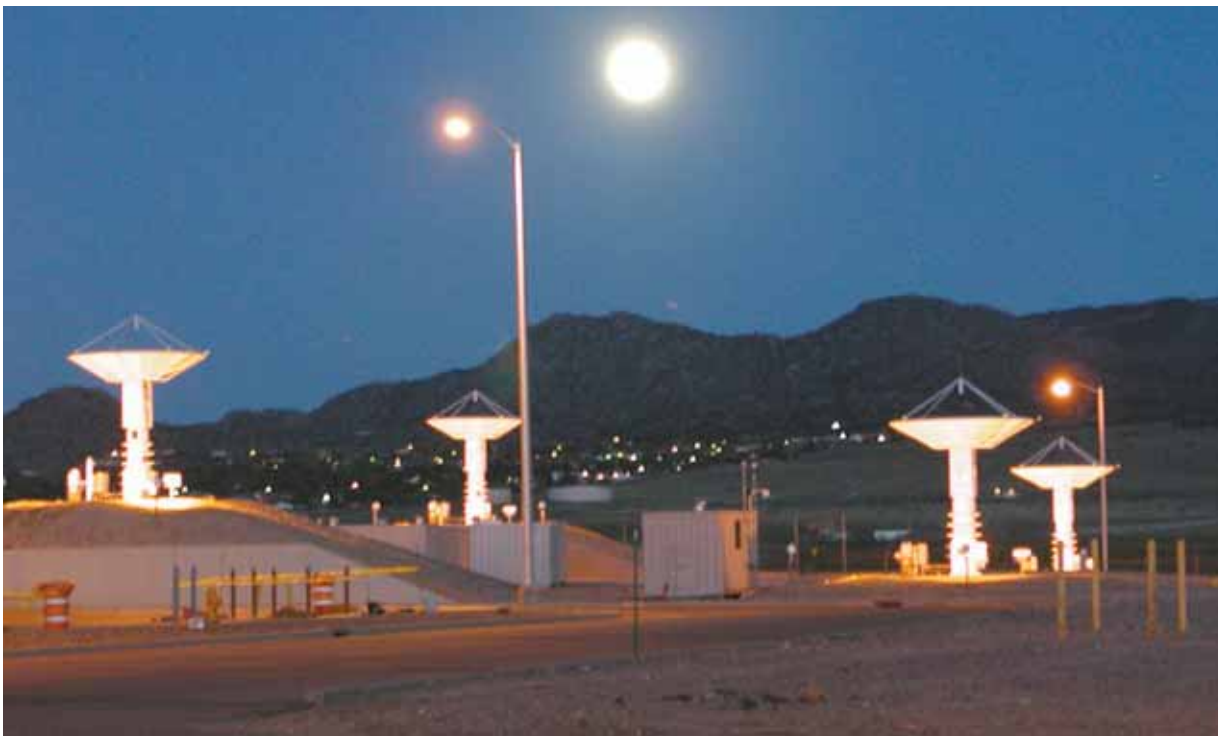


Global nuclear detonation detection system keeps watch on the world 24/7/365

Labs-designed and delivered Air Force ground stations simplify signals interpretation



NIGHT WATCH — Sandia's Nuclear Detonation Detection System Analysis Package antenna field in Area 4 tracks GPS satellites that carry USNDS program sensors. (Photo by David Kiffer, 5532)

By John German

The next time a nuclear detonation occurs in space or in Earth's atmosphere, enlisted men and women in US Air Force ground stations will be the first to know.

As data from dozens of satellites flood into their control rooms, it will be these operators' jobs to decide quickly whether to refer the event to higher-ups as a violation of international law or to designate the event as something less nefarious — a lightning strike or, perhaps, a satellite sensor glitch.

The snap decisions they make could trigger an international diplomatic crisis or, if they are wrong, result in an embarrassing false alarm.

Fortunately, the data will be processed, and their decisions simplified, by ICADS — the Integrated Correlation and Display System, created for the Air Force by Sandia.

ICADS is a key part of the US Nuclear Detonation (NuDet) Detection System (USNDS), a network of Global Positioning System and Defense Support Program (DSP) satellites, multiple detectors on board each satellite, and a handful of fixed and mobile ground stations.

(Continued on page 3)

ILMS offers strategic perspective on Labs business information

Management tool now online

By Charles Shirley

Sandia is gradually creating what will eventually be a Google Earth-like view of the Labs' business, from the proverbial 30,000-foot level down to the detailed street level.

It's the Integrated Laboratory Management System, or ILMS. For top executives managing a complex work environment like Sandia, a multi-level perspective like that provided by ILMS allows for better decision making and reporting of Sandia's operations.



THE ILMS PORTAL is available through a link on the internal web. Lenny Martinez, VP for Enterprise Transformation, invites Sandians to tour Release 2.0.

"ILMS is a management framework that allows us to understand, talk about, and improve the laboratory and its business processes from the general to the highly detailed and everywhere in

(Continued on page 6)

Sandia LabNews

Vol. 59, No. 5

March 2, 2007



Managed by Lockheed Martin for the National Nuclear Security Administration

An innovative solution to clean in tight spaces

Sometimes the best man for the job is a robot

By Stephanie Holinka

A recycled swarm robot is being put to work in Tech Area 5, scraping sludge from an old tank too deeply buried and small for workers to safely reach.

Swarmy the robot could be an inexpensive answer to a cleanup problem that has evaded solution for several months.

In November 2005, a problem was discovered with an old wastewater tank in Tech Area 5. The tank, designed to collect process drain waste prior to sampling, analysis, and discharge, was found to have leaked some 4,000 gallons of water.

Originally built to support reactor operations for the Sandia Engineering Reactor in the early 1960s, the tank floor is 26 feet below ground level near Bldg. 6580. The tank's process water is routinely tested before discharge to the city sewer system and has never shown any radioactive contamination.

