



SANDIA'S KAUAI TEST FACILITY, looking north. Trailer city and the Launch Operations Building are to the right. The launch pad area is near the center of the photo. Pad 1, with its large tent, is in the foreground. KTF is on the US Navy's Pacific Missile Range Facility on the western shore of the island of Kauai, Hawaii. (Photo by Diana Helgesen)

The Kauai Test Facility . . . Sandia's western-most outpost

By John German Photos by Diana Helgesen

Editor's note: This is the second in a series of occasional Lab News special reports on Sandia's remote sites.

200 beachfront acres on the western shore of the island of Kauai, Hawaii.

A dozen people — mostly contractors — work here year-round. But when a missile needs

launching, 75 Sandians might report to work here in a single day. Some fly out weeks early. Others spend just a few nights.

For more than 40 years dating back to 1962, when the US and Soviet Union were trading atmospheric nuclear tests in a volley of Cold War-style one-upmanship, Sandians have visited here to conduct rocket flight test experiments, from offensive and defensive weapons testing to atmospheric studies and high-tech

star gazing.

Now, as the United States works to develop a defensive capability against missile attacks, KTF is making steady progress in solidifying a reputation as a national test asset.

Here is a glimpse of life at KTF during one recent countdown, and the exceptional service in the national interest rendered at Sandia's western-most outpost.

The series of articles begins on page 4.

Sandia Labs budget may top \$2.2 billion

Growing budget allows expansion of work in key Labs programs

Sandia's budget is on the road to surpassing \$2.2 billion for FY2004, a record amount as the Labs expands its efforts in key national security, energy, and defense programs.

Optimism over the Labs' budget, for this year anyway, stems from the Energy and Water Development Appropriations Act passed by the House and Senate Nov. 18, sending the bill to the President. Sen. Pete Domenici, R-NM, said its provisions have far-reaching benefits for Sandia. Domenici was instrumental in achieving agreement on the bill.

"We worked very hard to craft a bill under tight budget constraints that still meets our nation's most urgent needs," Domenici said. "I believe that this bill does so. I'm particularly pleased that our national labs, including Sandia, will be able to move ahead with projects that are vital to our national security."

Sandia President and Labs Director C. Paul Robinson commended Domenici for his leadership of the crucial nuclear weapons funding, as well as Sen. Jeff Bingaman, D-NM, and Rep. Heather Wilson, R-NM, for their dedication and support of Sandia's national security mission.

(Continued on page 12)

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Security standdown reaches out to all Sandians

Ron Detry discusses 16-hour security awareness revitalization

By Michael Padilla

Every Sandian has a role in security at Sandia. This was the primary message delivered by managers to all employees during the 16-hour security awareness standdown held Nov. 17-26.

Ron Detry, chief security officer and VP of the newly created Integrated Security Div. 4000, says the standdown emphasizes an important aspect of Sandia's mission.

"This is not an event," Ron says. "It is the start of a journey, a journey that will take us back to the level of attention to security that we had a number of years ago."

He says the journey will take time and it will

"This is not an event. It is the start of a journey, a journey that will take us back to the level of attention to security that we had a number of years ago."

take persistent, visible commitment by management. And, he says, it will take increased attention to security by every individual who works at Sandia. Ron says a commitment to communication is also an important aspect of security.

The standdown concentrated on four primary objectives, Ron says. The first was to demonstrate credible and effective security through improved safeguards and security performance. Second was to ensure management involvement and leadership in security. Third was to ensure each Sandian knows his or her safeguards and security roles, responsibilities, and accountabilities. And fourth was to "kick off" a new culture of safeguards and security at the Laboratories.

"The last objective is the most crucial," Ron says. "The expectations at Sandia have been made clear by

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12 Eubank expansion project completed; heralded by city, Kirtland AFB, Sandia

What's what

The past couple of weeks haven't been quite as busy for all of us at Sandia as every week seems to be for Garrison Keillor at Lake Wobegone, but you'll find plenty of interesting reading in this issue of *Lab News*. We took a couple of days to reexamine security issues during the security shutdown — which ran Nov. 17-26, with a grace period to Dec. 23 for makeup work (see Michael Padilla's story on page 1). There was a ribbon-snipping at the nifty new Eubank route into Kirtland AFB and Sandia, with Albuquerque Mayor Martin Chavez and a clutch of other honorables admiring the widened and very much prettied-up boulevard (photo on page 12).

And if it seems to you like Sandians are everywhere these days, you're not as far off the mark as you might think. Besides the two main campuses in Albuquerque and Livermore, we've got smaller outposts in Washington, D.C.; Carlsbad, N.M.; Amarillo, Texas; Tonopah, Yucca Mountain, and the Nevada Test Site in Nevada; Alaska's North Slope; Russia, Jordan, North Africa, New Guinea, and a few other spots scattered here and there in the Far East and the Pacific.

One of those spots is the Kauai Test Facility in Hawaii, where John German went to begin a *Lab News* series of occasional reports about these far-flung Sandia posts and our colleagues who work in them. In John's stories, starting on page 1, you'll read about the work done at Kauai over the past four decades, including some 350 rocket launches in support of major national initiatives. John didn't complain too much about this tough assignment, and he managed to turn his week of self-sacrifice on Kauai into an interesting look at the people who do some of Sandia's highest-profile work, and do it well.

* * *

Despite all our locations, is it maybe time to drop the confusing-to-everybody-including-some-of-ourselves, plural-looking-but-really-singular "Labs" when referring to Sandia? As in "the Labs is closed for the apple harvest," or "the Labs was as-one with universal man," or "the Labs' budget for FY 2004 is the largest in its history?"

We may be scattered all over the globe, but the pay stubs all look alike. We have only one thunderbird logo. As staid institutions as *The New York Times* and *Washington Post* occasionally refer to us in print as Sandia National Laboratory. Even some of our execs refer to Sandia as the "lab," not the "Labs."

Agree? Disagree? What'da y'all think? (That's the singular "y'all," by the way.)

* * *

Santa Fe, being The City Different, is living up to its reputation by taking a different approach in dealing with the truly serious problem of people-vehicle conflict around the Plaza. The solution, they've decided, is to ticket jaywalkers.

Let's see: Hundreds of pedestrians daily, most of whom are tourists hypnotized by the Santa Fe mystique — especially the prospect of buying exotic stuff from Indian artisans beneath the Palace of the Governors portal — reading city ordinance signs?

Maybe the Advanced Concepts Group could look into this.

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

Sandia's technical savvy impresses Mexican President Vicente Fox

Labs President Paul Robinson, other Sandians meet with Fox

When Mexico's President Vicente Fox and a delegation of his cabinet officials came to Santa Fe this month, it marked the first such official visit by a sitting Mexican president to the state of New Mexico — and there was a key Sandia connection.

Not only did the visit give the Mexican leader an opportunity to talk economic development with New Mexico Gov. Bill Richardson, it also provided a venue for high-level discussion about technical cooperation between Sandia and Mexican researchers on issues of common concern: water, border commerce and security, alternative energy, and rural electrification.

Labs President and Director C. Paul Robinson was one of the invited guests to the governor's official dinner for Fox on Nov. 4. Paul says of that evening, "It was one of the nicest fringe benefits of being president of this laboratory and representing all the great work that is done here." Seated with Fox during the dinner, Paul recounts that Fox

"It was one of the nicest fringe benefits of being president of this laboratory and representing all the great work that is done here."

showed himself to be a master at "engaging with a broad spectrum of issues. I saw him in action with two national media representatives who were among the eight guests at our table," Paul says. "Fox sure worked hard; I was most impressed."

