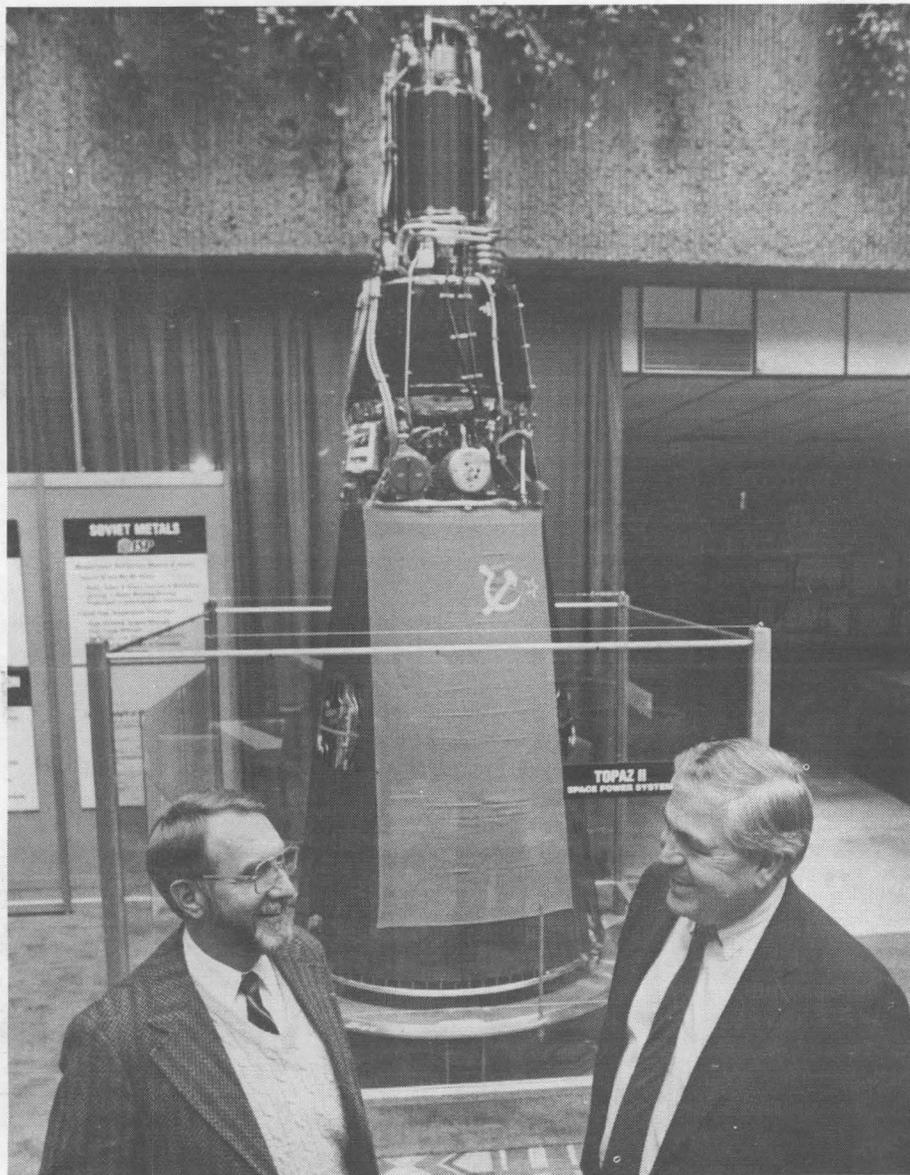


Sandia, Other New Mexico Labs Test Soviet Space Reactor



SPACE REACTOR — Frank Thome (left, 6453) and Jim Lee (6472) discuss the Topaz II Soviet reactor, on display recently in Albuquerque. The two are part of a Sandia team that will help test and evaluate the reactor in a joint program with KAFB's Phillips Lab, Los Alamos National Lab, and UNM.

A group of Sandians who participated in the recent unprecedented sale of a space nuclear reactor to the United States by the Soviet Union will continue to provide their expertise in the areas of safety and testing.

They will join three other New Mexico research institutions, including Los Alamos National Lab, the University of New Mexico (UNM), and the Air Force Phillips Laboratory at Kirtland, in testing and evaluating the Topaz II thermionic reactor, a space power system unveiled early this month at the Eighth Symposium on Space Nuclear Power Systems in Albuquerque.

The 6,000-watt, 12-foot-tall, one-ton, unfueled test assembly will be tested at a building now under construction at UNM's Industrial Park.

The goal of the program is to step up US research into the potential use of reactors using thermionic energy conversion to improve space power technology.

"This is a dramatic and historic opportunity in which the US — in particular New Mexico represented by four of its major institutions — is joining together and working with the Soviet Union in advancing space power," says Dave McCloskey, Director of Nuclear Energy Technology 6400.

"It will have broad participation by the space power industry and will serve our aspirations of making New Mexico an educational center, because students and researchers at UNM will be involved in the testing of space technology," he adds.

Beginning next year, after the Topaz II reactor is delivered and readied for operation, the efficiency and performance of the reactor assembly will be tested. An electrical power source will be used to generate the heat that drives the reactor; no nuclear power source will be used.

Thermionic vs. Thermoelectric Systems

With the addition of Topaz II, US researchers will be able to study and compare two kinds of nuclear power systems — thermoelectric and thermionic reactors, says Dave.

Both thermoelectric and thermionic reactors convert heat directly to electricity. The thermoelectric system is similar to a thermocouple, developing a voltage across a heated junction of dissimilar materials. The thermionic system is similar to a plasma diode, developing a current flow across a gap from a hot emitter (the core nuclear fuel) to a cold collector.

The Topaz II is the thermionic type; the thermoelectric type is already being researched by DOE under the program name of SP-100, explains Frank Thome (6474), who is on loan to the Phillips Lab from Sandia as the test director.

Private industry will also reap the benefits of the research effort. Several companies involved in nuclear power, such as Westinghouse, General Electric,

(Continued on Page Eight)



LAB NEWS

VOL. 43, NO. 2 SANDIA NATIONAL LABORATORIES JANUARY 25, 1991

***New Agreements with
DOE and AT&T Allow
More Cooperative
Work with Industry —
See Page Eight***

Most Critical Element

Change Ambassadors Create Informal Network

Making Sandia's Strategic Plan a reality will take change — not just in organizations or systems, but in how people think and act.

That's a conviction underlying the decision by 310 Sandians from Albuquerque, Livermore, and Tonopah. Responding to a *Weekly Bulletin* ad, they volunteered to become Change Ambassadors for their organizations. The Ambassador program, sponsored by Corporate Change Management (Org. 5), will bring together employees of all classifications — union members to directors — to support Sandia's change effort.

"In my mind, this program is the most critical element in the whole change effort," says Dan Hartley, VP of Org. 5. "It's an important group, and it will be entrusted with some significant tasks. Their first homework assignment, for example, is to gather information that SMC will use in the upcoming phase of Sandia's strategic planning."