But the tank bottom has a thin layer of old sludge on it that tested positive for extremely small but detectable amounts of radioactive forms of uranium, cobalt, and cesium; additionally, nonradioactive chemicals such as arsenic and cadmium were measured in extremely low concentrations. Though the contaminants found in the sludge were never found in the water, the

(Continued on page 6)



A DEFT TOUCH — Don Hanson (1382) controls the movements of Swarmy the robot in an old wastewater storage tank 26 feet underground, an environment not safe for human entry. (Photo by Randy Montoya)



Shawn Carpenter case

Last month, a jury awarded a former Sandia employee more than \$4 million in a wrongful termination lawsuit. Labs Director Tom Hunter addresses the case in a letter to all Labs employees on **page 3**.



Let there be LIHE

Sandia's unique Light Initiated High Explosives facility, offline for a decade, is operational again, providing vital weapons test data, helping keep the stockpile safe and secure. Read about LIHE on **page 4**.



Meet Sandhya Rajan

She pronounces her name "Sundia," but it sounds like "Sandia," and she loves her job as the Labs' newest protocol officer. Meet Sandhya Rajan — and her family — on **page 8**.

What's what

Diligent and ethical Feedback administrator Mike Clough (3651) carefully shields the names of Sandians who write him about ticklish situations or problems, but he has to look for answers, which is how the following found its way to me. The writer had just received a copy of Labs Accomplishments 2007 and "noticed that it smells really bad. Have others noticed the smell?"

Mike passed the query along to a couple of people in our group, wondering if we had had similar reports from other readers.

We've heard newspapers called fish wrappers, birdcage liners, and worse, and know people dump coffee grounds, disposable diapers, kitchen garbage, and other unpleasant things on them. We know that news coverage "stinks" (depending on your point of view of any issue) and before electronic news coverage came along, reporters and editors were referred to as "ink-stained wretches of the press."

Maybe the writer was having a "bad nose day," or maybe something got dumped on the bundle of Labs Accomplishments 2007 that his copy came out of. Anyway, we're still pretty proud of it, smell or no smell, and if you didn't get a copy, let us know and we'll get one to you.

But you have to agree to just read it. Not sniff it.

* * *

Los Angeles Times Pulitzer Prize-winning sports columnist Jim Murray once wrote, "Baseball is a game where a curve is an optical illusion, a screwball can be a pitch or a person, stealing is legal, and you can spit anywhere you like except in the umpire's eye or on the ball."

One Sandian would question that "spit anywhere you like," part.

In another of those Feedback notes Mike Clough passed to the folks in our group, looking for a suggested response, the writer declared, "There really is nothing more disgusting and rude than the bad habit of spitting in public, especially where other people walk. What happened to a little common decency? . . . Whatever the reason for this disgusting habit, please know that it is gross!"

No argument here. Pretty gross. But I can't help throwing in the line I remember best about that bodily function. FDR's first vice president, John Nance "Cactus Jack" Garner, was famously plain-spoken and once said of his position, "The vice presidency isn't worth a pitcher of warm spit."

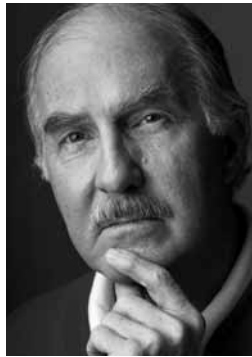
* * *

One day last week, the *Sandia Daily News* called readers' attention to government health officials' warnings about peanut butter that may be contaminated with salmonella bacteria. The *SDN* note referred readers to a couple of websites where they could learn more.

Soon after publication, a couple of readers pointed out in wry notes that the very next *SDN* blurb announced the next meeting of the Sandwich Support Group, a Sandia group whose members share experiences and suggestions about caring for aging loved ones.

Funny, but no connection intended.

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



HOWARD KERCHEVAL

Employee death

Jim Fleming liked to 'build things and see them wiggle'

Award-winning engineer and devoted family man died Feb. 13

"Let's go ask Jim what he thinks about this."

That was often the first thing Jim Fleming's colleagues considered at the start of any new project. Jim, a DMTS in Microsystems Science, Technology & Components Center 1700, died Feb. 13 at age 47 after battling cancer. He had been with Sandia for more than 18 years.

As co-inventor of the 3-D photonic lattice



JIM FLEMING (left) and Shawn Lin were co-inventors of the 3-D photonic lattice technology.

technology, Jim was the recipient of a Lockheed Martin Nova award, an R&D 100 award, and the *Industry Week* Technology of the Year award. He held more than 20 patents and earned many other awards during a distinguished career.

Colleague Bruce Draper recalls Jim as "an energetic and insightful engineer, always able to find creative ways to do things that most people would've given up on. His ability to visualize complex systems always amazed me. . . . Jim was a wonderful person, too, both at home and at work. We're all better for his being here, and his death has left a huge hole."

Says colleague Troy Olsson: "When I think of working with Jim Fleming, the first words that come to mind are fun and excitement. . . . He was not afraid to try things that were extremely difficult and his successes on these types of projects were remarkable. While some are motivated by publications, power, money, and acclaim, Jim once expressed to me that he was unconcerned with those things. He said 'I just like to build things and see them wiggle.'"

Says another coworker: "Jim was a great friend and mentor to me and many others here at Sandia. I was always amazed by how one person could be so courageous, optimistic, and giving."

An insight into Jim's character is offered by an anecdote his wife Cearlwyn Fleming shared with the *Albuquerque Tribune*: On their honeymoon in 1992, Cearlwyn recalls, "We were driving down the road [in New Zealand] and there was a sign that said 'bungee jumping.' [Jim] pulled to the side of the road and said 'We're doing that,' and within an hour we were upside down."