During a joint session of the New Mexico Legislature, Fox spelled out areas for cooperation that, again, included specific references to the mutual benefits of cooperative R&D efforts.

During a subsequent joint cabinet meeting between Richardson and his team and Fox and the Mexican delegation, which Paul was invited to attend and address, several officials spoke highly of Sandia and its capabilities. For example, Sandia's work on tracking and monitoring closed shipping containers was cited as a technology with great potential for ensuring security while also expediting cross-border commerce. Incidentally, Sandian Annette Sobel, an Air Force general, physician, and researcher (on loan from Sandia to the Governor's cabinet, serving as chief of the state's Homeland Security office), was a presenter at the Richardson/Fox meeting.

In his remarks to the cabinet, Paul noted that Sandia has a history of working with Mexico. In 400 separate projects, he said, Sandia has helped develop and deliver renewable energy capabilities to 30,000 people in several Mexican states. Citing common border problems, Paul discussed the potential of the proposed Bi-National Sustainability Laboratory to offer workable technological solutions.

While the cabinet meeting was serious, there were light moments. Paul recalls that one New Mexico state official greeted Fox with the welcome: "Mr. President, in New Mexico we say, 'Mi casa es su casa' . . . but we also say, 'Mi agua es mi agua.'"

That line brought down the house, Paul says, but also helped to get everyone's attention on the fundamental difficulty of talking about water-related issues.

Paul says Executive VP Joan Woodard and Labs Principal Scientist (and Bi-National Sustainability Lab champion) Gerry Yonas received outstanding responses to their presentations about the Labs' capabilities. In fact, Paul says, President Fox indicated just before leaving New Mexico for the next stop on his multi-state tour that on his next visit he wants to visit Sandia and Los Alamos.

Paul says Sandia is already working on a formal invitation. — Bill Murphy

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Ken Frazier, Editor **505/844-6210**

Bill Murphy, Writer **505/845-0845**

Chris Burroughs, Writer **505/844-0948**

Randy Montoya, Photographer **505/844-5605**

Nancy Garcia, California site contact **925/294-2932**

Contributors: Janet Carpenter (844-7841), John German (844-5199), Neal Singer (845-7078), Larry Perrine (845-8511), Howard Kercheval (columnist, 844-7842), Will Keener (844-1690), Iris Aboytes (844-2282), Michael Padilla (284-5325), Rod Geer (844-6601), Michael Lanigan (844-2297) Michelle Fleming (Ads, Milepost photos, 844-4902).

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Note to readers: The bulk of this issue is devoted to John German's special *Lab News* report from Sandia's Kauai Test Facility. Photos of employees recently given Distinguished-level appointments will appear in our Dec. 12 issue.

— Editor

Bill Oberkampf elected an AIAA Fellow

Bill Oberkampf of Validation & Uncertainty Quantification Processes Dept. 9133 has been elected a Fellow of the American Institute of Aeronautics and Astronautics (AIAA).

AIAA is the world's leading professional society in the broad areas of aeronautics and astronautics. Election as a Fellow is a distinguished honor. Only about 30 Fellows are elected each year.

The new 2004 Fellows will receive their honors during the International Air and Space Symposium in Washington, D.C., April 19-21.

Recent Patents

Kurt Wessendorf (1732): Active Shunt Capacitance Cancelling Oscillator Circuit.

Shannon Spires (6517): Exhaustive Search System and Method Using Space-Filling Curves.

Alan Mahoney (2542), Scott Reed (14192), Carol Ashley (1846), and F. Edward Martinez: Solar Selective Absorption Coatings.

Lothar Bieg (1735): Bi-Directional Planar Slide Mechanism.

Gas-plume imager scans refineries in field testing

Laser imager provides visual sense of gas flow rate; may be approved for quickly monitoring refinery leaks

By Nancy Garcia

A gas-plume imager developed by Sandia has left the lab and entered the field in the past year, undergoing refinery field tests from California to England.

The tests suggest that imaging technology is a viable alternative to hand-held sniffers currently used to detect leaks, says principal investigator Tom Kulp (8356). The Environmental Protection Agency is examining permitting use of the shoulder-carried imager as an alternate work practice for mandatory monitoring of refinery piping and valves. The petroleum industry sees gas imaging

Sommers (8356), and Sal Birtola (8350).

With support from DOE's Office of Fossil Energy and Energy Efficiency, the technology has been under development several years as a way to find leaks more quickly, to help protect the environment, and make monitoring refineries more efficient.

"Our biggest contribution has been to prove that a gas imager can be reduced to a format useable by a single operator under battery power," Tom says. "This has been accomplished using new nonlinear optical and fiber laser technologies."

The field trials started with a day at a refinery in nearby Martinez in January 2003, where the

visual sense of the flow rate," he says. If the approach is proven equivalent to existing technology, it could be approved for monitoring refinery leaks in addition to the already-approved Method 21. "The idea that there is a visual record is also useful," he says.

In August, the team traveled to a Chicago suburb for tests, funded by the state of Texas, that compared the laser imager to so-called "passive" imagers that sense thermal differences between the gas and its background without illuminating the scene with laser light.

Shortly after that, they traveled to Southampton, England, to show the technology to regulators and refinery representatives from England, Belgium, and the Netherlands. Jeff Siegell, chair of the Smart Leak Detection and Repair Project, organized the demonstration so European industry and government officials would be aware of other methods to potentially enforce fugitive emission laws.

Coming up this winter is another large Texas test, sponsored by Shell Oil, in which the technology is being evaluated for its usefulness in a refinery setting over six months.

Meanwhile, Sandia has been interacting

Sandia California News



THE SHOULDER-MOUNTED BAGI imager is shown in use at a Beaumont, Texas, refinery.

as a time- and cost-efficient alternative.

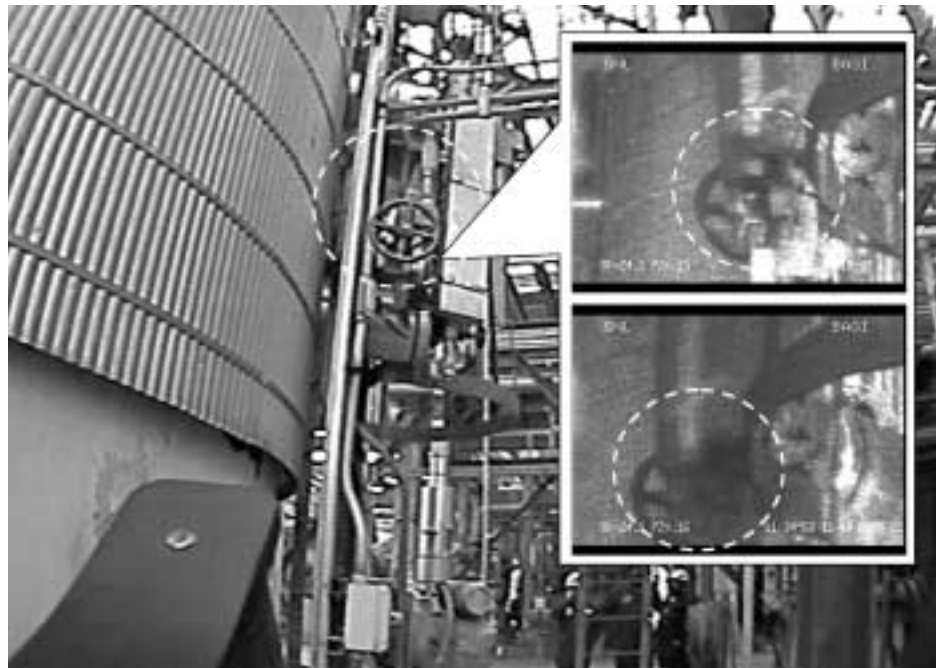
The imager (which resembles a large camcorder) works using the backscatter absorption gas imager (BAGI) method, in which a scene suspected of containing a leak is illuminated with infrared laser light. The laser light is reflected by the background of the scene and absorbed by the leaking gas. A camera in the device gives a visual display of the scene with the plume appearing as a darker region. The device was created by Tom and colleagues Karla Armstrong (8356), Dahv Kliner (8356), Ricky

team established a method for carrying the imager around the piping and double-checked its performance.