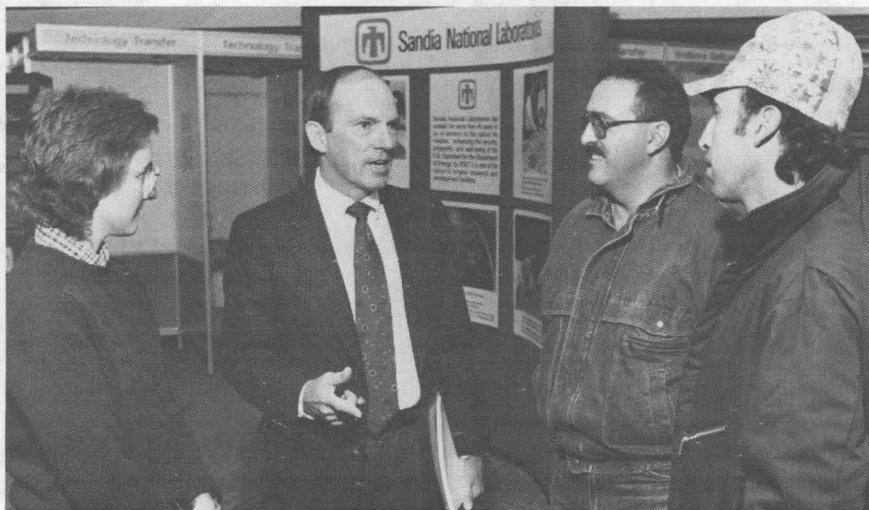
"From the Ambassadors' point of view, the program should prove exciting," says Jo Ann Romero (5), who is assisting Dan with the program. "It will be a unique opportunity to learn about and partici-

pate in Sandia decisions that will affect all of us.

"This program will provide a conduit for sending and receiving information up, down, and across the Labs," continues Jo Ann. "It will also provide sounding boards and evaluators of change throughout the organization, and it will train the Ambassadors to become champions of the

core values outlined in Sandia's Strategic Plan."

Beginning in February, the Change Ambassadors will meet twice a month. One key element of this program is to provide training on the change process itself, insights into how people react to change, and tools to help people accept and support change. ●



DAN HARTLEY (second from left), VP of Corporate Change Management 5, discusses the Change Ambassador Program with three folks who attended a recent meeting for potential Ambassadors. They are (from left) Heather Allen (7223), Joe Barela (7473), and Manny Trujillo (7423).

This & That

Shedding Some Conservative Skin - Like many company newspapers, the LAB NEWS has traditionally been pretty conservative about what we publish. But in line with the changing Sandia climate (more open communication, empowered employees, etc.), we're changing, too - "shedding some conservative skin" and publishing some material that probably wouldn't have seen daylight a year ago. That includes the employee suggestions we're publishing in the "What Do You Think?" feature.

You'll find some very frank suggestions/comments in this issue's feature about how to get more Sandians solidly behind the Labs' Environment, Safety, and Health (ES&H) compliance efforts. And the feature has a new dimension this issue - an individual reply to each response by ES&H VP Glen Cheney (3). I think you'll find the suggestions and the replies interesting, lively, and educational. See pages six and seven.

* * *

Understanding the Media - Several Sandians have been displeased and disillusioned by some recent media coverage about our ES&H problems. It's not pleasant to see Sandia - even ourselves - criticized in the media, but I think we should keep some things in mind during these difficult times: (1) Secretary of Energy James Watkins has made it clear that he expects DOE facilities to be open and honest with the public about ES&H matters, and that's exactly what Sandia is trying to do; (2) Newspapers, radio, and TV are not in business to please us but to report the news as they see it, which isn't necessarily the way we see it; and (3) Most reporters try to be fair, but they're human - at least most of 'em - and they can make mistakes, take information out of context, emphasize sensational aspects of stories, and may even occasionally misquote some of our leaders.

* * *

Values Into Action - Continuing on ES&H, the DOE Tiger Team is now scheduled to begin its Sandia, Albuquerque inspections in late April - less than three months away. Our readiness is going to be a test of our ability to put our corporate values into action - particularly leadership and teamwork. By the way, can you name all five of Sandia's corporate values? They're on page five of our *Strategic Plan*: Integrity, Quality, Leadership, Teamwork, and Respect for the Individual. I admit - I had to look 'em up.

* * *

Shutdown Savings - John Cerutti, Supervisor of Operations Engineering Div. 7816, says Sandia, Albuquerque saved about 2.7 million kilowatt hours of electricity - worth about \$164,000 - during the Labs' 1990 holiday shutdown. John bases these figures on electric- and steam-meter readings taken during the break, compared with figures during regular work periods just before and after the break. However, the extremely cold weather during the break did not allow significant savings of natural gas, says John.

* * *

Good News/Bad News - The good: According to the New Mexico Highway Transportation Dept., motor vehicle crashes in the state during 1990 killed "only" 492 people - 46 fewer than during 1989. The bad: Many, if not most, of the deaths could have been prevented. Drinking drivers caused 295 of the deaths, 282 victims wore no safety belts, and 41 motorcyclists who died wore no helmets. That's not just bad - that's really too bad.

●LP

Going for Three

Clean Air Challenge

As part of Albuquerque's "Better Air Campaign," Sandia has challenged DOE/AL and KAFB to participate in the annual "Don't Drive One in Five" contest. The winner is the organization with the highest employee participation rate during the week of Feb. 4 through 8. Sandia won the first two times out. The contest was close last year; however, Sandia won with 20 percent participation and DOE placed second with 17 percent.

To participate, employees must refrain from driving to work at least one day during the Challenge by sharing a ride with someone else, biking, or walking. Commuter Assistance Coordinator Linda Stefoin (3543) has information about Sun Tran buses and carpool/vanpool opportunities. Call her on 4-7433 for alternatives to driving.

Flyers containing information and participation coupons are being distributed to employees. Division secretaries will collect coupons from employees and contractors in their divisions by Friday, Feb. 8.

Employees who normally ride the bus, bike, or walk, and all members of carpools or vanpools (including drivers), may submit participation coupons. Please submit only one coupon per employee.

Internal competitions will also take place, with a plaque going to the Sandia vice presidency with the best participation percentage. Last year's winner was Org. 7000 with 41 percent of its employees participating. Individual prizes will be awarded to participants in a drawing. ●JW

Take Note

Sandia's Black Outreach Committee (Div. 3511) is sponsoring a video conference, "Beyond the Dream III," on Thursday, Jan. 31, from 11 a.m. to 1 p.m. at the KAFB Technical Training School Building (Wyoming & "H" St., south of the Credit Union). The conference will link audiences across the nation with national leaders to discuss global issues on education, economics, history, politics, and the arts. Patricia Salisbury (3511), conference host, can be reached on 5-8715.

