http://seesandia.com