Then a longer field trial followed for four days in February in Beaumont, Texas. There, committee members from the American Petroleum Institute's Smart Leak Detection and Repair Project organized tests observed by the EPA, oil companies, and potential commercialization partners. The tests compared the standard existing leak detection method using sniffers, called Method 21, and potential alternative technologies like BAGI. Also, leaks were entirely encapsulated and the flow rate measured.

Tom says the imager spotted 41 leaks and missed three whose flow rate was below 40 grams/hour, the current performance target stated by EPA. The EPA currently regulates leaks based on concentration, but is interested in detecting the presence of something with a particular flow rate.

"Our system images the plume so you get a



IMAGES OF A LEAK in a sight glass at a Houston refinery. The background photo shows the components. The inset shows two BAGE images in which the plume is seen as a dark cloud in the circled area. Taken at intervals, the inset images indicate the motion of the plume.

with companies that would manufacture a commercial version of the device if it's licensed and marketed. "I think there's going to be a lot of development," Tom says. Even since the imager's development began, cameras and lasers have advanced, he notes, and they are continuing to do so. "In five years, the technologies used will be completely different."

Feedback

Can Sandia safety culture learn from Columbia accident investigation?

Q: The Columbia Accident Investigation Board's final report discusses how management and organizational weaknesses in safety assessment crept back into NASA after the loss of the Challenger. Before the loss of each shuttle and crew, NASA was convinced it had an excellent safety culture. Does Sandia plan any formal effort to examine how our safety and reliability culture can be improved from the Columbia investigation report?

A: Thanks for your concerns about Sandia's safety and reliability culture. If it had not been for a major effort already underway, your suggestion to examine this component of the laboratories' culture in light of the Columbia investigation report would have been both timely and pertinent. As it turns out, a "Red Team" recently finished a review of our ES&H program and concluded that our culture was, in fact, too tolerant

of accidents. As a result, a significant effort is underway to implement an action plan to change this culture. One step in this effort is a Lab News article in the Sept. 19, 2003, issue. Please follow what unfolds in the next few months and feel free to get back to me if you have any ideas on what else we can do to enhance our safety awareness. — Al West (3100)

Q: I wear a Sandia pager and I am expected to respond to pages quickly. Since Sandia cell phones are not allowed to be used inside the tech areas except to call 911, I find it difficult to respond to those pages. Why aren't there more phones available in hallways and common areas in buildings in the tech areas, since I can't use a Sandia cell phone to respond?

A: This is a very good point, and one that Telecommunications will try to deal with. There

are many telephones scattered throughout the tech areas, but most of these are likely in newer buildings or in buildings that have special functions. For example, there are quite a few public telephones in Bldg. 810 — both in the hallways and in the auditorium area. Telephones may also be found near locked doors with badge-swipe readers. These are not primarily intended for public use, but the telephones are part of Sandia's telephone infrastructure and could be used to respond to a page.

At this time, budget and telephone port limitations on the Lucent 5ESS will make it difficult for us to expand our capability in the very near-term. However, we will attempt to provide better service in the future by adding public telephones to hallways and lounge areas throughout Sandia as budget and 5ESS capacity allow. — Merle Benson (9334)

Kauai Test Facility crew thrives in trying circumstances

Know-how, preparation, and practice are ingredients of 'nominal launch'

By John German Photos by Diana Helgesen

"FM-5?" asks the backlit shape of the uniformed sentry.

FM-5 is shorthand for the missile defense launch I have been invited here to see. At this dark hour, launch preparations are the only thing happening on the US Navy's Pacific Missile Range Facility (PMRF).

He cross-checks my credentials with the FM-5 guest list, then motions me to pass through a heavily fortified gate.

Three miles north, at the end of the Navy base's winding main road, a single fluorescent light illuminates a sign, framed in the familiar Sandia blue: "Sandia National Laboratories, Kauai Test Facility, Operated for the US Department of Energy."

Trailer city

Dean Manning (15419), team supervisor at KTF, climbs out of a red SUV, Hawaii license plate KTF-MGR, and meets me at the main office, a three-room trailer at the top of wooden stairs.

It's 1:15 a.m., but we are not the first to arrive. Five cars are parked in front of a brightly lit cluster of more than two-dozen aging but well-maintained trailers, all connected by white-painted wooden decking that raises "trailer city's" floor four feet off the ground. A half-acre corrugated metal roof held high by square steel poles — no walls — covers this indoor village.

I have flown 4,000 miles and driven 30 miles across an island paradise, and I still haven't seen a thing. It's pitch black out there, except for a ring of lights that bathes a large white tent — Launch Pad 1 — about 400 yards to the southwest. Underneath the tent, says Dean, is the rocket.

A generator hums, and lazy waves slap against an unseen shore.

Weather watching

We stop at the site's coffee pot and head down a flight of stairs and into the bunker-walled Launch Operations Building, referred to as the eloh-bee (LOB), one of a few permanent buildings at the site.

Originally KTF was a mobile launch facility, hence the trailers. But in the late 1980s a major upgrade was undertaken with funds allocated during President Reagan's Strategic Defense Initiative. The permanent buildings are a result of that upgrade. (See "Then and now ..." on page 9.)

Inside the LOB, Dave Salguero (15414) and



ANDY JONES (2333) installs a motor assembly on a tracking radar in preparation for a balloon launch.



CONSOLES in the control room of KTF's Launch Operations Building are staffed for launch. At the control console to the right (from near to far) sit Dean Manning (15419), Steve Lautenschleger (15406), and Al Lopez (15419). Each has his own set of decision-making responsibilities during a countdown.

Ed Mader (15419) preside over a wall of knobs and screens displaying squiggly lines that describe the ascent of a weather balloon launched a few hours earlier, one of three planned for today.

Here, at about 30,000 feet (Dave points out a leftward jut), the balloon encountered winds, the jet stream. Expected, he says, but high winds, particularly those that might carry rocket debris toward land or shipping lanes, could scrub a launch.

Telling the launch story

It's 2:30 a.m., and more people are arriving at the LOB now. Wilson Brooks (15419) and Shawn Garcia (2661) are in the data acquisition room troubleshooting a problem with a spaghetti dinner of connector cables. Wilson is an experienced hand at KTF. This is Shawn's first trip, but he's clearly been around racks of equipment before.

At launch, numerous data streams will flow into these racks from various radars, trackers, and on-rocket telemetry systems, to be recorded and re-routed to other KTF stations. A single 3-1/2-minute rocket flight can generate many gigabytes of data, all synced to universal time code, says Wilson. This data will tell the story of the launch.

In the LOB's control room, Walt Rutledge (15414 Manager) and Marc Kniskern (15414) pore over atmospheric data they're getting from the balloon and from various weather web sites. They are part of Sandia's flight safety crew, and their job is to advise PMRF on range safety conditions prior to launch. The Navy has ultimate authority to make and enforce flight safety decisions.