Jim's manager, Harold Stewart (1747), says "Jim will be remembered as someone who was extremely bright and creative while being one of the most giving and humble people at Sandia. He had a great understanding of human nature, an appreciation for differing viewpoints and treated everyone as an equal."

Once, years ago, a friend recalls, another colleague said of Jim — out of his earshot — "One of our most brilliant engineers has no ego."

Jim is survived by his wife; his children, Jesse, Keila, and Brigid; his parents, John and Nancy Fleming, and his sister, Ann Fleming McMahan.

For the record

An article in the Feb. 16 issue about the Managed Workforce Transition process incorrectly implied that the Laboratory Directed Research and Development (LDRD) program office was getting additional staff members as a result of the process. LDRD Manager Hank Westrich (1011) says no increase in the number of program office staff is planned.

Sandia LabNews

Sandia National Laboratories

<http://www.sandia.gov/LabNews>

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Nominations sought through March 23 for Director's Award

Sandia's Director's Awards recognize project and program managers and teams who excel in using small regional suppliers. Nominations for the award will be accepted through March 23. Nomination forms with detailed instructions are available at the following link: <http://slnsinc.com/snl/daform.doc>.

The Supplier Community Advisory Council (SCAC) recommended establishment of the awards in 2001.

Awards are presented in four categories: Regionally Procured Products and/or Services; Innovation in Small Regional Business Procurement; Sandia Staff Advocate; and Sandia Team Advocates.

Nominations may be submitted via email or fax only to:

SCAC: Sandia National Laboratories
Director's Award Nominations
c/o Strategic & Learning Services, Inc.
Attention: Tracy Alexis
505-823-0940 (fax)
email: talexis@slnsinc.com

The SCAC will recognize the winning programs and professionals during a special reception following the June 21 Supplier Community Advisory Council meeting at the National Hispanic Cultural Center.

Jury rules in favor of former Sandian

Editor's note: The verdict in the Shawn Carpenter trial came on Feb. 13, four days after the deadline for news stories for the Feb. 16 Lab News; as such, no information about the outcome of the case could be included in that issue. While much cannot be said due to post-verdict work, the following is provided.

A six-day jury trial in a wrongful termination lawsuit against Sandia ended February 13 with a verdict in favor of the plaintiff, former Sandia employee Shawn Carpenter.

During the trial, the jury heard testimony from Carpenter's supervisors, who testified that Carpenter disobeyed express directions to refrain from using information acquired at Sandia to backhack into foreign computer systems from his home computer during nonwork hours. Sandia's witnesses testified that this misconduct, which they believed was illegal as well as unauthorized, formed the basis for his discharge.

Carpenter admitted during the trial that he disregarded instructions to cease his backhacking activity, but contended that his discharge was in violation of public policy and therefore actionable under New Mexico law. The judge instructed the jury that if they found that any motivating factor of Carpenter's discharge was contrary to public policy, the termination was wrongful. The jury made such a finding and awarded Carpenter economic damages, damages for alleged emotional distress, and punitive damages, which totaled more than \$4 million.

Post-verdict motions are pending in the trial court, and Sandia attorney Marianne Hill (11100) said that Sandia is disappointed by the verdict and is evaluating a potential appeal. At right is a memo from Labs Director Tom Hunter distributed Labs-wide on Feb. 28.

Dear Sandians:

As many of you are aware, a New Mexico state court jury awarded former Sandian Shawn Carpenter more than \$4 million on Feb. 13, 2007. The outcome of the trial was a great disappointment to me personally, but I am most concerned about any perception that the laboratory may not have acted in the best interest of the nation.

It is essential in all cases that Sandians adhere to the principle of putting the nation first. I firmly believe Sandia must always conduct its work lawfully, with appropriate authorizations, and when people step beyond clear boundaries we must act responsibly. In fact, living and acting upon our values are of the utmost importance to our continuing to have the opportunity to provide exceptional service to the nation. I and the management team are committed to these values in all we do and every decision we make.

In my career at Sandia, I have come to know Sandia as a place of exemplary character and values, earned through the exceptional conduct of its employees and the significant contributions you have all made to national security. Our values are not new. For more than 60 years, service to the nation, excellence in our conduct and work, respect for each other, integrity, and teamwork have shaped our decisions at Sandia.

In closing, I ask that each of you take a moment and reflect on the exceptional service that you render in the national interest. I have a deep respect for our employees and this organization, the values we stand for, and the commitment we all have to our mission. Our contributions, both individually and collectively, are critically important to our nation's security.

Sincerely,
Tom Hunter

Detonation detection

(Continued from page 1)

"In some scenarios a nuclear proliferator or terrorist group might detonate a device in a way that makes it difficult to assign blame," says John Williams, Sandia senior manager for USNDS Program Office 5740.

In that case, he says, US policy makers would need accurate real-time information about the time, location, yield, and any other evidence available via USNDS.

With budding nuclear programs in at least two nations — Iran and North Korea — USNDS may be called upon at any time to gather the facts about a modern nuclear detonation that could change the course of history (see "Sandia has long history supporting USNDS" at right).

"USNDS may be more important than ever to strategic

national security," says Jerry McDowell, VP for Defense Systems & Assessments. "The threats are real, and USNDS provides critical global awareness."

Real-time reporting

ICADS includes the antennae, hardware, and software that help gather, correlate, and make sense of USNDS satellite data.

