

Unmanned weather research aircraft sets a new record

Atmospheric models will gain from data gathered by high-flying Altus

By Nancy Garcia

California Reporter

The biggest contributor to the greenhouse effect is, like the weather, beyond control, but not beyond attempts to predict its behavior. In fact, the role of this contributor — water vapor — is a key element in perfecting computer models that predict global warming.

"Water vapor is the dominant greenhouse gas," says Sandia engineer Will Bolton (8120), deputy technical director of a DOE effort that addresses this question, the Atmospheric Radiation Modeling - Unmanned Aerial Vehicle (ARM-UAV) program.

"There's more of it than carbon dioxide, and it's a strong absorber of heat. So high clouds provide cooling when they form over an area where the earth has warmed up, acting like a thermostat." At night, however, a layer of clouds can act like a blanket, trapping in heat that radiates from the ground, just like the windows of a greenhouse reflect infrared radiation back into the enclosed space.

This fall, the ARM-UAV program gathered data throughout the night and day from a high-altitude, long-endurance aircraft that took aloft instruments to measure radiation flux to and from the Earth, gathering data around the clock. This unmanned aircraft, the Altus, conducted

what is believed to be the longest scientific flight of its kind, 26 hours and 11 minutes — a first for unmanned, high-altitude, long-endurance weather reconnaissance.

The flights took place in Oklahoma in October, when many scientists were gathered for several related experiments. The DOE's Cloud and Radiation Testbed (or CART) site in north-central Oklahoma was subject to an "intensive observation period" for water vapor at that time. Ground-based instruments, weather satellites, and weather balloons took complementary measurements, providing a detailed profile of water vapor.

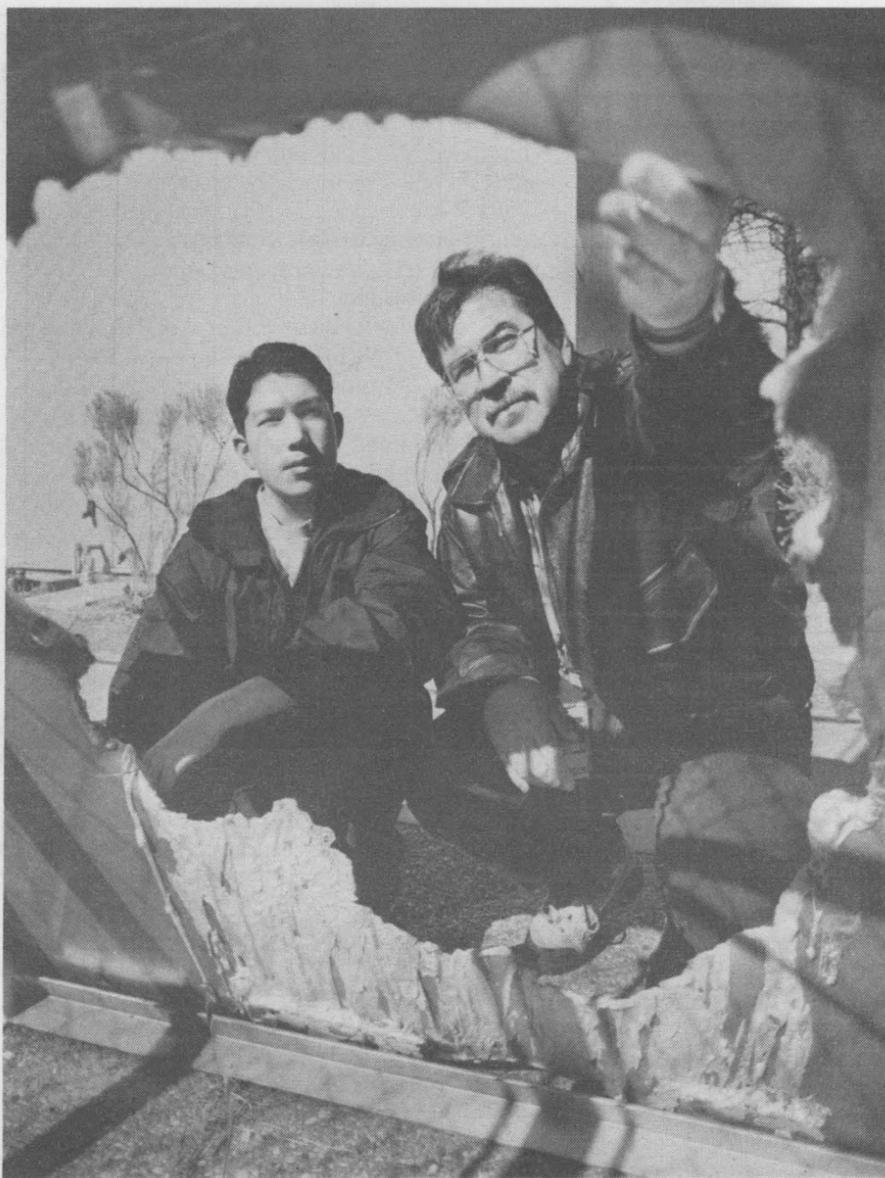
Altogether, the water vapor measurements should help computer modelers more accurately forecast global warming. Carbon dioxide, a

At night a layer of clouds can act like a blanket, trapping in heat that radiates from the ground, just like the windows of a greenhouse.

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Sandia National Laboratories **Sandia LabNews**

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TEST RESULTS — Richard Sanderville (12615) shows nephew Isaac Sanderville (left) the hole left in a half-inch-thick aluminum plate during a test at the Solar Thermal Test Facility in 1989. Richard and Isaac were participating in Sandia's Take Your Sons to Work Day on Nov. 5. Approximately 800 boys visited Sandia to see what their parents, relatives, and friends do in a typical work day. Take Your Sons to Work Day was sponsored by Charlie Emery, VP of Human Resources Div. 3000, and coordinated by Lisa Polito of Community Involvement and Issues Management Dept. 12650.

(Photo by Randy Montoya)

Sandia awaits DOE/HQ's response to workforce realignment plans

Numbers, likelihood of VSIP not yet known

As of press time Wednesday, Sandia's Human Resources Division was in a "holding pattern" of sorts, waiting to hear from DOE Headquarters about whether it will approve Sandia's workforce realignment plans for FY97.



Rumors have been circulating for weeks about possible staff realignments and a monetary incentive similar to the one offered last winter to employees who agreed to leave the Labs voluntarily. But, said Don Blanton, Director of Human Resources Center 3500, none of the rumors can be validated or invalidated until DOE responds to Sandia's plan.

"DOE is still assessing the proposal from Sandia, as well as others from across the complex," he said.

Sandia has identified impacted positions and has proposed a Voluntary Separation Incentive Program (VSIP) in response to a variety of staffing pressures, Don acknowledges. These pressures include funding shifts among Labs programmatic areas and mismatches between employees' skills and Sandia's business needs.

"We're hopeful that most if not all of our staffing problems can be resolved again this year without layoffs," he said. "At this point, it's really too early to tell."

Any announcement regarding the numbers of impacted positions and whether or not a VSIP will be offered will be communicated to employees primarily through their managers. Plans are underway to provide additional information via packets mailed to each employee, during town meetings at both the New Mexico and California sites, by way of articles in the *Sandia Daily News* and *Sandia Lab News*, and on Sandia's Internal Web.

Formal realignment process returns

Any staffing changes will occur with the help of Sandia's Workforce Realignment Process, a staffing tool proven during last year's realignments that is intended to provide a fair, no-surprises approach to resolving "skills mix" imbalances and funding shortfalls through a combination of internal transfers, retraining, and other staffing mechanisms, says Karen Gillings, Manager of Staffing Dept. 3535.

The three-step approach "formalizes the process by which Sandia moves the right people to the right places within Sandia, and lets go of those people whose skills no longer match Sandia's business needs," she

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John Crawford touts Sandia's progress in time of uncertainty

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WIPP compliance certification application submitted to EPA

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7

Russian delegation learns tech transfer techniques at Sandia

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DOE & Sandia adopt new process for assessing Labs' performance

This & That

A tough field - I sympathize with folks who work in quality, because people really love to point out their mistakes - especially those in print. Dominic Montoya (2611) received some circuit boards recently from a manufacturer. The accompanying letter confirmed that the boards met specifications, that appropriate documentation was on file, etc. It was signed by the "Quality Control Manger." Another victim of a computer spell checker, I assume.

* * *

Deadlines & schedules - Because of the short workweek next week, the deadline for news and ads for our next issue (Dec. 6) is noon Wednesday, Nov. 27. In years past, we often altered the *Lab News* publication schedule around Sandia's Thanksgiving and end-of-year holiday breaks, but the way everything breaks this year, we'll maintain our normal alternate-Friday schedule through the Dec. 20 issue. The first 1997 issue will be published Jan. 17. Normal "Friday-before" deadlines apply for all papers after the Dec. 6 issue.

* * *

Proud to be a shoe shill - There are many good holiday-season charity drives, but my favorite is Sandia's Shoes for Kids campaign. Why? Because knowing your donation will keep a poor child's feet warm this winter makes your heart feel warm, too! More than 6,000 pairs of shoes have been provided to needy Albuquerque kids since the program began years ago. Contributions received before Dec. 10 will "shoe a kid" this year. Send or deliver your check to either Albuquerque office of the Sandia Laboratory Federal Credit Union (SLFCU). Make it out to SLFCU, with this notation at the bottom: "For benefit of Shoes for Kids, account 223180." If you have an account there, you can also call the Credit Union at 293-0500 and transfer money directly. A \$25 donation buys one pair of shoes, but donations of any amount are appreciated. Call Lisa Polito (12650) at 845-0089 for more information.

* * *

Got me pegged - I love the way some junk mail plays to your ego. A recent mailing for a new communications newsletter informed me that I'm "no longer just a passive commentator, but a dynamic leader in strategic development." Wow! Combine that with my charm and good looks, and my future could be bright - if only I had \$195 for a subscription.

Larry Perrine (845-8511, MS 0129, lgperri@sandia.gov)

DOE's stockpile stewardship proposal calls for construction of NIF, CFF, and Atlas facilities

The "Final Programmatic Environmental Impact Statement for Stockpile Stewardship and Management" (EIS), released by DOE last week, calls for construction of major science facilities at the Los Alamos and Lawrence Livermore national labs.

The EIS, based on detailed analysis and extensive opportunities for public comment, spells out the department's "preferred alternatives" for managing the nation's nuclear stockpile in the post-Cold War era.

Specifically, the EIS recommends construction of the National Ignition Facility and the Contained Firing Facility at Lawrence Livermore and the Atlas Facility at Los Alamos.

In stockpile management, the EIS proposes restoration of pit component fabrication at Los Alamos, downsizing the secondary and case component fabrication at Y-12, downsizing the assembly/disassembly and high explosives work at Pantex, and downsizing the nonnuclear component fabrication at Kansas City.

During the comment phase of the EIS process, some members of the public indicated they believed several of the weapons production facilities should be shuttered. In its EIS, however, DOE noted that even though no new weapons programs are anticipated, the components facilities are needed - albeit on a smaller scale - to rebuild and maintain weapons components.

DOE Assistant Secretary Vic Reis discussed the EIS and the department's "preferred alternatives" with nationwide media in a Nov. 12 coast-to-coast conference call.

Decisions on strategic reserve storage of highly enriched uranium and plutonium pits are not yet final.

The EIS is the near-final step in the more-than-three-year DOE effort to ensure that the nation's nuclear stockpile will remain a safe and reliable deterrent without underground nuclear testing. Such tests are now banned by international treaty; the US has unilaterally abstained from nuclear testing for several years.

The next step - probably within the next 30 days - toward making the EIS and its "preferred alternatives" DOE policy, is for the department to issue an official Record of Decision to accept the report.

- Bill Murphy

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LOCKHEED MARTIN



Welcome

New Mexico - Mary Abt (2151)

Ohio - Gary Zura (15100)

Texas - Judith Sturtevant (4918)

Feedback

Q: It seems like it's been a long time between Family Days out here (either full or half day). Are there plans for one in the near future? I really look forward to them.

Q: Several years ago, Sandians voted in a referendum to have an annual no-frills Family Day. In 1994, the first of these was held. There wasn't one in 1995, and no mention has been made of any being held in 1996. Why was the annual Family Day dropped? Was this decision made by Lockheed Martin when it took over the Sandia management contract?

A: There has been no decision to stop Family Day. Our budget has been cut more than 20 percent and there is just no money for such an event. The Public Relations and Communications Center ran and funded these events in the past. When I arrived in January and reviewed our budget, there was not sufficient funding to conduct a family day. This was not a Lockheed Martin decision or the result of its winning the M&O contract. In fact, many Lockheed Martin facilities have open house and family day events. We are looking for ways to hold a low-cost event in the future. We will make announcements if we are able to hold the event. Thanks for your interest and for taking time to write.

Don Carson (12600)

Q: The new method for distributing pay statements is not as secure as one would believe. When pay stubs were placed in the old brown envelopes, it was difficult but not impossible to read the pay stub without opening the envelope. I have done this many times at home with my pay envelope by placing the envelope near a high-intensity desk lamp in a darkened room. The new white-with-blue security one-piece pay stub is even easier to read by using the above method. I suggest that if Sandia continues to use the one-piece pay stub/envelope that the security printing be done using black ink. The blue ink now in use becomes transparent when backlit by a high-intensity lamp.