Safety in numbers

Walt and Marc use probabilistic risk assessment techniques and models, running calculations on their laptops and on faraway supercomputers to determine the relative risks of the launch. They generate casualty-expectation estimates in the event of a launch mishap — in stark terms, if the rocket exploded before or after launch, or if it malfunctioned and had to be destroyed in mid-flight by launch controllers.

They use breakup models to predict the number and sizes of pieces of rocket debris following a hypothetical intercept or intentional destruct to produce impact probability contours — maps of the Pacific overlaid with swaths of bright colors representing zones of risk. Other factors, such as commercial air and shipping traffic and the number of visitors to a nearby public beach, must be watched as well, says Walt.

"There are millions of hypothetical situations and possibilities to be aware of," he says. "Our job is to consider all the things that can go wrong, backed up by analysis, to ensure that the test is as safe as possible for the public and test participants."

As real as it gets

It's 4 a.m. Al Lopez (15419 Manager) runs a meeting of 25 people representing the parties participating in today's practice launch — emissaries from Sandia, Orbital Sciences Corp., the Navy, Air Force, and Army, and from various other defense subcontractors, including a hush-hush group whose work no one talks about.

Today is only a dress rehearsal, but the room is electric.

In 25 minutes, a 5-1/2-hour countdown begins. It will be the final full "sim count" before the real launch two days from now. The FM-5 team, today about 75 people, will work through every procedure except launching the rocket.

The team already has conducted a dozen smaller simulations, including "off nominal" scenarios when mock obstacles are fed into the system by com-

puter, testing the team's ability to overcome them.

"Today we put it all together," says Dean. "This is as real as it gets."

Pitching it down the middle

For this test, KTF is providing launch support, but the pressure is on Orbital. In two days, if all goes well, Orbital program manager Joe Dimaggio and his team will watch the fruit of their labor blast into the atmosphere.

Then they'll watch the monitors in the control room, anxiously, for evidence that their baby has been destroyed in space by a Navy SM-3 interceptor rocket launched from a Navy destroyer 250 kilometers northwest of the island. (See "The FM-5 mission" on page 8.)

Orbital's objective is to provide a "good target" — a rocket pitched at the proper trajectory and velocity right over the plate, an imaginary exoatmospheric batter's box that is 6 miles high by 6 miles wide by 54 miles long, 55 miles above the Pacific.

Lists of checklists

Revision 4 of the official countdown is handed out. It lists launch tasks along with the organization or person that must carry out each action on queue for the launch to proceed. (See "Countdown can be a pressure cooker" on next page.)

There are some 550 actions on KTF's list, ranging from pre-launch battery checks to confirming burnout of the rocket's boosters one minute after liftoff. The actions will be carried out during the six-hour countdown and the 3-1/2-minute rocket flight — some in rapid-fire succession, others during slow periods.

But Sandia's list represents only a fraction of the FM-5 mission. PMRF's separate checklist contains some 800 tasks. A Navy crew on board the destroyer will follow its own similarly complex countdown.

At 4:25 an electronic male voice reports over the PA system: "All range personnel report to your stations. All unnecessary personnel clear the launch pad now."

It's T minus 5:30:00. Dean and Steve Lautenschleger (15406), at the control console in the LOB, begin radio roll call.

Beauty in launch

The sun is up, and I accompany launch photographer Diana Helgesen (15419) into the fenced launch pad area. Diana needs to run systems checks on her 10 cameras, which sit in the sun for days. Come launch day, they must work.

Minutes after launch Diana will rush into her trailer darkroom, choose an official FM-5 launch photo, and print copies for the newspapers. More

(Continued on next page)

KTF crew readies

(Continued from preceding page)

important, her photos become part of the documentation package KTF offers its customers.

"I try to get something that's unusual, something someone is proud to hang on their wall," she says. "I try to put a little beauty in that launch."

She moves quickly from camera to camera to minimize the time she spends near the pad. Access is restricted during the countdown due to the multiple hazards out here, including 250 pounds of high explosives and four tons of rocket propellant.

Dry like New Mexico

On the way to a camera station we pass Roy Apo and Sharon Cabral (both 15419), members of the full-time contractor crew here, as they prepare a balloon for launch. They have tied on reflectors and GPS locators that allow the balloon to be tracked until it expands and finally pops, at about 120,000 feet.

Three hundred feet away Andy Jones (2333) trains a radar dish on the balloon. Roy releases, and the balloon ascends. Sharon's walkie-talkie crackles as Andy reports that the radar has a valid radar track.

Except for the ocean view and the sugar cane fields east of the Navy base, this could be south-central New Mexico. It's dry on this side of the island. Scraggly thickets of kiawe, a form of mesquite, cover high sand dunes that border the launch site. A volcanic outcropping to the north, Makaha Ridge, resembles a black mesa. Mt. Waialeale, a steep green cone to the northeast, overlooks this half of the island.

The sandy shoreline is less than a football field from Pad 1. It is some of the best beach in



LAUNCH PHOTOGRAPHER Diana Helgesen (15419) sets up cameras atop a 40-foot pole overlooking Pad 1.

Hawaii, says Diana, but access is restricted, except to the sneaky.

Tent to trailer

We return to the LOB, but in seconds I am headed out with pad chief Eva Renninger (15419) in a fast red golf cart. A dozen contractors, big guys driving trucks and forklifts and wearing NFL-team-logoed hard hats, fall in behind.

We stop at Pad 1. Before my feet hit the ground members of the pad crew are hurriedly unlatching tie wires and disconnecting air conditioning ducts and positioning a forklift next to the tent. They fold up one end of the tent accordion style and lift the whole thing up on wheels.

As they pull the tent away, the rocket emerges. It is in its horizontal position, affixed to a large rail launcher, and aimed right at the nearby sand dune. A small American flag taped to the rocket's nose tip slaps in the breeze.

When I return to the LOB 12 minutes later, Dean and Steve are remotely raising the launcher to its upward position, watching the rocket on a video screen as they adjust the azimuth and elevation within tenths of a degree.

Pre-launch pressure

At T-minus 46 minutes Eva and Norm Corlis (15419) head out to the launch pad one last time to install the arming plug, a step that provides the electrical power to the rocket needed to initiate the launch sequence. They return to the LOB and return the key, which is kept in a lockbox as a safety precaution.

At T-minus 40 minutes the "terminal count" begins — the final and most critical run-up to launch. Dean and Steve are feeling some pressure.

We are on schedule, says Dean. No anomalies so far. This is good, he says, but the team is taking nothing for granted.

"We start to get tense during this part of the sim," says Dean, "and it's not even real. Actually, I get nervous just typing the countdown."

Finally it's launch time. The automated PA voice reports 3 . . . 2 . . . 1. Everything is nominal and the team follows an imaginary rocket into space and reports its imaginary destruction.

While the rocket is in flight, KTF team members receive and record telemetry information from the rocket, provide useful real-time data displays, and capture launch video.

Four minutes later, people are scattering from the control room.

"There's still a lot to do," says Steve. "There's a missile on the pad."



MEMBERS OF KTF'S pad crew disassemble cooling conduit used to keep parts of the rocket at the optimum temperature prior to launch. Clockwise from lower left are Warren Kawaguchi (15419), Jim "Mack" McDonald (Orbital), and Hovey Corbin (15419).

We have to safe it and get it ready for Wednesday." (See "Countdown can be a pressure cooker below.")

But the KTF team has passed every one of its tests. They're ready.

Blessing the rocket

Tomorrow a limited staff will convene and run through a series of mini sims.