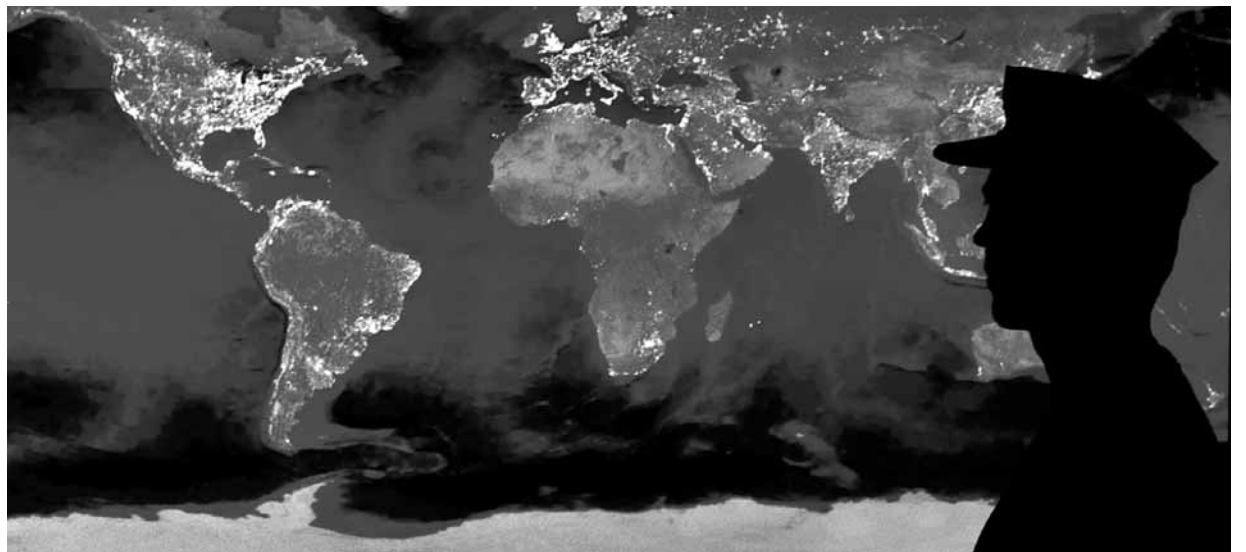
The system allows operators to quickly compare live satellite signals with hundreds of event profiles in its event database. Certain atmospheric phenomena — lightning, solar storms, and even pings to a satellite by energetic micrometeorite particles — can cause energy disturbances that register on the sensors.

"This is a complex, data-rich environment," says John. "It would take a very long time to integrate, correlate, and assess the signals from dozens of sensors. But US decision makers need answers immediately. The analysis provided by ICADS before an operator ever sees the data helps make real-time interpretation possible."

When a signal is verified by detectors aboard multiple satellites and bears the pulse waveform signature characteristic of a nuclear event, the operators refer the event up the national command structure, including the US State Department.

"The analysis provided by ICADS before an operator ever sees the data helps make real-time interpretation possible."

— John Williams



THE INTEGRATED CORRELATION AND DISPLAY SYSTEM, or ICADS, helps Air Force personnel in their 24/7/365 mission to monitor the globe for nuclear detonations. (Photo by Randy Montoya)

Rare commitment

Last year Sandia delivered ICADS IIF, the latest USNDS military ground station system, including more than a million lines of custom software code and an emphasis on human-computer interface, which makes the job of interpreting ICADS data more intuitive. (IIF signifies the next generation of GPS satellites; the first GPS IIF bird is scheduled for launch in 2009.)

The \$188 million Sandia ICADS IIF program was unusual in its size and complexity. It was delivered fully qualified, under budget, and on time based on a delivery date set half a decade earlier — a rarity for a large military software development program, says Sandia ICADS project manager Don Rountree (5740).

"A program this complex is almost expected to fall behind schedule," says Jerry. "To keep the promise we made back in 2000 required an incredible level of dedication by hundreds of people."

The program also required a broad spectrum of Sandia expertise, he says, from atmospheric phenomenology and high-energy physics to software development and systems engineering.

24/7 support

Sandians continue to support the USNDS program. Technical experts at Sandia and Los Alamos national labs are on pager call around the clock to assist the Air Force with satellite and ground station troubleshooting.

They also provide second opinions regarding Air Force analysis of "zoo events" — unusual data signatures that don't match existing event profiles. And Sandians train the Air Force ICADS trainers, who in turn train the ICADS operators.

In addition, under NNSA nonproliferation

funding, Sandia is working on the next generation of lighter-weight, smaller global burst detectors to fly aboard the GPS IIF and a planned new series of DSP and GPS III satellites. Continued ICADS development to support the new satellite systems is under way as well.

"USNDS is a long-term commitment for us," says John.

Sandia has long history supporting USNDS

Sandia and other NNSA laboratories have supported USNDS since the early days of the Cold War.

Optical, electromagnetic pulse, and X-ray sensors now in orbit aboard GPS and DSP satellites were developed and built at the national labs.

And Sandia has long played the primary payload integration role for USNDS, ensuring newly developed satellite sensors fit seamlessly with the satellite's hardware and software.

Sandia developed the first ground station for NuDet data processing in the early 1960s. In an effort to make sense of the increasing number of signal feeds from USNDS satellites, the first ICADS was delivered by Sandia in 1992, with upgrades in 1998 and 2005.

Each iteration has included significant new hardware and software functionalities.

As a whole, ICADS now is considered a national command structure asset, says John Williams, Sandia senior manager for USNDS Program Office 5740.

Let there be LIHE

Stories by Stephanie Holinka • Photos by Randy Montoya and LIHE team

The Light Initiated High Explosive facility lies next to the much larger Thermal Test Complex. It looks small from the outside, but big things are going on inside.

The LIHE Facility supports nuclear weapons development and qualification testing for DOE/NNSA. It also provides test data for validation of computer models developed for the nuclear weapons Stockpile Stewardship Program. The facility was recently resurrected after the original facility was mothballed in the early 1990s, when testing activities slowed down at the Labs (see "Collective memory, great planning, textbook mothballing process helped revive unique test facility" below).

