Labs Inherits Neutron Generators

Hazel O'Leary Gives 'Go Ahead' on Plan to Manufacture Some Nuclear Weapon Parts at Sandia and Los Alamos

Secretary of Energy Hazel O'Leary announced May 27 that Sandia and Los Alamos national laboratories will inherit manufacturing responsibilities for certain non-nuclear weapons components as DOE streamlines its nuclear weapon production complex to meet the needs of the post-Cold War era.

The "go-ahead" announcement followed an independent review of plans to reconfigure the DOE production complex into a more efficient and cost effective manufacturing operation — called Complex 21 — that fulfills the nation's reduced demand for weapon components since the end of the Cold War. The consolidation plans were initiated in 1991 under former Energy Secretary James Watkins.

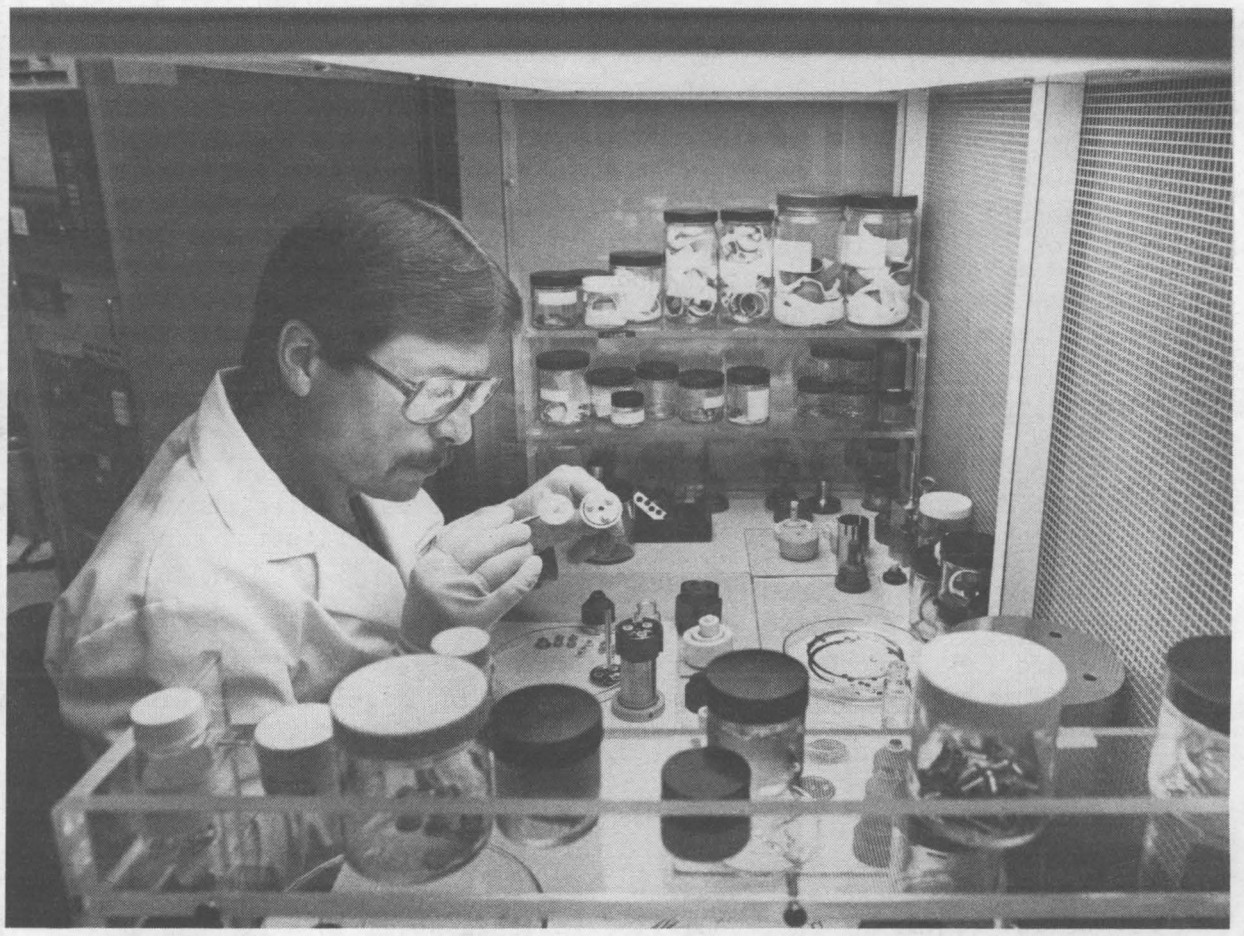
Sandia will inherit the manufacture of neutron generators previously fabricated at Pinellas.

Under O'Leary's direction, three independent consultants reviewed the plans and concluded that the consolidation of DOE's production capabilities would be cost effective and would not increase associated technological, environmental, safety, or health risks.

"I am convinced that the Department's proposed non-nuclear consolidation plan is cost effective and should be implemented," said O'Leary.

In announcing her decision, O'Leary also

(Continued on Page Nine)



NEW NEUTRON generator work will soon come to Sandia as part of the recently approved reconfiguration plans for DOE's nuclear weapon production complex. Here, Jak Strascina of Thin Film, Vacuum, and Brazing Dept. 2471 assembles metal piece parts for a prototype neutron generator. The tube assembly facility, better known as the Tube Lab, will be moved from its current location in Bldg. 891 to a new, much bigger facility in Bldg. 870, where approximately 500 neutron generators a year will be manufactured by Sandia. Jak has been working with prototype generator parts at Sandia for 27 years. (Photo by Randy Montoya)

Peach-Colored Badges

Labs Adds 'L' In Response to Changing Times

In another sign of changing times — the Cold War's end, shifts in global politics, and declining federal budgets — many Sandians will soon be going to work with a different type of security clearance.

These and other changes have combined to create a demand for a less costly security clearance process at DOE facilities, and the response at Sandia will be a new peach-colored badge denoting an L clearance. They could start showing up at Sandia/New Mexico Monday (June 14).

It's something that has been talked about at the Labs during the past several years, says Jim Martin, Director of Safeguards and Security Center 7400. "It's not a new idea," he says. "It's just been a long time in coming."

The L clearance will permit access to most places within Sandia's tech areas and will allow access to some secure information and some categories of nuclear materials. It requires the same high standards of personal conduct on the part of its holders as the Q.

A major difference, however, is the background investigation. For an L clearance, this investigation is much less extensive — hence much quicker and cheaper — than for a Q clearance.

No Lessening of Security

The new clearance does not mean a lessening of security, Jim emphasizes. "This means a shift in overall responsibility from a dependency on fences and physical barriers to a system based on the person possessing the asset," he says. "We expect security will actually be heightened in the future as Sandia's work shifts

(Continued on Page Eight)

LAB NEWS

VOL. 45, NO. 12 SANDIA NATIONAL LABORATORIES JUNE 11, 1993

State of the Labs 1993: Labs Top Execs Discuss Sandia's Mission, Directions — See Page Four

Labs' Score: 27 since 1976

Sandia Takes Five R&D 100 Awards — Greatest Number in 1993 Contest

Sandia took top honors in the 1993 R&D 100 Competition with five awards, the most winning entries this year for any organization in the international contest.

The awards, given by *R&D Magazine*, recognize the 100 most significant technical products developed in the previous year.

Sandia's winning projects (some shared with other organizations) in this year's competition were

- A solar parabolic dish system for converting sunlight into electricity — the first commercial application of a free-piston Stirling engine.
- A microsensor that can detect hydrogen in a wide array of industrial applications.
- A family of integrated circuits used to test semiconductor assembly and packaging processes.
- A family of water-based chelating etches for the photolithographic processing of metal-oxide thin films used in the development of microelectronic devices.
- A mesh-generation algorithm called "paving" that enhances computer-aided design of numerous industrial products.

The awards, to be presented at a Sept. 9 dinner at Chicago's Museum of Science & Industry, bring to 27 the total of R&D 100 awards Sandia researchers have received since 1976.

Dish-Stirling Generates Electricity

Sandia and three companies are co-winners of the award for the 7.5-kilowatt dish-Stirling system, which was developed by a team of engineers at Columbus, Ind.-based Cummins Power Generation, Inc. and Sandia researchers in Solar Thermal Technology Dept. 6216. Sandia and Cummins were assisted in the development of the system by Sunpower, Inc. and Thermacore, Inc., who share the award with Sandia and Cummins. The Sandia effort was led by Rich Diver (6216).

Dish-Stirling technology is named for its two major components — dish-shaped solar concentrators

(Continued on Page Nine)

This & That

No Slowdown – A couple of years ago, President Al Narath and Executive VPs Orval Jones and Lee Bray made the point in a State of the Labs feature interview that the Labs wouldn't ever get back to "normal"; rather, they predicted, we would see change at an accelerating pace. Judging by events since then, their forecast was on the money. Just in the handful of weeks since LAB NEWS Managing Editor Charles Shirley interviewed Al, Orval, and Lee for the 1993 State of the Labs, we've had announcements of a salary freeze for DOE contractors and the go-ahead on a plan for non-nuclear weapon parts to be manufactured at DOE labs (we were able to add some discussion about the salary freeze to the original interview). For reflections on how Sandia might fit into current national agendas, how we're dealing with the decline in nuclear weapon work, how we're developing relationships with industry, and other timely topics, have a look at the interview beginning on page four.

* * *

A Good Question? – Does anyone know why the large, reusable "US Government Messenger Envelopes" we use at Sandia have holes punched in them in eight of the spots where you're supposed to write the name of the recipient?

* * *

Irreverent Rival – Most folks simply don't have the basic irreverence I do, but my colleague and friend Nigel Hey (4524) comes close. In his May 21 *Sandia Management Bulletin*, Nigel wrote: "Lawrence Livermore National Lab staff are somewhat glumly awaiting a visit from a *60 Minutes* TV production crew. This time they offered to share the publicity with us." The visit reportedly has something to do with cleanup problems.

And speaking of LLNL, something caught my eye in the May 7 issue of its employee newspaper, *Newsline*. This statement was in a story about a new policy requiring that qualified internal applicants be considered first for job vacancies: "Only *indefinite career employees* may apply." I don't know how LLNL defines such employees, but I'm pretty sure that I wouldn't want to be one.

* * *

Any More 100-plus Parents? – I discovered that one Sandian – Isabel Castillo (1956) has a 100-year-old parent. Her father, Nick Castillo, turned 100 on May 12. Anyone else?

* * *

Stupid Computer! – Spelling checkers on modern personal computers are great for folks who aren't good spellers, but the checkers that suggest alternate words for ones they don't know can sometimes surprise you. I wrote the word borehole not long ago, but my spelling checker didn't know that word, so it suggested "brothel." Sometimes spelling checkers can suggest some interesting alternatives that are even related to the word it doesn't know – for example, mine suggested "Tacos" for Taos. Yes, you can certainly buy tasty tacos in Taos.

* * *

Do You Hear the Hum? – I thought several weeks ago that the mysterious "Taos Hum" had migrated toward Sandia, but that turns out to be untrue. The hum around Sandia is caused by many "salary-frozen" employees muttering softly, "Hmmmmmm – I wonder if I can afford to pay all my bills next year!" •LP

Decision Expected in July

DOE Evaluates 'Best And Final' Offers for Sandia M&O Contract

The process of picking a new management and operating (M&O) contractor for Sandia is down to evaluating the "best and final" offers submitted by the two finalists and presenting those findings to the DOE officer who will decide which of them will be awarded the contract.

Denny Krenz, Chairman of DOE's Source Evaluation Board (SEB), says contract offers from Battelle Memorial Institute and Martin Marietta were turned in by the May 28 deadline and are being evaluated by SEB members.

"We now have everything in hand and we're performing our final evaluation," he says. "We're evaluating information in the final offers and information gathered during site visits to installations of both organizations, and our conclusions will go into the briefing we give the Source Selection Officer (SSO)."

Krenz says SEB members hope to brief the SSO in early July. DOE is expected to announce a decision by the end of July and plans to have the new contractor's transition team in place by the first of August for a two-month phase-in period.

AT&T's contract expires Sept. 30. The new contractor will take over Oct. 1. •

Take Note

Recycle Coordinator Louise Bland (7617) sends the following information for employees to consider:

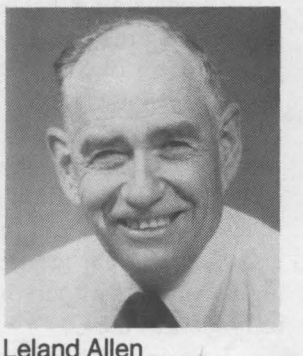
"Keep Albuquerque Beautiful" will once again have an opportunity to earn up to $4,500 by collecting grocery receipts. The Glad-Bag Company will donate 15 percent of total dollar value of grocery receipts collected to "Keep Albuquerque Beautiful" projects. Last year, Sandia was the largest contributor in the city. Glad products do not have to be purchased. Please send your grocery receipts to Louise by June 30.

Get rid of your old vehicles by contributing those "jewels" or "junkers" to the National Kidney Foundation of New Mexico. Donations are tax deductible and towing is free. For more information, call 266-4573.

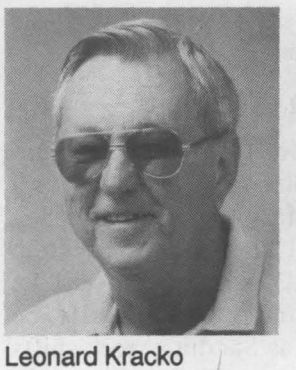
Open House

The Labs is holding an open house in honor of retiree **Helen Richardson** (7533) in the Area 1 Cafeteria (Bldg. 861) on Wednesday, June 16, 2-4 p.m. Refreshments will be served. Friends and acquaintances are invited.