Father Tom, a local Hawaiian priest, will bless the rocket from the roof of the LOB with a small contingent from PMRF and KTF present. Many years ago locals requested the ceremony out of reverence for native Hawaiian burial grounds on the site. Now it's tradition. A prayer is orated, and salt is scattered to ward off evil spirits.

"No rocket leaves this base without being blessed by a native priest," says Al.

At 2 p.m. Al sends everyone home for a good night's rest. He'll stay. There is unconfirmed word that the Director of the Missile Defense Agency, Lt. Gen. Ronald Kadish, USAF, the ultimate customer for this test, is on the island and might visit KTF this afternoon.

3-2-1 . . . Countdown can be a pressure cooker

By John German

On launch day, the LOB is a hive of activity as the KTF team focuses on the highly complex work of launching a target missile for a missile defense test.

Out on a launch pad a thousand feet away sits a rocket containing high explosives and thousands of pounds of rocket fuel. Safety is job one. But there are other priorities.

The world is watching. Generals, legislators, critics, the president, and the world's bad guys all have a stake in the outcome of the work that takes place here today.

The roster of people allowed to remain on-site has been pared down to 55 people for safety reasons. The 55 includes VIPs who are here to observe the test.

A 10 a.m. to 2 p.m. launch window, defined in part by the fly-by schedules of orbiting satellites, provides a finite deadline for getting the job done.

The test's international profile, high safety standards, and unforgiving schedule add up to a

great deal of stress for the KTF launch team, says Jerry McDowell, Director of Aerospace Systems Development Center 15400.

"I can't say enough about the professionalism of the Sandia KTF team," he says. "They are remarkably adept at balancing the needs and demands of customers with responsible management of one of Sandia's most valuable assets, all in the midst of a fishbowl of oversight and intrusive requirements."

"Somehow, they always manage to keep one eye on the customer's wish list and the other on being good stewards of Sandia people and property and good neighbors to the Navy," he says. "They can be counted on to execute safely, securely, and responsibly."

Control team

At the helm — a console atop a raised floor at the back of the LOB's control room — sit Dean Manning, Steve Lautenschleger, and Al Lopez.

Dean serves as the intra-range test director, communicating with KTF personnel and verifying

(Continued on page 8)



THE FM-5 TARGET MISSILE lifts off from KTF's Pad 1 on its way to planned intercept 55 miles above the Pacific. The private Hawaiian island of Niihau 18 miles southwest of Kauai is in the background.

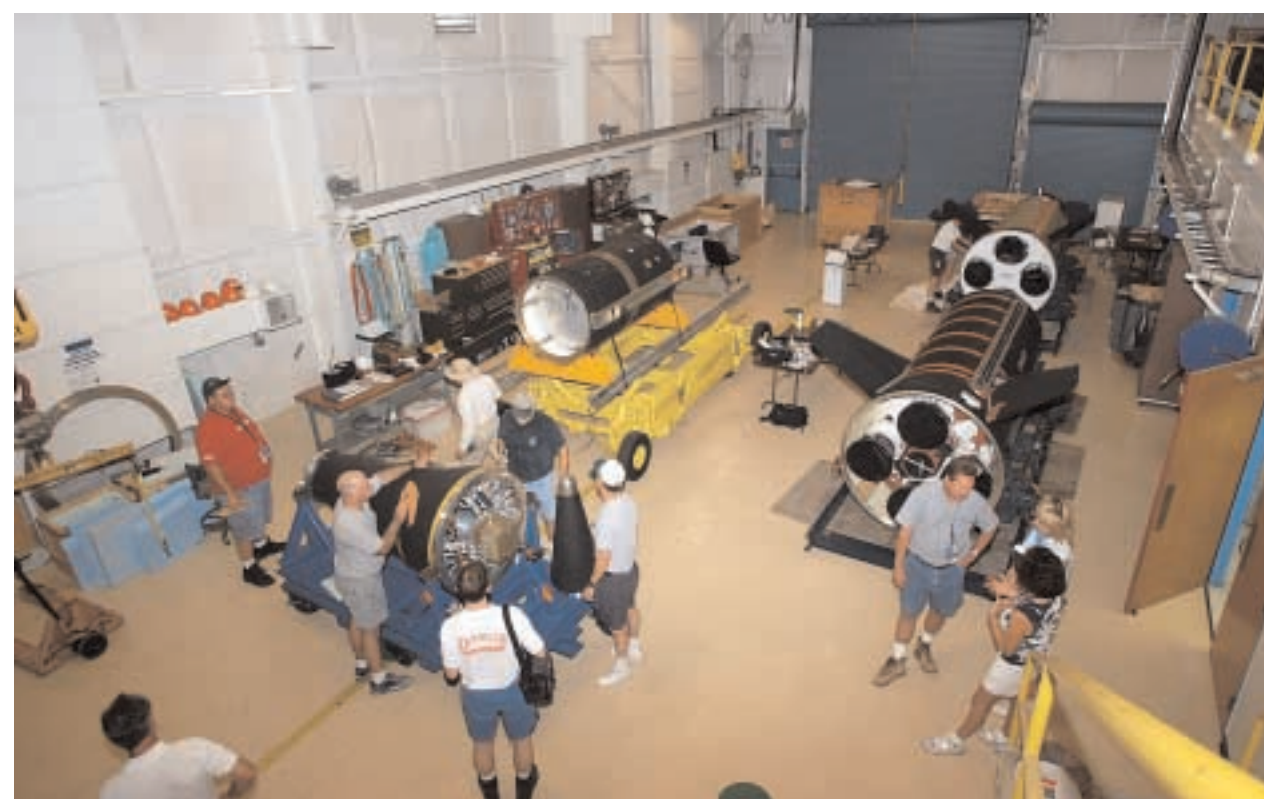
The Kauai Test Facility . . .



TARGET ROCKET for the FM-3 Navy Aegis Ballistic Missile Defense test lifts off from KTF on June 13, 2002.



WORKERS TOW the FM-5 target vehicle to Pad 1. The Launch Operations Building is in the background.



KTF CREW readies the FM-5 missile for transport to Pad 1 several weeks before launch in the site's Missile Assembly Building, one of four permanent buildings constructed in the late 1980s.

Photos by Diana Helgesen



PRIOR TO LAUNCH, Roy Apo and Sharon Cabral (both 15419) release a final weather balloon. Pad 1 is in the background.



KTF STAFF LOAD the FM-5 target rocket to its rail launcher weeks prior to launch.



A FOUR-HOUR time difference with Albuquerque is little consolation to Sandia travelers who must arrive at KTF as early as 1 a.m. local time on launch day.



HOVEY CORBIN (15419) in the saddle of an ME-16 tracking telescope one mile south of Pad 1. The ME-16 follows the rocket's trajectory shooting video and pulling film at 100 frames per second.

Countdown

(Continued from page 5)

completion of a torrent of on-screen launch tasks.

Steve serves as the supervisor of test operations (STO), the inter-range point of contact who communicates KTF's progress to the PMRF launch team stationed in a similar control room two miles south. PMRF is the lead test range for this launch.

Al assumes the role of troubleshooter, moving about the LOB helping solve problems and readying contingencies in case something goes wrong.

Accumulation of problems

At T-minus 3:30:00, launch operations are suspended for an hour because a cargo freighter wanders into the impact zone. PMRF tries to hail the captain.

PMRF pushes back the launch time by an hour, then two as the Navy realizes that because of the delay, two of its observatory aircraft will need to land and refuel.

Then Orbital has a problem — it can't talk to the target missile's navigation system. Could be an electronics problem or a cable connection. Orbital's engineers pull out the circuit designs. Someone needs to visit the pad to check the connection. Orbital program manager Joe Dimaggio lets go one of his trademark incendiary outbursts.