LIHE's tests simulate some of the specific conditions that occur when a nuclear device is set off near an asset such as a weapons system or a satellite. Using a thin, sprayed-on explosive coating that can be ignited by a high-intensity light flash, LIHE generates an impulse that elicits the proper structural response of the test item (see "About LIHE" below).

The LIHE facility is the only high-fidelity test technique available for the impulse testing of nuclear weapons. Nuclear underground testing used to be the best way to do this type of impulse response experiments, but the US has not done underground testing since 1992 and has no plans to resume.

Every major nuclear weapons system fielded in the US has been tested, in some capacity, at LIHE. The customer base for the LIHE facility now includes most of the nuclear weapons systems groups, computer modeling groups, and some work for others groups outside Sandia.

The LIHE facility is operated by a team of five from Explosive Projects/Diagnostics Dept. 2554, including the project lead and test engineer Gary Rivera, test engineer Tim Covert, instrumentation specialist Ed Mulligan, spray operator Dan Dow, and high-voltage operator John Liwski. It's an integral part of the Explosive Technology Group, which also operates the Explosive Component Facility.

Ed Mulligan, LIHE's current lead instrumentation technologist, was the LIHE high-voltage operator team member who mothballed the facility when it was deemed that there were not enough customers to keep the facility open 100 percent of the time. LIHE is the only Sandia facility he knows of that has been completely shut down and then brought back more than a decade later.

Before an LIHE test, the explosives are remotely formulated on site in an environmentally controlled spray booth. LIHE uses the primary explosive silver acetylide-silver nitrate

(SASN), which is highly sensitive and can be initiated with a bright flash of light. SASN is so sensitive that it's not widely used and is carefully controlled throughout its life cycle at LIHE.

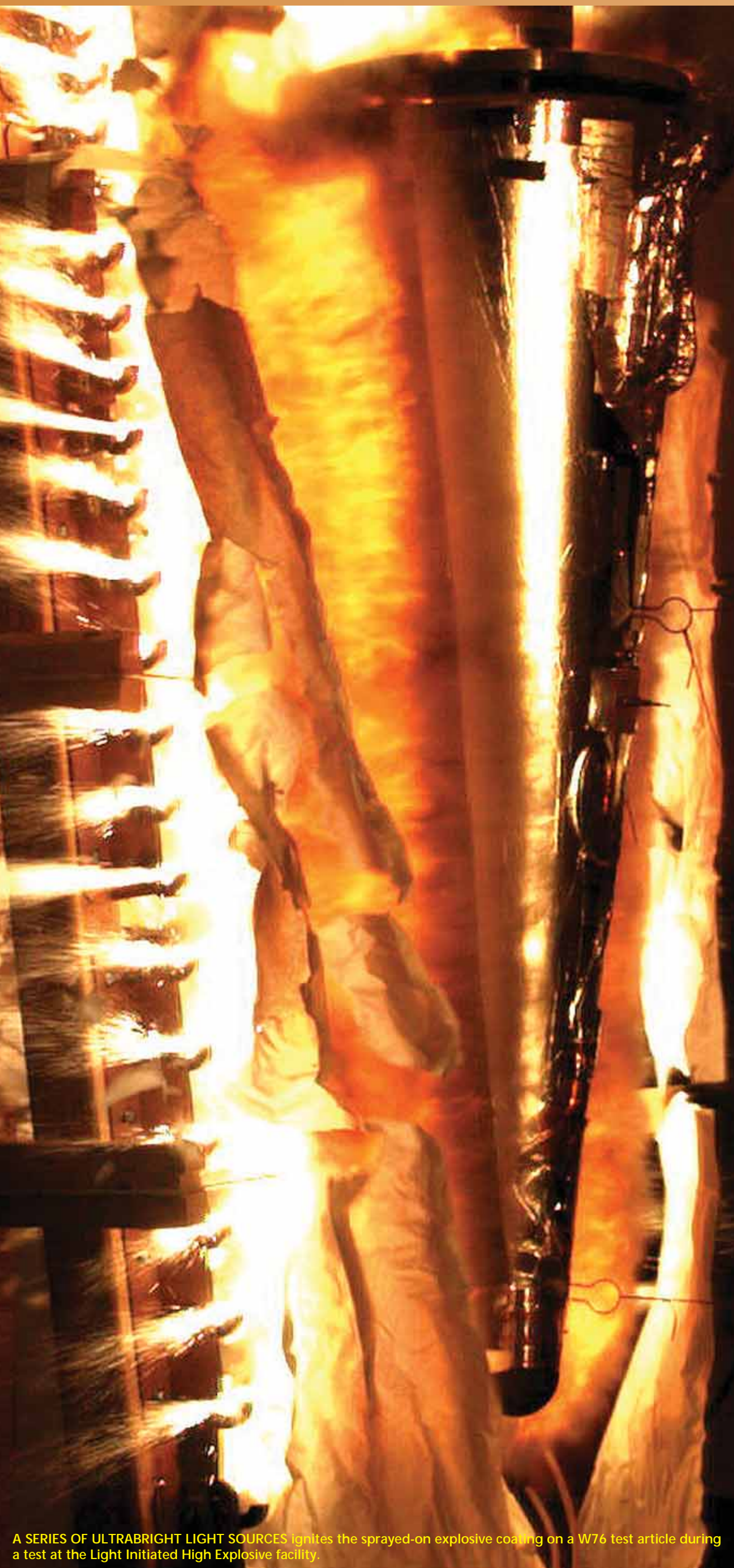
After the explosive is made, a remote-controlled robot arm holding a modified spray gun carefully sprays thin layers of explosive onto the surface of complex structural shapes. Depending on the complexity of the shape and the desired explosive characteristics required, the spray process can last up to 13 hours.