* * *

The next meeting of Professional Secretaries International, Albuquerque Chapter, is Tuesday, Feb. 12, at the Holiday Inn Midtown (2020 Menaul NE). The meeting includes a social at 6 p.m. in the Conversation Lounge, dinner at 6:30, program at 7:30, and business meeting at 8. Dinner costs \$10.50. Call Ann McCoy on 296-5376 for information and reservations (required).

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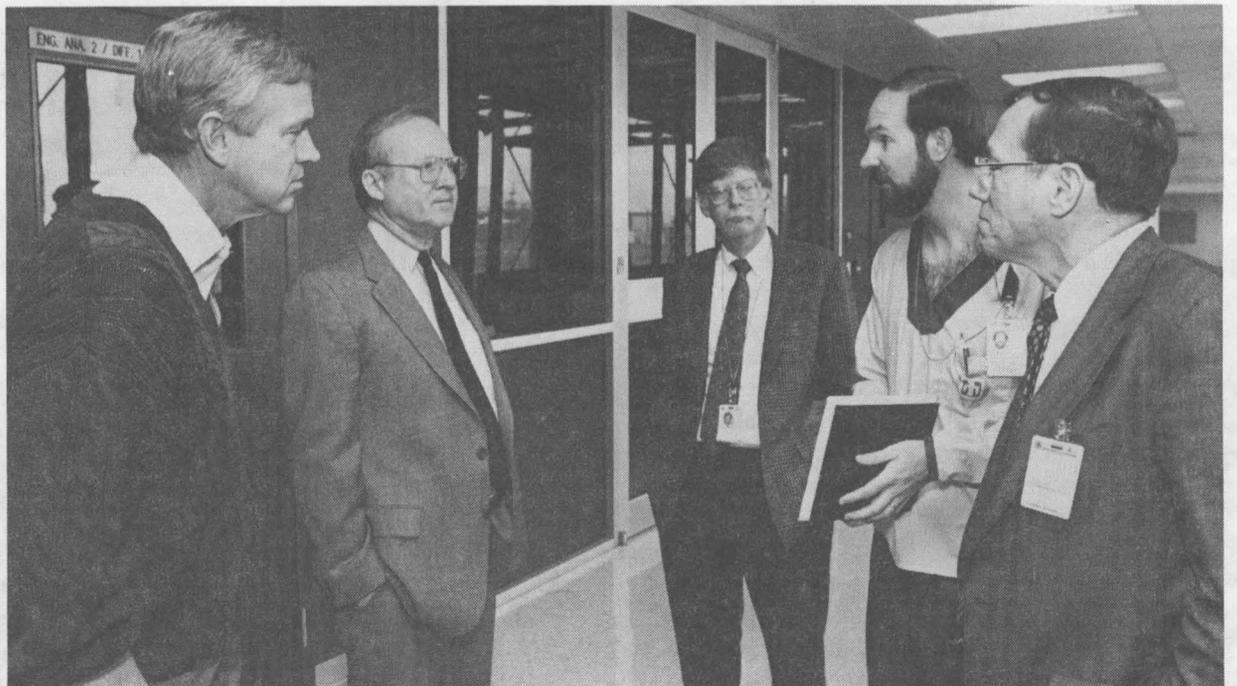
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AT&T BELL LABS executives visited Sandia recently for briefings and tours of Sandia facilities. Hosts and visitors at the Microelectronics Development Lab are (from left) Harry Saxton (2100), Ralph Wyndrum (Director of AT&T Bell Labs' Quality Process Center), Jim Woodard (2140), Brad Smith (2131), and William Scheerer (Executive Director, Quality Technologies and International Planning, AT&T Bell Labs). The visitors also met with President Al Narath, Gerry Yonas (400), Larry Bertholf (7300), Ed Barsis (1400), and the Sandia Management Council.

'Satisfactory' in All Six Areas

Sandia, Livermore Performs Well in Security Survey

Sandia, Livermore received the highest rating after an annual Security Survey by DOE's San Francisco Operations Office in December.

Physical Security Div. 8531 Supervisor Don Charlesworth says it was the most in-depth audit of Sandia's security operations that he has seen. The DOE team of auditors had 26 members.

"Congress has directed the DOE Headquarters Office of Safeguards and Security to have the field offices conduct more rigorous and exhaustive audits," says Don. "We've now experienced that. The positive results of this audit are a tribute to the efforts of everybody involved — Security, document custodians, and the general population at Sandia, who have demonstrated a heightened security awareness."

Marlin Pound, Administrative Services Dept. 8530 Manager, says, "I want to thank all the employees and contractor staff for their efforts. It was evident throughout the survey that the DOE auditors were impressed with the quality of our security program and the professionalism displayed by the staff in meeting security requirements."

Documents All Accounted For

The DOE team evaluated six main areas and 31 subtopics. Major areas were program planning and management, protection program operations,

information security, computer security, Operation Security (OPSEC) assessment group findings, and personnel security (matters such as clearances, badging, and security education).

Document custodians and the document control program draw Don's commendation for their record in the audit. A sample of 898 randomly selected secret documents were inventoried at 23 stations around the site, and all were accounted for.

Singled out for special praise by the DOE audit team was the Advance Security, Inc. (ASI) security force. Tests included firearms and physical fitness proficiency, written tests, detection of faked badges, checking material gate passes, and discovery of mock classified documents left unsecured after hours. This is the third year that the security force had no negative findings — "a highly significant accomplishment," says Don, adding, "In my opinion, they are one of the best

security forces in the country."

The DOE auditors also commended the OPSEC program, which is coordinated by program manager Sherry Angelini (8531). The OPSEC program focuses on the protection of critical or sensitive material that could assist an adversary or competitor.

The DOE rating system has three levels of performance ranking: Satisfactory, Marginally Satisfactory, and Unsatisfactory. Sandia, Livermore received Satisfactory for all six main topical areas and for 30 of the 31 subtopics. The audit team praised the high degree of commitment and support for security by upper management at Livermore.

Don concludes, "Although we still have some areas to address, this audit puts us in a favorable position as Security prepares for the DOE Headquarters Inspection and Evaluation by its audit team this spring." ●BLS



Family Day Scheduled For April 27



DARLENE WEST

Darlene West (8161) has been named chairperson of the 1991 Family Day at Sandia, Livermore, slated for Saturday, April 27. Held every five years, the event opens the site to families and friends of employees for a look at the labs, offices, and test facilities.

Retirees are also invited back to see what's new and visit with former co-workers.

Representatives from all five directorates have been named to the steering committee to plan activities and displays. They are Denny Sparger (8171), Mel Lagasca (2913), Lois Johnston (8316), Ray Ng (8445), and Holly Stryker (8511). ●



DEMONSTRATING PROPER POSITIONING for video display terminal (VDT) use is part of a 2-1/2 hour short course being taught at Sandia, Livermore. Employees learn ways to adjust their office workstations to increase comfort and safety and reduce headaches and other pain. The next class is Jan. 28; those interested in future class dates can call Nancy Zahnder on 294-1502. Shown at a recent class is Bob Allen (8161), being instructed by Sandra Hansen (left), a contract registered physical therapist, and Sandia nurse Mary Gould.