Recent Retirees



Leland Allen
5111 36



Leonard Kracko
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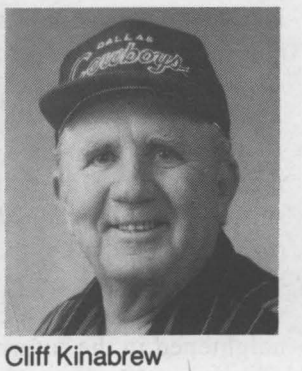

Cliff Kinabrew
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How to Find Us

Employee Communications Dept. 7162 is now located in Mobile Offices 172 and 173 (MO172-173), immediately east of our old location in Bldg. 814, but we are now *inside* Tech Area 1. To find us, head north from Bldg. 801, wind around the suite of lovely aluminum temporary buildings (T14-23), and bear left (west). Our entrance is on the west side of MO172. We are told that the tech area fence will eventually be moved inward, putting our facilities back outside the tech area.

In the meantime, uncleared employees, retirees, and others who want to place "unclassifed ads" in the LAB NEWS can mail them to us at Department 7162 or fax them to us at 844-0645. Also, the receptionist in the Bldg. 800 lobby will accept ads there on workdays 8 a.m.-noon and 1-4:30 p.m. We do not accept ads by telephone. Ad rules and deadlines are published at the top of the ad page in each issue.

Call us on 844-7522 or 844-7841 if you can't find us or if you need more information.

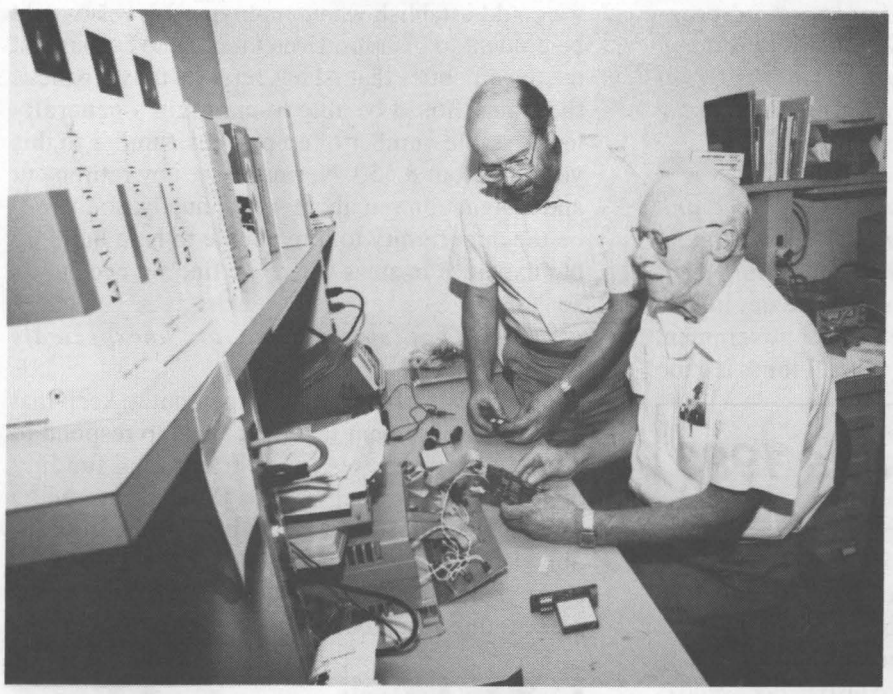
Need a 'Thingamajig'?

Digital Systems Development Lab May Have Answer

If you needed an automated, fiber-optic, gyro-stabilized, laser-lighted *thingamajig* for your next Labs project, you might try the Digital Systems Development Laboratory (DSDL) at Sandia/California. The two-man DSDL team of Doug Macmillan and Leo Mara (both 8453) have a motto: "Some jobs too big, no job too small."

The DSDL fills an in-house need for just about any off-track, small-to-medium digital, electronic, and electro-mechanical "device" that Sandians can dream up, along with control systems ranging from the very simple to the very complex. It also provides internal customers with first-hand consultation and advice on unusual needs. The specialized equipment and services provided by the DSDL are not available in the marketplace and are not within the purview of other Sandia service groups.

Whether you need some advice, some help finding a vendor, or something designed and built, consulting with DSDL can often save time and money and avoid inappropriate and unsatisfactory acquisitions, says Doug. When consulted early, the team often helps clarify a problem or suggests a commercially available product that meets almost any need or design.



TWEAKING A TESTER — Doug Macmillan (seated) and Leo Mara (both 8453), the two-man team that makes up the Digital Systems Development Lab (DSDL) at Sandia/California, make changes in the tester for a Permissive Action Link (PAL) controller in their Bldg. 910 workshop/lab.

When Duty Called . . .

In the past, the DSDL has provided a variety of devices and services for internal customers that have proved to work out "just right." For example, a gadget provided for the X-ray film lab helped stop overflows of chemical waste in an automatic film processing system.

Waste from the lab's automatic film processing system is collected in carboys and properly disposed of when a carboy is full. But once in a long while someone in the film lab forgot to check the level in the carboy, and it overflowed. No spill resulted, due to a secondary containment system, but cleaning up after an overflow was irritating and burdensome. At the request of the film lab, the DSDL designed and had built carboy corks with battery-powered float alarms to remind the operators when it was time to empty the carboys.

Another small but successful design task was a request for a secure system that switched computer stations between classified and cleared networks. Standard network switches would not do because of the possibility of electromagnetic cross-talk. The user located a fiber-optic switch that seemed to offer a secure switching technique, and the DSDL packaged the switch and provided battery power, switch control, and network status display.

Consulting with DSDL can often save time and money and avoid inappropriate and unsatisfactory acquisitions.

Examples of small, one-time-only DSDL solutions are many. But the DSDL has also provided solutions to several major, more complex problems over the years. One of these was brought to Doug and Leo by Sandia security.

The California site's access control booths are connected to the main security computers via ring networks. Each booth must receive authorization for admission from the main computer. Periodically one of the computer networks would go into uncontrolled oscillation, thus preventing employee access and resulting in lines of irate Sandians trying to get off-site, and sometimes on-site. The situation persisted until someone from security came to reset the booth.

The access booth supplier didn't offer any reasonable solution, and recommended replacement of the entire system at considerable expense. Sandia was not ready to commit to such an expensive upgrade.

Doug and Leo were asked to come up with a simple, less expensive solution. They designed and fabricated a piggyback board that plugged into the existing board. The piggyback board included a micro-controller that monitored the system's operation. Whenever signs of "loop hum" were observed, the board put out a reset signal. "This simple Band-Aid required no wiring changes or other labor-intensive activity," says Doug. "By simply plugging in the piggyback board the problem was solved."

Another major project came to the DSDL in 1977, when the Tritium Research Lab needed a system to monitor radiation levels of effluent from tritium-handling glove boxes in the facility and initiate appropriate processing based on that information. A process display and manual control station was also required.

The DSDL designed, fabricated, and installed a process control system based on the earliest microprocessor (Intel 4004). It has been running 24 hours a day, seven days a week ever since, with a minimum of outages, says Leo.

In 1980, the DSDL also provided a laboratory automation system for Don Nissen, Manager of Environmental Protection Dept. 8642, who was then a physical chemist conducting an investigation into the potential use of molten salts for solar power collectors. He had designed a clever apparatus that used a spring-mounted bob to measure salt viscosity at high temperatures. Unfortunately the operation of the rig, as well as collecting and reducing the data, was inordinately time-consuming and laborious.

The DSDL was able to design a control and data collection system that ran a series of experiments at different temperatures. The 8085 microprocessor analyzed the collected data, and the results were provided to the experimenter. The apparatus ran unattended day and night so that weeks of experiments and data collection were accomplished in days.

Ongoing DSDL Projects

Now Sandia is proposing an Automated Emergency Notification System to the California Department of Transportation and several common carrier associations. The monitoring system would report dangerous incidents involving hazardous shipments. It might be attached to a shipment of hazardous material, like a tank car full of hydrazine.

The system includes a set of on-board sensors that measure temperature, altitude, pressure, vehicle attitude, and whatever else is appropriate. The status of the shipment is evaluated by an on-board microprocessor. A Global Positioning System and a satellite receiver relate the vehicle's location to the computer.

If a hazardous condition is noted by the computer, it dials the number of the main station. After communication is established, the on-board "Green Box" processor downloads the necessary information into the main computer at the base station where an operator is located, saying, in essence, that "on the corner of Hollywood and Vine, Vehicle No. 34 turned over and everything is on fire — better come quick!"

The DSDL is also designing a system to record attendance at Labs meetings or classes without having attendees fill out a sign-up sheet. The recorder is based on an inexpensive ($600) laptop computer which acquires registration information using badge readers. The attendance information is recorded on a 3-1/2-in. floppy disk for transfer to whatever data base is used for record keeping. •

SANDIA CALIFORNIA NEWS

Women's Committee Honors High Schoolers

Twelve high school juniors were recognized recently by the Sandia/California Women's Committee for their outstanding academic achievements and significant improvement in science and mathematics.

The 12 young women, their parents, teachers, and school principals looked on as the winners were presented a scientific calculator and certificate by Sandia/California VP John Crawford (8000). The awards were presented during the Committee's second annual Math/Science Colloquium at the Pleasanton Holiday Inn. Dona Crawford, Director of Scientific Computing Center 1900, delivered a keynote address titled "Choices and Challenges."

Outstanding Achievement awards went to Jessica Hindmarsh of Livermore High, Carolyn Wong of Granada High, Sophy Wong of Tracy Joint Union High, Lisa Morrison of Amador Valley High, Dawn Ceizler of Foothill High, and Anny Tu of Dublin High.

Significant Improvement awards were presented to Tara Prescott of Livermore, Lindy Forsberg of Granada, Rose Machjado of Tracy, Lana Volk of Amador, Rita Chang of Foothill, and Dawn Fischer of Dublin.

By honoring high school juniors each year, the Women's Committee hopes to encourage young women to pursue technical careers in math and science as well as provide recognition they can include on college admission applications, says Celeste Rohlfing of Combustion Chemistry Dept. 8353, who chaired the honors banquet. •

Uncertainties Won't Go Away, So . . .

'Agile Employees' Are Key to Sandia's Future Strength

Continuing a tradition that began 24 years ago, the LAB NEWS recently interviewed President Al Narath and Executive Vice Presidents Orval Jones and Lee Bray about the current "State of the Labs." Here's what they said:

LN: The nation has a new President and Secretary of Energy. What trends affecting Sandia have you seen so far as a result of this change?

Al: The biggest impact I see is greater uncertainty about the directions the federal government will take over the next several years. I think it's too early to say much about definite trends. We all know what President Clinton is attempting to accomplish, in areas such as balancing the budget and redirecting defense effort, including R&D, toward civilian needs. There are also many agendas competing for federal support. And it is unclear how our difficulty with making ends meet in this country will finally impact DOE programs.

State of the Labs 1993

LN: What are some of the agendas you have in mind?

Al: For example, how to safeguard R&D capabilities essential to the maintenance of an enduring nuclear weapon stockpile, at a time of shrinking defense budgets, while at the same time accomplishing a major reconfiguration of the production complex. Health care is also a major issue and is likely to be a costly initiative for the federal government. The federal commitment to improving our nation's infrastructure, including an information "superhighway," is another example.

Then there's the issue of how to raise additional revenues. If we want to balance the budget, at some point we have to balance income and outlays. The decision of Secretary of Energy Hazel O'Leary to freeze DOE lab salaries [LAB NEWS, May 28] addresses that issue directly. The announcement was unexpected, but the initial reaction of most Sandians was positive, based on their belief that similar sacrifices would be made elsewhere in support of the urgent need to gain control over the federal budget.

There are also some indications of encouraging trends not requiring large investments. The administration is intent on supporting greater cooperation among government agencies in solving some of the nation's problems. I think that will increase federal R&D effectiveness. Speeches that I've heard recently by Secretary O'Leary and Commerce Secretary Ron Brown seem to indicate a greater willingness than ever before for departments of the federal government to join forces in addressing problems that have a technological dimension.

"We can't predict how rapidly defense spending will be cut and how the decline will impact nuclear weapon R&D."

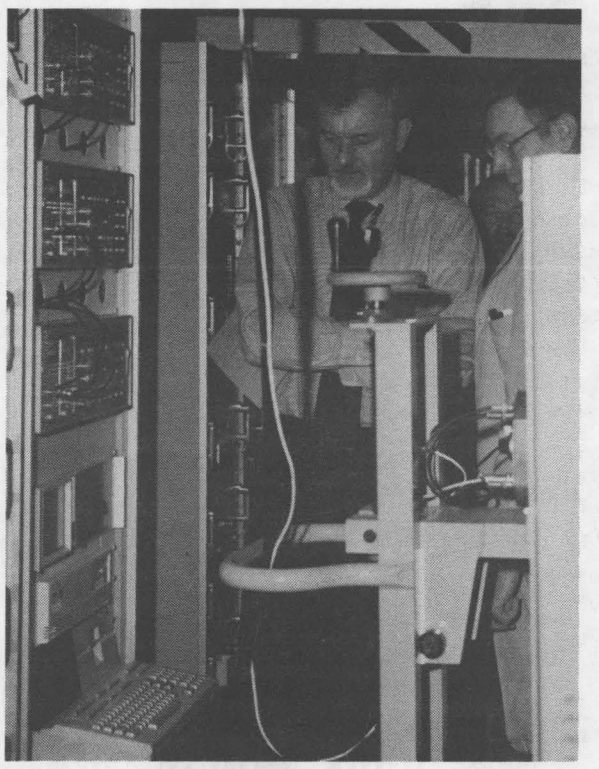
There are uncertainties, too. We do not know at this point how the so-called defense conversion process will evolve. We can't predict how rapidly defense spending will be cut and how the decline will impact nuclear weapon R&D. It's just too early in this administration to be very clear on many details, and we have to plan accordingly.