A: We changed the method of preparing pay stubs to improve privacy of the pay information. Under the old process, a number of individuals handled the pay stubs before they reached employees. In addition, because of the large number of statements prepared each week and the level of reliability of the inserting/sealing equipment, envelopes could be sealed improperly (or not sealed at all) or multiple statements could be sent in a single envelope. The new all-in-one mailer was implemented to resolve these issues.

The new statements were designed by business form professionals to protect private information. We have experimented with high-intensity lights and have discovered that it is possible to determine that there is printing on the statement but have been unable to read the contents. We do understand your concern and will evaluate the enhanced privacy of a black security background when we order our next batch of statements.

Ralph Bonner (10500)

Weekly Bulletin now available on fax request line

Since Oct. 1, employees have been able to read the *Sandia Labs Weekly Bulletin* only on the Sandia Internal Web. In an effort to reach employees without Web access, effective Nov. 15, the *Bulletin* is also available by fax request from Sandia Line. Call 845-6789, press 9 for Quick Dial access, and enter Quick Dial Code 1247# to have the current issue faxed to you. You will be able to obtain only the most current issue. Back issues are not available by fax request. Fax *Bulletins* will be available on Fridays, the same day the *Weekly Bulletin* goes on the Internal Web.

Because of Thanksgiving and Energy Conservation Day, Nov. 28 and 29, the *Weekly Bulletin* and job opportunities will not be issued Dec. 2. If you have questions about job postings, call Denise Stewart (3535) at 844-9070.

For information about accessing the *Weekly Bulletin* or how to submit articles for publication, call *Weekly Bulletin* Editor Janet Carpenter (12640) at 844-7841.

ARM-UAV record

(Continued from page 1)

"greenhouse gas" released by burning fossil fuel, is important because its emission can be limited by altering people's activities. Consequently, more accurate forecasts can help policymakers decide what might be done to limit the greenhouse effect.

The effects of carbon dioxide, says mission scientist Bob Ellingson, a professor of meteorology at the University of Maryland, account for about 1 percent of the "radiation budget." This budget, the energy of atmospheric heating and cooling, cannot be calculated with certainty to that degree, however.

"It turns out that the biggest uncertainty in the models really has to do with the interaction of the clouds and the radiation budget," Ellingson explains.

The Oklahoma mission provided useful data from a single package of instruments for an extended time but, perhaps more important, demonstrated that scientific reconnaissance can be conducted with a remotely controlled aircraft, he says.

A variety of tools developed at Sandia and elsewhere can potentially be installed in the Altus' payload for future missions, says John Vitko (8102), who functions as the ARM-UAV technical director focusing on scientific issues.

In meteorology, scientists would like to make long observations of cloud systems or other phenomena that may occur over remote areas.

Labs' laser-based weather-watching system debuts in the field

For the three weeks that scientists gathered in Oklahoma to study the role of water vapor in the atmosphere, an instrument developed by Sandia's John Goldsmith (8366) and Forest Blair (formerly 8366, now 8930) took a bow.

The instrument automatically detects water vapor present in the atmosphere by beaming laser light at the sky and recording any light scattered back. It is a lidar, a laser-based system that operates in a fashion similar to the way radar devices bounce signals off objects they are detecting.

"I feel that it's the world's best daytime Raman lidar," John says. It rejects background daytime light, can be run by a technician with limited training, and is computer automated.

"It takes all of five minutes to turn on, and then it operates for days without being touched by anyone," John says.

The lidar was first installed a year ago at DOE's Cloud and Radiation Testbed site in northern Oklahoma. The new laser in the system, which at first had operational difficulties, has been operating well since early last spring, John says. The lidar uses a Nd:YAG laser which emits infrared light at 355 nm (in its third harmonic). Atmospheric water scatters some of this energy and reflects back

One such area, the tropical Western Pacific, plays an important role in changes in our climate, and manned aircraft are not well suited to carry out missions there. Instead, scientists plan to park a "geostationary" remote aircraft over the region to obtain data for extended periods, according to Ellingson.

Besides the scientific contributions of the mission, he says, "engineering-wise, it's a real accomplishment."

Will says one success was integrating technical know-how and individuals from many sectors — universities, government, and industry — to make all the elements work together.

For instance, the FAA had to approve, for the first time, letting the pilotless aircraft fly at 18,000 feet and higher, in unrestricted airspace where planes rely on flight plans, instruments, and air traffic controllers to navigate safely. The

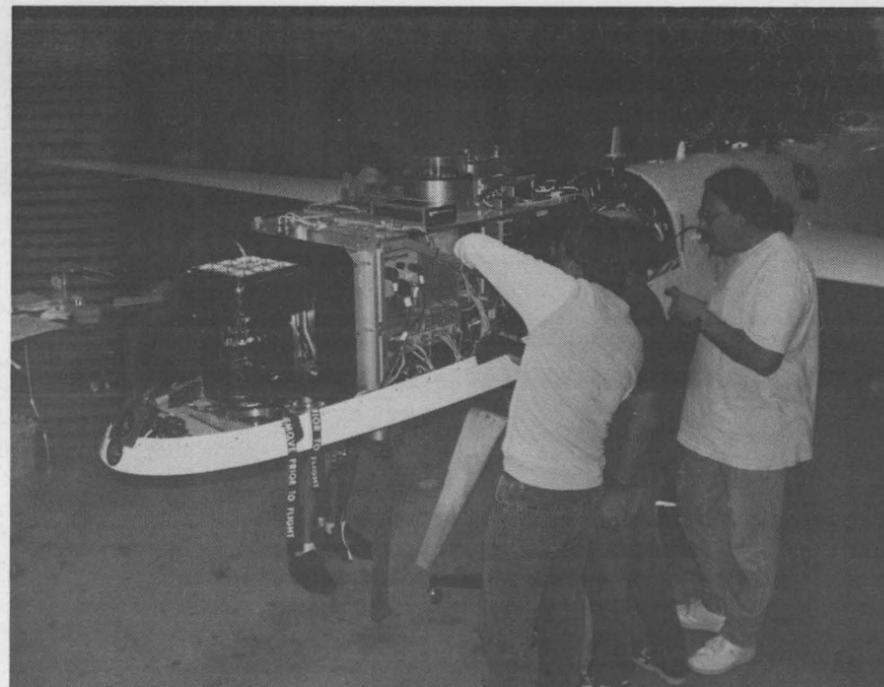
a slightly longer wavelength of light.

A major greenhouse gas that traps solar energy, water vapor has a patchy distribution that is hard for computer models to accurately portray when predicting climate change, John says.

Up until now, climate studies have relied on balloon-borne instruments launched only every couple of hours and which drift downwind. The lidar can correlate the moisture measurements taken by these weather balloons, and can provide quicker snapshots of conditions directly above the weather research site, too. It has been operating on an increasing basis since the spring, John says, and worked "beautifully, nearly continuously" during the fall focus on water vapor studies.

In fact, the lidar was used to compare data with measurements taken by the Atmospheric Radiation Measurement-Unmanned Aerial Vehicle (ARM-UAV) sensors borne by the remotely piloted Altus during one of the aircraft's missions there.

"The lidar can study practically any water vapor problem you'd want to study," says Bob Ellingson, ARM-UAV mission scientist and professor of meteorology at the University of Maryland. The field-hardened system is expected to operate



CLOUD WATCHER — Mike Ferrario (2254, left), Jim Berg (8411, center), and Dave Brown (General Atomics) install payload into the Altus.

Sandia California News

Altus is flown by a ground-based pilot whose controls and display panels resemble those of a cockpit. The Altus pilot also has a view out the front of the plane, provided by a pair of video cameras (the second camera is redundant in case the first has technical difficulties). During take-off and landing, it is escorted by a manned chase plane which Will says functions like the "eyeballs" of the UAV. In addition, a ground observer checks airport traffic during takeoff and landing.

In subsequent years, one series of ARM-UAV flights is anticipated annually. Altogether, the UAV is expected to log not more than 200 hours of flight time during the entire weather reconnaissance program.

LEAP campaign collects \$154,000

The annual Livermore Employees Assistance Plan (LEAP) collected pledges of \$154,042 during the October campaign. LEAP chair Johnny Ellison (8533) says he is pleased that the average pledge this year reached a new high of \$219 among those employees participating, up from \$203 last year.

Some 702 people, 71 percent of the site, pledged money for the 40 human service agencies, United Way, Combined Health Agencies, and the Tri-Valley Community Fund. An employee committee determines where the bulk of the undesignated funds will go after interviewing local agencies and studying the trends in giving from employees in recent years. Sandians also have the option of designating where they would like their contributions sent, and this year \$40,000 of the total pledged was done that way.

Sandia/California has held an annual drive among employees since 1969. Giving has totaled \$2.6 million over the 27-year period.

Employee death

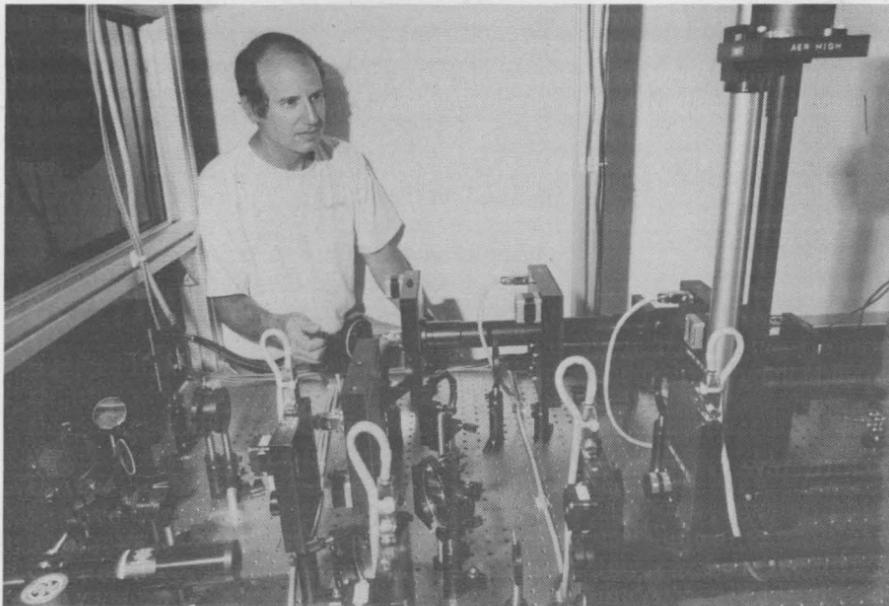


FRED HART

Fred Hart Jr. of Health and Safety Dept. 8421 died in a car accident Oct. 30. He was 48 years old.

Fred was an electrical and pressure safety engineer and had been with Sandia for 20 years.

He is survived by his parents, one brother, and one sister.



EYE ON THE SKY — John Goldsmith (8366) displays his Raman lidar system installed at a DOE Cloud and Radiation Testbed site in Oklahoma. The meteorology equipment is housed in a climate-controlled sea cargo container. It is expected to obtain atmospheric data through an overhead port for about a decade.

(Continued page 4)

Despite uncertainties, Sandia continues to make 'incredible progress,' says Executive VP John Crawford

'Every day I find myself amazed at what our people can and do accomplish. . . .'

By Bill Murphy

Lab News Staff

In an era of unprecedented change and uncertainty, it is important for Sandians to remember, Executive VP John Crawford said this week, that the Labs continues to accomplish great things and to do great and important work.

John's comments came during one of two Nov. 19 employee dialogue sessions at the Technology Transfer Center (Bldg. 825) attended by about 100 employees. John was scheduled to conduct similar sessions at both the California and New Mexico sites during the rest of the week.



JOHN CRAWFORD

In addition to prepared remarks and a video presentation about Sandia's accomplishments over the last quarter, John responded to employee questions about the possibility of a Voluntary Separation Incentive Program (VSIP), the retirement fund, the likelihood of continued direct DOE funding of technology transfer efforts, overhead costs, the potential for what might be called a "brain drain," and

speculations about the future of DOE.

In response to the question about the VSIP process and impacted employees, John apologized for being somewhat circumspect in his remarks, but explained that Sandia's recommendations regarding the process are in DOE's hands and have not received official department sanction at this time. (See "Sandia awaits DOE/HQ's response to workforce realignment plans" on page one.)

John, echoing a theme that he and Labs President and Director C. Paul Robinson have addressed frequently, said the Labs' future will be closely tied to partnerships with industry, universities, and other laboratories. Although he said he expects direct DOE funding for technology transfer efforts to completely dry up, the technology transfer program will thrive, with a large portion of tech transfer dollars coming in the form of direct funding from industrial partners. The Labs received about \$18 million in such revenues in FY96; the goal for FY97, he said, is \$30 million.

"I'm very optimistic about the technology transfer program," John said. "I don't think it's out of the question that we could eventually see \$100 million [per year] in industrial funding."

To emphasize the value of Sandia's industrial partnerships, John cited the relationship with General Motors.