Take Note

Yellow ribbons appeared on the arbor over the computing center early this week as Sandia employees sought a way to show their thoughts of family and loved ones in the military.

The yellow-ribbon tribute was organized by Lizbette Cox (8361), who has a US Marine son-in-law stationed in the Persian Gulf. Each ribbon has a laminated card attached, displaying the name of someone serving in the US armed forces.

Liz invites other Livermore Sandians who wish to have a ribbon displayed for a family member or loved one to contact her on 4-2232.

Dave Abrahams (8200E) and his wife Jolene, who have a son in the Marine Corps, have organized a support group in the Livermore area for families of US military personnel. They invite anyone who has fears or concerns they would like to talk about to contact them on 447-9386.



Recent Retirees



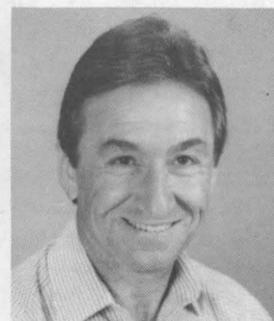
Bill Thompson 8511 29



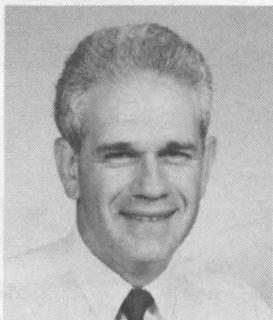
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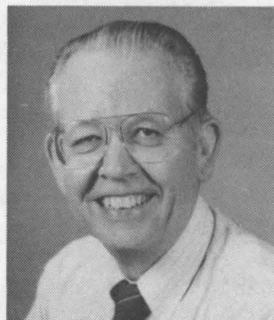
Carl Schoenfelder 8313 29



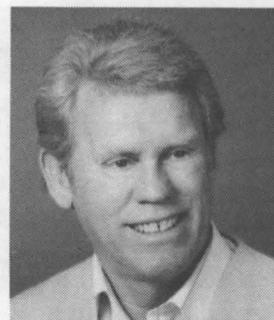
Tommie Bryant 8536 31



Frank Halasz 8524 25



Arnie Rivenes 8130A 31



Doyle Baker 8451 30



Bob Freeze 8284 23

Know Your Space, Know Its Hazards

Pre-Tiger Team Self-Assessment Takes A Critical Look at the Labs' ES&H Problems

Know your space, know your work, and know the hazards associated with them, said Glen Cheney (3), Vice President of Sandia's ES&H compliance program, as he spoke to Albuquerque Sandians last week. "Then develop a strategy for managing those hazards and reducing risk, share it with others, and document that strategy," he added.

His comments were based on Sandia's Pre-Tiger Team Self-Assessment (PTTSA) report, a 400-page document released last week that contains a self-critical view of the Labs' compliance with federal, state, and local ES&H requirements.

"There was a time when we thought our ES&H performance was pretty good," he said. "Not any more. We are both impressed and

sobered by this report's hard-hitting appraisal."

Ed Graham (3600) explained the findings of the report during six "town meetings" Jan. 15 and 16 in the Technology Transfer Center. Five of the meetings attracted capacity crowds, and an estimated 2,800 of 7,000 Albuquerque Sandians attended.

Ed says the purpose of the candidly worded report is to expose the Labs' "warts," not hide them. "I hope this self-critical report will get us off on the right foot with the Tiger Team," says Ed. "We can't possibly achieve total compliance by the time the Tiger Team comes, but we can show that we're serious about ES&H and that we've got a plan. It's critical for the future of this laboratory."

Asking Why

The PTTSA report was developed by a group of 19 department managers who sent questionnaires to more than 400 Sandians. After the questionnaires were returned and interviews with several responders were conducted, the group spent three months compiling several hundred significant findings, 17 key findings, and three root causes for Sandia's lack of compliance with applicable ES&H requirements.

"We took everyone's comments about our ES&H problems and then asked why these prob-

"We are both impressed and sobered by this report's hard-hitting appraisal."

lems existed," says Ed. "We kept asking why until we discovered three root causes representing the most basic, deep-seated reasons for our lack of compliance."

The first root cause: Most Sandians believe that no ES&H problem exists at Sandia, and that by industry standards, Sandia is a safe and clean place to work. Not so, says Glen. DOE doesn't measure the Labs by industry standards, and if it did, Sandia still wouldn't fare well.

In FY90, Sandia was 4th worst of 31 DOE research facilities in number of combined deaths, permanent injuries, and restricted work days from work-related accidents. (However, the Albuquerque site has had only one work-related death in its history; in the mid-'70s, a contractor fell while doing construction work.) From 1985 to 1989, Sandia placed 21st out of 31 facilities for lost work days. In both cases, Sandia fared worse than Lawrence Livermore and Los Alamos national laboratories. (See "Making

Sense Out of Safety Statistics" this page.)

The second root cause charges that Sandia's management and staff don't understand the ES&H requirements and how they apply to Sandia. This lack of understanding, says Ed, is because most Sandians don't receive training to recognize and correct problems, and most don't think the requirements apply to their own work.

Root cause number three — "Sandia's management and staff believe ES&H requirements are incompatible with the current Sandia culture" — can be blamed on a lack of formality by Sandia management in dealing with requirements, says Ed. Managers must instill in their employees a sense of ownership responsibility for ES&H, he says.

Planning for Action

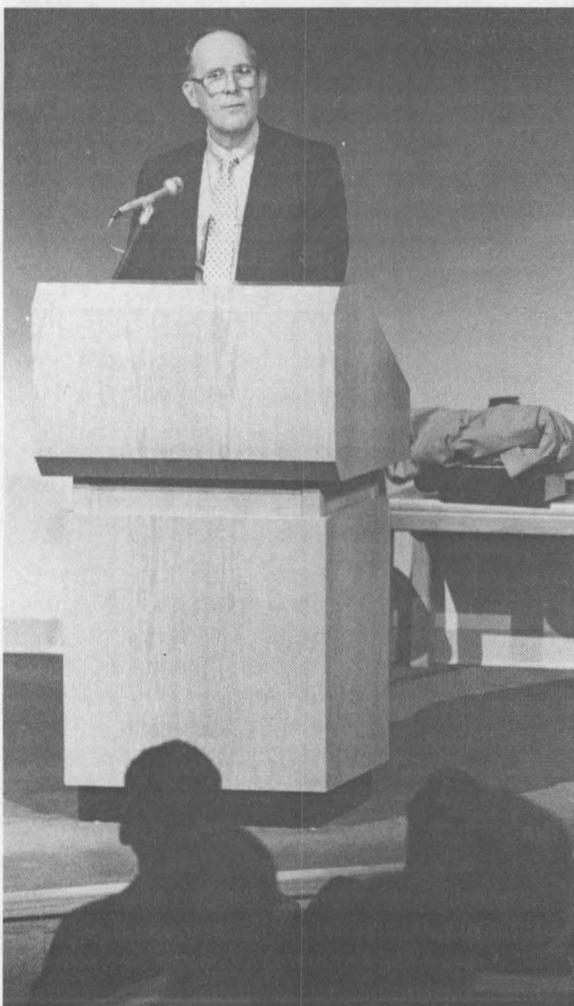
The PTTSA report also describes 17 key findings, which point to an incomplete ES&H program, inadequate self-assessment process, and insufficient response times for correcting problems. Other key findings state that communication between Sandia's line organizations and ES&H professionals is insufficient and that a Labs-wide program to learn from past mistakes does not exist.