Later something, perhaps rogue radio traffic, is interfering with KTF range communications. "Somebody's walking all over us," says Dave Salguero.

Game on

A few minutes later Orbital overcomes the electrical problem, but KTF's countdown computers lock up. Another setback could scrub the launch for today. What's worse — it could be KTF's fault.

Dave, Wilson Brooks, and Kenny Abigania



POWERING UP THE ROCKET from the missile control console is Norm Corlis.

(15419) work some magic, and the computers are up. The cable connection is fixed, the radios are working, and the freighter is gone. But KTF is 20 minutes behind PMRF's count.

"If the coffee doesn't wake you up, some red on your computer screen will," says Dean. Red highlighting denotes launch tasks that haven't been completed on schedule.

"No problem," he says. "We practiced this. We can catch up."

Steve is stoic, but Dean's feet do a nervous tap dance under his chair.

The two speak quickly and clearly into their headsets as they plow through the count list, checking off tasks, gaining ground. At T-minus 40 minutes the red is gone and KTF is back on schedule.

Here at last

Al smiles. "There's an old rocketeer's superstition," he says. "The ones that beat you up the worst are the ones that fly the straightest."

"Range is green, sensors green, ship is green," reports PMRF over the radio.

Finally, at 1:30 p.m., the final count . . . 5 . . . 4 . . . 3 . . . 2 . . . 1 . . .

From where I now sit, one mile south of the launch pad next to a tracking telescope operated by Hovey Corbin (15419), I see white smoke engulf the lower half of the rocket. Then the missile slowly rises, picks up speed. Blue pieces of Styrofoam from an external cooling chamber slough off and slalom down.

The roar reaches us.

The white contrail curls like a gift ribbon against a clear blue sky, and the missile is out of sight.

The radio crackles: "Target away . . . telemetry good . . . radar good . . . TM track good . . . trajectory is nominal . . . cross range is nominal . . . motor pressure nominal . . . we have target burnout." Then more silence. It's T+60 seconds.

"We have a good target," reports Steve's voice over the radio.

"Roger that. Good target," reports PMRF. That's the signal: KTF has accomplished its part of the mission. Now the KTF team sits back and listens.

'Mark India'

Hovey switches to auto track, and the telescope robotically follows the rocket's expected trajectory, still shooting video and pulling film at 100 frames per second. He doubts we will be able to see the intercept — too far away — but you never know.

"If something goes wrong, we'd

like to document what happened," says Hovey.

Another countdown . . . 3 . . . 2 . . . 1 . . . and we're told the interceptor is away from the Navy cruiser 250 miles downrange.

Thirty seconds later a third countdown marks the anticipated intercept.

Then silence. Hovey and Diana Helgesen exchange looks. We should have heard "Mark India" — the official designation for an intercept. We didn't.

Something went wrong. No intercept.

Good news and bad

Back at Pad 1, the smell of rocket propellant hangs in the air like 1,000 just-popped firecrackers. People are picking up debris. Some are pocketing small pieces as souvenirs. The faces tell the story. There is relief, but no one is smiling.

Sandia provided as good a target as possible. But there's disappointment the overall mission did not succeed.

Getting ready for the next launch

At this point, no one knows for sure what happened up there. That will come later, after a lot of study of the data, much of it provided by KTF, perhaps. The good news is that the customer will learn something from the test.

The ceremony is brief. Already trucks and people are moving toward Pad 15, where the FM-5 backup rocket, identical to the one just launched, sits under a tent. The KTF team will move it indoors and prepare it to be the primary target for the next mission, FM-6, scheduled for December.

It is the continuation of a cycle that has continued for 30-plus years at KTF, that has resulted in the launches of more than 350 rockets, and that has involved many hundreds of Sandians. (See "Then and now: KTF contributions have evolved with changing national security needs" on next page.)

The FM-5 mission

The purpose of the Missile Defense Agency's (MDA) Aegis Ballistic Missile Defense (BMD) FM-5 mission — nicknamed "Stellar Hammer" — was to intercept a KTF-launched target vehicle during the "mid-course" portion of its flight with a radar-assisted SM-3 interceptor launched from a Navy cruiser 250 kilometers offshore.

Midcourse refers to the rocket's long flight through space, after booster separation and before reentry.

The target rocket — an M-56A missile made from the recycled second stage of a Minuteman I ICBM, is intended to simulate, roughly, the trajectory of a scud-type missile fired at a Navy ship formation.

The target rocket was overlaid with a grid of coaxial cables so data could be collected about where exactly the interceptor struck the warhead. In addition, it contained a payload of high explosives so a successful intercept would create an explosion in space that could be characterized by radar on the ground.

"This was the first time the customer has looked at the aftermath of an intercept," says Al Lopez, Manager of KTF and Remote Ranges Dept. 15419.

The goal was to gather radiometric data to help the customer, the MDA, answer the questions: "How do we know we've achieved a lethal kill?" and "What does a kill look like from ground radar?" he says.

The SM-3 interceptor is a ship-launched missile intended for theatre defense.

FM-6, the next Aegis BMD test, is scheduled for December.



FM-5 TARGET ROCKET on Pad 1's rail launcher ready for liftoff. The flexible conduit supplies cold air to a fall-away cooling chamber affixed to the rocket, which keeps critical electronics cool until launch.

Then and now: KTF contributions have evolved with changing national security needs

By John German Photos by Diana Helgesen

During KTF's 41-year history, more than 350 rockets have been launched from the site. But KTF's work has always waxed and waned with the political winds and national security priorities of the day, says Dick Hay, Manager of Range Integration and Lab Support Dept. 15406, who served as KTF's on-site manager from 1990 to 2002.

In September 1961, following a three-year atmospheric nuclear test moratorium between the US and Soviet Union, the Soviets abruptly resumed testing, conducting 45 tests in two months. The US found itself flat-footed — unprepared to quickly resume its own program.

Congress demanded a response, and the US weapons community began preparations for Operation Dominic, a series of atmospheric and exoatmospheric nuclear tests conducted at and launched from islands in the Pacific south and southwest of Kauai.

Barking Sands

By early 1962 the Atomic Energy Commission had acquired the use of part of a military reservation on western Kauai known as Barking Sands. From the site Sandia launched diagnostic rockets to measure the effects of the 29 Operation Dominic air bursts and five Dominic Fishbowl high altitude tests conducted in 1962.

The Barking Sands site later became the Kauai Test Facility.

In 1963, the US and Russia entered into an atmospheric test ban treaty that again outlawed above-ground nuclear tests and closed down KTF. But the US Senate, as part of the treaty's ratification, required that the US maintain a readiness to conduct such tests, and KTF was rebuilt in 1964. Much of KTF's maintenance funding continued under this readiness umbrella until 1976.

During the late '70s and early '80s, KTF was kept active by three launches of the developmental Sandia Winged Energetic Reentry Vehicle (SWERVE), a DOE- and DoD-funded technology demonstration intended to provide precision delivery through use of a maneuvering reentry vehicle, says Dick.

Star Wars revival

In the mid '80s the Reagan administration sought to revive rocket launch capabilities for the Strategic Defense Initiative development program, and KTF was modernized. In 1990 the site got a new launch pad, new electronics, new computer systems, and several permanent buildings, he says.

The upgrade included a 54-foot missile service tower to accommodate vertical launches of large missiles. Four Strategic Target System (STARS) three-stage missiles were launched at KTF from 1991 through 1996.

A fifth STARS launch from KTF is being planned, according to STARS program manager Eric Schindwolf, Manager of Missile & Flight Systems Dept. 15425.