"For three years we worked with GM to develop a way to spray steel onto the cylinder walls of aluminum engines," he said. The challenge brought into play Sandia's expertise in materials science and modeling, both of which are key competency areas for the years ahead. As a way of saying "thanks" to Sandia for its contributions to the successful R&D effort, GM sent a fleet of five Saturn automobiles with the aluminum/steel engines on a 1,500-mile convoy from Michigan to New Mexico.

The customer was very pleased with Sandia's work, John said, but more significant for Sandia's larger mission, as a result of the partnership "we now know how to better coat our neutron generators."

Labs continues to excel

"Business in general and national laboratories in particular," John said, "are operating in an environment of unprecedented change and unprecedented uncertainty. We face problems every day that we must solve — and there's a mental trap here. It seems our jobs are usually focused on solving problems as they come up. . . if you're not careful, you can start to think that our entire enterprise

is made up of nothing but problems, and that can start to affect the way you think.

"Nothing could be further from the truth. In spite of the change, in spite of the uncertainty, in spite of the downsizing, this laboratory continues to make incredible progress. Every day I find myself amazed at what our people can and do accomplish."

To reinforce his point about the quality of Sandia's ongoing work, John showed a video produced by Video Services Dept. 12614 that highlighted a number of significant accomplishments and milestones over the past few months.

Among the video highlights:

- Major advances in power output at the PBFA-Z facility
- The successful launch of a series of STARS (Strategic Target System) missiles in Hawaii
- Stockpile evaluation work at Tonopah
- Dedication of the Chemical and Radiation Detection Laboratory in California
- Dedication of the Robotics Manufacturing Science and Engineering Laboratory in New Mexico
- Observation of the first anniversary of the National Atomic Museum under Sandia's management
- The WIPP Compliance Certification Application submission (see story on page 6)
- A visit by officials from Japan's NUPEC nuclear energy agency to review work on reactor safety at Sandia
- Launch of the moly-99 (molybdenum-99 medical isotopes) process.
- Advanced wafer polishing in conjunction with the Sematech consortium
- Mapping science (software that displays science funding trends as a three-dimensional landscape)

Well-poised for FY97

John said FY96 was "a difficult year, but one that I think we closed out quite successfully," actually carrying over to FY97 \$20 million more than projected.

"We ended the year [FY96] at just slightly under 8,000 people after a very successful VSIP in FY96," John said. "In spite of bringing the Labs' size down by almost 500 people during the year, we still managed to hire 100 additional critical skills into the staff of the laboratory. . . All in all, I can say that in tough times we closed out FY96 in good shape, well postured for FY97."

Laser system

(Continued from page 3)

greenhouse effect, and they provide clues to the onset of cirrus clouds there.

"We have a problem in specifying water vapor distribution in the atmosphere," Ellington explains. "We're not sure of the accuracy of values that are used in radiative transfer models of how much solar energy reaches Earth."

John continues to be an "instrument mentor" for the CART site Raman lidar. Using their background in laser diagnostics at the Combustion Research Facility, John and Forest developed the lidar with help from the laser remote sensing team (also including Scott Bisson, Tom Kulp, Mark Mitchell, and Randall Kennedy, all of Dept. 8366). Forest received a Sandia President's Quality Award for his work.

—Nancy Garcia

Realignment

(Continued from page 1)

says. "It also ensures that every employee is given every opportunity to adjust to Sandia's changing needs and gets treated as equitably as possible."

In Phase One, each vice president compiled a staffing plan detailing that division's current and anticipated work requirements and how many (and what types of) people are needed to accomplish that work. Sandia's VP-level Realignment Board (chaired by Human Resources VP Charlie Emery) met Oct. 31 to review these division staffing plans.

Based on the VPs' data, groups of people, called "impacted peer groups," were identified whose members perform job functions that are being affected by Sandia's changing business requirements. Sandia then submitted a realignment plan to DOE. If DOE accepts Sandia's proposal, Phase Two, the "General Notification/Voluntary Action Period," will begin.

In Phase Two of the process, employees who are members of impacted peer groups would have 60 days to try to find other work within the Laboratories, if they choose to do so, with the help of various corporate assistance mechanisms. If a peer group's staffing problems haven't been resolved

by the end of the 60-day period, some individuals in that peer group likely would be "surplused." Surplused employees who haven't found work by the end of Phase Three, a second 60-day period, could be laid off or terminated.

Karen emphasizes that the monetary incentive offered last year was an addition to Sandia's normal, ongoing realignment process intended to help reduce the number of people who might later have been asked to leave Sandia if internal transfers, attrition, and other realignment mechanisms didn't yield sufficient results.

"Again we are going to make every effort to help employees find jobs within the Labs that they are qualified for," says Karen.

New Web sites, special job postings, a job bid line, a menu-driven realignment info line, special incentives to organizations that receive impacted employees, and outplacement services all are planned to help match impacted employees to new jobs within and outside the Labs, if necessary.

Don says the Workforce Realignment Process proved to be an effective tool during last year's realignment. "We're pleased with the way the process worked both for Sandia and for employees, and we're hopeful it can achieve similar results this year," he says.

The Lab News will continue to cover realignment-related developments as they occur.

—John German

Outstanding innovations sought by Discover magazine

Discover magazine's Technological Innovation Awards committees are looking for competitors for their 1997 awards. The form is simple to fill out. All charges are waived for Sandia entries. Closing date for applications is Dec. 6.

All nominations should "solve a well-defined problem or meet a clearly defined objective" in the following categories: Automotive and Transportation, Aviation and Aerospace, Computer Hardware and Electronics, Computer Software, Environment, Sight, Sound, and Emerging Technologies. One winner will receive a \$100,000 fellowship.

The awards "celebrate the outstanding technological innovations of our time, and specifically, the scientists, engineers, and inventors who all too often are the unsung heroes of our technological age," according to the magazine's promotional literature.

For an application and further information, call Iris Aboytes of Employee Communications and Media Relations Dept. 12640 at 844-2282.

Nation's experts look to the future of intelligent machines

Robotics and intelligent machines already touch the lives of most Americans. And yet that impact is negligible compared to the role those technologies can and will play in America's future, in areas as diverse as surgery, entertainment, and packaging the foods we eat, say many of the nation's top robotics experts meeting for the first time recently in Albuquerque.

The experts met for three days during the National Needs Workshop on Robotics to identify barriers to wider use of automation and to formulate plans to overcome them.

"We sense that the time is right for a national initiative to spur new applications of robotics and intelligent machines," said George Bekey, professor of computer science at the University of Southern California and president of the IEEE Robotics and Automation Society. "There's a confluence of technologies that will make this possible."

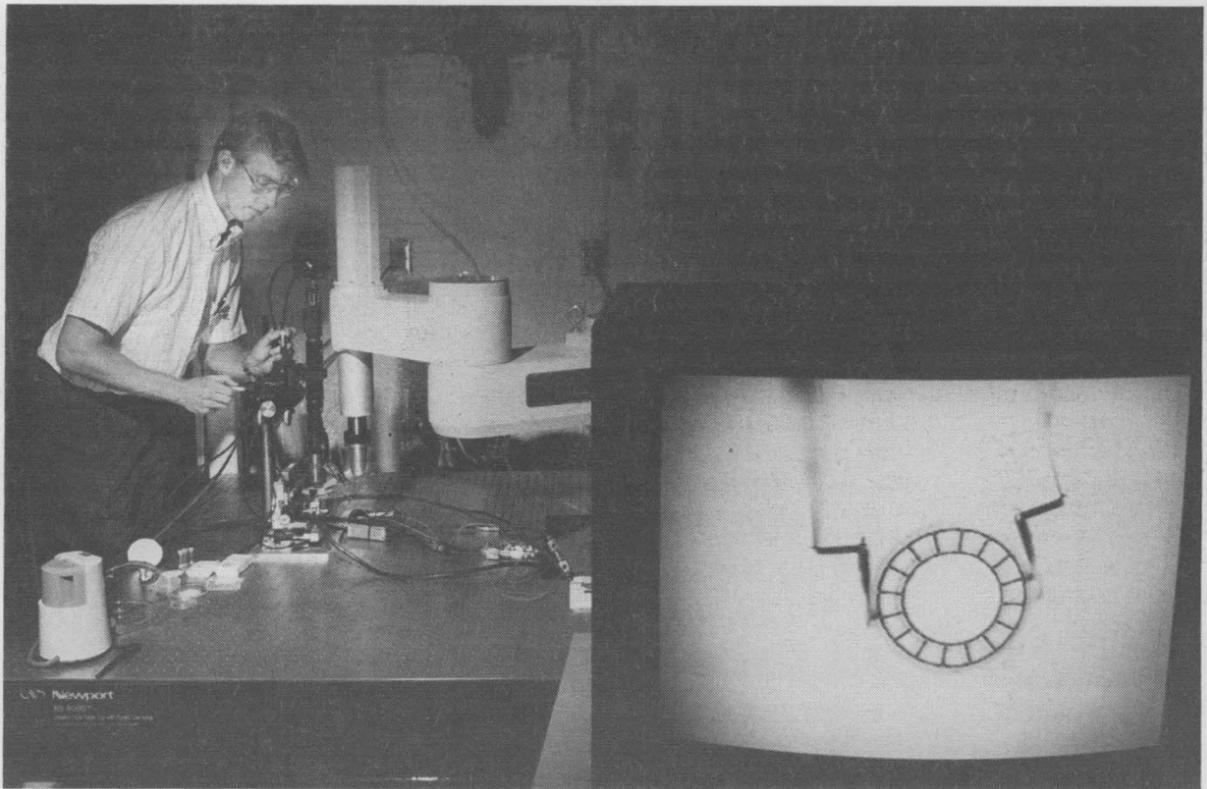
"For the first time users, vendors, and developers of these robotics technologies are meeting and openly discussing ways to cooperate, to create new markets together, with no axes to grind," said Pradeep Khosla, a professor at The Robotics Institute at Carnegie Mellon University in Pittsburgh. "We're creating a web of interdependence."

The workshop began Oct. 28 with the dedication of the nation's most advanced robotics research center, the Robotic Manufacturing Science and Engineering Laboratory (RMSEL) at Sandia (*Lab News*, Oct. 25). The workshop was sponsored by the National Science Foundation and DOE and organized by the Robotics and Intelligent Machines Coordinating Council (RIMCC), a joint committee of the Robotic Industries Association and the IEEE Robotics and Automation Society.

Many of the approximately 70 robotics experts — representing industry, vendors, universities, and the national laboratories — said the workshop provided a forum to break down existing barriers, exchange ideas, and create new products and markets. Robotics and intelligent machines already are vitally important for the assembly and disassembly of nuclear weapons and waste remediation, and they are assuming a critical role for industry in the manufacture of everything from small precision electronic components to clothing and automobiles. Yet the intelligent machines industry has recognized a need to conquer barriers that impede the spread of robotics technologies to other major industrial sectors, such as food preparation, agriculture, health care, entertainment, and construction.

RIMCC Chairman Pat Eicker, Director of Sandia's Intelligent Systems and Robotics Center 9600, says the workshop was a big step in solidifying support and cooperation among all segments of the robotics and intelligent machines community, from users and suppliers to those involved in

"The time is right for a national initiative to spur new applications of robotics and intelligent machines."



JOHN FEDDEMA (9611) manipulates a 100-micron-diameter silicon part (enlarged on the monitor in the foreground) using microtweezers employing Sandia-developed teleoperation software. The new MicroManipulation Laboratory, part of Sandia's recently opened Robotic Manufacturing Science and Engineering Laboratory, will investigate technologies that are practical for assembly of 10- to 100-micron parts into a variety of micromachines for use in weapons components, surveillance devices, and microsurgery applications. (Photo by Randy Montoya)

research and development.

"It has been recognized for years that intelligent machines are one of the key critical technologies of the future," Pat says. "Yet because of the diversity of the technologies needed, the diversity of the people who are potential users, and the diversity of companies and government agencies interested in intelligent machines for their particular applications, it's been very difficult to get a common thrust going in the area of intelligent machines."

Support for a national initiative

Pat says policymakers in Washington have recently expressed their support for a national robotics and intelligent machines initiative.

"We now have both sides of the equation enthusiastic — the robotics and intelligent machines community and Washington," he says. "Now comes the hard work of planning, prioritizing, and putting this initiative into action."

Discussion among workshop participants of current and future needs already is providing a source for much of that planning.

"We're seeing a lot of connection between people who have things and people who need things," said Greg Bryant, technical director for Walt Disney Imagineering in Glendale, Calif.

Bryant said he is interested in how robotics can be better used in the entertainment industry. Current uses range from audio-animatronic figures in theme parks to automated scenery changes for Broadway shows. The computer graphics industry, which has grown from creating special effects in movies to producing full-length features like "Toy

Story," also has strong ties to robotics technologies, he said.

Hollywood's depiction of robots typically has outshone the current state of robotics technologies, but he said those technologies are rapidly fulfilling the big screen images.

William "Red" Whittaker, director of the Field Robotics Center within The Robotics Institute at Carnegie Mellon, said industry is still just breaking the surface on ways in which robotics technologies can be applied. "Every year you are surprised by something new that's really big," he said. "We saw that effect five years ago when medical robotics applications broke."