Each finding in the report is accompanied by an action plan requirement (APR), which specifies the particular action that must be taken to correct the problem. These APRs will be combined and organized in a later ES&H report called the "Action Plan Report," which will set forth cost-effective plans for meeting all ES&H requirements.

Glen's message included a warning from Secretary of Energy James Watkins to Argonne National Laboratory following its Tiger Team assessment last year. Watkins stated: "A DOE facility that cannot conduct its activities in accordance with relevant and applicable ES&H requirements, whether it be a nuclear production facility or a research laboratory, will simply not be allowed to operate."

"The customer [DOE] has changed the requirements," says Glen. "Two years ago, our conduct of operations was OK given the norms of behavior. Now, with new, tougher requirements placed on us, we can't continue to operate in the old mode. I think this assessment will sharpen management's focus on ES&H."

Copies of the PTTSA are being printed and should be available next week. Sandians who want to examine the report can find one in the Technical Library (Livermore or Albuquerque) or borrow one from any supervisor. ●JG



SPEAKING TO A FULL HOUSE at the Technology Transfer Center last week is Glen Cheney, Vice President of ES&H Improvement and Compliance Program Management Org. 3. Six "town meetings" in the TTC attracted an estimated 2,800 of 7,000 Albuquerque Sandians.

It's Not Easy!

Making Sense Out of Safety Statistics

Although DOE statistics show that Sandia doesn't stack up well with other DOE research facilities when it comes to injuries and lost work days (see main story), it's not easy to determine exactly how well we're actually doing or why, says Dr. Larry Clevenger (3300), Sandia Medical Director.

That's why Larry and his folks in the Medical Directorate are working with Nestor Ortiz and others in ES&H Directorate 3200 to give some perspective to the DOE statistics — to help Sandians understand what they mean. (A future LAB NEWS article will cover this.)

"It's natural to look at the DOE-facility accident and injury statistics and conclude that

Sandians are less careful or working in a more dangerous place when compared with other DOE groups," says Larry. "However, we may be better at reporting our accidents and ES&H shortcomings than the other facilities. In fact, we think that's partly why we don't fare well in comparison. Also, the type of work we do — lots of hands-on engineering and testing — may hurt our ranking.

"But the important point — the one that Glen Cheney [3] is emphasizing — is that we simply aren't as good as we need to be," continues Larry. "After we started examining our accident rates and lost-workday rates in detail, we found they were higher than we had hoped.

We're going to take a hard look at why that is, where the accidents are happening, and then do what we must to reduce them. This will be a part of our ES&H 'lessons-learned' program."

Larry says Sandians had 311 work-related "OSHA Recordable Incidents" in 1990, or nearly 4.05 incidents per 100 full-time-equivalent employees. An OSHA (Occupational Safety & Health Administration) Recordable Incident is defined as "all work-related deaths and illnesses and work-related injuries that result in loss of consciousness, restriction of work or motion, lost work days, transfer to another job, or that require medical treatment beyond first aid." ●LP

Questions and Answers

Town Meetings Answer Sandians' Questions about ES&H

Several Sandians had questions following the ES&H "town meetings" held in the Technology Transfer Center on Tuesday and Wednesday, Jan. 14 and 15. Excerpts from selected questions and responses have been printed below and have been condensed to conserve space. These selected questions and responses represent some of the things on Sandians' minds concerning the Labs' ES&H initiative.

Q: Statistics were shown about the number of lost work days and how Sandia stacks up against other DOE facilities. Will those statistics be used as a measure of how well we're doing in the future with ES&H?

Glen Cheney: We have data showing lost work days at the DOE production agencies and research laboratories. Among the facilities ahead of us are Lawrence Livermore and Los Alamos national labs. We are last — third in a three-person race. I don't think this will be used as a measure of our compliance, but it does indicate that there's work to be done.

Q: Why didn't people at Sandia, Livermore find all the same problems [found in Albuquerque] before their Tiger Team visit last year?

Ed Graham: I think John Crawford [8000] would tell you that we had a misconception that we were better than we were. The Albuquerque report is a more objective and frank assessment of our operations.

Q: Is there any relationship between the PTTSA report and the ES&H findings from October of 1989?

Ed: There's some relationship, but the PTTSA was focused on finding the underlying base, not just the symptoms. The PTTSA is more extensive.

Q: How does this new, formalized ES&H environment fit into empowerment?

Ed: Empowerment means recognizing problems yourself and taking initiative to get them fixed. Don't wait for somebody to find the problem and tell you how to fix it. If you see something wrong around here, try to get it fixed. Fix it yourself if you're qualified, find somebody to fix it, or do what is necessary. Mike Callahan [2340] has also implemented a "self-assessment jump-start" program, which will train 30 to 40 people from each vice presidency to recognize and deal with problems. Take advantage of this training if you get the opportunity. Get curious, ask questions.

Q: Every time we "empowered" employees try to initiate ES&H activities, the rules and directions change. With all this ambiguity, how can empowerment be achieved without duplication and waste?

Glen: You're right. But I think the PTTSA and the Action Plan Report will accomplish exactly what you are asking for. We are defining clearer objectives and requirements for both management and staff. We realize there are deficiencies, but we are working diligently to correct them.

That's the purpose of the PTTSA report: to find deficiencies. When we do things the first time, we don't do them very efficiently. There are going to be some problems, and we're going to have to learn some lessons. We can't let that become an excuse for inaction or an excuse for resistance. We can't sit back passively and wait for ES&H to happen to us or for us.

Q: Are we planning to appease the Tiger Team predominantly with the paperwork and the plans we've generated, or are we going to show some real progress? The wait is sometimes months for getting work requests taken care of. Am I just supposed to show the Tiger Team the paperwork requesting that this work be done?

Glen: Please keep in mind that we have placed tremendous requirements on Facilities Directorate 7800. We are asking 7800 to do more things and at a faster rate than it has ever done before, and we have to look very closely at the resources that we are providing to 7800 and, again, make sure that we are prioritizing work in the most productive way.