Missile defense

The missile defense mission brought other new work to KTF in the 1980s and 1990s, including a



ABOVE THE CLOUDS — This building at the peak of Maui's 10,000-foot Mt. Haleakala is probably Sandia's highest-altitude site. No one is stationed permanently at the building, but during flight tests that take rockets down the Hawaiian island chain, bay doors at the back of the building can be opened so instruments, such as tracking telescopes, can be used to observe the flight. Sandia has occupied the site since 1962 under an agreement with the Federal Aviation Administration.

series of countermeasures experiments and target discrimination experiments for which several diagnostic rockets were launched from Kauai, says Dick.

During the early '90s KTF supported periodic scientific experiments, a nuclear depth-bomb test series, ionospheric studies being managed by Los Alamos National Lab, and space-based sensor development projects for various agencies.

In the late '90s KTF provided launch support for a steady stream of missile defense missions and in 1998 began to support Navy Aegis Ballistic Missile Defense tests such as FM-5 by launching missiles that simulate enemy offensive systems. That work continues. (See "KTF's future a moving target" below.)

Some tests more difficult

Among the more complicated flight tests Sandia has supported was the MSX mission in 1996, one of the STARS launches. The missile carried 26 experiment packages that were released into space in a timed sequence.

Strypi-Lace, another complicated and successful mission in 1991, required that KTF launch a Strypi rocket into space over Maui, where its trajectory paralleled that of an orbiting satellite that gathered data about the plume created by the Strypi's burning third stage motor.

Close coordination with NASA was key as the KTF team attempted to insert the rocket into the exact space and time required to "rendevous" with the satellite, says Al Lopez, Manager of KTF and Remote Ranges Dept. 15419.

"Timing was everything," he says.

"Sandia's flight test ranges at Tonopah and Kauai are enabling capabilities that have historically made critical contributions to many of the largest programs undertaken by Sandia," says Dick. "They also have been a powerful tool in attracting and satisfying customers for our engineering services."



KTF TYPICALLY LAUNCHES smaller rail-launched diagnostic or target rockets, but during the early 1990s the site launched four large, three-stage missiles as part of the Strategic Target System (STARS) missile defense program. This STARS launch took place in July 1994. At least one more STARS launch is planned for KTF.

KTF's future a moving target

Today the nature of KTF's work is changing — again — says Jerry McDowell, Director of Aerospace Systems Development Center 15400.

The capabilities available at KTF are as relevant today as they were in the early 1960s, but the missions that drive the use of those capabilities are shifting, he says.

"We no longer expect to use KTF to launch diagnostic rockets in support of high-altitude nuclear tests, and it's been a decade since a nuclear weapon development program used the site," he says. "We are instead busy applying our expertise and KTF to support the nation's missile defense program for the DoD. Our work aligns very well with the new strategic triad laid out in the most recent Nuclear Posture Review."

In recent years, Sandia's management team has worked hard, especially back in Washington, to assure continued support for KTF from customers such as the Missile Defense Agency (MDA) and the Navy, with good success, he says.

"I think the future is reasonably bright," says Eric Reece, 15400 Deputy Director and Manager of Missile Defense Systems Program 15401. "We are continuing to develop a partnership with PMRF. Our MDA customers from top to bottom continue to express their desire to have Sandia be a major player on the island. We are expecting some significant upgrades to expand our launch capability. And although we have a lull in FY04, FY05 appears to be very busy."

"KTF is better known outside of Sandia than inside," says Walt Rutledge (15414 Manager). "We're small, but what we do per person exceeds what anyone else is doing. The KTF customer gets a heck of a bang for the buck."

KTF team supervisor Dean Manning

(15419) says Sandia's high number of advanced degrees and a can-do attitude accounts for that difference.

"That's what makes this a successful operation," he says. "We are just surrounded by gifted people."

Dean says he's working to integrate KTF with PMRF, and to build trust.

"We need to change the old model, where we were an autonomous entity," he says. "These days, autonomy will drive us out of business. We depend on PMRF, and PMRF is starting to see how we can help them. We're making progress."

"We say at Sandia that we are a national security lab," adds Jerry. "I'm excited about building on that assertion and using places like KTF to continue to play an important role in a dimension of national security that complements our nuclear mission."

The work the KTF team does in support of the DoD also exercises critical skills and expertise that are relevant to the future needs of DOE and NNSA, he says. But the management and leadership challenge is to get DOE, NNSA, and DoD to recognize that investments in KTF benefit each party and collectively the nation's security, he says.

"I've been very pleased in recent years at the progress we've made internal to Sandia in viewing KTF as an important element of the Labs' work," Jerry says.

Lynn Jones, VP for Lab Integrated Management System and Services Div. 7000, and others have helped reduce the cost to outside customers at KTF by reducing the administrative tax burden at the range, he says.

"That is one example of Sandia saying to the Missile Defense Agency that we are real partners in delivering 'exceptional service in the national interest,'" Jerry says.

Mileposts

Photos by Michelle Fleming



Charles Adams
30 9125



Terry Hutchinson
25 14181



Robert Johnston
25 1646



Patty Jojola
25 10257



David Duggan
20 6516



Jim Kajder
20 14407



Randal Schmitt
20 1118



David Schulze
20 9122



Gloria Solis-Spidle
20 9337



Pat Willan
20 3521



Mary Adams
15 9623



Olin Bray
15 5941



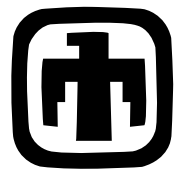
Pat Griffin
15 6423



Nanette Morton
15 9600



Lynne Schluter
15 10824



Management promotions

New Mexico

Jon Rogers from DMTS, Strategic Weapons Studies Dept. 9743, to Manager, National Security Studies Dept. 9745.

Jon joined Sandia in October 1986. From 1986 until 1991, he was with the Vibration Testing Department, where he conducted vibration tests in support of various nuclear weapon and work-for-others programs. John developed combined dynamic environment test facilities for combined acceleration and vibration testing and for combined vibration and acoustic testing.



JON ROGERS

He did system studies in the New Initiatives Department and then the Strategic Weapons Studies Department from 1991 until 2003. Jon's recent studies have involved investigations into testing capability requirements and alternatives to local test capabilities, weapon systems requirements, and characterization for defeat of underground facilities. The underground facilities studies have included weapons effects on the underground structures from both conventional and nuclear weapons.

Jon has a BS in engineering science and an MS and PhD in engineering mechanics, all from Iowa State University.

John "JF" Nagel from DMTS, W7601 Life Extension Dept. 2132, to Manager, 276-1/Mk4A Qualification Dept. 2137.

JF joined Sandia in July 1984, as a member of the Reliability Assessment organization (now in the Surety Assessment Center). He transferred to the New Mexico Weapons Center, where he was a system nuclear safety design engineer on the B90 Weapon System. A year later he became the Weapon Center's first Directorate ES&H Coordinator in preparation for the DOE Tiger Team reviews. He then moved to Use Control

Recent Retirees



Gerard Krause
42 14011



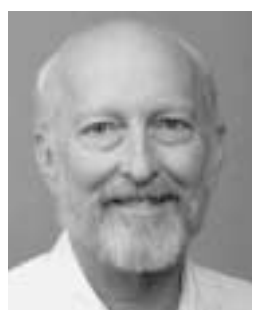
John Finger
41 6211



Earnest Roberts
21 1735



Robert Edgar
37 6218



Jim Pierce
33 6142



Richard Pettit
32 2542



Dick Hawkins
20 9311

Systems Center 2100, where he was project lead for the MCCS Encryption Translator (MET) development for the B61-3,4,10 Alt 339. JF also managed the PAL Equipment Stockpile Obligations project and led the establishment of the Advanced Code Control program to develop the next-generation Permissive Action Link Coded Switch.