Whittaker also sees changes in the nature of how robotics are perceived. "Traditional successes were based on cost benefits to industry," he said. "Now we're talking about how these technologies touch people directly, whether it's in the area of entertainment, surgery, or helping to clean a home for the elderly." — Chris Miller

Mars '96 mission failure disappoints Sandians

Although the Russian Mars '96 mission launched last Saturday (Nov. 16) ended up in pieces on the Pacific Ocean floor on Sunday when a fourth-stage booster failed, the scientific justification for the mission remains as strong or stronger than ever, says Mike Butler. Mike is the Sandia physicist who helped design one of the mission's key science instruments.

Mike and colleague Tony Ricco, both of Microsensor Research and Development Dept. 1315, designed the fiber optic-based chemical sensor technology used in the Mars Oxidant Experiment, or MOx, the US contribution to the internationally flavored Mars '96 mission.

In light of recent widely publicized findings about possible ancient life on Mars, Mike says, the value of data that would have been gathered by the Mars '96 orbiter, landers, and penetrators becomes more significant than ever.

It is not clear, Mike says, whether an instrument similar to MOx will be adapted to fly on any of the several Mars missions planned by NASA.

The private sector is interested in the fiber-optic chemical sensor technology. Mike is working on a cooperative research and development agreement with a US company to adapt the technology for environmental applications.

Although Mars '96 failed, NASA's Mars Pathfinder mission, which uses Sandia airbag technology in its landing system, is on schedule for a December launch.

Establishing a national agenda for intelligent machines

Philip Monnin, president of the Robotics Industry Association and president of Motoman, a robotics company, praised the National Needs Workshop on Robotics as a major first step in outlining problems and developing solutions to future robotics research and development.

"This is just a beginning, but it has accomplished a lot," Monnin said. "We have never sat down in a room and had good, frank discussions like this. There is an awareness coming out of here that there is no established national agenda for robotics and intelligent machines and that there definitely needs to be one."

Monnin said it's vital that federal government laboratories such as Sandia be closely

involved with industry and research universities in developing new robotics technologies. He said Sandia's ability to integrate sensors and computer software with existing industrial robots has resulted in valuable dual-use technologies that industry is eager to use. Sandia's agile manufacturing project, designed to make manufacturing more flexible and responsive to market needs, is of particular interest to industry, he said.

"Most everything that is done at Sandia's robotics center has a direct application to industry," Monnin said. "We need ways to fund this research, and that means more government and industry involvement."

Presentation of compliance certification application marks 'major milestone' for WIPP project

Sandia conducted scientific site characterization for DOE

By Bill Murphy

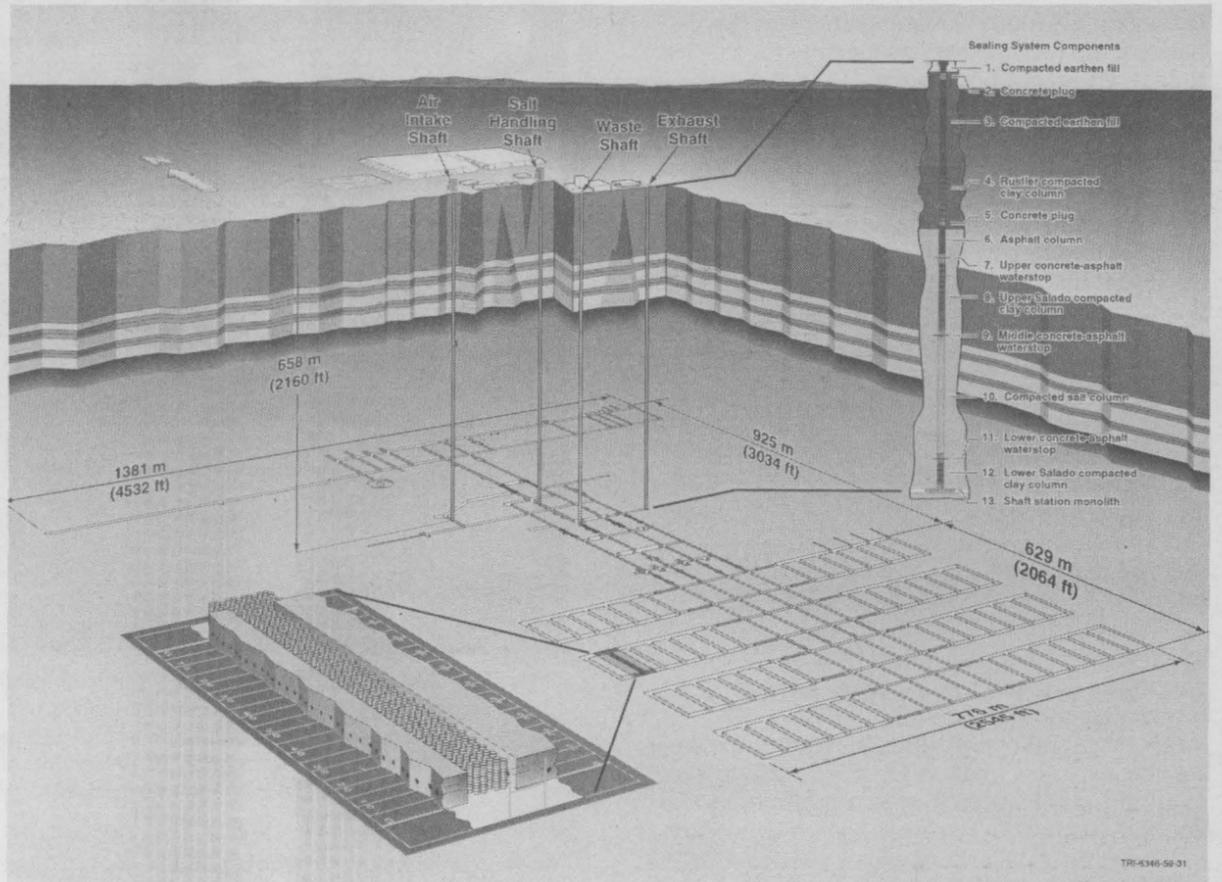
Lab News Staff

DOE's never-ending story — the WIPP saga — may be moving toward a final chapter. Late last month, DOE submitted to the Environmental Protection Agency (EPA) the Compliance Certification Application, or CCA. The 20,000-plus pages of documentation, representing the results of more than 20 years of scientific study of the WIPP site by Sandia scientists and others, form the basis upon which DOE is asking the EPA to certify that the site is safe for permanent disposal of transuranic wastes.

"The quality of science done during the WIPP studies has been extraordinary."

Sandia, says WIPP senior scientist Wendell Weart (6000), has been involved in the Waste Isolation Pilot Project since 1975. Since then, Sandia has served as DOE's chief science consultant on the project, with responsibility for all the scientific studies that demonstrate WIPP's compliance with EPA certification standards.

EPA was designated WIPP's certifying agency in the 1992 Land Withdrawal Act. Since then, Wendell says, the Sandia WIPP team has been sharply focused on developing the data for the CCA. That effort has been coordinated by Regulatory Compliance Dept. 6821 Manager Mel Marietta and Center 6800 Director and WIPP Project Manager Les Shephard. Many Sandians have been involved in WIPP over the years, with a peak number of 122 employees in



DEEP GEOLOGICAL REPOSITORY — This artist's rendering of the WIPP site near Carlsbad, N.M., graphically indicates the scale of the project. Note how each of the repository chambers compares to the size of an American football field. The chambers are bored into a stable compacted salt column more than 2,000 feet below the desert surface. Studies by Sandia scientists and by the National Academy of Sciences find that the site will remain geologically stable and secure for at least the next 10,000 years.

1995, when the annual budget was \$54 million.

The presentation of the CCA to EPA, says deputy project manager Margaret Chu (6801), "represents a big step, a major milestone."

Now that it has the CCA, the clock is ticking for the EPA. Within the next year, the agency must conduct detailed technical reviews and propose a draft position on WIPP compliance. The public will be allowed 120 days to comment, and EPA will then publish its final WIPP determination in the *Federal Register*.

If the timeline is followed, Wendell says, transuranic wastes could start moving into WIPP's 2,150-foot-deep repository chambers by November 1997.

Process began in the 1950s

The presentation of the CCA represents an end-game in a process that actually started in the 1950s, when a National Academy of Sciences panel recommended that a deep salt bed site for nuclear waste disposal be identified. A salt bed at a site with other very stable geologic characteristics, the panel said, would be an ideal location for storing radioactive materials. After a couple of false starts, the present WIPP site near Carlsbad in southeast New Mexico was selected in 1975, based on studies conducted by Sandia.

Over the years, Sandia scientists have accumulated vast amounts of data about the site's geology, hydrology, and possible chemical and physical interactions with the waste. Those data, Wendell says, were plugged into a performance assessment computer

model. The model, developed by a Sandia team, convincingly demonstrates that the site is an excellent one for its proposed use, Wendell says.

"We can say with confidence that WIPP is a very robust repository," he says. The geotechnical studies over-

whelmingly suggest that no natural processes will breach the site during its 10,000-year design lifespan, Wendell says. The science team looked at earthquakes, erosion, volcanics, hydrology, and tectonics, he says, and none appeared remotely likely to pose a threat to the site's stability. In fact, he says, the only mechanism for potentially releasing radiation from the repository is human intrusion — well drilling or mining, for example. To minimize the chance of that happening during a multi-generational time-frame, Wendell says, Westinghouse (the site contract manager) has designed a system of markers to warn off curious humans. This design was based on the conclusions of an expert panel convened by Sandia.

Margaret says the Sandia team was gratified to hear that a recent National Academy of Sciences panel study of the issue came to the same conclusion as Sandia: the site is a very stable one, with human intrusion representing the only potential threat to its integrity (*Lab News*, Nov. 8, 1996).

Margaret, a chemist by training who has been involved in nuclear waste management for most of her 16 years at Sandia, says the quality of science done during the WIPP studies has

"... there is probably no single piece of similar-sized real estate on the planet that has been more closely studied and thoroughly characterized than the WIPP site."

(Continued on next page)



IT ALL STACKS UP — WIPP Deputy Project Manager Margaret Chu (6801) scans the first volume of 20,000 pages of documentation presented in support of DOE's Compliance Certification Application to the EPA. The documents stacked up behind Margaret contain the results of 20 years of data collection and analysis of the WIPP site conducted by Sandia scientists. (Photo by Randy Montoya)

Russians hone business skills during visit to Sandia

Team from Russian weapons lab focuses on tech transfer issues

By Bill Murphy

Lab News Staff

A delegation visiting Sandia from Russia's Arzamas-16 nuclear weapons laboratory last week completed a month of hands-on training in the "art of the deal." The delegation spent the month working shoulder-to-shoulder with folks in Sandia's Technology Partnerships and Commercialization Center 4200, learning the ins-and-outs of commercializing laboratory technology.

The three-man Russian team focused on a number of business-related activities, including patents and licensing, copyrights, cooperative research and development agreements, market research, and business negotiations.

According to Vic Chavez, Manager of Partnership Outreach Dept. 4221 and host to the delegation, Sandia and Arzamas-16 worked for 15 months to arrange the delegation's visit.

"We set up an extensive training program for them," Vic says. "They've read the books, they've studied the manuals. Our intent here was to give them an opportunity to get some hands-on experience."

The arrangement with the Russians was not a technical exchange, Vic emphasizes. "Our objective has been to help them learn about our technology commercialization organization and give them ideas for their lab. Hopefully, we'll help them avoid some of the hard knocks we experienced when we were breaking this same ground a few years ago."

Converting defense technologies

Russia's weapons labs, like their US counterparts, developed a number of innovative technologies over the years, but the technologies were kept under lock and key within the nuclear weapons complex. With the end of the Cold War, Russia's labs have been seeking to move those technologies into the global marketplace.

To that end, says Gennadiy Sosnin, deputy head of marketing at Arzamas-16, the lab has been in the process of improving its business center to handle what he calls "defense conversion" processes. Sosnin, speaking through interpreter and fellow Arzamas-16 marketing staff member Vitaliy Tkachenkov, notes that the lab has had some success in commercializing technology. Specifically, he says, a small, low-cost, consumer-oriented radiation dosimeter based on lab technology was successfully commercialized. However, says Sosnin, the research institute has been unsuccessful in attempts to commercialize other intellectual properties for which there would seem to be a market.

Arzamas-16 chemist and delegation member Aleksei Golubev notes that since the 1991 collapse of the Soviet Union, Russia has experienced a sort of "wild [no-holds-barred] capitalism."

"We want to learn a more civilized capitalism," Golubev says. It is important, Golubev says, that Arzamas become more sophisticated in its understanding of the all-important global marketplace for technology. The Sandia experience, he says, has



DEAL-MAKING — Vic Chavez (second from left), Manager of Partnership Outreach Dept. 4221, goes over some of the fine points of licensing laboratory technologies during a meeting with a delegation from Russia's Arzamas-16 nuclear weapons laboratory. The Russians are, from left, Aleksei Golubev, Gennadiy Sosnin, and Vitaliy Tkachenkov. The delegation spent a month at Sandia learning about the Labs' technology commercialization program.

provided the delegation invaluable insights into the workings of modern capitalism, a subject of which most Russians have very little knowledge, experience, or exposure.