One of the key elements of our strategy is some priority-setting activity. We have a lot of information now;

we have the Livermore Tiger Team report, we have the PTTSA, we have other audits that have produced findings, and we have the knowledge of our ES&H professionals. We need to take that body of information, begin to digest it, and set priorities for action.

We need to organize our actions into four categories. First, there's imminent danger, or near danger — the sort of things that can cause a serious accident right now. Those have to be addressed immediately. The second category is compliance issues and root causes. Compliance issues that produce the highest risk have to be addressed as the highest priority.

The third priority level is best business practices; that is, other people are following practices that they have found successful, and we can emulate them and learn from them. And the fourth category is desirable changes that we should make, but which are not required by law or best business practices.

Q: In light of the fact that we are overloading Org. 7800, and in light of the fact that on Jan. 2 we adopted a policy that says we shall not eat in the workplace, what can we expect from 7800 in turnaround for moving people, rearranging laboratories, and relocating outlets?

Glen: The questioner is referring to our new eating policy that, in short, says if you are working around what OSHA identifies as toxic chemicals, you can't eat, smoke, or chew gum.

When Dick Lynch presented our new policy, he didn't say that we needed to have full implementation immediately. That means a good-faith effort. It doesn't mean we can put it off.

Dick also suggests finding innovative, creative ways to deal with this policy. I've heard of some people who have offices inviting people from across the hall to have lunch with them. That's innovative and good human relations. In another case, a partition divided two halves of a laboratory roughly equally, and the partition had an open passageway through it. The staff had chemicals and desks on both sides of this partition. These innovative people figured out that if they put all chemicals on one side and all desks on the other and moved a cabinet into the opening in the partition, they could eat lunch safely on the office side.

But, certainly, there are some problems that no amount of innovation is going to solve. I understand that. But many of our problems can be solved with a little innovation. We can modify the policy and make exceptions as time goes on, but we can't spend the next three months arguing about it. If we do, we will fail.

Q: Don't you think all these initiatives — ES&H, Change Management, etc. — will be too expensive to work for us? Will we still be competitive in the reimbursable market.

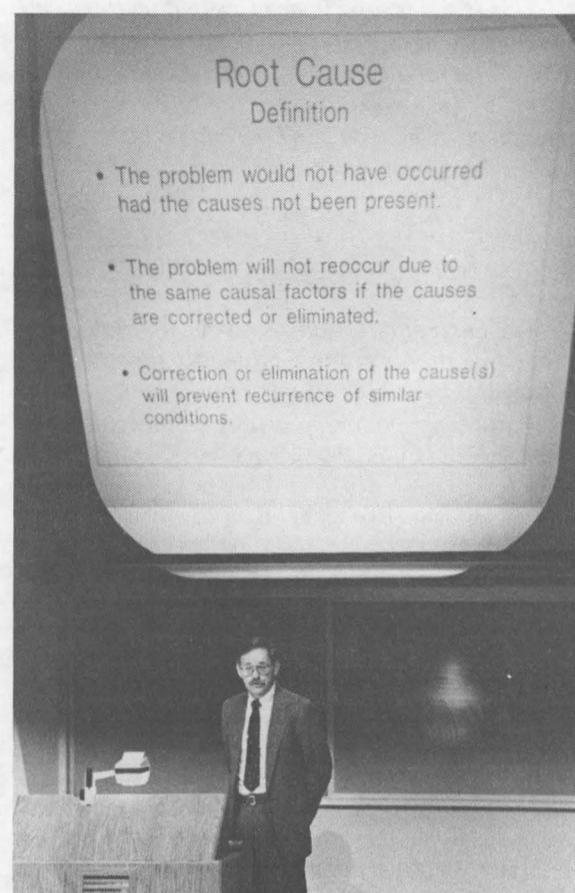
Glen: One of the things I'm doing on the ES&H activity is applying rigorous project management standards to it: performance, what we expect to get done, cost, how much we expect to pay for it, and schedule. Mike Eaton [5170], who is preparing the ES&H project plan, is applying these standards very early in the planning process. The object is to get good value for money spent.

As to this project and others being so expensive that we won't be able to compete in the reimbursable market, we are not going to spend infinite dollars. We are going to get value for the money we spend. The point is, if we don't succeed with this activity, there won't be a reimbursable program — there won't be any program. This is an essential investment in Sandia's future. We must proceed in an effective, efficient, value-adding manner, but we absolutely must succeed.

Q: The question has been raised that this initiative will be prohibitively expensive. Has anyone looked into immediate benefits or payback of implementing ES&H initiatives?

Glen: I don't think we have to do any fancy data-taking to find the answer to that question. Common sense will answer it. For instance, you don't have to have a Material Safety Data Sheet [MSDS] for a chemical you've never bought or brought into your laboratory. You don't have to pay for waste disposal for waste you don't produce.

As I walked around organization 2000, I found that we sometimes ordered too much of a chemical. Not only do you have to pay for the chemical, you have to



ED GRAHAM (3600) defines "root causes" for Albuquerque Sandians last week. The Pre-Tiger Team Self-Assessment report lists three of these root causes, which explain the Labs' lack of compliance with ES&H requirements.

devote valuable space to store it. Also, someone must gather and inventory MSDSs. It goes on and on. You don't have to pay if you don't use the chemical or pay nearly as much if you keep quantities to a minimum.

Q: You said the difference between today and several years ago is that the customer [DOE] has changed the requirements. But haven't we become more aware of our customer's changing requirements ourselves? Shouldn't we emphasize that we are aware of these changes in our operating procedures? In other words, are we just jumping through hoops to pass a Tiger Team inspection, or are we changing our behavior to meet our customers' requirements?

Ed: I think DOE is using a stiffer yardstick with us than they have used before. We are taking a critical look at the "warts," and we intend to correct them. We also intend to put a system in place so we don't run into the same problems in the future. We need to make these changes because it's good for us, not because we simply want to look good for the Tiger Team.

Q: There's not much time between now and the Tiger Team visit [scheduled to begin April 22]. Is there any plan to set work priorities between now and then? Until the Tiger Team visit, will our efforts be focused on the big stuff, such as root causes, or will it be focused on the little stuff, such as detailed 100-percent-compliance issues?

Ed: I believe the time will be spent pursuing our ES&H programs that address the root causes and key findings as well as total management programs for achieving compliance. The 19 department managers have agreed to stay on and provide support toward getting these programs in working shape before the Tiger Team arrives. We are moving toward a total system that will address the PTTSA findings.

Q: What happens after the Tiger Team leaves?

Ed: We are obviously not going to be done with our ES&H initiative by the time the Tiger Team leaves. There will be plenty of work to do because we will not be able to achieve total compliance before they arrive. We'll likely proceed with our action plans with modifications based on the Tiger Team assessment. We can expect follow-on Tiger Team visits every 18 months to two years to track our progress. ●

What Do You Think?**Sandians Offer Ideas about ES&H Support**

This is the second in a series that features employee responses to questions posed by the LAB NEWS. The idea is to give Sandians an opportunity to suggest ways to make the Labs more efficient, more responsive, and perhaps a better place to work. Most responses have been condensed, excerpted, and paraphrased to conserve space. In some cases, only partial responses are printed to minimize repeating the same basic suggestion too many times.