JOHN "JF" NAGEL

In January 2000, JF took a two-and-a-half-year assignment in Washington, D.C., as Technical Surety Advisor to NNSA HQ, NA-12. Upon completion of that assignment, he received the DOE/NNSA Defense Programs Award of Excellence "for significant contribution to the Stockpile Stewardship Program. JF returned to Sandia's New Mexico Weapon Systems Center in July 2002 and worked as Deputy Project Manager for the

W76-1 Life Extension Project.

He has a BS and an MS in mechanical engineering from the University of New Mexico.

Steven Johnston from PMTS, Product Testers Value Stream Dept. 14407, to Manager, New System Testers Dept. 2956.

Steve came to the Labs in 1975. His career has primarily encompassed test equipment development for weapon component acceptance and development. He has also worked on AMAC and flight line readiness equipment. Steve was the lead for transferring equipment from Pinellas to Sandia for neutron tube and generator production in Division 14000.



STEVEN JOHNSTON

He has a BS in electrical engineering.

Standdown

(Continued from page 1)

DOE/NNSA, which entrusts us with sensitive and classified information and material in support of our mission, and those expectations are very high. We all have work to do in order to meet those expectations."

Significant endeavors

Ron says making the standdown relevant and meaningful for each organization is a significant challenge.

"Different departments have very different security concerns, depending on their mix of work and customers, volume of sensitive or classified material, and how information is handled," he says.

The implementation of the standdown, announced Oct. 28 (*Lab News*, Oct. 31), was delayed for a couple of weeks to allow time for a team to develop supporting tools and information to create a structure that included several mandatory activities. The responsibility was then put on department and center management to add to those activities including discussions, presentations, or readings that were most relevant to the groups' work and therefore would provide the most benefit.

Departments and centers were encouraged to discuss what changes in policy or process would make it easier for them to do the right thing, and harder to do the wrong thing.

"We will be collecting those inputs and looking for suggestions of broad applicability and high payoff that we can implement to improve our overall security posture," he says, "That did happen following the previous security standdown, although we did not communicate the fact that changes had been



RON DETRY, chief security officer and VP of new Integrated Security Div. 4000, talks to members of Dept. 12640 as part of the security standdown. Groups conducted their standdown activities at different times over the eight-day period. (Photos by Randy Montoya)

made as a result of the feedback. We hope to do that better this time."

Cyber concerns

Ron says his biggest concern is cyber technology and the vulnerabilities it poses to security. He says each individual can help by constantly being aware of the cyber security threat.

"Information networks make us very productive by making it easy for us to access vast quantities of information very quickly," says Ron. "But the same technology makes it possible for others to access vast amounts of our information quickly, without our even knowing it happened."

He says each Sandian can ask if the information placed on the networks is appropriately protected. Each Sandian can be alert to things that "look funny" or raise security concerns, and pass on concerns or suggestions for improving the protection of cyber information to management or to the groups responsible for cyber security.

Sandia budget

(Continued from page 1)

"I am extremely pleased to see that funding for our missions is strong, and that we will be able to advance important projects such as the Microsystems and Engineering Sciences Applications [MESA] project," Paul said. "These efforts strengthen our national security portfolio and position Sandia for a positive future." Sandia now receives funding from many agencies of the government for supporting research and development from military systems to homeland security.

The Senate-House appropriations bill, which still must be signed by the President, includes \$185 million in major construction projects for Sandia, including the following:

- \$87 million to continue construction of the MESA complex.
- \$29.85 million for construction of the Center for Integrated Nanotechnology, a joint venture of Sandia and Los Alamos National Laboratory located at the Sandia Science and Technology Park in Albuquerque.
- \$36.4 million for the test capabilities revitalization project, which includes the aerial cable facility and a new thermal test complex.
- \$20 million for exterior communications infrastructure modernization.
- \$12 million for the Distributed Information

Systems Laboratory at Sandia/California.

The MESA project is Sandia's largest major capital construction project, with a total cost of \$462 million and completion slated for 2008. It will create three facilities and provide the equipment required to design and prototype qualified microsystems-based components for nuclear weapons. MESA is part of the National Nuclear Security Administration's (NNSA) microsystems engineering effort, which integrates essential activity for the Stockpile Life Extension Program and positions DOE/NNSA to meet new national security initiatives and directions.

Appropriated funds also provide \$4 million for the Z-Pinch inertial fusion energy research program and \$5 million for modification of the beamlet laser for the Sandia Z machine.

The appropriations bill includes \$6.272 billion for all weapons activities throughout the NNSA laboratories, a \$254 million increase over FY2003. The bill provides \$1.327 billion for NNSA nonproliferation activities. Both Sandia and Los Alamos national laboratories are key participants in this work.

The bill also funds key DOE programs in renewable energy, water desalination, and nuclear energy research and development, as well as diverse programs in the basic energy sciences. Sandia also performs work for other government agencies. The aggregate impact of all these funding sources is expected to exceed \$2.2 billion for Sandia.

— Chris Miller

Eubank expansion project completed, heralded



THE WIDENING of Eubank Boulevard from Central Avenue south to the Eubank Gate of Kirtland AFB is complete, and a ceremony to celebrate the project's conclusion was held Nov. 17. Here Kirtland commander Col. Henry Andrews Jr., Albuquerque Mayor Martin Chavez, and Sandia President and Labs Director C. Paul Robinson gather at Eubank and Gibson SE, where the ceremony took place. More Sandians use the Eubank Gate than any other entrance. "The widening of Eubank Boulevard saves thousands of Sandia employees time each day as they drive to and from work, and it serves as a beautiful entrance to Sandia," said Paul. "I am thankful to Mayor Chavez, the city council, and the many community leaders who wrote letters in support of this project." The Eubank expansion also provides much easier and more attractive access to the growing Sandia Science and Technology Park, which now has 15 tenants employing more than 600 people. (Photo by Randy Montoya)

Series of initiatives started in March

In a memo to all Sandians, Sandia President C. Paul Robinson said the standdown is the latest in a series of initiatives to improve security at the labs.

"Our nation places a great responsibility in our hands each day, based on trust that has been painstakingly earned by more than 50 years of exceptional service," he said. "It is imperative that we maintain that trust by ensuring security at our lab remains uncompromised."

Improvements in security began in March when Sandia announced changes in its security management (*Lab News*, April 4).

Since then initiatives have included the appointment of a new Sandia vice president (Ron Detry) to oversee security; the hiring of additional security guards; the creation of a corrective action team to identify cultural, structural, and operational issues that have given rise to security problems; a new corporate policy that defines management's responsibility to respond to security concerns; mandatory training of all management to improve how issues are handled; and now the implementation of Labs-wide training to ensure security remains strong.

Sandia has undergone increased oversight of its security operations. The latest example is a comprehensive audit of Sandia's security practices by the DOE Office of Independent Oversight and Performance Assurance (OA). Although the classified report, which is still a preliminary draft, acknowledges Sandia's recent security improvements, it also outlines areas in need of improvement. The OA report is one in a series of both internal and external reviews over the past year that are assisting Sandia in improving security operations.

"While we have made major progress in our security performance, problems still exist," Paul said. "We cannot fulfill our missions if we are perceived to be less than 100 percent vigilant in the protection of our classified assets. This is a responsibility shared by all Sandians."

Good news for a green world!



You can now recycle the Sandia Lab News along with your standard white office paper.