"To some extent," Golubev says, "the Sandia technology transfer and commercialization process has been like a black box to us. We suspected there were some very interesting things inside, but we didn't know what they were. Now, because of what we've done here [at Sandia], we have learned about some of the things inside this black box. It is not such a mystery to us now."

Hands-on experience

During their visit to Sandia, the Russian delegation got the hands-on experience Vic promised them. Instead of getting bogged down in theoretical case studies, the Russians brought with them four Arzamas technologies — an asbestos substitute, an environmental sampler, an explosive cutting technique, and an enhanced safety detonator. They then worked side by side with Sandia's tech transfer pros to license the technologies.

"We worked them [the technologies] just as if they'd come out of Sandia," Vic says. By the end of the month, he says, the cooperative Sandia/Russian effort had made real progress, with a couple of the technologies on a fast track toward commercialization.

Delegation leader Sosnin says that based on what his team has learned, they will prepare a report on their training and experiences at Sandia, including a proposal to their leadership that some "structural rearrangements" be made in the evol-

ing Arzamas business office. The lab's leadership, he says, is fully supportive of the technology partnership and commercialization exchange program, and likely will be receptive to such a proposal.

Arzamas-16's senior management, Vic says, considers the relationship with Sandia to be a very high priority. During a trip to Russia early in the process of arranging for the delegation's visit, Vic says, Arzamas-16's director called him aside and said, "I want this to succeed. If you have any problem at all on this end, call me directly."

The relationship with Arzamas is fully reciprocal, Vic says. At some point in the future, Sandia may send a similar delegation to Arzamas-16 to learn more about the Russian market and to attempt to commercialize Sandia technologies to Russian industry. And the door is open, Vic says, for a return "post-graduate" visit by the Russian delegation to further refine their tech transfer skills.

In the meantime, Vic says, the exchange has already resulted in one very useful outcome: the development of an English-Russian technology transfer/technical glossary.

"This is going to be an extremely valuable tool as we move forward," Vic says.

Tkachenkov says the team members couldn't be more pleased with their Sandia interaction.

"Everyone we worked with was very kind, and very patient with us," he says. "They were always ready to explain everything to us."

"This was a very good experience. We'll never forget it."

(Continued from preceding page)

been "extraordinary."

Sandia scientists and external experts in geology, hydrology, rock mechanics, and chemical/physical behavior of the wastes have thoroughly studied all aspects of WIPP, Margaret says. As a result, she says, there is probably no single piece of similar-sized real estate on the planet that has been more closely studied and thoroughly characterized than the WIPP site.

Margaret also cites the contributions of the project's records management team, which has developed an information storage and retrieval system that makes a vast amount of data easily accessible to EPA regulators and scientists alike.

"This is the first-in-the-world deep geological repository," Margaret notes. "There's an incredible amount of interest in what we've done here in terms of characterization and modeling. The international community is taking a very keen interest in this process."

Clock ticking on EPA rulemaking process

Here is the timeline for EPA's certification of WIPP as a transuranic waste repository:

- Compliance Certification Application (CCA) delivered to EPA 62 days early on Oct. 29, 1996.
- 45-day completeness review initiated (November).
- Advance Notice of Proposed Rulemaking (ANPR) published in the *Federal Register* upon receipt of CCA.
- 120-day public comment period initiated by ANPR.
- Completeness information requested within 45-day period.
- Potential for public hearings.
- Additional certification information

requested throughout process (Technical Adequacy review through February 1997).

- EPA proposes Conditions of Certification.
- EPA prepares Proposed Rule (mid-March).
- EPA initiates 120-day public comment period.
- Public hearings held.
- EPA requests additional certification information as necessary.
- EPA prepares a "Response-to-Comments" document.
- EPA decides on Conditions of Certification
- EPA prepares the Final Rule.
- Office of Management and Budget reviews Final Rule for Certification.
- EPA publishes the Final Rule for Certification by Oct. 31, 1997.

Sandia unveils new Web-based electronic time cards

Sandians will fill out and submit their own time cards online

Soon many Sandians will be able to fill out and submit for approval their own time cards via Sandia's Internal Web.

The collaborative application — the Web-based Time Card Application — is the result of the Web Time Card Application Project Team that includes Payroll Dept. 10502; Business Systems Development Dept. 4813; Electronic Commerce and Desktop Systems Dept. 4815; Database and Applications Support Dept. 4823; Corporate Computing Help Desk and Password Control Dept. 4412; CSUs Dept. 4423; Decision Support Systems Programs Dept. 6531; and the CIO Test Bed.

"This project has been quite a collaboration between the CFO and the CIO," says Ray Shaum, Manager of Payroll Dept. 10502.

In a policy directive on electronic commerce issued earlier this year, Sandia Deputy Director John Crawford pointed out that Sandia has a long-term commitment "to radically change the way it conducts its business processes" by utilizing its communication network. "Our vision," he said, "is to have employees transact business and share information directly from their desktop workstations Once access to an electronic commerce application is enabled and an opportunity for adequate training is provided, use of such an application will become mandatory since it will eliminate costly paper-based processing."

The electronic time card move was deliberately chosen as a process that would have a large impact on Sandia. "By choosing some-

thing that everyone needs and uses, we also learned a great deal about all of the business systems Labs-wide," says Ray. "We believe that the resulting product is another positive step toward ensuring that the Labs' integrated information system provides a strategic advantage."

Converting time cards to the Web

Sandia deployed its first electronic time card application in early 1996. It was soon discovered that the great diversity of computer systems at the Labs makes deploying applications to every desktop expensive and time consuming. The CIO Organization and Payroll decided to leverage the investment already made in the Internal Web by converting the deployed electronic time card to the Web, so anyone with a Netscape 3.0 browser can fill in and submit his or her time card.

"This time card application is much easier to deploy and does not require a visit to every desktop," says Sue Swanback (4815), one of the lead developers. She says the earlier electronic time card version had no UNIX support, but the Web-based version is supported for PCs, Macs, and UNIX desktops.

Other key application development team members were Sam Cancilla (4813), Charles Cote (4823), and John Herzer (4815).

Requires Netscape Navigator 3.0

Sandia is in the process of deploying the new Sandia-customized Netscape Navigator 3.0 to desktops. The time card application team used several Navigator features that aligned with Payroll's requirements. Since time card data is secure data, Netscape's commerce server is used to authenticate the user to prove identification. Kerberos passwords, which are encrypted, will be automatically assigned to all Sandians and are necessary to use this application. The time card also needed to be "active," meaning it automatically sums hours to be paid and checks data entered against most Sandia business rules and policies. Javascript, a relatively new Web capability, is used to format and validate data entry and provide running hour totals.

This is a great advantage to both Sandians and the Payroll department, Rays says. "If time cards come in with accurate data, Payroll does not need to touch them." He says the application's easy-to-use front end helped make it possible for Payroll to cut its staff by three people.

Web tools: tests, benefits, and the future

Sam Cancilla, one of the lead application developers of the new Web-based electronic time card, was particularly surprised by the number of people who needed to be involved and the rigor and formality in developing a corporate application. "This application went through five different test phases — more than any other I have been involved in during my career," he says. Sam, Sue Swanback, and Ray Shaum all say the project was exciting because of the teaming involved. "This was the best cooperative effort I have experienced since joining Sandia," says Sue.

Any Sandia employee with access to Sandia's Internal Web can access their own electronic time card if they meet these requirements:

- Employee's manager must have access to approve the employee's time card using the EDM or cc: Mail Review and Approval time card application.

- Employees must have the Sandia-customized, US version of Netscape Navigator 3.0. The US version allows access to secure servers, and 3.0 supports the Javascript embedded in the time card application.

- Employees must have an Internal Restricted Network Kerberos password, which will be supplied automatically from Password Control.

There are numerous benefits to using the new Web-based time card application, says Ray. "The application supports most Sandia business rules and policies concerning timekeeping. We expect a significant decrease in corrected time cards with this new application because it validates case numbers and automatically calculates hours to be

paid and overtime."

One of the largest benefits is its ability to accurately support the 9/80 workweek schedule. "It has been extremely difficult for us to manually keep up with the 5,500 people who work 9/80," Ray says. "This system makes the time-keeping burden much simpler." The application also replaces the Delegation of Authority with broad, concurrent approval for managers and allows employees to input their time cards as many times as needed until a manager's approval is received or until Payroll processes the time card at noon on Friday.

Changing the new system is also much easier than in the past, Ray says. For example, when the Office and Professional Employees International Union and the Metal Trades Council accepted a paid-time-off bank as a benefit recently, the time card process had to be updated. This change would have taken a couple of months in the old system; it took less than a day in the new system.

Further improvements in the works include contractor time invoices, the ability to correct time cards, Web-based review and approval capabilities for OAAs/managers, and the ability to allow OAAs to enter time cards for their staffs.

This Web-based electronic time card application is the first of several such changes coming. The Electronic Expense Report will begin deployment over the next several months. Others to come this fiscal year include an electronic SAND report review and approval and the electronic foreign travel approval process.

'Terrorism comes to America' colloquium set for Dec. 11

"Terrorism Has Come to America," a colloquium sponsored by Systems Development and Engineering Center 5500 that provides an overview of domestic and international terrorism as it has impacted the US, will be held Wednesday, Dec. 11, 9:30-10:30 a.m. at the Technology Transfer Center (Bldg. 825). If you would like to receive security training credit for attending, you can find the form under Center 7400's home page on the Internal Web.

The colloquium will be presented by John O'Neill, section chief of the FBI's International Terrorism Section.

O'Neill will discuss recent terrorist incidents worldwide and the capability of the US and other countries to meet the challenges of countering terrorist infiltration and attack.

O'Neill joined the FBI as a special agent in 1976. In 1991 he served as assistant special agent in charge of the Chicago office of the FBI and had overall responsibility for violent crime and white collar, drug, and organized crime investigative programs. In 1995 he was appointed chief of the FBI's counterterrorism section and is responsible for the direction and support of all of the FBI's international and domestic counterterrorism investigations.

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Overhauling oversight: DOE, Sandia agree on a single, unified process for assessing Labs' performance

By John German

Lab News Staff

Performance goals. Weighting. Self-assessment. Feedback.

Sound familiar? Three years ago, Sandians began negotiating their individual performance goals with their managers at the beginning of each year, then were evaluated at year's end based on how well they met those goals.

Now Sandia and its "boss," the Department of Energy, have adopted a similar way of managing the Laboratories' overall performance based on how well the Labs meets a few critical, high-level performance goals negotiated between Sandia and DOE at the beginning of each fiscal year.

Called the Sandia National Laboratories Integrated Assessment Process, the new approach consolidates a variety of DOE, Lockheed Martin, and internal Sandia audits, inspections, and oversight of Labs operations into a single, unified evaluation process. And, like the Performance Management Process for evaluating individuals' performances, its centerpiece is a self-assessment regimen that allows Sandia to provide evidence to DOE about how well it is meeting its performance goals before DOE renders its annual appraisal of the Labs.

"There are myriad assessment activities at Sandia — financial management reviews, facility reports, regulatory audits, ES&H compliance appraisals," says Don Schueler, Manager of Integrated Management Systems and Assessment Dept. 4541. "Integrated Assessment provides a framework for these various activities and focuses at once and comprehensively on Sandia's performance on a few critical performance measures. It will reduce the number of times per year DOE auditors visit Sandia, and it will provide a strong self-assessment basis to facilitate other regulatory audits."

An appropriate level of oversight

Virgil Dugan (4500), who is leading the Integrated Assessment effort at Sandia, says DOE contract reform, the Galvin report, the commitment the DOE labs made to reduce overhead costs (better known as the "Curtis commitment"), and government reform in general are driving the need to change the traditional appraisal relationship between DOE and Sandia.

The new process means Sandia's performance expectations are better defined, and there are fewer of them, he says. Also, it achieves a better balance between technical and administrative performance, he adds. (At least 50 percent of the scoring weight now relates to the Labs' programmatic performance.)

"The biggest advantage is that the appropriate level of oversight will be accomplished in a coordinated way rather than piecemeal," he says.

"Oversight of your operations has grown too prescriptive," says Bill Myers, Acting Assistant Manager of DOE/KAO's Office of Management and Assessment. "We need to back away from our oversight role and play more of a validation role. That will allow Sandia to use its technical and business skills to find ways of operating more efficiently." Similar oversight reforms are occurring throughout the DOE complex, he says.

The new process was formalized in May by a "Guidance Document" negotiated between DOE and Sandia. It provides the framework for Integrated Assessment — including the scope of the appraisals and the roles and responsibilities of the participants.

As part of the process, Sandia and DOE

negotiate an "appraisal agreement" for the upcoming year before the end of each fiscal year. The appraisal agreement for FY97 was approved Sept. 30.