The current question: "In your opinion, what one or two things could be done to get more employees solidly behind ES&H compliance?"

Following each response is an individual reply from ES&H Vice President Glen Cheney (3).

Accountants live longer than chemists — we are exposed daily to workplace hazards that can shorten our lives. Our division is using the DOE emphasis on ES&H as an opportunity to correct years of workplace neglect and marginal practices. Compliance is straightforward once we appreciate the positive effect this will have on our lives.

Frank Gerstle, Sally Douglas, Ron Snidow (all 7476)

A cooperative, positive attitude toward ES&H compliance is a critical first step we all must take. Federal, state, and local law as well as DOE orders are intended to produce safe and healthy workplaces and communities. I firmly believe, like Frank, Sally, and Ron, that compliance will have a positive effect on all our lives. I have full confidence that Sandia's traditions of "can do" and superior technical performance are fully compatible with ES&H compliance.

I believe that what's needed is rational programs, SOPs, deadlines, guidance, etc., that have been written and developed by people who know and understand all of Sandia.

Bill Leisher (7414)

One of the key elements of our strategy to achieve ES&H excellence at Sandia is to foster broad and continuous line involvement. Although formal ES&H documents will continue to be written, for the most part, by ES&H professionals, line input on implementation needs to be part of the process. SOPs should be the product of line organizations working together with ES&H professionals.

Upper management and Directorate 3200 need to provide substantial assistance (not merely orders to "clean up or shut down" or "procedures to write procedures"). Permanent compensation (not simply IPAs, ECAs, or SAFEs) should be used to reward a spirit of cooperation among non-3200 staff.

Steve Lambert (6233)

One element of ES&H excellence is ES&H professionals coaching and teaching the line on what problems we have and how to make Sandia a safer, healthier place to work. The team that did the Pre-Tiger Team Self-Assessment (PTTSA) now has the assignment of designing processes to generate procedures for our ES&H programs. Organization 3500 is working on a proposal to relate compensation to ES&H performance.

Involve more staff employees in implementation programs; give credit to those who believe that Quality and ES&H Initiatives are both top priorities; use the Labs' technical expertise to determine where the hazards really are; and develop reasonably conservative and enforceable mitigation measures.

Al Jacobson (2522)

We are seeking ways to get more line involvement in ES&H, and we are developing ways to recognize excellent ES&H performance. Certainly the Labs' technical expertise is important to recognizing hazards, but don't forget that the law defines the hazard and the required response. Mitigation measures must be effective, auditable, and in compliance with DOE orders. Often, these factors may require us to go beyond mere compliance. But be assured that we will always look for the most effective and creative way to achieve ES&H excellence.

Make ES&H more personal to the average Sandian. To increase motivation, enhance positive rewards, recognition, ownership, and personal influence. To reinforce the desired change in professional behavior, issue a formal policy on ES&H in performance/salary reviews. Publicly recognize ES&H "heros" within each line. Employ a less prescriptive, more participatory approach to implementation and use project management team behaviors. Institute temporary shutdowns of out-of-compliance facilities to have more Sandians experience the gut-wrenching feeling of "being out of business."

Steve Goldstein (9020)

Right on! But I will comment on project management. The standard for all Org. 3-managed work will be a comprehensive project plan following the Org. 2000 preferred process for project management.

What Do You Think?**The Next Question**

Agreements have just been signed by AT&T, Sandia, and DOE that allow establishment of CRADAs (cooperative research and development agreements) with private industry (story on page eight). This enables Sandia to negotiate R&D agreements directly with domestic companies, in support of our technology transfer objectives. **What specific actions do you think Sandia could realistically take to attract/encourage appropriate US companies to work with us?**

Please limit responses to 75 words, concentrate on presenting constructive ideas, and include your name, organization, and phone number with your response. We print names and organization numbers with the response unless you request otherwise, but we'll call you personally to verify that you submitted it before we go to press. If you tell us you do not want your name associated with your response, we will not reveal your name to anyone, but we still need your name to verify that the response is from a Sandian. We will also consider publishing responses from Sandia contractors who work on site.

Send responses to "Question," Division 3162, to arrive by noon on Wednesday, Jan. 30. If you prefer, responses can be faxed to 844-0645. Suggestions for future questions are appreciated.

ES&H is defined as generating paperwork to keep DOE happy. It has nothing to do with environment, safety, or health. Sandians are first and foremost problem solvers, and until ES&H is defined as solving problems instead of generating paper, Sandians won't be behind it.

Mark Sears (1424)

I disagree. Certainly DOE requires some paperwork to document ES&H, but let's not forget that DOE is our most important customer. And DOE has a government-sanctioned oversight authority for Sandia. Sandia simply doesn't have a choice about ES&H compliance; Secretary Watkins has made that abundantly clear.

ES&H is all about having a safe, healthy place to work and protecting the environment. We need to seek innovative ways to achieve ES&H excellence that delight our customer and our community.

In interpreting ES&H requirements, management frequently chooses the most conservative path. This can result in inefficient use of scarce resources and time. We need to concentrate on realistic interpretations that ensure compliance without wasting effort. If we later learn we erred, we can take further action.

Craig Tyner (6216)

We must choose policies and procedures that are manageable, compliant, and auditable. We'll try to do that together and wisely. Comment, debate, and creativity are welcome while we are in the decision process, but time is limited. In the end, it is frequently Al Narath or I who must decide, and once the decision is made, we must not get bogged down in continued debate, but move on to the next problem and its solution.

Management can motivate employees in the ES&H arena by appealing to our desire to avoid polluting the earth and poisoning ourselves. I would like to know such things as: What are the most common types of waste we generate and their potential effects on environment and health?

Management can also obtain better cooperation by improving its own performance. Some employees have been frustrated by the plethora of conflicting guidelines and lack of clear direction.

Barbara Mills (2311)

I agree. We do need better, more effective communication. More on that later. We also need clearer direction and guidelines. I believe that's why I have this job.

Currently, ES&H is perceived as dissipating staff resources on endless trivia and cumbersome procedures irrelevant to genuine safety/environmental concerns. Shift the focus of ES&H to emphasize identification of significant potential threats to safety and the environment and cost-effective solutions for them; publicize these cases in the LAB NEWS to show employees that problems exist and the solutions needn't be crippling.

Dave Williams (6424)

Carefully documented procedures are required by DOE for hazardous operations. Every supervisor should do these four things: Identify the work and the space for which the supervisor has responsibility, identify the hazards of that work or space in a Preliminary Hazards Analysis (PHA), develop a plan to reduce the risk of those hazards and achieve ES&H compliance (including procedures and training), and document the plan and execution of it, reviewing it from time to time and sharing it with subordinates.