After spraying and conditioning, the test unit is remotely moved to a test cell in front of a light array of tungsten wires enclosed in quartz tubes.

The explosive is simultaneously detonated over the sprayed surface by exposing it to an intense flash of light generated by a 40,000-volt capacitor bank discharged through the tungsten wires to create a bright electrical arc in each quartz tube. A state-of-the-art instrumentation system, capable of recording up to 160 channels of strain, acceleration, and pressure data, captures the effects of the test. Those data are provided to LIHE customers for system validation.

After the test, excess explosive is safely disposed of at an on-site, New Mexico Environmental Department-permitted treatment facility.

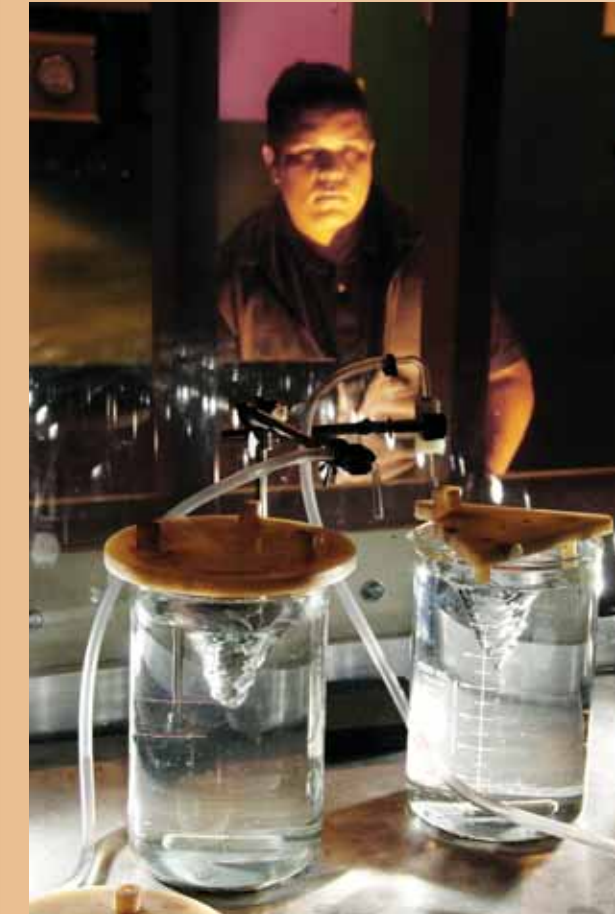
Gary says he hopes to expand the LIHE customer base to groups such as satellite purveyors and materials investigators to take advantage of the expertise at the LIHE facility for any structure that gets put into space or undergoes similar endoatmospheric impulse loading.



A SERIES OF ULTRABRIGHT LIGHT SOURCES ignites the sprayed-on explosive coating on a W76 test article during a test at the Light Initiated High Explosive facility.



Sandia brings the Light Initiated High Explosive facility back online for stockpile surveillance



GARY RIVERA (left photo) prepares chemicals used in spray-on explosive coating at the LIHE facility. In photo at right, Dan Dow and Gary (both 2554) prepare a test article for an LIHE test.



(Photo by Randy Montoya)

Collective memory, great planning, textbook mothballing process helped revive unique test facility

LIHE first came online in the early 1970s, and was one of many test facilities for the nation's nuclear stockpile. Every major reentry weapons system in the nation's nuclear arsenal came to LIHE for testing. In the early 1990s LIHE closed its doors. The end of the Cold War and a decreasing need for large testing facilities diminished the ongoing need for the facility. Gary Rivera says facilities like LIHE all "were shut down, mothballed, or just plain went away." But it turned out that the need for an impulse test facility remained.

Luckily, the engineers and technicians who worked at LIHE didn't just tear down the facility and walk away. They felt that the nation might require LIHE's capabilities in the future. So when the facility went offline, all the major systems were crated, documented, and carefully stored in the Manzano storage facility with an eye toward returning LIHE to operation if the nation called.

Bob Benham, now retired, packed up the major LIHE systems, many with detailed documentation that allowed it to be resurrected.

"He saved everything," Gary says. "Even the facility computer systems were still there. They were so outdated that we couldn't use them anymore. Fortunately, we were able to retrieve many of the computer files and programs from the computer tapes and rewrite them and implement them in modern code."

As the plans for the W76-1 Life Extension Program got off the ground, the decision was made to re-open the facility, under the direction of then project lead Mike Skaggs, to conduct two full systems tests for both model validation and system certification.

John Tisser, who was the manager for Tech

Area 3 at the time of the LIHE's tear-down, wasn't convinced that there'd ever be a need for the LIHE, and did not initially support the careful storage of its equipment. But his experience with LIHE's return changed all that.

In 2002, when Sandia decided to restore LIHE to test the W76-1, the experts who made the LIHE so successful were no longer available, either through retirements or through re-assignment to other long-term projects.

As part of a knowledge preservation project, retired Sandians Bob Benham, Ben Duggins, and Jerry Brock came back as consultants and went through the processes and equipment that made the facility so successful.

"They were able to discuss some of the 'skill of the art,' that doesn't get documented," Gary says. The LIHE veterans began mentoring Sandia personnel on LIHE's principles, processes, and equipment. They also suggested improvements to the old facilities and improvements in capabilities for a new facility.

When the decision to restart the LIHE facility was made, the new facility operators were already in training.

Some of the major features of the facility were simply brought back online. Others were replaced due to modernization of computing equipment, facilities improvements, and updated safety requirements.

After equipment calibration and proof-of-capability testing, the LIHE facility conducted two fully instrumented impulse tests on a WR-quality W76-1 unit. The tests succeeded completely.