LN: What can we say about the picture at Sandia? The news media have been pretty bold in forecasting that we'll lose employees because of budget cuts in weapon programs.

Orval: In mid-April, the Sandia Program Council assessed the most likely upper- and lower-bound revenue streams for 1994 through 1996, so we could establish what employment levels would be prudent to plan for. Even taking into account all the uncertainties that Al has referred to, we believe the Labs should be able to maintain a generally level, stable number of employees, similar to this year — about 8,550. Normal losses by retirement and resignation run about 400 annually, so there'll be the opportunity to hire people to help build up our expertise in areas where we find we need to do so.

LN: That sounds like an unexpectedly pleasant picture.

Orval: It's basically positive, but to keep that kind of employment level, we have to respond to continuing decreases in our traditional funding areas. Our traditional weapon R&D supported by DOE's Office of Military Application will probably decline 10 to 15 percent per year over the next three years. Considering that it's already down 13 percent this year from last year, that's going to be a dramatic change. It will impact the very core of how Sandia manages itself.



SANDIA PRESIDENT Al Narath (left) visited Sandians at the Pantex Plant in Amarillo earlier this year. He's seen here with Jim Godfrey (right, now retired) and Ted Frederiksen (364, just visible behind Al and Jim) in the Weapon Evaluation Test Laboratory operated by Department 364 — Stockpile Evaluation Dept. IV, Pantex. They're in an area that contains system test equipment for B61 bombs.

We have to make significant shifts of people to different programs. That's going to require Sandians to be flexible, open-minded, willing to re-educate themselves, and willing to work in new areas.

For example, the cuts I just mentioned are expected to be significantly offset in the Defense Programs [DP] sector by opportunities in verification and control technology, by the reconfiguration that's going on in the production complex, and by increases in safeguards and security. At the bottom line, funding increases in those areas will keep the DP sector from being hit too hard overall. But internal to the sector, there will be changes that have to be accommodated.

Just to glance at the other sectors, Energy and Environment [E/E] is one where we continue to see opportunity for growth in Sandia programs.

We're forecasting the Work for Others [WFO] sector to continue at a basically steady level. That's a prudent position to take in terms of the kinds of things Al talked about — particularly what will be happening to the budgets of the military services, which make up a large part of the WFO customers.

LN: How are we doing at adjusting our work force and making the needed shifts of people?

Orval: Many Sandians are naturally inclined to continue working on Military Application programs. That's a serious problem this year — we're overcharging that budget by more than 100 FTEs [full-time equivalents], and the overcharging has been growing month by month. As a result, we're having difficulty internally moving on to new programmatic opportunities that are coming into the Labs. Certainly, there's a natural desire to hold on to what's been in place, what's familiar, but we're simply going to have to break with that feeling, or we'll have difficulties next year.

"We have to make significant shifts of people to different programs."

LN: What's our funding breakdown now?

Orval: In FY93, 48 percent of our funding derives from our traditional nuclear weapons Military Application work. Then there's about five percent that's involved with verification and arms control, safeguards and security, assessment of foreign technologies, etc. That makes up a grand total of 53 percent of Sandia work done for DOE Defense Programs. Five years ago, in 1988, it was 62 percent.

Then we have 19 percent that's Energy and Environment, and 28 percent of our revenue derives from Work for Others. The corresponding numbers for 1988 were about nine and 30 percent, respectively.

The decline to 48 percent in nuclear weapon work reflects the direction we talked about earlier, that we truly are becoming in every way a multi-program laboratory. And that's good news. We have lots of diversity, lots of programs. That's a splendid insulation against decline in any one program area. But it also means we'll need to be working for new customers, delivering quality products for them. Employees need to be aware of that. Management is certainly thinking about it, and we'll be working to assist employees with appropriate education, skills expansion, and so on.

LN: Do individual Sandians need to be more flexible and willing to move from job to job?

Al: Yes, but it's not just a matter of moving. As I implied earlier, Sandians have to accept the reality of uncertainty. It's with us. We're all acutely aware of it.

And I don't think that situation will change anytime soon. We're moving away from a bipolar world, in which much of our effort was focused on protecting ourselves in the face of threats associated with a single opponent. We're now in a multipolar world. There are many more players, and many more conflicting interests. We're also caught up in a global economic battle with industrial nations around the world.

LN: In other words, what's happening internally is a reflection of events outside.

Al: Yes, and it's important to keep the larger picture clearly in mind. The measure of success for a laboratory like Sandia is the impact of its contributions. Laboratory size is not a good measure. To optimize our contributions might require driving the Labs down in size, or in the long run it might cause some growth — I don't really know. I try not to become too preoccupied with simply preserving the current level of employment. What I am concentrating my efforts on is how we can best live up to our strategic intent. "Exceptional service in the national interest" is a more powerful motivator than worrying about employment levels.

After all, even with all the uncertainties, all the stresses that we are suffering, there has never been a time in our history when the opportunities to live up to our strategic intent have been greater. The country is increasingly facing problems that have a technological component, and we are extremely

well positioned, in terms of capability and reputation, to take advantage of that fact. In the long run, the most assured way to safeguard jobs at Sandia and create jobs elsewhere is to contribute to our nation's most pressing needs.

LN: At the same time, we have a major corporate change coming up, with the transition to a new management and operating [M&O] contractor. How's that transition going?

Lee: It's going well. The process is working, it's on track, it's on target to meet the schedule and have the new contractor take over on Oct. 1. Best-and-final offers from the two remaining candidates — Battelle Memorial Institute and Martin Marietta — went to DOE on May 28. And now it's a matter of DOE's Source Evaluation Board spending a lot of time evaluating the two final proposals. DOE still expects to make a decision by the end of July. It's likely that at that time they'll have agreed upon many of the terms and conditions of the resultant contract. I think that's all we can really say. Everything is moving along. We don't expect any significant complications. [See related article on page two.]

LN: Not quite a year ago, many people wondered whether a process this large and intricate could be done in the time available.

Lee: When AT&T announced it didn't wish to continue as the M&O contractor, 17 months was left for the contract to run. A lot of people in Sandia and DOE have worked hard to make this transition happen smoothly. The Source Evaluation Board, led by Denny Krenz, deserves a lot of credit for doing an outstanding job of keeping the process on track.

LN: In this time of change, what's the state of Sandia's reputation?

Al: We have a solid reputation for performance as a multiprogram laboratory, and we can reach out in many directions. We just have to choose wisely. There are lots of opportunities for us to do good work, and we intend to do that. We do need to pay careful attention that we maintain the fundamental technical competencies of the laboratory, so that we don't fragment our efforts and ultimately become a job shop. We need to concentrate on continuing to build on our core technical competencies, and to take advantage of them in serving a broad spectrum of customers. Solution of the economic problems is fundamental to the future of the country. To the extent that technology has a contribution to make, we're very well positioned to contribute.

"Sandians have to accept the reality of uncertainty. It's with us. We're all acutely aware of it."

The economic security of the country is really part of the larger issue of national security. Today we understand that national security is made up of a military dimension, an energy dimension, an environmental dimension, and a competitiveness dimension. They're all intertwined — you can't deal with one without dealing with all of them. There is also a common technical foundation underlying these areas of concern.

LN: Are we taking advantage of the good positioning you mentioned?

Al: Yes. One example is the rapid growth in the support we're providing the microelectronics industry, as evidenced by the large CRADA [cooperative R&D agreement] that was recently signed with SEMATECH [LAB NEWS, April 16]. There was much good work preceding that important milestone, for example, in improving domestic equipment reliability and in contamination-free manufacturing — work that SEMATECH paid for. The growth and the expansion of the relationship with SEMATECH was built on solid performance, not just promise.

Generally, our strategy is to encourage, wherever it makes sense, larger-scale cooperation and collaboration among DOE's national laboratories and between us and laboratories of other federal departments, and with industry and universities. I think a very significant step in that regard was the recent signing of a memorandum of understanding with the National Institute of Standards and Technology [LAB NEWS, April 2], which both institutions are strongly committed to turning into a success.

ORVAL JONES (Executive VP-20, center) discusses Sandia's work with Senator Jeff Bingaman (left) and Representative Steve Schiff during a recent visit these members of the New Mexico congressional delegation made to a robotics research facility at Sandia.

Orval: There's a very special place for the national labs in what I see as the agenda of the current administration. That's as a catalyst for bringing government resources together with those of industry and universities. It's an exciting prospect.

Al: An important trend is a growing recognition within the scientific community that science needs to be linked more directly to practical applications. And there's growing enthusiasm among the members of the scientific community for doing just that. It's not that basic research is any less important, but there's a new understanding, a much clearer recognition, that basic science gains value by being linked more rapidly to societal needs.

LN: What's industry doing, on that side of this issue?

Al: In the past, there has been much duplication of industrial R&D, a fragmentation of scientific and technological effort — which brings me to a second very important trend. That's the trend toward greater cooperation among our industries. A number of industries — such as the textile industry, the semiconductor industry, the auto industry, and others — have organized themselves and are cooperating on technology strategies that get quite close to the marketplace. In other words, the precompetitive domain has been enlarged by industrial commitments to expanded joint R&D efforts. That opens up opportunities for national labs like Sandia to participate without danger of accusations that we're "picking winners," because we can operate precompetitively, as a member of a joint industry–university–federal government team.

The key to making that work, of course, is greatly improved coordination. I see the national labs as being strategically positioned to help encourage such coordination. Orval mentioned the catalytic role that we can play. Part of that catalytic role is to encourage more coordination among various projects. The labs are linked tightly to government. I believe historically we've been linked well to universities. And we are developing effective connections to the industrial sector.

By the way, we intend to play a major role in helping organize a truly national-scale effort in support of the Semiconductor Industry Association's "road map" of future directions in that industry [LAB NEWS, April 2]. And that will be facilitated through our very tight linkage with SEMATECH.

I want to note that we've gained significant recognition for our capabilities in electronics in general, and microelectronics in particular. Witness the fact that IBM picked us as their first choice to transfer the bulk of their processing equipment when they decided to close down a research line in Yorktown Heights [LAB NEWS, Dec. 18, 1992]. That's going to be very helpful. Thanks to IBM's generous donation, we are now in a position to establish a Center for Microelectronics Technology that will serve as a major user facility for industry, university, and federal laboratory researchers.

Incidentally, Sandia's electronics activities illustrate the power of "dual use" technology development and applications.

LN: One of the traditional strengths of the Labs has been making prototype hardware and field-testing it. The world we're moving into doesn't seem to have as much demand for that kind of work.

Orval: Certainly there's a lack these days of new nuclear weapon development, which has heavily engaged our core support activities in manufacturing technologies, fabrication, metal machining, and so on. As we make less hardware, there's less of it to test. So all of these areas, starting with design definition, moving on to the fabrication activities, and then to testing activities, are probably oversized for the future directions that we see.

On the other hand, they represent a strong capability for Sandia that has been valuable to us and the nation for many years. So we're grappling with the appropriate balance of how to retain essential capabilities and yet downsize at the same time. We're having to deal with that right now at Tonopah, as we move that test range from a regularly staffed operation to a campaign mode of operation.

LN: Which means people will go in as needed for a particular test program?

Orval: Right. There'll be a basic core group there, but when we have a large test series, we'll have to "campaign" that with additional staff brought in from outside the range.

LN: Is Kauai Test Facility [KTF] a model for that? We have only two Sandians there permanently, and then 40 or 50 for a rocket launch.

Orval: I think it probably is a model. I remember very clearly in the early '80s facing decisions about whether to give the site up. We decided not to, because occasionally we needed to launch a rocket ourselves, to test hardware such as SWERVE [Sandia Winged Energetic Reentry Vehicle]. So we decided to keep the facility alive at a low level. The needs of the country later made it a very happy circumstance that we did, because there has been a substantial amount of work done there. In fact, KTF is one of our recent success stories, with the first STARS — Strategic Target Systems — launch earlier this year [LAB NEWS, May 28].

Lee: There are two evolutionary changes taking place simultaneously. On the one hand, we increasingly use computer modeling and computational capabilities that mean, even if we were delivering the same kinds of products, we'd have a

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State of the Labs

reduced need for testing. And then on the other hand, the types of products that we're delivering are also changing. So both of those forces come together to cause a significant reduction.

Al: In the long term, Sandia will have fewer opportunities to design products and transition them into manufacture for government customers. And therefore the need for full-scale test activities is inevitably going to decline.

More and more of our work is going to be in technology development, and the actual product development is going to be done by others. That's certainly true for the work we do for the civilian sector of our economy.

LN: What about underground nuclear testing?

Orval: Certainly one of our unknowns right now is the fate of the underground test program. The Hatfield Amendment enacted last year put in place a moratorium until July 1 of this year. The moratorium can be lifted if the President certifies the need for a continued program. There are strong forces in the Congress that would like to see that moratorium simply continue, leading into something of the nature of a comprehensive test ban.

I can't tell you how that will come out. It will certainly have an effect on us, but we're also working to balance that area with above-ground experimentation — AGEX — that utilizes test capabilities such as our Hermes pulse gamma-ray simulator, reactors, and the Saturn X-ray test facility. We're engaged in a teaming effort with the Defense Nuclear Agency toward a new soft X-ray machine that would be called Jupiter.

LN: How prominently does our California site figure in the Labs' plans?

Al: Our West Coast location, Sandia/California, is very much in our future picture. Among other things, it's a very important window for Sandia to a region of the country that's much more highly industrialized than the Southwest. Therefore it provides us with opportunities to link ourselves to some important industry segments, like the microelectronics industry.

As an additional point, nowhere are the environmental issues more sharply defined and more demanding than in California. We're interested in environmental developments such as environmentally conscious manufacturing. Again, the window to the West Coast will allow us to engage these much more effectively.