The agreement, like an individual's Performance Management Form, documents the performance measures and relative weightings by which Sandia's performance will be rated during the appraisal year. Some functional areas, such as financial management or ES&H, are assessed every year. Others, such as individual technical programs, may be assessed on a rotating, multi-year cycle. If a functional area performs well one year, its assessment may be waived in the following year or years.

The appraisal agreement is designed to satisfy most of DOE's oversight requirements while also ensuring compliance with the requirements of many of Sandia's external regulators — such as the New Mexico Environment Department and the Occupational Safety and Health Administration.

A foundation of trust

During the year, Sandia monitors its own performance in four general areas: Laboratory Management, Administration, Programmatic (technical/scientific work), and Operations Support. Each general area encompasses a variety of Sandia programs and functional areas. DOE/KAO managers stay informed about Labs operations through normal business interactions and brief, informal status reports from their Sandia counterparts.

Near the end of the fiscal year, four Sandia Process Management Teams prepare formal self-assessment reports for DOE evaluating the Labs in the general performance areas and their associated functional areas. Programmatic (technical) areas are assessed based on a mixture of qualitative peer reviews (conducted by non-Sandia scientists and engineers) and quantitative measures such as cost, schedule, and performance data. Administrative, Operations Support, and Laboratory Management functional areas are assessed

based on a variety of quantitative and qualitative measures as well.

DOE could respond to Sandia's self-assessments in one of three ways, says Don. It could accept Sandia's reports at face value based on operational awareness and the quality of the self-assessment process. It could request additional evidence supporting one or more of the assessments. Or it could conduct its own on-site review of specific functional areas. All on-site assessment by DOE will be conducted within a defined two-week period.

DOE then will issue its performance report for the previous fiscal year containing numerical scores (from 1-100) representing the Labs' performance in each of the general and functional areas, as well as a combined score representing the Labs' overall performance. Those scores and associated qualitative comments will serve as tools to Sandia's management for determining which Labs operations are outstanding, which are satisfactory, and which need improvement.

An eight-member Joint Assessment Management Steering Group, with executive-level representatives from DOE/AL, DOE/KAO, and Sandia (represented by Paul Stanford, VP 15000; Lynn Jones, VP 7000; and Virgil Dugan), oversees the process.

Paul Stanford, who is also chairing the larger DOE/AL and Laboratories Partnering Initiative (*Lab News*, July 5, 1996) aimed at reducing unnecessary external oversight of Sandia and Los Alamos National Laboratory, says the Integrated Assessment Process requires partnership at all levels — among employees, managers, Sandia, and DOE.

"It's a good example of the customer and the supplier working together toward the same goals, and of giving DOE more insight into our operations," he says.

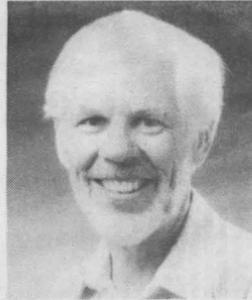
"Our new relationship is based on a foundation of trust, which I think is a fundamental change," adds Myers.



THANKFUL FOR THE ATOM BOMB — Samuel Billison, President of the Navajo Code Talker Association, shows fellow World War II code talker William Kien a Japanese island his Marine unit would have invaded on Nov. 7, 1945, if the war hadn't been put to an early end with the dropping of US atomic bombs on Japanese cities three months earlier. Three Navajo code talkers — Billison, Kien, and Samuel Smith — visited the National Atomic Museum Nov. 13 to attend an opening for the museum's latest traveling exhibit, "Warriors: Navajo Code Talkers," on display through Dec. 31. The exhibit features 40 black-and-white photographs of surviving code talkers taken by Japanese-American photographer Kenji Kawano from 1982-1988. During World War II, some 420 Navajos, using a system of fewer than 500 Navajo "code words" representing common military terms, served as signalmen with Marine combat units from May 1942 until the war's end. The linguistic complexity of the Navajo language frustrated Japanese intelligence efforts. The code was never broken.

Mileposts

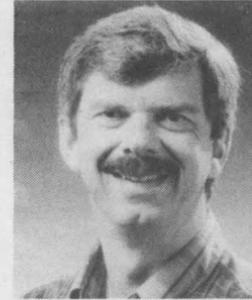
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Terry Herther
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James Young
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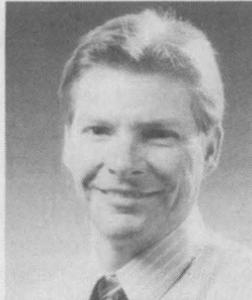
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Ric Davis
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Glenda Tenbroeck
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Dan Pritchard
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Chuck Borgman
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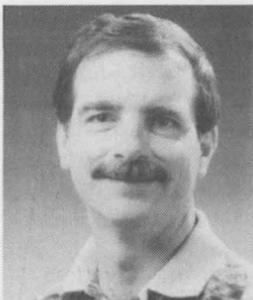
Bob Paulsen
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Louann Grady
20 6533



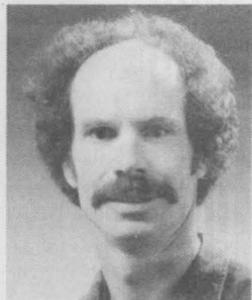
Richard Lincoln
25 5415



Gary Kellogg
20 1114



David C. Williams
30 6421



Barry Ritchey
15 1472



Earl Graff
20 2111



Geoffrey Mueller
30 2343



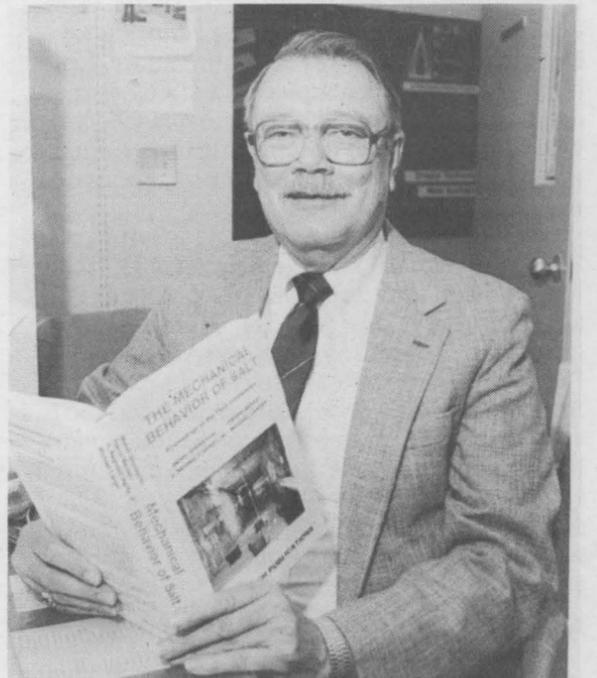
Robert Dubois
20 1484



Lonnie Widler
15 6512



Lynn Loveland
20 9732



Darrell Munson
35 6113

Around the corporation **LOCKHEED MARTIN**

Air Force picks Lockheed Martin team for new missile warning system

The Air Force picked a four-member team headed by Lockheed Martin to develop the Space-Based Infrared System (SBIRS), the next-generation technology designed to detect and warn of a ballistic missile attack and track incoming missiles. Other team members are GenCorp Aerojet, Honeywell, and Northrop Grumman. The initial \$1.8 billion contract includes five geosynchronous satellites and provides the possibility for continuing business through 2020. SBIRS, which replaces the aging Defense Support Program satellites and ground station, provides real-time warning information in support of missile defense, battle management, and technical intelligence.

M4 Environmental lands three new jobs

M4 Environmental, a company owned jointly by Lockheed Martin and Molten Metal Technology, has announced three new contracts. Under terms of the first, it will supply a Catalytic Extraction Process system for destroying chemical weapons left in China after World War II. The second is a contract for the Hanford Tank Waste Remediation System, which could pave the way for similar cleanup work at Oak Ridge. And the third is a contract with the Center for Environmental Excellence to process hazardous waste streams generated by Air Force operations.

Neutron inspection system could benefit industry, military, drug interdiction

A nonintrusive pulsed fast-thermal neutron analysis system developed by Oak Ridge National Laboratory and researchers at Western Kentucky University could increase the efficiency of coal-fired electric power generation plants by analyzing coal so its users can blend it to minimize sulfur and chlorine content. The system also has been demonstrated to distinguish between real and mock explosives, which could make it valuable in detecting plastic and wooden land mines and detecting cocaine and other substances hidden in shipments of rice, sugar, and coffee.

Computer system would enable secured sharing of medical records

A prototype computer system being tested by Lockheed Martin Energy Systems would allow users to access medical records across locations and sources without compromising the personal privacy of the records. The Communitywide Secure Information System would benefit growing emergency medical care and managed medical care demands among the ever-increasingly mobile US population. It is being developed in cooperation with the Connecticut Health Care Research and Education Foundation and the Anesthesiology Department at the University of Florida's Shands Hospital.

1997 student intern deadlines coming up

If you wish to hire a student for summer 1997, the time to start planning is now, Staffing Dept. 3535 reminds you.

Tactical Staffing Requisitions must be placed with your staffing specialist by no later than Feb. 1, to ensure a May-June 1997 start date. Of course, if decisions have already been made in your organization, the requisitions can be placed at any time prior to Feb. 1 — even now. An early summer start date cannot be ensured if the requisition is received after Feb. 1.

If you are in communication with students interested in summer 1997 employment consideration, advise them that a resume and transcript must be received in Staffing Dept. 3535, MS 1023. Here are the specifics:

For students attending high school and postsecondary institutions in Albuquerque and the surrounding area, including New Mexico State University and the University of Texas-El Paso, deadline for receipt of resume and current transcript is Feb. 1.

In California, Stanford, UC Davis, UC Berkeley, and California State-Hayward are considered part of the local market.

For all other student applicants, the deadline for receipt of resume and current transcript is Nov. 30, 1996.

Carol Manzanares (844-7650) is the program administrator for graduate-level interns; Sharon Ortiz (284-3558) is the program administrator for undergraduate-level interns. Direct questions to them.

Sandia Classified Ads Sandia Classified Ads Sandia Classified Ads Sandia Classified Ads