—Stephanie Holinka

Mileposts

New Mexico photos by Michelle Fleming
California photos by Randy Wong



Thomas Hund
30 2522



Carl lafonaro
30 2714



Dennis Carroll
25 4211



Timothy Lucero
25 4244



John Clauss
15 12305



Diane Gaylord
15 1123



Michael Kent
15 8332



Ron Meyer-Hagen
15 2124



Robert Reese
15 10321



Sue Spear
15 5054

Recent Retirees



Sam Varnado
32 12100



Jeanne Bando
31 1523



Toyoko Lee
31 2995



Alex Padilla
30 10843



Dwight Miller
25 6642

Swarmy

(Continued from page 1)

sludge had to be removed before the tank could be closed and abandoned.

The 47-year-old tank's shape, depth, and position have made clean-up efforts difficult. Its low-oxygen, confined-space environment has precluded manned entry and inspection.

The viscosity of the sludge also presented a technical challenge. Mock-up tests for moving, vacuuming, and pumping were conducted using various mixtures of flour and water to replicate the texture and viscosity of the sludge, but all of the standard approaches proved unsatisfactory.

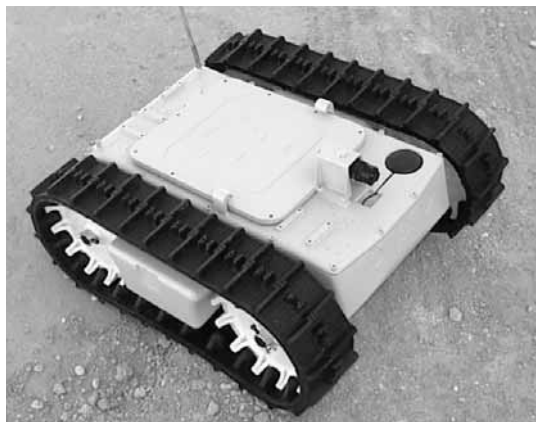
Initially, the options for cleaning the space looked complicated and expensive. Experts from across the Labs were brought together to present their concerns: Environmental Restoration, Regulated Waste/Nuclear Material Disposition and its contractors, Industrial Hygiene, Radiation Protection, Environmental Programs and Assurance, and Facilities Projects representatives defined the solution boundaries. Because of safety concerns, the contractor organizations familiar with similar projects chose not bid on the job.

Dan Borneo (6336) was the facilities project manager involved with trying to get the tank cleaned up starting in April 2006.

"We didn't want to send anybody down there," Dan says. "Twenty feet below ground, you're going through a 30-inch diameter hole with no place to stand up. I wouldn't want to do that. The contractors didn't want to do that, either. Nobody would touch it."

Leaving the sludge alone wasn't an option, but Dan didn't want to just dig up the tank. "Digging it up would be extremely expensive, but we couldn't just leave it alone," Dan says.

Dan and his group looked at small robots



FIRST COUSIN — The Swarmy robot is similar to the robot shown, but with a few modifications.

(Photo by John Feddema)

attached to complex vacuums such as those being used at DOE's Hanford site for similar projects. Each of those systems cost \$300,000, plus another \$300,000 to bring one here and set it up. Dan decided to ask around.

"The great thing about being at Sandia," Dan says "is if you can dream up a solution to something, someone at Sandia has already built one and it's sitting on their shelf somewhere. The key is finding the right person and the right shelf."

In October, Dan wrote to a few robotics engineers and asked if they had any extra robots. John Feddema, manager of Intelligent Systems Controls Dept. 6743, wrote back and said that, as a matter of fact, he did have a few. Dan had found the right shelf.

"We had produced these swarm vehicles for an LDRD project on cooperative robots and for several DARPA programs," John explains.

For this application, one small 10-inch by 2-foot swarm robot was fitted with treads from old snow blower tires for extra traction. "We were limited to 24 to 28 inches from diagonal to diagonal. It just barely fit within the riser hole," says John.

The robot's small size would allow it to get from one side of the 16-foot-long tank to the other.

In the most recent experiments, Swarmy was able to carry a tethered can to the farthest corners of the tank so that pulling the tether drags the can through the sludge, collecting the material and allowing it to be removed from the tank and emptied for proper disposal.

The process is still being refined. Don Hanson of Hot Cells and Gamma Facilities Dept. 1382 hopes to fit Swarmy with a small snow blower to further break up the sludge and push it toward the access hole.

After some trial and error, it looks like Swarmy may provide a long-sought solution, one that Dept. 1382 Manager Dave Wheeler is happy to have now.

"Getting the sludge out of the tank ensures that future releases don't happen," he says.

ILMS

(Continued from page 1)

between," says Lenny Martinez (9000), VP for Enterprise Transformation.

Moving ILMS to a web portal available to all Sandians Feb. 19 was the latest step in the ongoing development. This step is termed Release 2.0, and further releases aren't far behind, says Lenny. The ILMS portal is available through a link near the top left of the internal Techweb home page.

As modeled in ILMS, the job of top management looks like a short list: provide leadership, engage the customer and stakeholders, and accomplish the mission. That's the 30,000-foot view. ILMS now allows management to drill down several more levels, providing access to some of the detail involved in carrying out those top jobs.

Zooming in

As ILMS continues to mature, it will let managers zoom to "street level," where you'll find the processes, procedures, and tools that define day-to-day activities. T. J. Allard (9240), senior manager in charge of ILMS implementation, says he looks forward to the system enabling individual employees to leverage the processes and information that apply to their work.

At this point, Lenny says, information available through ILMS is of most interest to Sandia's executive officers and to NNSA's Sandia Site Office, which has oversight responsibilities for the Labs and obtains assurance data through ILMS. The next several releases will make ILMS increasingly useful to the Laboratory Leadership Team level (vice presidents), then to center directors, and so on. The next release is scheduled for this spring.