So I see a very important future for that location. Our strategy has been to integrate the

"The most assured way to safeguard jobs at Sandia and create jobs elsewhere is to contribute to our nation's most pressing needs."

New Mexico and California activities as much as we can, for the sake of achieving greater efficiency of operation. But we've also moved in that direction in order to make the vision of a window a reality. Any scenario in which the two locations become separate, independent laboratories gets in the way of that vision. John Crawford [VP of California Laboratory 8000] supports the need for Labs unity very strongly.

Orval: There are growing efforts at our California site that are linked to work done in New Mexico. We're expanding both the the Energy and Environment and Work for Others sector activities in California. I can think of a number of examples, ranging from a satellite platform being developed for strategic defense research, to atmospheric monitoring development work. So I think we're making good progress.

Al: The dedication of the new Integrated Manufacturing Technology Lab was also a very important step in the direction that we just described.

Orval: I think the two labs together are an outstanding example of diversity in action. The culture at Sandia/California is somewhat different than at Sandia/New Mexico, and there's a real strategic advantage to that difference that we can put to strategic use.

LN: What about Sandia's part in the DOE weapon complex generally?

Orval: We don't fully understand just what the reconfiguration, or Complex 21, will finally

LEE BRAY (Executive VP-30, left) and New Mexico Gov. Bruce King were among the speakers earlier this year when the Governor's Business Executives for Education (GBEE) announced plans for a pilot project to help improve the quality of New Mexico schools. Lee chairs the GBEEs.

result in here at Sandia. I think it's an opportunity for us, potentially. It's been studied for the Secretary by a three-person advisory group that has made recommendations on what elements of the production complex to retain. As the designer of non-nuclear components of nuclear weapons, Sandia may end up managing the procurement of components manufactured by commercial industries. So there's a role there that's being defined. It's still unclear, but the DP sector, in particular Harry Saxton [5400], is taking a strong leadership role for Sandia. [See related article on page one.]

In the neutron generator area, for example, we'll likely see significant change. Simply put, the numbers of neutron generators needed for limited-life component exchanges for a greatly reduced stockpile will begin to approach what we would have called prototype lot builds in years past. That changes traditional relationships and offers us new possibilities and opportunities.

Al: I see the trend toward moving more of future production of non-nuclear components to industry less as a threat than as a significant opportunity. It's a way to link ourselves, in a mutually beneficial way, to the outside world — and, in the process, help US industry implement the agile manufacturing paradigm.

The nuclear weapon production complex of the future will have to have all of the attributes that come to mind when we talk about agile manufacturing: the ability to produce on demand, very quickly, a customized product at low cost, with very high reliability, and do it by rapidly linking various partners together in the form of what has been called a virtual corporation. We see government defense needs increasingly supported by directions in the private sector. There are opportunities for us to apply defense program resources, not only to assist in the reconfiguration of the DOE production complex, but in that process also do things that will be of value to industry.

Orval: The timing of these interests is serendipitous. There's a growing sense across the country that we need to do a better job of manufacturing, just at the time when we're being called on, in relation to our historic work, to take a stronger role in manufacturing. So that's a nice confluence.

LN: The characteristics of agile manufacturing track closely with a quality-oriented attitude toward delighting customers. How are our quality efforts going?

Al: One thing that I find encouraging is the strong commitment the Secretary of Energy has made to quality. She's clearly intent on DOE adopting the principles and practices of total quality management. She should be applauded for that, and we need to redouble our own efforts to support her commitment.

LN: In essentially the same direction we've been going?

Al: Same direction. It's a wonderful thing to see happening. It's going to be difficult to change an organization as large and complex as DOE in a few years' time into one that manages itself very

"We will find ourselves dealing with a more diverse set of organizations and individuals."

differently. But Secretary O'Leary is emphasizing the key values that we've identified for ourselves. She talks about more self-direction, teamwork, cooperation, and trust.

And we must help her succeed, even when it may seem at times that progress is very slow. I recall that we have experienced temporary setbacks in our own efforts occasionally. We should also remember that some DOE organizations, most notably Bruce Twining's Albuquerque Operations Office, have been quality leaders for some time.

Lee: I agree with the idea that we have to redouble our efforts in quality, and I think the fact that DOE has taken a positive turn toward it is going to facilitate our efforts. The more the environment supports it, the more we're likely to achieve success. And the commitment continues to feed on the success.

Orval: I'm pleased with progress we're making along those lines internally. But one of the lessons we've learned over the last couple of years is that we have to keep working at it. I think we were all very pleased with the score that we received on the AT&T Chairman's Quality Award application that was generated last year.

But coming out of that, as part of continuous improvement, we identified areas where we need to do the most additional work and put our emphasis. So we established seven high-leverage areas, championed by various officers of the Labs, to emphasize for about a year and improve some key areas such as managing by data, properly working customer interfaces, and so on — with the idea of coming back to our award application and continuing the process of continuous self-assessment and self-improvement [LAB NEWS, March 19].

I've been asked by Sandians whether it was some kind of flash in the pan, or if we were backing away from quality, when we chose not to immediately start a second Chairman's Quality Award application. No, not at all. The answer is that it was felt that the best purpose for our time would be to take a year here and improve a number of key processes significantly, and then go back and re-evaluate ourselves.

Lee: As our missions and business evolve, we will find ourselves dealing with a more diverse set of organizations and individuals. We can optimize our probability of success by having a work force that relates well to the diversity of thought and opinion exhibited by this changing set of customers.

Orval: Along that line, in February I vol-

unteered to chair the Sandia Diversity Leadership Committee and to lead the Sandia Management Council in a quarterly Diversity Forum, because I have become more and more convinced that Sandia, and its project teams, will be stronger as we bring diversity, as represented by ethnicity, gender, culture, social style, discipline, and left/right brain-type into play. Our natural tendency is to form teams with people who think like us and, often, look like us. However, by bringing diversities into constructive alliance with each other, a team's imagination, insight, and understanding are enhanced and expanded — making it stronger and more competitive. Bob Eagan [1700] is leading a Corporate Diversity Team — diverse in itself — that will help the Council in making diversity a strategic advantage for Sandia.

"The economic security of the country is really part of the larger issue of national security."

Al: And the Clinton administration is putting tremendous emphasis on accelerating the rate at which this country achieves a truly diverse work force. We intend to stay in tune with that trend.

LN: Is the quality movement still strong in industry?

Al: I just had an opportunity to visit Milliken and Company and some of its facilities in South Carolina — production plants, the headquarters, research and development labs. And I must say, my own commitment to quality got a tremendous boost. I saw there something that I have rarely seen at Sandia. That was an all-pervasive, universal enthusiasm for the quality ethic. At Milliken, it's immediately obvious that employees (at Milliken they are called "associates") see quality not only as a competitive necessity, but also as a way of conducting their work in a way that's more fun. They put heavy emphasis on teamwork. At the same time, I observed a strong commitment to rewarding individuals who foster teamwork and stand out in supporting team effort. The quality spirit was truly alive everywhere I went. If I could be granted a wish, it would be that overnight all Sandians could adopt those same attitudes toward the quality movement.

It was very clear to me that at Milliken the quality ethic is seen as a means to an end, not an end in itself. They have translated quality into greater profitability. That is, they're doing more for customers now than they were able to do before. They're responding faster, at lower cost, and achieving better product quality.

LN: They can look at profit. Do we yet have one single measure to evaluate ourselves?

Al: No. As a matter of fact, I think one of the biggest challenges facing us over the next several years is to develop better ways of measuring the value that we deliver. In my interactions with the Congress this year, the question that was repeated most often was, "Now that the national labs are getting themselves more directly involved in the competitiveness issue, how do we measure the value they add?" I don't have a good answer for that. The way I have responded is to say that, at the very least, the Malcolm Baldrige National Quality Award criteria provide a structured framework for addressing the question. But that's not the kind of precise answer I'd like to be able to give.

Lee: I think one good measure is revenue stream, and what we might call market share. The degree to which we can't compete in the marketplace for market share is evidence that we're not performing well. And the revenue stream is also a reasonably good indicator. The more of our revenue that doesn't come from a level-of-effort kind of government funding, the more it's an indicator of success.

Al: I agree with Lee, but I would add that while we've been successful in maintaining our revenue stream, and while we get a lot of positive feedback from our customers, it's important to recognize that Congress is playing a wait-and-see game right now. We've said that we can make a substantial contribution to competitiveness while maintaining our nuclear weapon capabilities, and that we will be able to demonstrate the importance of dual-use technology development and application. They're willing to give us some time. But ultimately, I think, they will come back to us and say, "Prove it."

I believe a way to give us a better shot at establishing our contributions is to increase program focus. That may mean concentrating more effort in fewer areas, concentrating on teaming with other organizations so that collectively we can have a measurable effect.

In that regard, there have been some very encouraging developments at Sandia this past year. We have committed ourselves to advanced manufacturing technologies as a principal theme for our industrial outreach efforts. And underneath that, electronics has become a major program commitment for us. By concentrating our efforts, by creating this additional focus, I hope we will eventually get in a position to estimate the number of new jobs we've added to the economy. That's what it finally comes down to.

Lee: I want to come back to something we talked about earlier that's related to this issue. To demonstrate the kind of performance we need for continuing to win customers, we have to have a more agile work force than we have now. Dan Hartley [VP-6000] communicated something recently indicating that this year, with his full-court press on recruiting people into Energy and Environment, he has a net outflow of people to Defense Programs Div. 5000. I think that's a management problem, but it's also a cultural problem. We must be leaving some customers unsatisfied. And if we're doing that, we can't retain either market share or funding levels in the future. So there's evidence of a problem that, collectively, we still haven't managed to deal with.

DOE SECRETARY Hazel O'Leary visited Sandia in April for the signing of a $100 million cooperative R&D agreement with SEMATECH. Here, Sandia President Al Narath listens as Secretary O'Leary addresses Sandians and the press.

Al: We need to be careful that we satisfy all of our customers. Based on our past successes, we've attracted many very important customers, and we now have on the books a large number of difficult commitments. It's extremely important that we live up to those commitments. As well positioned as we are, what the rest of the world thinks of us could change very quickly if we cease to deliver as promised. There may even be instances where it would be preferable to terminate a project, with customer concurrence, than to continue expending resources knowing we will most likely fail to deliver as promised.

LN: What are some of the difficult commitments you're thinking of?

Al: I see them in all the growth areas. And in particular I see them in new technology transfer efforts — our CRADAs. But I think it's also true in the Energy and Environment sector, where significant growth is occurring and we're making promises that will stretch our abilities.

Orval: It's going to mean we all take more risks, moving out of what have been long-term comfortable areas of work, which have often been in association with nuclear weapons funding, and entering into these more task-oriented, perhaps more schedule- and performance-directed kinds of activities.

And I think — I know — it's a challenge we can meet. We've met it before. I have many friends who are working in totally different areas than when they started in the Labs. It's an opportunity for personal growth and added technical dimensions. And, as Al pointed out, we've promised customers delivery in certain projects, so we must get people applied to them — good people, making results happen.

Al: I thought Lee said it very well, when he said we're moving away from a level-of-effort funding arrangement, where we have considerable freedom to choose what to work on, into one in which we commit ourselves to specific deliverables. Increasingly we're serving customers — I've been saying this for years — who can take their business elsewhere. We need to show that we provide better value than these customers can obtain elsewhere.

"Basic science gains value by being linked more rapidly to societal needs."

LN: Is this a shift away from basic research?

Al: No. Even though more of our work is becoming task-oriented, and is focusing on specific customer needs, that doesn't diminish the need to encourage scientific and technological innovation at Sandia. In fact, the technical foundation provided by our research programs will become even more important than in the past. Ultimately, the differentiating strength we offer is, first of all, our ability to generate technical innovations, and second, our ability to translate these advances into results that provide tangible benefits to our customers.

But it's fundamental to our continued existence to maintain a strong science and technology base. And I'm strongly committed to helping protect that.

LN: For instance, by making sure that we choose to accept work that's related to our core competencies?

Orval: Yes. In addition, we need to put our LDRD program — our laboratory directed R&D program — to work for us in the most effective way. I think we've got a good process under way. I think it will create a wellspring of forward-looking ideas that we can build on.

Increasingly, as what's been termed the level-of-effort activity declines, we're going to need to use that LDRD funding very wisely to support new concepts, new ideas. I've been impressed by the quality of proposals that our staff have submitted as they compete for funding under that program.

LN: Again, that seems to require what we might call agile employees.

Lee: I'd like to imagine an environment in the future in which people are going to Dan Hartley and his Energy and Environment program

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'L' Clearances

to give more attention to industry."

A phased approach is being used to determine who should have L clearances. The first peach-colored badges will show up on visitors and subcontractors working at the New Mexico site who already hold L clearances.

Harry Chaney of Project Management Office 7401 says the next New Mexico groups to be designated for the L clearance haven't yet been chosen, but that a likely group for phase two will be some of Sandia's resident contractors — individuals who work at Sandia daily but do not need the Q-level clearance.

"We want to go slow and gain insights into needed security procedures," says Harry.

He says some Sandia employees now holding the Q clearance may be shifted to the L by Oct. 1, but they haven't yet been identified. "We don't know who the individuals will be or how many will have their clearances changed," he says.

Clearance Needs Assessed

Starting in September, each employee scheduled for a five-year clearance re-investigation will have a job assignment review to assess his or her need to retain the Q before any decisions are made. A security survey will establish areas where impacts are expected to be minimal and those where more complex problems may arise.

"We have no plans to move organizations or make major modifications to facilities," says Harry. "This would not be cost-effective and would disrupt the normal work routine. The emphasis will be on administrative controls, with a concentration on policies, procedures, and plans, and an occasional added lock for a door."