MISCELLANEOUS

- TEAK DINING ROOM SET: 5 pieces, \$300; wicker living room, 6 pieces, \$500; new furniture coming, old must go. Beckmann, 296-1829.
- CHILD CARRIER BICYCLE SEAT, w/rack, Rhode Gear seat allows easy installation & removal, great shape, \$40. Martinez, 821-7467.
- BABY CRIB, Childcraft, oak, \$100; travel crib, \$30; voice-activated crib rocker, \$20; assorted baby stuff. Miller, 281-9470.
- 28.8 MODEM for Mac (PowerMac), never used, shrink-wrapped, paid \$265 +tax, sacrifice for \$200 OBO. Lujan, 299-2218.
- MULTIFUNCTION LASER PRINTER, Okidata Doc-It/4000, 400 DPI, integrated fax, scanner, copier, paid \$2,500, asking \$700 OBO. Hutchins, 856-3361.
- SEGA GENESIS, w/2 controllers (regular/turbo), three games, \$100; Super Nintendo, \$55; Sega Game Gear, \$50. Schneberger, 298-5955.
- LOVESEAT COUCH, blue/white/peach/beige striped, purchased from American Furniture, paid \$460, asking \$300. Wilson, 293-2228, after 5 p.m.
- MORGAN BUILDING, 8x16, \$950 OBO. Vickers, 291-1333, after 8:30 p.m.
- AMD X5-133MHz & ACER PCI motherboard, PnP BIOS, \$100; Hercules Terminator PCI video card, 2MB DRAM, \$85. Marshall, 293-3207.
- ETHAN ALLEN SOFA SLEEPER, & matching chair, \$150; portable adjustable ballet barre, \$40. Biringier, 821-8741.
- TIRES & WHEELS, 5 ea., Chev. 6-hole wheels, used P235x75R15 tires, w/trim rings & center caps, \$150. LeGalley, 822-0676.
- LUMINARIAS, Boy Scout Troop 395, will deliver weekend before Christmas, \$4/doz., \$11/3 doz. Quinlan, 296-1852.
- '82 280ZX RIM, \$75. Garcia, 343-8091.
- XIRCOM PS-CEM-28BT CREDIT CARD ETHERNET, + modem 28.8kbs, never opened, asking \$325; left-handed golf clubs, \$140. Mervini, 899-9754.
- LUMINARIA SALE, Albuquerque Youth Symphony, \$5/dozen, free delivery for 3 dozen or more, on Saturday, Dec. 7. Lyo, 299-6470.
- MOVING BOXES, approximately 100, assorted sizes, pretty good shape, \$200. Schrader, 254-1727.
- SOFA, 8-ft., modern, elegant country rust/blue, kidney-shape, new fabric, \$200. Brown, 271-8916.
- MARCY EXERCISE MACHINE, \$300; dresser, \$85; Sears 5-hp rototiller, \$450; 2 Motobecane 10-spd. bikes, \$100 ea. Brosseau, 896-3801.
- CORVETTE PARTS for '69 and '7, bra, exhaust manifolds, wiper door & hardware, luggage rack, two covers. Wilde, 281-7027.
- TRUCK BUMPER & HITCH, heavy-duty, great condition, great price, \$25. Avila, 275-9572.
- BINOCULARS, spotting, unparallelled for astronomy & big game hunting, Fujinon 16X70, brand new, \$650. Jimenez, 891-2593, after 7 p.m.
- TODDLER BED, \$65; child's bicycle seat, \$30; hall gates, \$20; booster seat, \$15; walker, \$5; luggage. Renk, 242-1277.
- NORDICTRACK, 20th anniversary edition, 1 yr. old, w/manuals & video, \$250. Plut, 298-3060.
- KENMORE REFRIGERATOR, almond, 17 cu. ft., top freezer, works great, \$200; 4-drawer desk, \$20; glass storm door, \$10. Johns, 858-1430.
- IBM LAPTOP, 386/25MHz CPU, 8MB memory, 80MB HD, Windows 3.1, Word Perfect & Excel, excellent condition, \$475. Connor, 821-4349.
- ROSENTHAL CHINA SET for 6, w/additional serving pieces, Japanese Blossom pattern, classic modern w/plat-inum trim. Wagner, 823-9323.
- BABY JOGGER II, Electrowheels Barbie car, Little Tykes outdoor activity center, 3-piece table/chairs set. Surbey, 823-2843.
- 486DX-33 CPU, motherboard, controller, desktop case, 1MB video, 4MB RAM, \$150; Kenwood 80W A-V receiver/amplifier, \$100. Burstein, 275-3370, after 6 p.m.
- BABY STUFF: car seat, \$35; girl's clothes, furniture, monitor, walker; 3-piece luggage set, \$30 OBO. Beazley, 255-5652.
- PARLOR STOVE, cabinet-style, uses wood or coal, new condition, great heater, \$250. Hayes, 299-1200.
- FUTON, single-size, attractive maple frame, converts into chair, lounge, & bed, \$175 OBO. Field, 268-4914.
- WASHBURN SIX STRING, 2 yrs. old, great condition & sound, w/pickup & case, \$345. Adams, 281-6767.
- WELDER, Miller Dialarc 250, AC/DC, cords & some rods, \$250. James, 298-0709.
- DROP-LEAF TABLE, antique Duncan Phyfe-style, 42" x 57" (extends to 42" x 75") needs refinishing, \$195. Snelling, 294-5751.
- KEROSENE HEATER, portable, 19,700 Btu, w/manual, Sears, \$100. Booker, 299-3554.
- HARD-SIDED SKI CASES, Flightmaster telescoping; protect skis & poles while traveling (e.g., airline baggage), \$30/ea., \$50/both. Schkade, 292-5126.
- CHRISTMAS TREE, beautiful 7-1/2-ft. artificial tree, used 1 yr., originally \$199, asking \$75. Crego, 292-0266.
- KITCHEN TABLE, w/4 chairs, pine w/Formica top, 30" x 48", \$180. Smith, 856-1567.
- WOOD FUTON, w/mattress & cover, \$175; '94 Diamond Back mountain bike, lots of extras, good shape, \$250. McDuffie, 292-0459.
- MAC LC COMPUTER, 40MB internal HD, 10MB RAM, external 14.4 modem, \$325. Silverman, 298-1308.
- ORIGINAL WATER COLOR PAINTINGS, by Sean Wimberly, New Mexico adobe & Southwest landscape, \$495 & \$445. Locher, 256-3406.
- FIREPLACE SCREEN, brushed brass, w/doors, \$20 OBO; several lamps, best offer. Walston, 298-1500.
- ENTERTAINMENT CENTER, 3-piece, birch fruitwood finish, like new, retail \$4,900, asking \$2,150; velvet tufted vanity chair, \$95. Madsen, 856-1530.
- SEGA-CD VIDEO GAME SYSTEM, w/"ESPN Hockey," "FIFA Soccer," "Road Rash," "Sherlock Holmes II," \$100 OBO. Walton, 897-0092.
- WHEELS, 10-in. wide, for Jeep, \$50; utility trailer, 4' x 7', poor condition, \$20. Robertson, 299-7561.
- NORELCO COFFEE MAKER, \$10; Sony CD/FM/twin cassette, \$75; Sony answering machine, \$20; Dirt Devil upright vacuum, \$20. Tucker, 869-3469.
- WOODBURNING STOVES (2), long burn capacity; dispatch phone. Garcia, 343-8207.
- KITCHEN SINK, stainless steel, w/leakproof faucet, \$35; 36-in. shower door, \$30; stove hood, \$25. Troy, 821-5499.
- FULL-SIZE BEDS (2), \$150/ea. OBO; 5-piece dinette set, \$150; Cardio-Glide Plus, \$160; AT&T 6300 computer, \$100 OBO. El, 891-5732.
- WEIGHT MACHINE, DP Gympac 1500, complete w/documentation, \$100 OBO. Orand, 833-2060.
- SUPER NINTENDO, w/4 games, 2 standard controllers, 1 Super Advantage controller, \$50. Cancilla, 298-8741.
- SCHWINN AERODYNE EXERCISE bike, excellent condition, \$200. Hartley, 292-7437.
- UTILITY TRAILER, 4' x 8', 12-in. wheel, wood frame, excellent condition, \$250 OBO. Sartor, 858-2554.
- REBA McENTIRE CONCERT TICKETS, Nov. 29, 8 p.m., Tingley Coliseum, \$40/ea. Creel, 839-7335.
- WOODSTOVE, Orley fireplace-insert stove, model 243 (Clipper), good condition, \$175 OBO. Puissant, 821-2447.
- NORDICTRACK ACHIEVER MODEL, \$500. Desonier, 856-1652.
- VICTROLA, fancy mahogany & gold trim, floor model, 42" x 36" high, complete, excellent condition, from the 1920s, \$325 OBO. Dybwad, 296-9047.
- SKI BOOTS, '95 Rossignol, size 8-1/2, used 3 times, paid \$300 new, asking, \$75. McGirk, 884-4592.
- ELECTRIC STOVE, working; gas furnace, old as dust, free, you haul. Alexander, 291-8028.
- LATCH SETS, gray pewter, 3 closet, 7 hall, \$5/ea.; 26 brass hinges, 3-1/2", 50¢ ea. Biffle, 293-0330.
- SOUTHWEST AIRLINE ROUND-TRIP PASS, use by Dec. 15, \$100. Shapnek, 281-5913.
- BABY ITEMS: Snuggli, extra nice, \$15; timeshare in Tahiti, make reasonable offer. Ludwig, 856-5111.

DEADLINE: Friday noon before week of publication unless changed by holiday. MAIL to Dept. 12640, MS 0165, FAX to 844-0645, or bring to Bldg. 811 lobby. You may also send ads by e-mail to Nancy Campanozzi (nr campa@sandia.gov). Questions? Call Nancy at 844-7522. Because of space constraints, ads will be printed on a first-come basis.

Ad Rules

1. Limit 18 words, including last name and home phone (We will edit longer ads).
2. Include organization and full name with the ad submission.
3. No phone-ins.
4. Use 8 1/2" by 11-inch paper.
5. Type or print ad; use accepted abbreviations.
6. One ad per issue.
7. We will not run the same ad more than twice.
8. No "for rent" ads except for employees on temporary assignment.
9. No commercial ads.
10. For active and retired Sandians and DOE employees.
11. Housing listed for sale is available without regard to race, creed, color, or national origin.
12. "Work Wanted" ads limited to student-aged children of employees.

FIFTH-WHEEL TRAILER HITCH, Reese, for pickup bed, 14,000-lb. capacity, 1 yr. old, \$425 OBO. Padilla, 294-3127.

SIDE-VIEW CAR MIRRORS, for trailer hauling; assorted wood doors, undrilled; 5 x 10 gray wall tile, Moss, 298-2643.

CABINET for stereo/cassette/radio/turntable, \$85; rattan/glass end & coffee tables, \$85; beige drapes, \$40. Pitts, 293-5481.

WOOD DOGHOUSES (2), large 3.5' x 4', small 2' x 2', new, never used. Flori, 293-5187.

MODERN MAID ELECTRIC COOKTOP, w/removable grill, downdraft, extra burner module, \$200. Garcia, 294-1442.

GARAGE SALE, crib, misc. baby items & clothes, Fri.-Sat., Nov. 22-23, 9 a.m.-1 p.m., 12612 Yorba Linda SE. Martinez, 292-1083.

HP DESKJET 200 PRINTER, works great (wasn't used a lot), manuals & software included, \$165. Jean, 833-2165.

CAMCORDER, PAL format (Europe), compact VHS-HQ, JVC Model GR-AX48, loaded w/features (12:1 zoom, etc.), \$500 OBO. Schmidt, 275-7252.

BUNK BEDS, dark pine, includes mattresses, great for children, \$95; steel office desk, \$65. Goering, 897-9505.

TELESCOPE, Celestron 4.5" Newtonian, 250x, equatorial mount, several lenses & filters, hardwood tripod, \$900 invested, asking \$600 OBO. Robbins, 292-7355.

COUCH & LOVESEAT, gray/blue pinstripe, wood trim, pillowed style, we need space, great buy at \$200. Cocain, 281-2282.

LANDSCAPING BRICKS, scalloped, 2 ft long, total of 34 for \$15; chicken wire, 1 roll, \$5. Detry, 293-9056.

KENMORE CHEST FREEZER, w/2 levels of baskets, in great condition, moving sale, \$200 OBO. Lemen, 266-6408.

SADDLE, Collegiate Sr. Event, all purpose, 17-in., Havana brown, like new, leathers, Toklat dressage pad. McCall, 242-4866.

TRANSPORTATION

'93 BUICK CENTURY WAGON, front-wheel drive, all power, loaded w/options, excellent condition. Sayers, 877-8094 or 873-2815.

'91 DODGE GRAND CARAVAN SE, AWD, excellent condition, white/tan, seats 7; 72K miles, \$10,000. Turner, 345-1086.

'92 CHEV. S10 PICKUP, 43K miles, V6/2.8L, 5-spd., cruise, AC, PS, PB, 7-1/2-ft. bed, matching shell, Tahoe trim, \$7,900 OBO. Branscombe, 881-4589.

'93 NISSAN SENTRA, 4-dr., AT, AC, new tires, 50K miles, \$7,500 (below book). Brown, 298-8447.

'90 CHEV. TRUCK, 4x4, full-size, 45K miles, excellent condition, CD, alarm, custom rims, tires, \$13,000. Harrison, 899-0193.

'62 A55 BARON, 5 seats, 180 kt. cruise, hangared in Moriarty, 1/5 share of airplane & hangar, \$14,000. Lorenz, 281-9321.

'94 CHEV. TRUCK, regular cab, V6 4.3L, 2WD, AT, many extras, 22K miles, Sportside, like new, \$16,850. Perez, 828-9005.

'72 MG MIDGET, more than \$3,000 invested in new parts to date, will consider any reasonable offer. Beck, 281-1792.

'89 JAGUAR XJ6 VANDAN PLAS, sandstone, 59K miles, garaged. Tapia, 269-8300, leave message.

'69 DODGE CORONET, w/SPRBBE pkg., 440 rebuilt engine, new paint & top, classic muscle car, \$5,000 OBO. Montoya, 833-5718 or 247-8152, ask for Allen.

'93 DODGE RAM 250 EXT-CAB, Cummins diesel, 2WD, 5-spd., 14K miles, many extras, \$16,900. Curzi, 296-5386.

'90 NISSAN, parting out. Chavez, 861-0712.

'88 CHEV. CAMARO RS, loaded, excellent condition, 67K miles, 305 V8, AT, AC, cassette, \$4,900 OBO. Zamora, 296-8251.

'95 FORD CONTOUR, 32K miles, 4-cyl., fully loaded, \$12,000. Powell, 866-0136, leave message for Jerry or Leann.

'71 BMW 2002, new carpet & tires, needs work, \$900. Nienow, 856-6096, ask for Jeremy.

'87 BUICK GRAND NATIONAL, SFI turbo V6, Astrorof, all power options, 97K miles, 2nd owner, \$7,500. Hanskecht, 899-0644.

'87 DODGE D-50 4x4 TRUCK, sports package, new tires, 1 owner, excellent condition, 65K miles, \$4,200. Sandoval, 275-0904.

'94 FORD PROBE GT, AM/FM cassette, 5-spd., immaculate condition, dual air bags, new tires, female-owned, sporty/black, \$10,200. Brown, 266-1653.

'83 COUGAR, 58K miles, original owner, 5-liter V8, AC, cassette tape deck, must see, \$2,990. Reed, 884-4505.

'84 VISTA COLT WAGON, tinted windows, \$1,000 OBO. Sanchez, 898-9598.

'96 TOYOTA TACOMA, ext. cab, AT, 4-cyl., camper shell, bed liner, tinted windows, AC, AM/FM cassette, \$15,995 OBO. Orona, 821-8643.

'88 GRAND AM, 4-dr., AC, AT, PB, PS, AM/FM cassette, cruise, 100K miles, new battery & front tires, \$3,200 OBO. Ramirez, 292-7030.

'89 SUZUKI SIDEKICK, 4x4, 5-spd., AC, removable hardtop, bucket seats front & back, \$4,900. Hayward, 292-2980.