Management information reached through ILMS will eventually be detailed enough to be directly relevant to decision making by management at all levels. When managers and stakeholders need to find essential, trustworthy information, the ILMS structure and the portal that conveys the information are intended to lessen frustration and increase efficiency.

"As we continue to zoom in and extend ILMS down to street level," says Lenny, "you can start to get a bird's-eye view of your neighborhood. It will give you a sense of how Sandia management views and operates the Labs."

Sandhya Rajan, Sandia's newest protocol officer, loves when the Sandia mountains turn the color of watermelon

By Iris Aboytes

Born in Chennai (formerly Madras), India, Sandhya Rajan (12126) did not see herself as a protocol officer at a national laboratory with a similar sounding name.

"When I tell people how to pronounce my name," says Sandhya, "they say 'you've got to be kidding' or look at my badge to see how my name is spelled." Sandhya pronounces her name Sundia.

"Sandhya" means dusk in Sanskrit, the classical language of India. "Maybe that is why sunset is my favorite time of the day," she says. "I love when the Sandia mountains turn the color of watermelon."

Sandhya came to Sandia in November 2004 as an Office Administrative Assistant (OAA). Her husband, Red Storm team member Mahesh (4326) came to Sandia in 2002. She enjoys being the front-line contact and is proud to introduce visitors to Sandia. "I like taking care of people," she says.

Her arranged marriage to Mahesh brought her to the United States. "I could have said no," she says of her arranged marriage, "but I chose to marry him. When I first met him, I was attracted to his sense of humor. He was also very grounded and, of course, he was cute. We have been married almost 25 years. I have learned much from him. His quiet humility and knowledge amaze me. I love the respect and care he shows my mother. He is the best thing that has happened to me; he is the wind beneath my wings."



SANDHYA RAJAN

(Photo by Bill Doxy)

Sandhya worked at Arizona State University, where Mahesh was a member of the faculty, for two years. She became a stay-home mom when she and Mahesh began their family. They have three children. Pravin, 21, is a senior at Georgetown University. He graduated from Officer Candidate School and will be joining the Marines when he receives his degree. Nisha, 20, attends the University of New Mexico and hopes to go to law school. Ashwath, 16, is a junior at Albuquerque Academy.

Her mother, Raji, is the matriarch of the family. Last year at age 70, she became a US citizen. "We all helped her prepare for the test," says Sandhya. "We were so proud when she answered all the questions correctly. She is a classy lady who gives much of herself. I hope I have half her grace and kindness when I am her age." Raji spends eight months of the year in New Mexico and four months with her other daughter in Maryland.

Sandhya was a member of the PTA at her children's schools and spent time organizing, fundraising, and coordinating banquets and football dinners. Her children grown up, Sandhya decided to get back into the workforce. Before coming to Sandia she was coordinator of the graduate program at the University of California, Irvine.

She enjoyed interacting with students and with national and international seminar speakers as she coordinated their visits.

Sandhya says Albuquerque reminds her of India. "There are churches on every street, just like the temples in India," she says. "Spirituality here is palpable. People are so down-to-earth. Family and family ties are so important."

Sometimes she yearns for the excitement of the bigger city, but appreciates the glorious open skies, mountains, and the sunsets.

"I have made wonderful friends at Sandia," she says. "I have been lucky to work with people



SANDHYA RAJAN, top right, with her family: husband Mahesh (top left) sons Pravin, 21 (middle left), and Ashwath, 16, daughter Nisha, 20, and mother Raji.

who have shown me kindness and given me undreamed-of opportunities." Sandhya takes pride in being a Sandian, and though she cannot contribute to science, she believes by doing her job well she enables her customers and upper management to concentrate on what they do best. She works at making a difference.

"If someone had told me as a student that I would be a protocol officer in the future, I would have been incredulous," she says. "I am blessed that I get to do what I love and get paid to boot."

Sandia now part of LMCO's Electronic Systems business area

Under a restructuring plan announced by Lockheed Martin CEO Bob Stevens, management of Sandia will be moved to the Electronic Systems business area. Electronic Systems will also assume the Lockheed Martin share in the management of the Atomic Weapons Establishment in the United Kingdom.



BOB COUTTS

Sandia had been part of the Information Technology and Global Services business area. Under the reorganization, that group will be combined with the Integrated Systems & Solutions business area to form a new business area named Information Systems & Global Services.

Electronic Systems is headed by Robert B. Coutts, who has served on the Sandia Corp. Board of Directors since last year. Coutts, who came to Martin Marietta from General Electric in 1993 during the GE Aerospace merger, has a degree in mechanical engineering from Tufts University and is a member of the American Society of Mechanical Engineers.

Coutts began his career at General Electric in 1972. He is a graduate of the GE Manufacturing Management Program. During his tenure at GE, Coutts held a managerial position in Albuquerque in the company's Aircraft Engine Group.

In a recent business area-wide communiqué, Coutts wrote: "Building on its heritage of leadership in nuclear stockpile stewardship and nonproliferation, Sandia has become a leading source of advanced technologies for homeland security; energy and infrastructure assurance; defense systems and assessments; and science, technology and engineering."

Wind energy on Thunderbirds' March 12 agenda



The March 12 meeting of the Thunderbird Club (Sandia's retiree organization) will address alternative energy. The meeting will be held at 2 p.m. (or come early for lunch) at the Mountain View facility on KAFB. The presentation will focus largely on PNM's Sky Blue program, which offers its electric utility customer the option of having up to 90 percent of their energy derived from wind. Sky Blue is reportedly one of the most successful green energy programs in the nation. According to the National Renewable Energy Laboratory, PNM Sky Blue ranked 15th in terms of number of participants out of more than 100 programs reporting nationally in 2005. The meeting is open to all with access to KAFB. No charge (lunch is extra). Call Genelia Boenig at 836-6977 for more information.

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