Although the first L's will appear at Sandia/New Mexico, selected contract workers at Sandia/California are expected to have the peach-colored badges within a few weeks.

Don Charlesworth, Manager of Physical Security Dept. 8531, says his group at Livermore will be changing clearances in parallel with Albuquerque. "There will be differences in the time schedule, but the gist of what we are doing here in California is the same," he says. "However, because of past audit findings and negotiations with a different DOE operations office [San Francisco], we will be reviewing clearance levels for all employees on-site, beginning late in the summer."

The L clearance is a logical step for Sandia to take at this time, Jim adds. Although there are no quotas, or goals, for having a certain number of the clearances in one year or five years, the new peach badge appears to be the shape of the future, he says. "In five years, it may be that the L clearance is in a majority here." •WKeener(7161)/HK

For more information about L clearances, see the questions and answers below.

Cost, Length of Investigation Drive Move to 'L' Clearances

Editor's Note: The following questions were answered by Jim Martin (7400), Harry Chaney, and Kent McIntire (both 7401).

Question: What do the letters L and Q mean?

Answer: The letters L and Q, used in describing the clearances, have no special meaning.

Question: Since expense is a major reason for adding L clearances, what are the relative costs of Q and L clearance investigations?

Answer: The Q clearance costs about $3,000, compared to about $100 for an L clearance. These figures aren't precise, because there are variables. But the budget for new clearances and reinvestigations has been cut by 50 percent this year and will be cut again next year.

Question: Timeliness has been given as a factor, so what is the length of time involved?

Answer: The lengthy Q-clearance process precipitated a number of letters to members of the congressional delegation. This, in turn, resulted in a GAO audit of DOE's security clearance process. The audit questioned the large number of Q security clearances in view of the end of the Cold War, budget reductions, and other factors. This led DOE to take up the oft-discussed idea of an L clearance with some urgency.

The institution of the L clearance means there will be fewer Q investigations. DOE expects that the Q process will be speeded up as a result. Depending on circumstances of the investigation, Q clearances are being issued in 12-14 months, while L clearances are averaging only about six weeks for issuance.

Question: How are you going to ensure L-cleared personnel don't gain access to more restricted categories of information?

Answer: This is the most complex aspect of the new clearance. Generally speaking, those with L clearances will have access to Sandia's secure areas. DOE policy requires that appropriately cleared personnel are responsible for the protection of any classified material or data they may be using. Thus the person working with or discussing classified information

Q clearances are being issued in 12-14 months, while L clearances are averaging only about six weeks.

must ensure that others present have the proper clearances and the need to know certain information. Actions can be as simple as closing an office door or turning a computer screen. Situations may require posting warning signs or more complex actions involving access to secure computer networks. Sandia's security staff is reviewing its procedures now in order to better advise employees on how to handle specific situations.

Question: What do you mean by need-to-know?

Answer: Need-to-know has always been the cornerstone of Sandia's security policy. Simply stated, this principle reminds employees that it is not enough for an individual to have the appropriate clearance. To gain access to secure information, the employee must need the information to perform his or her own job functions.

Question: Won't the L clearance be seen as less desirable, creating problems with a "two-class" kind of system?

Answer: This has been one of the concerns addressed in approaching the new clearance. It is Sandia's intention to implement the clearance changes in a way that won't impede organizational change or career movement. Procedures now being instituted will permit an L-cleared person to be changed to a Q (assuming the person previously held

Procedures now being instituted will permit an L-cleared person to be changed to a Q . . . in two to four weeks.

a Q clearance and that the reinvestigation period hasn't been exceeded) in two to four weeks. This could be speeded up to 4-10 days in especially urgent situations.

For those who have never held a Q clearance, there are also methods for changing from an L. Remember, because there will be fewer Q investigations under the new system, DOE's ability to complete these in a more timely manner will be improved.

Question: What are the specific differences between the L and Q for access to information and materials?

Answer: The Q clearance, along with need-to-know, will be required for access to Top Secret, Secret Restricted Data, Categories I and II Special Nuclear Materials, and the Sandia classified computer network. Those with L clearances will have access to Confidential Restricted Data, Secret and Confidential Formerly Restricted Data, Secret and Confidential National Security Information, and Categories III and IV Special Nuclear Materials.

Generally speaking, lower classification numbers for special nuclear material mean that material can more easily be made into nuclear weapons.

Question: What exactly is the enabling legislation or ruling for the use of multiple clearances, and does this set any quotas for Q's and L's?

Answer: DOE Order 5631.2B states that clearances are to be granted "only when absolutely required and at the level of access required to avoid the unnecessary expenditure of funds and resources." An informal "blanket" clearance policy is being eliminated in light of this order; each clearance will now be job-specific.

Sandia still has a weapons mission, although the size and scope of it are clearly changing. The need for Q clearances will change in proportion. There is no target figure for reduction in number of Q's. The order will be approached on a job-by-job basis.

Question: Is this happening anywhere else?

Answer: Yes. DOE is trying to consolidate its security interests. An example is Hanford, where the DOE mission has changed from defense-related production to environmental restoration and waste management. This change enabled the Richland Field Office to eliminate two secure areas and a number of limited areas, resulting in a 66-percent reduction in the number of employees holding Q clearances.

Question: Is this a response to employees who have complained about the clearance process and their needs to have counseling for emotional problems or alcoholism, for example?

Answer: The clearance process is designed to match security needs to jobs, not to individuals. The L clearance is not being introduced in response to this ongoing problem, which is a separate issue. This is a response to the times and their economic and political constraints.

Question: Will the new clearance levels affect the use of computers?

Answer: Yes. Individuals with L clearances will not have access to the secure computer networks because there is the possibility of incidental or accidental access to SRD. The situation for other types of networks and stand-alone personal computers will change as we progress through the establishment of administrative controls. Our plan is to establish administrative controls as quickly as possible for the stand-alone units, so as not to impede the performance of anyone performing work for Sandia. •

Who To Call with Questions

General L implementation

Dan Poole (7401)	4-4003
Harry Chaney (7401)	4-9208

Sandia/California

Don Charlesworth (8531)	294-3531

Physical security, security plans

Conrad Carrington (7432)	5-8479
Don Duran (7432)	5-9189
Al Villareal (7432)	4-0673

Computer security

Dave Ortiz (1932)	5-9124
Paul Sands (1932)	5-9084

Classified documents, material, SNM

Jim Kaiser (7442)	5-8664

Classified documents

Maggie Lucero (7442)	4-0721

Materials classification, accountability

Terri Giron-Gordon (7442)	4-8831

Security access, education

Bob Baca (7437)	5-8288

Access-Badging

Ray Chavez (7437)	4-3668

Security education

Lori Lauriano (7437)	5-9207

(Continued from Page One)

Weapon Parts

pledged $15 million to help retrain workers and develop reuse plans for production facilities that will be shut down or lose work as a result of the consolidation. "We cannot turn our backs on the workers and communities who helped us win the Cold War," she said.

About 500 Generators a Year

The meat of the reconfiguration plans withdraws most defense production responsibilities from the Mound (Ohio), Pinellas (Florida), and Rocky Flats (Colorado) plants and consolidates them at the Kansas City plant. Tritium work now done at Mound eventually will be moved to Savannah River (South Carolina).

The plans also specify that Sandia and Los Alamos take over the manufacture of a select group of non-nuclear weapon components considered too difficult to maintain and too important to national security to be handled outside DOE facilities (by a commercial vendor, for instance).

Under current plans, Sandia will inherit the manufacture of neutron generators previously produced at Pinellas. Los Alamos will first load tritium into neutron tube targets, the core of a neutron generator, and ship them to Sandia/New Mexico. Sandia will then produce finished neutron generators in limited numbers.

For the past 10 years, Pinellas manufactured from 2,000 to 7,000 neutron generators a year. To meet reduced demand, Sandia will be expected to produce only about 500 per year, just enough to maintain the current nuclear stockpile. (Neutron generators provide the pulse of neutrons that initiates a nuclear explosion as fissile material is brought together as a critical mass. Because the half-life of tritium is only 12.3 years, a weapon's neutron generator needs to be replaced periodically.)

The proposed changes could bring as many as 350 new positions to Sandia.

Moving fabrication to Sandia, where the generators are designed, should also result in a more responsive manufacturing effort that will incorporate Labs advanced and agile manufacturing technologies, says John Gronager, Manager of Reconfiguration and Neutron Generator Program 5401. This should help ensure that the generators are technologically up-to-date.

Battery Back-Up

In addition to generators, Sandia will inherit manufacture of mechanical components known as CAP assemblies, as well as DOE's milliwatt heat source surveillance operation (supports stockpile safety and reliability work). The Labs' thermal battery prototyping facility in Albuquerque will also provide a back-up production capability for thermal batteries. (They are currently manufactured by a commercial vendor.)

> "We are pleased to assist DOE in carrying out its reconfiguration plans, and we are looking forward to putting to work the concepts of concurrent engineering and agile manufacturing. Strong teamwork, both inside Sandia and with our partners in the DOE complex, is essential to the success of this program." — **Harry Saxton, Director of Defense Programs Sector Manufacturing Engineering and Support Center 5400.**

Existing buildings inside Tech Areas 1 and 3 will be used for the new operations, although some structural modifications are expected, says John.

The proposed changes could bring as many as 350 new positions to Sandia/New Mexico. While some of these jobs will be filled by new hires, many are likely to be filled by current Labs employees. At Los Alamos, the new work may save the jobs of as many as 110 employees already on roll there, according to Los Alamos spokesman Jim Danneskiold.

"We've expected this for a long time, and we've prepared a plan that should smooth the transition," says Harry Saxton, 5400 Director. "I think we're well-positioned to handle our new production responsibilities." •JG

(Continued from Page One)

R&D 100 Awards

and a Stirling heat engine. (Unlike the internal-combustion engines used in automobiles, Stirling engines use an external heat source.) The Cummins 7.5-kilowatt system has the potential to produce environmentally acceptable, low-cost electricity from the sun.

A low-cost, faceted stretched-membrane concentrator tracks the sun and focuses its rays onto a receiver above the dish. Each dish can function independently or as part of a group of dishes. Inside the receiver, sodium metal is vaporized by the intense heat. The vapor is used to heat helium gas inside the Stirling engine, driving the power piston to make electricity.

The main application of the system is to provide electricity in remote locations for water pumping and for communities not connected to a utility grid. It is the first commercial application of a free-piston Stirling engine. The system competes in cost with other renewable energy systems and is easier to maintain than diesel generator sets.

Thermacore, Inc. of Athens, Ohio, provided the receiver, and Sunpower, Inc. of Lancaster, Pa., provided Stirling engine and linear alternator expertise. Sandia solar concentrator and receiver design expertise and system integration analyses supported the development effort.

Sensor Detects Hydrogen

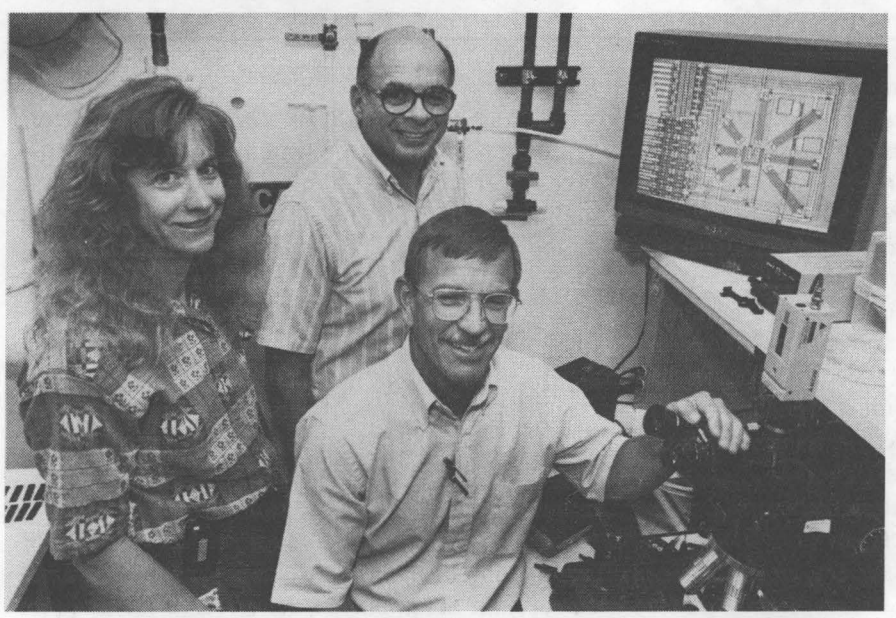
The hydrogen microsensor was developed by Bob Hughes of Microsensor Research and Development Dept. 1315, Jose Rodriguez of Silicon Technologies Dept. 1325, and Wayne Corbett of Nonvolatile Memories Dept. 1341.

Hydrogen, encountered in a large variety of industrial, space, and military applications, poses a fire and explosion hazard. Existing techniques for detecting hydrogen have many limitations. Compared with other sensors, Sandia's hydrogen microsensor is smaller, lighter, faster, and less expensive. It also works over greater dynamic and temperature ranges.

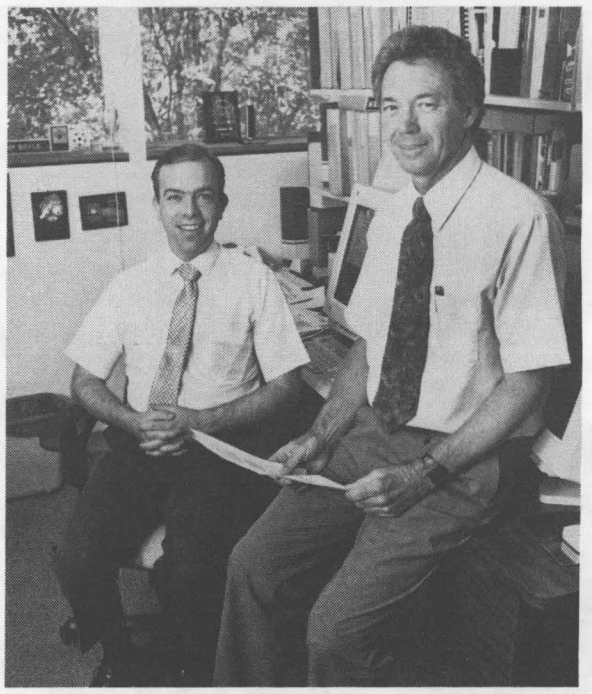
Sandia's hydrogen microsensor is smaller, lighter, faster, and less costly.