'76 FORD F-250 SUPERCAB PICKUP, 86K miles, PS, 4-spd., camper package, burns unleaded, very good condition, \$4,000. Detry, 856-2999.

'94 CHEV. EXTENDED CAB PICKUP, 4x4, 11,800 miles, 5-spd., H-D transmission, matching fiberglass shell, \$19,500. Jackson, 792-1037.

'88 TOYOTA COROLLA DLX, 4-dr., light blue, AC, AT, 80K miles, runs great, \$3,800. Gillen, 298-2282.

RECREATIONAL

'92 CANNONDALE R700 TRIATHLON BIKE, 56cm, gripshifters, triple crank, shimano, aerobars, black/purple, like new, \$600. Jacobs, 281-9483.

SKIS, Fischer SC4 Vacuum Technique, 195cm w/Marker M40 bindings, \$30. Pletta, 281-4277.

SAND RAIL, 6-cyl. Ford engine, great condition, fast, street legal, \$2,800 OBO. Johnson, 884-1728.

ATV, Kawasaki 300, 4-wheeler, new, no-slip differential, back-mounted 20-gal. sprayer, boom, & wand, \$4,700. Rivers, 864-2335.

'94 COACHMAN TRAVEL TRAILER, Catalina Lite 200RB, 20-ft., fully self-contained, sleeps 4, AC, awning, toilet, \$8,500. Cerutti, 237-9658.

WOMAN'S SKI EQUIPMENT, Rossignol 190s, Look bindings, Solomon boots, size 9, parka/bib stretch pants, ski rack. Williams, 299-3108.

'87 STARCRAFT CAMPING TRAILER, 23-ft., excellent condition, \$6,000. Chavez, 865-4556.

'95 SEA-DO GTX PERSONAL WATER CRAFT (2), 3-passenger, many engine extras, dual trailer, will separate, \$12,000. Baldonado, 765-1961.

'93 WEST WIGHT POTTER SAILBOAT, 15-ft. cabin daysailer, w/trailer, easy rig, excellent condition, outboards, \$3,800. Ewing, 823-1112.

MOUNTAIN BIKE, Diamondback Ascendant, large frame size, \$175; Gortex jacket outershell by Sequel, w/detachable hood, \$150. Morrison, 298-0347.

SEASON SKI PASSES, Sandia Peak, 2 at \$85 ea. or both for \$150. Schultz, 821-5158.

COLONIAL WILLIAMSBURG VACATION, luxury condo for 4th of July week, resort has "tons" of amenities, "tons" to do in area. Devonshire, 821-7863.

REAL ESTATE

3-BDR. TOWNHOUSE, Juan Tabo & Copper, 1,450 sq. ft., 2 baths, 2 story, 2 car garage, fireplace, large back yard, \$103,500. Giere, 296-1347.

3-BDR. MOSSMAN HOME, 1-3/4 baths, 1,420 sq. ft., 2-car garage, clean, updated, nice yard, convenient location, \$108,000. Strong, 880-0399.

3-BDR. HOME, 1,865 sq. ft., 2 baths, 2 fireplaces, recent paint/carpet, Jacuzzi/gazebo, storm windows/doors, clerestory, many upgrades, \$128,000. Edmund, 881-7974.

FIVE ACRES, unimproved vacant land near proposed Paseo Vulcan Corridor in Paradise Hills, \$30,000. Williams, 275-3554.

3-BDR. TOWNHOME, loft, 2-car garage, 2 baths, utility room, fireplace, adobe accents, Saltillo tile, Four Hills/Central area, \$143,350. Pierce, 299-2801.

3-BDR. MOBILE HOME, 14' x 76', well kept, appliances, W/D, deck w/awning, carport, storage shed, Bemalillo, \$19,500. Griffin, 856-6213.

3-BDR. HOME, 2-story, Sandia Park, 2,300 sq. ft., 2-1/2 baths, 2-car garage, 2 yrs. old, 2.25 acres, \$205,950. Salazar, 281-0560.

WANTED

EXHIBITORS, "Cherished Creations" arts/crafts show, Thanksgiving weekend, Nov. 28-Dec. 1, state fairgrounds, Flower School Arts Bldg. Self, 296-4137.

RADIO WIRING DIAGRAM or shop manual for '85 Dodge or Plymouth. Peterson, 883-8463.

HOUSING for sabbatical professor, from January-August 1997, will be commuting from Flagstaff, Arizona, no pets. Hughes, 296-8940.

RIDING LAWN MOWER, 3-blade, good condition, Calleges, 864-1111.

HOUSEMATE, nonsmoker, large Bellhaven home, near Wyoming/Indiana School, \$500/mo. Campbell, 293-2195.

'60-'95 CHEV./GMC V8 PICKUP, w/big rear window, for restoration. Wilde, 881-6910.

MAN'S SCUBA BC VEST, 185 lbs., 5'11". Pierce, 299-2801.

LOST & FOUND

LOST: Linked copper bracelet, w/Southwest design, lost Nov. 4, between parking lot north of Bldg. 890 & in/around Bldg. 880, aisle B. Wilson, 293-2228, after 5 p.m.

LOST: Sterling silver clip-on earring, on Oct. 31, between TTC, 880 & parking lot Gate 6, oval, 1"x1/2"x1/8". Freeman, 844-7988.

FOUND: Bicycle rear flasher, Bldg. 859. Lane, 845-9122 or 884-4566 (home).

FOUND: Book titled,And Now Miguel, left behind at TTC, Bldg. 825, on Take Our Sons to Work Day. Serafin, 844-6909.



Sandia News Briefs

Energy Secretary Hazel O'Leary resigns

Secretary of Energy Hazel O'Leary submitted her resignation to President Clinton Nov. 13, effective Jan. 20. A DOE news release attributed several accomplishments to O'Leary's administration, including providing the technical foundation for ending nuclear weapons testing, gaining public trust by becoming more open, making progress toward cleanup of waste sites at former nuclear weapons facilities, helping reduce the federal budget deficit through business reform, increasing the diversity of the nation's energy supplies, improving energy efficiency, winning several Nobel Prizes and more R&D 100 awards than all other government agencies combined, and helping improve the position of the United States in the global economic marketplace. O'Leary's successor has not been named.

Dick Brow wins prestigious Gottardi Prize for glass work

Dick Brow of Materials Joining Dept. 1833 has received the International Commission on Glass (ICG) Prize in memory of Professor Vittorio Gottardi. His award came during the opening ceremonies of the ICS International Symposium on Glass Problems in Istanbul, Turkey, in September. The Gottardi Prize is intended to recognize meritorious research, development, teaching, or commercial achievements in the field of glass and is presented annually to a person under forty years of age. Dick is the first American to receive the prize in the ten years that it has been awarded. He was recognized for his spectroscopic studies of glass structure and his development of novel sealing glasses, including those for aluminum hermetics and lithium corrosion-resistant applications. Dick was presented with two pieces of glass art, from the ICG and from SISECAM, the largest glass manufacturer in Turkey and host for the meeting. He then delivered the opening lecture for the symposium, describing in part DOE Basic Energy Sciences-supported work on the structure and dynamics of phosphate glasses.

Ombud Wendell Jones named president of dispute resolution group

Wendell Jones, Ombudsman in Organization 11, has been appointed president of the Board of Directors for the New Mexico Center for Dispute Resolution (NMCDR). The NMCDR is a nonprofit organization that provides training in dispute resolution and mediation services to schools and government agencies. This includes court-referred mediation services for victims and offenders, social services referrals for parent-teen mediations, and the supervision of peer mediations in the public schools at all levels. The NMCDR also develops and distributes dispute-resolution curricula for teaching students in preschool through high school constructive ways of handling disputes. Wendell joined the board last spring.

Retiree Harold Jeske wins telemetry pioneer award

The International Foundation for Telemetry (IFT) presented its 1996 Pioneer Award to Harold Jeske, a Sandian who retired in 1986, for his 35 years spent in the telemetry field. The presentation was made at the 32nd annual International Telemetry Conference in San Diego. In addition to his duties in the Field Test organization, Harold was a member of the Telemetry Group of the Range Commanders Council for 28 years. He was also a member of the Telemetry Standards Coordinating Committee for 16 years. Retired Sandian Stan Reynold received the 1995 IFT Pioneer Award.

Send potential Sandia News Briefs to Lab News, Dept. 12640, MS 0165, fax 844-0645.

Sandia Web Watch



Featured Web site explains Sandia's robotics program — Sandia's robotics program received lots of publicity during and following the Oct. 28 dedication of the new Robotics Manufacturing Science and Engineering Lab (*Lab News*, Oct. 25). Now the respected

program is getting more exposure through Sandia's newest featured External Web site — the Intelligent Systems & Robotics Center (ISRC) at <http://www.sandia.gov/isrc/Main.html>.

The ISRC is one of the nation's leading R&D facilities devoted to integrating diverse technologies (software, sensors, vision systems, and hardware) and applying them to challenges faced by industry and the DOE. The Robotics Manufacturing Science and Engineering Lab (RMSEL) is said to be the first facility in the US designed specifically for intelligent systems R&D.

"Cybervisors" can see photos of the handsome new RMSEL and some of the robots and intelligent systems in use, and learn about special facilities and projects, notes Center Director Pat Eicker (9600). One fascinating featured project is the MicroManipulation Lab, created to investigate the automated assembly of microelectromechanical systems components. The lab is developing technologies for a robotic work cell that can assemble parts that are about the diameter of a human hair into tiny machines for use in weapons, surveillance devices, and microsurgery.

For more information about ISRC's Web site, contact Laurie Bergeron (contractor) at 845-9862. For the next few weeks, the site can also be found by clicking on "Featured Web Site — Robotics" on Sandia's recently redesigned External Web home page: <http://www.sandia.gov>. The featured site will be changed about every two months.

— Larry Perrine

★ Congratulations

To Marlene Shields (9752) and Fernando Uribe (1411), married in Kansas City, Kan., Nov. 9.

To Tammy Wilson (9103) and Mike Eldred (9234), married in Albuquerque, Oct. 19.



AN ICY RECEPTION — Ice sculptures were a highlight of an evening reception Nov. 8 at the National Atomic Museum celebrating completion of the museum's remodeling project (*Lab News*, Oct. 11) and thanking the museum's supporters. Three of the sculptures displayed the insignias of the National Atomic Museum, Lockheed Martin, and Sandia; two were in the shape of the Little Boy and Fat Man atomic bombs. About 100 people attended, among them several VIPs including Al Narath, President of Lockheed Martin's Energy and Environment Sector; Mike Zamorski, Manager of DOE's Kirtland Area Office; Col. Daniel Danstro, Vice Commander of Kirtland's 377th Air Base Wing; and Gary Bratcher, State of New Mexico Secretary for Economic Development. Labs President C. Paul Robinson and various other members of Sandia's executive management attended as well.

Coronado Club

Nov. 21 — Thursday bingo night. Card sales and buffet start at 5 p.m., early birds' bingo at 6:45 p.m.

Nov. 22 — "Western Night" dinner/dance. \$8.95 steak or shrimp dinner, 6-9 p.m. Music by Bobby Buttram, 7-11 p.m.

Nov. 26 — Traditional Thanksgiving lunch, \$4.95; also serving normal lunch line.

Nov. 28 — Thanksgiving Day dinner, seating 11 a.m. and 1:30 p.m.; \$8.95 adults, \$4.95 children 4-12, under 3 free.

Dec. 5, 12, 19 — Thursday bingo night. Card sales and buffet start at 5 p.m., early birds' bingo at 6:45 p.m.

Dec. 6 — "Western Night" dinner/dance. \$7.95 all-you-can-eat buffet, 6-9 p.m. Music by Isleta Poorboys, 7-11 p.m.

Dec. 13 — "Western Night" dinner/dance. \$7.95 all-you-can-eat buffet, 6-9 p.m. Music by Midnight Magic, 7-11 p.m.

Dec. 15 — Sunday brunch buffet, 10 a.m.-2 p.m. \$6.95 all-you-can-eat buffet. Kids 3-12, \$1, under 3 free. Music by Bob Weiler, 1-4 p.m.

★ Recent Patents

Barry Spletzer (9611): Method and System for Rapid Piece Handling.

Neil Davie (9761): Simulation of Pyroshock Environments Using a Tunable Resonant Fixture.

Kevin Lear (1312): Optical Device with Low Electrical and Thermal Resistance Bragg Reflectors.

Retiree deaths

D. C. Davis (88)	.....4518	.....Sept. 28
Alice Moore (73)	.....3141	.....Oct. 1
Phyllis Bernyk (84)	.....9000	.....Oct. 2
Richard Prokash (74)	.....1211	.....Oct. 8
Gordon Williams (73)	.....9213	.....Oct. 8
Floyd Forsythe (76)	.....5636	.....Oct. 11
Cecil Kinney (75)	.....3155	.....Oct. 12
Robert Hamilton (84)	.....9310	.....Oct. 18
Everett Giesecker (76)	.....5165	.....Oct. 26
Delfino Jinzo (69)	.....3423	.....Oct. 27
Reuben Barwick (83)	.....4124	.....Oct. 30
Herbert Anderson (69)	.....7223	.....Oct. 31