This new technology already is being used in ground-based test facilities at the National Aeronautics and Space Administration and has been included as part of a robotic test probe developed to monitor underground radioactive waste storage tanks. No previously existing hydrogen detection technologies met the stringent requirements of these two applications.

The Sandia hydrogen microsensor was developed with state-of-the-art silicon microelectronic fabrication techniques, using a palladium-nickel alloy in the fabrication of transistors in the microsensor. The threshold voltage of these transistors shifts in response to the concentration of hydrogen. The palladium-nickel alloy has the unique property of allowing detection of hydrogen as low as the parts-per-million level but not failing at higher concentrations. Microelectronic fabrication techniques allow the batch fabrication of more than 8,000 identical sensors in one production run.



MELANIE TUCK (left), Jim Sweet (center), Dave Peterson, and Dave Palmer (not pictured), all of Advanced Packaging Dept. 1333, won an R&D 100 award for a family of integrated circuits used to test semiconductor assembly and packaging processes.



RAY MEYERS (left), John Biffle, and Ted Blacker (not pictured), all of Computational Mechanics and Visualization Dept. 1425, won an R&D 100 award for a mesh-generation algorithm called "paving" that enhances computer-aided design of industrial products.

Chips Watch for Damage

Developers of the family of assembly test chips were Jim Sweet, Dave Peterson, and Melanie Tuck, all of Advanced Packaging Dept. 1333. The project was directed by Dave Palmer, Manager of Dept. 1333.

Assembly test chips are silicon integrated circuits used for testing semiconductor devices' packaging environment. Fabricated on a standard CMOS (complementary metal oxide semiconductor) line, test chips contain microsensors rather than logic gates.

The microsensors can determine whether the assembly and packaging of semiconductor devices have resulted in any damage or any degradation of function. These transducers measure such things as corrosivity, mechanical damage, electrostatic threat, mechanical stress, bond pad degradation,

(Continued on Page Ten)

(Continued from Page Nine)

R&D 100 Awards

and moisture content.

Assembly test chips are used by the microelectronics industry in three ways — as manufacturing-line monitors, in evaluating new micro-packaging technologies, and as electronic system monitors over years of use.

In the last few years, assembly and packaging in microelectronics have become increasingly important. Until the assembly test chip family was designed and fabricated, industry could only use either commercial integrated circuits or single-purpose, specially built test chips to make packaging decisions. The integration of many sensor types, the continual availability, the increase in sensitivity and accuracy of the sensor readings, and the ability to take all degradation measurements electrically through the package pins has allowed greater efficiency and lower risk for industry.

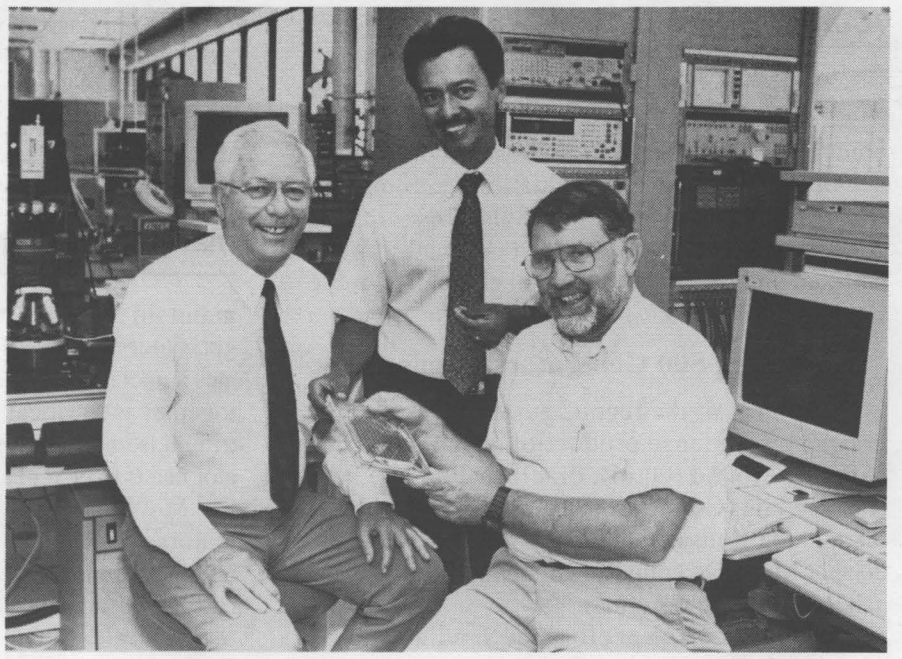
Water-Based Etch Is Improvement

Carol Ashby, David Ginley, Jon Martens, and Tom Plut began work on water-based chelating etches while all were employees at Sandia. Carol is a member of Semiconductor Materials Dept. 1311, and Tom is a member of Compound Semiconductor Technology Dept. 1322. Ginley and Martens have since left Sandia, but Ginley continued to refine his research on the etches at the National Renewable Energy Laboratory, which shares this R&D 100 Award. Martens now works for Conductus, Inc.

The development of microelectronic devices that use nontraditional oxide thin films — such as high-temperature superconductors and ferroelectrics — has been plagued by difficulties in processing these materials. Previous technologies for etching micron- and submicron-sized features in microcircuits have the drawbacks of requiring expensive equipment, lacking selectivity between layers of differing composition, or leaving surface layers that significantly reduce performance.

A new family of water-based chelating etches using organic acids was developed by the Sandia research team. The etches, which have been used to process a variety of superconductor and ferroelectric devices, eliminate the major drawbacks of previous technologies.

By using the ideas and methods employed to develop these etches, the researchers expect to extend the technology beyond oxides to other semiconductor materials.



WAYNE CORBETT (left, 1341), Jose Rodriguez (center, 1325), and Bob Hughes (1315) won an R&D 100 award for a microsensor that can detect hydrogen in a wide array of industrial applications.

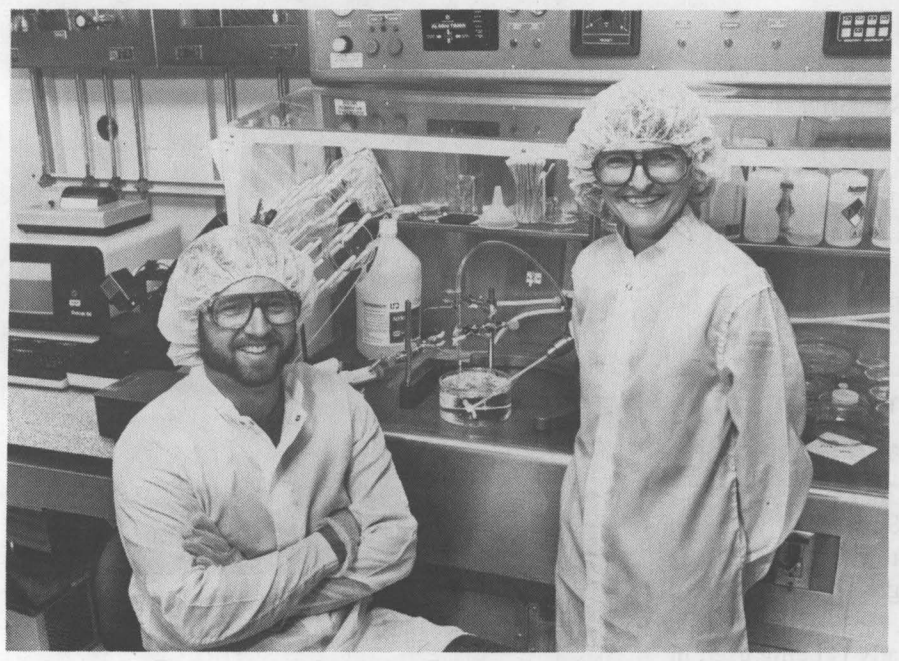
Mesh-Generation Speeds Simulations

Ted Blacker and Ray Meyers, of Computational Mechanics and Visualization Dept. 1425, under the direction of Dept. 1425 Manager John Biffle, developed the mesh generation software. The work was done in collaboration with Michael Stephenson and Roger Cass while Stephenson was a faculty member and Cass was a student research assistant at Brigham Young University.

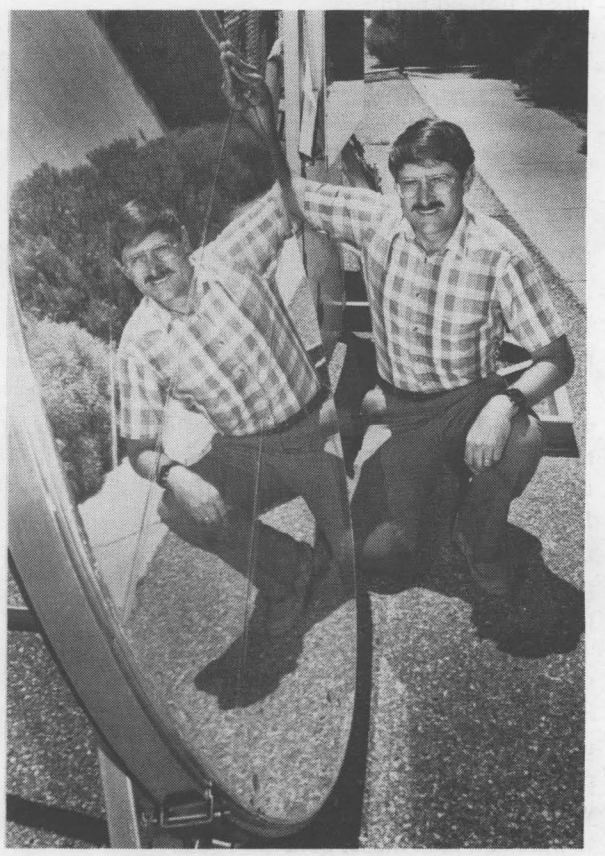
The researchers developed an innovative "mesh generation" algorithm that can drastically reduce the time required for computer-aided design of vehicles and other industrial products. Before computer analysis can be applied to the design of any complex object, the analyst must generate a customized geometric "mesh" that represents the surface of the object.

Generating these meshes is difficult and time-consuming. For example, generating the mesh for an automobile to prepare a computer simulation of a crash requires six to eight weeks. This is too long to allow engineers the flexibility they need to speed the design process. The Sandia three-dimensional surface-meshing (called "paving") algorithm does much of this process automatically.

●AEtheridge(7161)/CS



TOM PLUT (1322) and Carol Ashby (1311) are the Sandia members of a team that won an R&D 100 award for a family of water-based chelating etches for the photolithographic processing of metal-oxide thin films used in the development of microelectronic devices.



RICH DIVER (6216) led the Sandia team that won an R&D 100 award for a solar parabolic dish system (dish-Stirling) for converting sunlight into electricity.

(Continued from Page Seven)

State of the Labs

managers and asking what they can do to ensure that he doesn't leave any customer requirements unmet — instead of him having to work so hard to recruit.

LN: What's the company doing to help that process?

Orval: We have an arrangement that was established in February, in which the Defense Programs sector is supporting the training of 50 individuals in Sandia to work in the environmental restoration activity. That's the kind of staff and management teaming that we'll need to be implementing more of.

We've set up the Employee Development Center under Karen Gillings [7531] to facilitate this kind of move by supporting employees and providing necessary training courses.

LN: As we're making those internal changes, employees are very aware of the fact that DOE will soon be announcing the successful bidder for the Sandia M&O contract. What would you say to Sandians about the next few months?

Lee: I think the contractor selection hasn't interfered with our progress to date. We don't anticipate that it will. Regardless of who the contractor is or what the contract looks like, our primary objective of meeting or exceeding customer expectations will remain. We must not allow our energies and attention to be diverted.

Al: We know that DOE is supportive of the directions we've defined, and there's every reason to believe that the next contractor will be strongly supportive as well. I think it's important for us to recognize that.

In addition, both finalists in the contract competition have been very respectful of our strategic plan. It is obvious that both companies are very interested in contributing to the success of the Labs.

Certainly we should *not* develop an attitude of, "Between now and the time the new contractor takes over, let's just hunker down and see what happens then." Sandia's management team will welcome the new contractor, whoever it is, with open arms, in anticipation of a long and mutually beneficial relationship — and we're intent on continuing the Labs' progress without breaking stride.

It is true that the world looks a lot more threatening today, in terms of the Labs' continued productive existence, than it did a few years ago. Nonetheless, our prospects look very encouraging. As Lee said, it's going to require an agile, fast-moving response to customer needs. But the belief that I want all of us to adopt and support is this: Never have the opportunities to serve the national interest been more promising, never has our reputation been better, and never has the rate of progress we are achieving been greater. ●CS

UNCLASSIFIED ADVERTISEMENTS • UNCLASSIFIED ADVERTISEMENTS • UNCLASSIFIED ADVERTISEMENTS

Deadline: Friday noon before week of publication unless changed by holiday. Mail to Dept. 7162.

Ad Rules

1. Limit 20 words, including last name and home phone (the LAB NEWS will edit longer ads).
2. Include organization and full name with each ad submission.
3. Submit each ad in writing. No phone-ins.
4. Use 8½- by 11-inch paper.
5. Use separate sheet for each ad category.
6. Type or print ads legibly; use only accepted abbreviations.
7. One ad per category per issue.
8. No more than two insertions of same "for sale" or "wanted" item.
9. No "for rent" ads except for employees on temporary assignment.
10. No commercial ads.
11. For active and retired Sandians and DOE employees.
12. Housing listed for sale is available for occupancy without regard to race, creed, color, or national origin.
13. "Work wanted" ads limited to student-aged children of employees.

MISCELLANEOUS

IBM PROPRINTER III, like new, $199 OBO. Coe, 266-6579.

AMERICAN RACING WHEELS, four, aluminum, 16-in., 6-lug, fits '88-'93 GM 4x4, new, $375. Showalter, 889-7627 days, 1-832-0514 evenings.

KODAK INSTAMATIC 104 CAMERA, w/General Electric flash cubes; girl's skates on white shoes, size 6; Delonghi portable heater. Wagner, 823-9323.

EQUIPALE "PIGSKIN" FURNITURE, New Mexican style, 6 pieces, settee, 4 armchairs, glass-topped round coffee table, $350. Gomez, 291-0691.

'73 OVER-CAB CAMPER, "Idletyme," 9-1/2 ft., self-contained, sleeps 5, fits long wide bed pickup, good condition, $700 OBO. Chavez, 293-4268.

SHELTIE PUPPIES (mini "Lassies"), AKC-registered, champion bloodlines, 2 males, 1 female, tri-colored, $350 OBO. Davalos, 293-7980 after 4 p.m.

WATERBED, queen-size, 1 year old, controlled flotation, heater, liner, frame w/padded rails, headboard, $250 OBO. Lockwood, 298-9563.

MOTORCYCLE LEATHER JACKETS, three, all size large, good condition, $125/ea. Hammond, 823-9619.

GEAR SET, 3.08 ring-gear, pinion, installation kit, for 12-bolt Chevy/GMC rear-end, $130; ring-gear carrier, $85. Shannon, 281-3038.

GOLF CLUBS (left-handed), bag, & bag boy pull-cart, full set, $100. Hobbs, 291-8267.

TWIN-SIZE BED, Sealy mattress & box spring, frame, nice headboard, good condition, $85. Cook, 869-6921.

WASHER, Kenmore Heavy Duty 60, $75; two Fisher Price child car seats, $30/ea. Greene, 899-1405.

WATERBED, queen-size, 12-drawer pedestal bookcase, headboard, padded railing, $175 OBO. Harstad, 298-6551.

LARGE DOG HOUSE, good condition, $20. Snelling, 292-7460.

USED TIRES, two Firestone Supreme P215/70R15 whitewalls, tread to Lincoln's eyebrow, $25. Tooley, 836-0220.

NORDICTRACK, Achiever model, like new, $675. Bono, 281-9505.

LIVING ROOM SET, includes queen-size sleeper, recliner, lamps, glass-topped end tables, and coffee table, $400 OBO. Plummer, 296-4327.

ORGAN, Conn Prelude Strummer, plays rhythms and band instruments, playing guides, beautiful piece of furniture, good condition, $450 OBO. Donnelly, 293-0542.

CINDER BLOCKS, 6-in., used, approx. 70 available, free. Robertson, 293-1007.

NEIGHBORHOOD CRAFT & FLEA MARKET, S.R.M. Elementary, June 12, 8 a.m., I-40 to Unser north, 1st right on Ladera, 3rd right on 72nd. Duran, 839-0408.

'89 POP-UP CAMPER, 7-ft., Sunlite, fits mini pickup or short wide bed, three-way hookup, great condition, $2,500. Baca, 881-4184.

MOTORCYCLE BOOTS, size 9-1/2 narrow, for off-road, excellent condition; ham radio, tube type w/tubes, $25; king-size bedframe. Stuart, 265-7315.

COMPUTER, Packard Bell 386SX, 40MB HD, IBM mouse, 3-1/2-in. and 5-1/2-in. drives, Super VGA, nearly new. Barton, 268-7349.

GUN, .22 single six revolver, interchangable cylinder, 22 LR/22 mag., excellent condition, good shooter, $115. Guthrie, 299-7182.

YORK SPEAKERS for stereo, $25; rear window for GMC/Chevy pickup ('70s-'80s), $45; bug shield, $15. Ortiz, 898-2650.

INFANT CAR SEAT, $15. Forster, 293-7231.

DEAD MAC SCROLLS, $25; English bridle (less bit), $10; saddle lollipop, $5; left hander's baseball mitt, $10. Baldo-Pulaski, 345-1288.

MEADE TELESCOPE, 8-in., includes equatorial mount w/tripod, clock-driven with AC/DC capability, solar filter, case, & gadget box, $900. Knutson, 271-0146.

NINTENDO GAME SET, 10 games and lots of accessories. Jimenez, 296-9256.

MIKASA STONEWARE, Indian Feast Half Moon pattern, 5-piece place setting, plus sugar bowl, creamer, and serving platter, $35 OBO. Tilgner, 821-7551.

COMPUTER, IBM PS-2, 386 processor, 20MB HD, 3-1/2-in. floppy drives, color monitor, $450 OBO; DP Bodytone 250 rowing machine, $50. Aselage, 281-8746.

REAR CHROME BUMPER, for '89 Toyota, $75. James, 294-6837.

GARAGE SALE, Saturday, June 12, 9 a.m., 5816 Lost Dutchman NE, color video camera & VCR, Super 8 movie camera, kids' and household items. Drotning, 294-4807.

CRIB & MATTRESS SETS, two, $100 and $60; sewing machine w/cabinet, $100; Fisher Price toys; childrens clothing. Drayer, 821-4017.

ADMIRAL WASHER & DRYER, white, electric, 6 months old, under warranty, extra-large capacity washer, cost $912 new, sell both for $500. Moss, 291-0516.

SUPER NINTENDO, 3 controllers, *NCAA basketball, Super Mario Kart, Street Fighter II, Mario World*, brand new, $200. Shannon, 281-3038.

ELECTRIC LAWNMOWER, 19-in. cutting surface, good condition, $50 OBO. Henderson, 281-8271.

COMPUTER, PC-XT clone, Tandon 640K math co-processor, 10MB disk, 5-1/4-in. floppy, VGA card, parallel & joystick ports, no monitor, $150. Lagasse, 298-0977.

POOL TABLE, bar room size, coin mechanism disengaged, includes cue sticks, rack, and large overhead lamp, $600. Scholl, 823-9119 or 296-0230.

INFLATOR/COMPRESSOR, "Airstation," Black & Decker Model 9527, pressure guage inaccurate but useable, cost $60 new, asking $35. Schkade, 292-5126.

CAMPING TRAILER, 14-ft., stove, icebox, water tank, two propane bottles, needs work on roof, $1,300. King, 298-8643.

ZENITH COMPUTER, XT clone, w/monitor, 20 MB HD, 640K RAM, built-in modem, $200. Carcia, 293-7373.

'90 TENT TRAILER, Palamino Pinto, FWD height, rarely used, excellent condition, $3,500. Payne, 291-0124 after Monday.

DINING ROOM CHANDELIER, heavy, elegant brass, $300. Layne, 857-0989.

HOT TUB, luxury model w/lounger, seats 6, fully equipped, 110/220-volt electric, excellent condition, $3,000. German, 281-1719 after 6 p.m.

COUCH, loveseat, La-Z-Boy recliner, entertainment center, glass-top coffee table, refrigerator, electric recliner. Jones, 873-8478.

PORTABLE SEWING MACHINE, Brother, button holes, 10 decorative stitches, accessories, bobbins, instruction book, $50. Young, 256-9158.

WURLIZER ELECTRIC ORGAN, plus bench and music, cost $1,500, sell for $400. Pilkington, 883-0223.

ROCKS, small and large, river rock and cinder, you haul, free. Leigh, 294-8862.

ANTIQUE CHINA CABINET, oak, excellent condition; two electric stoves, one built-in, $175 and $275. Byrum, 898-7234.

CAT, white, beautiful personality, good with children, free to good home. Locher, 266-2021.

LOVEBIRD & CAGE, good company, $25. Rexroth, 293-6025.

RCA CONSOLE TV, 25-in., remote, cable-ready, $225; Simmons waveless waterbed & frame, queen-size, $300; hide-a-bed, $75; AT&T telephone/answering machine, $35. Martel, 293-1892, leave message.

Feeling Rejected? Please Follow the Rules

Some "unclassified ads" are rejected because they do not meet requirements. LAB NEWS staff members do not have time to call people who submit ads, so non-qualifying ads are rejected *without notice*. The most common reason for rejected ads is that Sandians do not list their full names and organization numbers; this information is not printed, but it is necessary to verify that the ad was submitted by a Sandian. The rules are printed at the top of this page in each issue, and Sandians are encouraged to clip and save a copy.

SOFA SLEEPER, w/queen-size mattress and TV/reading fold-up, light colored, $95. Shortencarier, 856-0618.

KITCHEN UTILITY CART, $45; dog crate, $20; oscillating window fan, 20-in., $20; viola, $250; Litton microwave oven, $95. Geitgey, 821-5827.

DESK, oak, double pedestal, excellent condition, $175; Kirby vacuum cleaner, $50. Miller, 883-0218.

MOVING SALE: tent, sleeping bags, push mower, exercise bike, luggage, kitchen stuff, closet accessories, more. Casper, 268-4464, leave message.

CHEST OF DRAWERS, 4 drawers, antique white, gold trim, solid oak wood construction, 41"H x 30"W x 17"D, excellent condition, $50. Stang, 256-7793.

IBM MONITOR, color CGA, see it work, $85. Dietzel, 294-4702.

COUCH & LOVESEAT, solid toast color, like new, $450. Luikens, 881-1382.

COUCH, 8-ft., beige background w/floral pattern. Meyer, 296-9066.

SKI-TYPE EXERCISER, "Fit One," new condition, $200 OBO. Rainhart, 821-3690.

WOODEN CABINET, 50" x 46" x 21", medium stain, for small TV and stereo or linens, pantry items, etc., $100. Plimpton, 275-7456.

COMPUTER, ICOM735, w/PS55 power supply, $825; two vertical trap antennas, $40 and $75; antenna tuner, $75. Muchow, 299-1813.

TRANSPORTATION

'80 HONDA CIVIC, station wagon, new clutch, tires, brakes, front-end components, high miles, excellent mechanical condition, $1,150. Hesch, 256-0758.

'57 CHEV. BELAIR, 2-dr., red & white, approx. 5,000 miles on rebuilt 350 engine, excellent condition, $6,000 OBO. Padilla, 296-5048 after 3 p.m

'88 GLASTRON CVX-23 DAY CRUISER, 270-hp Mercruiser, loaded, 207 hours, excellent condition, $16,500. Showalter, 889-7627 days, 1-832-0514 evenings.

ALUMINUM OUTBOARD FISHING BOAT, 14-ft., w/trailer, 3 motors, life jackets, and other accessories, $1,200. Garcia, 836-5661.

'85 JEEP, 4-cyl., 4-spd., 4WD, trailer rigged, high miles, great service, $3,100 negotiable. McClaflin, 292-3543.

'79 FORD F-250 RANGER XLT SUPERCAB, 105K miles, AT, AC, AM/FM, CB, factory dual tanks, grill guard, chrome running boards, $4,000. Miller, 292-5634.

'79 TOYOTA CELICA GT, 3-dr., sunroof, AC, PB, 5-spd., new tires & battery, good car, $900. Talbert, 298-9036.

'83 HONDA V45 MAGNA MOTORCYCLE, $1,150; '85 200X Honda ATC, $800; Schwinn LeTour bicycle, 12-spd., $160. Trussell, 821-5751.

MAN'S TOURING BICYCLE, Centurion Elite GT, rugged, smooth riding, well equipped, 23-in. frame, $200. Mayer, 294-2531.

MAZDA RX-7, only 36K miles, original everything including tires, one owner, always garaged, perfect condition, $4,000. Robertson, 293-1007..

'81 VW RABBIT CONVERTIBLE, low mileage, pull-out stereo, 5-spd., new top and headliner, very clean and economical, $2,500. Dawson, 298-9508.

'88 FORD RANGER PICKUP, extended cab, XLT package, 5-spd., manual, AC, AM/FM cassette, 2.3L fuel-injected, $5,100 OBO. Tomasi, 268-0919.

'78 MOBILE TRAVELER RV, generator, CB, 81K miles, overhead AC, just tuned-up, runs great, $4,500. Koenig, 294-2264.

GIRL'S DIAMONDBACK BIKE, 20-in., $50. Prior, 281-5532.

'91 FORD PICKUP, 3/4-ton, XLT Lariat, V8, 351, 5-spd., towing package, camper shell, 8K miles, $16,000. Curtis, 281-8364.

BICYCLES, two, 10-spd., good condition, $35/ea. or $60 for both. Sikora, 899-1914.

'69 GTO, rebuilt original engine, 4-spd. transmission, perfect body, excellent interior, $6,500. Prevender, 296-8586.

'86 HONDA CB700SC NIGHTHAWK, only 6K miles, black/red, always garaged, excellent condition, $2,300. Holswade, 294-2017.

'85 SAAB 900S, 4-dr., 5-spd. manual, AC, PS, FWD, cruise, AM/FM cassette, sunroof, 57K miles, $4,500. White, 294-6529.

'86 PONTIAC 6000, 4-dr., AT, AC, 27K miles, always garaged, immaculate condition, $4,200. Fink, 293-0725.

'89 KAWASAKI 750R NINJA, 3K miles, fresh tune-up, one owner, excellent condition, asking $3,300. King, 298-8643.

'88 FORD TAURUS L, 57K miles, AT, AC, cruise, 4-dr., clean, excellent condition, $4,450 OBO. Feng, 275-6639.

'84 VOLKSWAGEN JETTA, 4-dr., original owner, 125K miles, Mom's car, great condition, $2,500. Payne, 291-0124.

MOUNTAIN BIKE, Jazz Flipside, 21-spd., 26-in. disconnect wheels, twin-shifters, Suntour Accushift. Jones, 873-8478.

'80 MONACO MOTORHOME, 24-ft., Dodge 440, AT, cruise, tilt wheel, roof AC, new awnings, upholstery, batteries, good rubber, $11,750. Allen, 298-9833.

'89 DODGE CONVERSION VAN, low mileage, PB, PS, AC, original owner, power windows, under warranty, $10,800. Liguori, 256-3613.

'84 LINCOLN TOWNCAR, 92K miles, white, w/vinyl top, $3,500. Wheeler, 281-2402.

'83 TOYOTA CELICA GT HATCHBACK, 5-spd., AC, PB, PS, electric sunroof, good condition, runs great, $2,500. Gentry, 298-3574.

'78 SILVERADO SUBURBAN, 2WD, good 350 engine, AT, mags, $1,400. Byrum, 898-7234.

BIKE, Dyno D-Tour, 20-in., w/mags, pegs, etc, good condition, $95. Dunivan, 296-3937 or leave message on 296-3970.

'89 KAWASAKI 300SX JET SKI, approx. 20 hours, high performance parts, excellent condition, $2,500 firm. Spencer, 292-8241.

'85 CHRYSLER LEBARON GTS, 2.2 liter, 90K miles, 5-spd., 25/35 mpg, AC, cruise, PB, PS, FWD, AM/FM cassette w/CD input, $3,475. Martel, 293-1892, leave message.

REPO: '85 Lincoln Towncar, 4-dr., 8-cyl., AT, approx. 116,694 miles; bids accepted through June 16, 1993; we reserve the right to refuse all bids; subject to prior sale. Sandia Lab FCU, 293-0500, ext. 344.

'72 DATSUN 240Z, runs well, needs some TLC, $1,600 OBO. Zownir, 256-3753.

REAL ESTATE

3-BDR. HOME, 1-3/4 baths, 1,352 sq. ft., attached 1-car garage, new stucco, cooler, roof, MLS Century 21, 881-9195. Ennis, 298-3631.

TIMESHARE, Lake Tahoe, 1 bedroom, lakeside, odd year, kitchen package, RCI package, worth $7,500, must sell, $3,000. Hobbs, 291-8267.

2-BDR. TOWNHOUSE, 1-3/4 baths, greatroom w/fireplace, covered patio, security wrought iron, near I-40 and Tramway, Open House Sunday, 1-4 p.m., $84,500. Myers, 292-3672.

3-BDR. HOME, 1,510 sq. ft., nice neighborhood, Open House Sunday, 12-4 p.m., 1713 Hiawatha NE, Juan Tabo/Indian School area. Garcia, 293-2810.

3-BDR. HOME, 1-3/4 baths, corner lot, new roof, 3 miles to Eubank gate, $76,000. Normann, 291-1860.

2- OR 3-BDR. HOME, vaulted LR w/fireplace, hardwood floors, pitched roof, porch w/views, fenced corner lot w/backyard access, Ridgecrest, $84,000. Schofield, 268-8011.

3-BDR. MOUNTAIN HOME, 1-3/4 baths, 2,200 sq. ft., living room, dining room, den, garage, sprinklers, more, $140,000. Wheeler, 281-2402.

WANTED

RENTAL HOUSE or house sitting position, young couple w/two dogs, July 1-October 31, new house being built, references. Alsbrooks, 897-1893.

USED CHAIN-LINK FENCING, any dimension or condition, will remove if necessary; gate; cinderblocks and bricks; body for '86 Ford Escort. Brooks, 255-7551.

BASKETBALL BACKBOARD & RIM, with mounting hardware. Prior, 281-5532.

TO RENT, LEASE, OR HOUSESIT, returning from TDY approximately July 1, ideally 3-bedroom/2-bath home near Montgomery and Juan Tabo. Graham, 294-7740.

COMPUTER with printer & scanner, for student, prefer a 486-DX w/color monitor and software, but will see others. Ortiz, 898-2650.

HOME FOR DOG, Chinese Shar-Pei, spayed, all shots, housebroken, sweet personality. Rex, 764-9655.

SMALL ELECTRIC LAWNMOWER, w/rear discharge or push mower, in good condition. Cooper, 883-7494.

MOVING BOXES. Geitgey, 821-5827.

SHARE-A-RIDE

CEDAR CREST VANPOOL has openings, Frost Rd., N-14, Tijeras. Yelton (281-2893) or Burns (281-3922).

Coronado Club Activities

Are You Ready to Splash Down?

YOU CAN DO IT TODAY! Lounge in a comfortable chair — or stretch out on the lawn. Swim a few laps — or float languidly around the pool. Whatever your choice, take advantage of the Club's "Splash Down" every Thursday and Friday evening at the pool and patio. Throughout the summer, on "Splash Down" days, the pool is open until 9 p.m. An a la carte buffet is served from 5 to 8 p.m. (Club members get 10 percent off buffet prices.) For the kids, there are amusements ranging from a playground to video games. For everybody, there are volleyball and basketball courts, horseshoe pits, and more. Regular admission prices apply — $2 for members who haven't purchased season passes, $3 for members' guests.

GRAB DAD and bring him to brunch on Father's Day, June 20. After brunch, let him take a dip in the pool — any member eating brunch at the Club that day gets to swim free by showing the brunch receipt at the pool office ($3 for guests). Then top off a fabulous Father's Day by enjoying a concert on the patio, with the Roland de Rose Orchestra playing from 3 to 6 p.m.. Brunch costs $7.95 for adult members, $8.95 for guests, $4.95 for children 4-12, and free for kids 3 and under. Reservations required — call 265-6791.

THEY PLAY IT ALL — That's the word on Sonny and Company, the band on the Club stage next Friday evening, June 18. Not only do they play it all, it's all enjoyable, from country to soft rock to easy jazz. You can also expect a fine performance from the kitchen crew, as they dish up filet mignon or fried shrimp, each two-for-one priced at $14.95. And of course, there's that favorite, the all-you-can-eat buffet for $6.95. Dinner is served from 6 to 9 p.m., and Sonny and Company play from 7 to 11. Reservations recommended — dial 265-6791.

Sandia News Briefs

Chris Cherry Recognized for Work with Albuquerque's Bomb Squad

Chris Cherry (9333) recently received a plaque of recognition for his work with the Albuquerque Police Department Bomb Squad. Chris has spent the past three years serving as a technical consultant to the Albuquerque Police Department Bomb Squad, assisting with squad training, and helping design systems to "beat terrorist devices."

Chris' involvement with the Albuquerque Police Department was part of a Work for Others (WFO) contract with the FBI to train all bomb squads in the nation. The inscription on the plaque thanks Chris for his "significant contributions to ongoing crime fighting efforts," saying he has "given unselfishly" in his work with the bomb squad.

Symposium Will Apply Technology to National Needs

Sandia is one of nine sponsors contributing to the first national symposium on "Coupling Technology to National Need." The symposium, to be held Aug. 23-26 at the Albuquerque Convention Center, is designed to enhance use of technical resources in areas of national need. The symposium will focus on six areas of need: transportation, visualization and communication, energy and environment, public safety, manufacturing, and health.

Sessions will present technologies that address each need as well as barriers to utilization of these technologies. For more information, contact the International Society for Optical Engineering at (206) 676-3290 or symposium co-chair Art Guenther (4500B) on 844-6015.

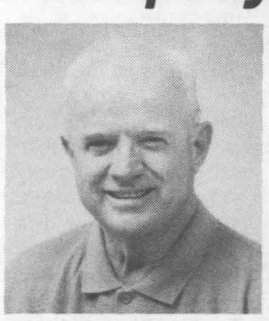
Group Effort Brings 'Data Superhighway' to Vice President

Researchers from Sandia, Lawrence Livermore National Laboratory, and AT&T Bell Laboratories recently pooled resources to prepare a demonstration for Vice President Al Gore during a May 3 visit to Bell Labs in Murray Hill, N.J. The demonstration, an animated data visualization package developed by LLNL, was transmitted across the country via the XUNET (Experimental University Network) using a Sandia/California computer and the help of Helen Chen (1951) and Bob Mines (1952).

The demonstration served as an example of how industry and government laboratories can contribute to the creation of the National Information Infrastructure, also known as the "Data Superhighway." Earlier this year, Sandia joined a collaboration headed by Bell Labs to use the XUNET high-speed network testbed to understand high-speed, wide-area networking and develop computing applications for this environment.

Send potential Sandia News Briefs to LAB NEWS, Dept. 7162.

Employee Death



WILLIAM LUTGEN

William Lutgen of Design Service Dept. 2883 died May 29 after a long illness.

He was 64 years old.

William was a senior technical associate and had been at Sandia since 1956.

He is survived by his wife, three sons, and three daughters.

Sympathy

To Jeff (9538) and Denise (9617) Carlson on the death of his father and her father-in-law in Houston, May 17.

To Josephine Ellis (2574) on the death of her mother in Florida, May 21.

Take Note

Advances in Pulsed Electron Acceleration and Applications is the topic of a three-day workshop sponsored by UNM's College of Engineering to be held June 28-30 at the Department of Electrical Engineering on the UNM campus. The course will be led by Academician Gennady Mesyats, Vice President, Russian Academy of Sciences. For technical information, contact Prof. Edl Shamiloglu on 277-4423. For registration information, contact the Professional Engineering Development Office on 277-0435.

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Albuquerque's first Red Nose Day USA on April 2 raised $2,500 for Sudden Infant Death Syndrome (SIDS) research, family support, and education. Local businesses and radio stations, the Old Town Optimist Club, and University Hospital participated in promoting the event and collecting contributions. Planning for Red Nose Day 1994 begins in January. If you are interested in helping to plan for this event, please contact Betty Pierce (9213) on 294-0871.

Sandia in the News

This is a periodic column listing a selection of print and broadcast news reports about Sandia. It is provided by Public Relations Dept. 7161 and is published to give Sandians a sense of what is being said about Labs work in national and international media.

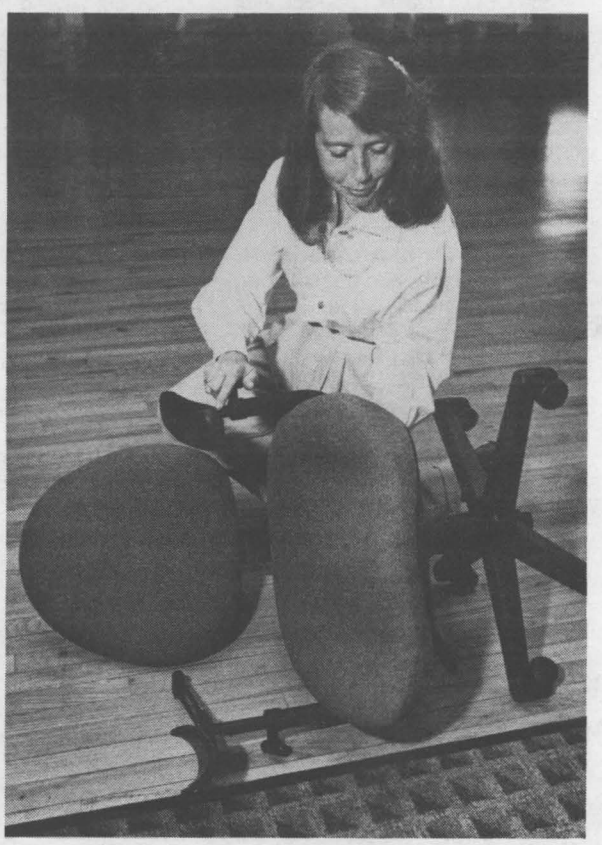
Paul Klarer (9616), Jim Purvis (9204), and their RATLER lunar rover all were featured during a recent national PBS-TV special, "Living and Working in Space: The Countdown Has Begun." The program used lots of Earth-based shots of RATLER in operation and had Paul on camera saying, "I'd love to see the moon so crowded with people in robots that we'd have a licensing problem." (If you missed this program, Public Relations Dept. 7161 has a tape to loan — call 844-8066.)

The *New York Times*' weekly science page ran a lengthy feature about techniques scientists are now using to "peer into the workings of the human brain." It points out that supercomputer experts at places like Sandia are using fast MRI (magnetic resonance imaging), magnetoencephalography, or a combination of the two "to produce high-resolution, high-speed movies of the human brain with the aim of helping stroke victims and spinal cord patients."

Richard Schneider's (1311) and James Lott's (1322) new vertical-cavity surface-emitting laser (VCSEL) is making big news in the prestigious magazines *Science* and *Science News*. Both have run color art with their stories. *Science News* notes how such lasers are rapidly lighting the way to advances in communications. *Science* points out that our work "has already caught the eye of such electronics giants as Hewlett Packard, Honeywell, Xerox, and others, some of which have expressed interest in collaborating." It also quotes experts from Stanford and Xerox who are impressed with Sandia's VCSEL work.

CNN's coverage of the Taos Hum investigation featured video of the Sandians at work in the field and quoted Horace Poteet (5902) about the hum: "It sounds like a diesel truck idling way off in the distance, at a low, continuous rate."

Newsweek also mentioned Sandia in its coverage of the Taos Hum. •



CHAIR FAIR — Mary Gould (8527), a member of Sandia's Corporate Ergonomics Group, looks over one of several ergonomic chairs available for inspection at the Coronado Club recently. The chairs can be adjusted in various ways, including seat height from the floor, armrest height, lumbar support, seat tilt, and others. Sandians were invited to examine and evaluate the chairs of 13 manufacturers. The highest-scoring chairs will eventually become available for use at the Labs.