I have asked a group of Sandians to identify some of our best ES&H practices and communicate them widely.

Circulate reports of incidents directly related to ES&H. These should include injuries incurred on the job, accidents or near-misses, and pollution inquiries or concerns. By informing the general corporate population, we would see an improvement in awareness and motivation. Security bulletins, the LAB NEWS, or the *Weekly Bulletin* could be used to publish such information.

Maureen Eatough (6341)

Good ideas. [Editor's Note: Descriptions of accidents and "near misses" will be reported in Sandia's ES&H Update newsletter.]

In order to get more employees solidly behind the ES&H mission at Sandia Labs, I would suggest having them read excerpts from *Under the Cloud — The Decades of Nuclear Testing*, by Richard L. Miller, The Free Press, 1986.

Lars Roose (1244)

It is certainly important to realize that public perception of ES&H in the nuclear weapons complex is generally negative. Secretary Watkins seeks to restore our reputation through ES&H excellence. He deserves our support and commitment.

Management needs to convince staff that complying with ES&H requirements is more beneficial to their careers than meeting schedules.

Chad Looney (5141)

I would like to refer you to Admiral Watkins' warning in a letter to the Argonne, Illinois, site (See "Pre-Tiger Team Self-Assessment [PTTSA] Takes a Critical Look," page four).

Provide employees with facts about Sandia's position with respect to federal and state laws. For example, how many violations of these laws do we have? How do we compare with private sector firms in hazardous waste generated and work days lost per year due to on-the-job injuries? All Sandians are concerned about having a safe and healthy workplace and will surely contribute if they are informed about what must be done and given the resources to accomplish it.

Randy Harrison (2811)

The PTTSA done by 19 Sandia department man-

(Continued from Preceding Page)

agers, soon to be published as a SAND report, will go a long way toward meeting this request. Sandia was 28th of 31 DOE research contractors in FY90 for the combined category of deaths, permanent injury, and lost or restricted work days. For 1985-89, Sandia was 21st of 31 for lost work days due to job-related accidents or illness. [Editor's Note: A LAB NEWS article will soon examine some of the reasons for this and what is being done to improve Sandia's standing.]

Do not tell us Sandia has an ES&H problem; convince us with facts gathered over our 40-year existence. Show us the ES&H effort is intended to solve this problem, and that it is not primarily an exercise of the type used in military basic training to condition people to blindly follow orders.

George Libman (4050)

Please refer to my two previous responses. Do we really have to be convinced that complying with Occupational Safety and Health Administration (OSHA) rules will reduce accidents?

The ES&H program seems to show little respect for employees who must live with, work with, and implement the initiatives. The program appears to demand absolute compliance without regard for fiscal, emotional, or productivity costs to workers. Until there is more "downward" respect shown, there will be little respect and enthusiasm returned.

Bill Sullivan (5213)

I pledge that I and the ES&H teams will do our utmost to respect individuals and perform our work in a fiscally responsible way that avoids unnecessary costs to productivity. But we will make mistakes. Don't let our shortcoming become an excuse for you to not do what you need to do. As Al Narath notes in Sandia's ES&H Policy: "Conflicts between ES&H requirements and other programmatic needs will be resolved to meet the ES&H requirements." Non-compliance isn't an option.

Avoid newspaper announcements that Sandia employees have a "bad attitude," easy-solution rules that inconvenience many and go beyond what is required, and ES&H courses that offer non-relevant material and repeat much information. Eliminate "no-solution" situations such as how to dispose of dry cells and items containing asbestos.

To get us positively involved, present us with problems that pertain to us and invite us to participate in solving them.

Jim Hanlon and Bob Baron (both 2552)

Change is always difficult and produces heightened sensitivities. I am proud of the can-do attitude of Sandians. Staff participation is vital. But don't wait for problems to be presented — find some yourselves; they are all around you.

And remember that what gets printed in the newspaper and what is actually said or intended may not always be the same.

The Facilities organization needs to aggressively address facility ES&H problems. Building occupants do not have the expertise to identify building, electrical, and plumbing code violations, yet they are the ones doing so.

Name Withheld by Request

I agree that 7800 needs to aggressively address ES&H problems, and I believe it is already doing so. But the changes needed have increased dramatically in the past 1 1/2 years. Let's not fall into the trap of blaming someone else for a problem that has taken years to develop. On the matter of expertise, Michael Callahan's [2340] Self-Assessment Jump-Start project will begin to produce the ability to identify problems.

Abandon rhetoric and fear as motivational methods. Foster two-way, genuine communication. Treat employees' opinions with respect, and treat employees as valued persons instead of pawns to be moved on the DOE chessboard.

Name Withheld by Request

I agree without reservation. But let's be careful of falling into: "First you must change before I will consider your ideas." This sort of implied quid pro quo bargaining just won't work. We're all in this together, and it is incumbent on all of us to begin acting like team members instead of adversaries.

The best way to get more employees solidly behind ES&H compliance is to include it as a major factor in the performance review of each employee. When the evaluation process includes ES&H compliance, amazing things will happen.

Mason Blaich (155)

Yep!

"The things that get rewarded get done." — Michael LeBoeuf. If ES&H is indeed top priority, reward good performance and penalize poor performance during merit and salary review, at all levels right up through President. Continually give awards for exemplary performance and suspensions or terminations for unacceptable performance.

Richard Palmer (2912)

I definitely prefer positive motivational behaviors over punishment, though of course, in extreme situations, extreme actions are occasionally justified. See my previous response.

The new ES&H initiative has caused many OSHA, EPA, and other regulations that need to be met. Unfortunately, what is required involves more people than the ES&H department has. When ES&H acquires more people to support the line, the line will more solidly support ES&H.

Name Withheld by Request

I agree that 3200 is understaffed. I'm working on the problem. Please don't let 3200's understaffing become grounds for your not doing what you need to do.

ES&H Wall Charts Available

ES&H Org. 3200 has compiled a wall chart showing applicable federal, state (N.M.), and local ES&H requirements. These requirements will be the basis for the Tiger Team's assessment of the Albuquerque facilities during its visit beginning April 22. Copies of the chart can be picked up in the Bldg. 857 Annex (on the table near the entryway).

Stick with the serious issues and don't overinterpret the rules. For example, the safety code supposedly requires that nothing be located within 12 inches of a sprinkler head; some organizations have extended this to 18 inches and others to 24 inches. The perception is that a bunch of bureaucrats are playing games and the staff is being victimized.

Also, an effort has been made to improve housekeeping in Bldg. 823, but harassment over housekeeping often has been interpreted as being the result of ES&H.

Name Withheld by Request

The correct number is 18 inches. But the deeper issues here may be trust and resistance to change. I assure you no one is playing games. We've all been thrust into a new environment and required to adapt and change rapidly. Making good judgments with little experience is always problematic. But exert some initiative in cases like this; consult with an ES&H professional in 3200 and give your supervisor the information.

Housekeeping is important, too, though the standards are less well-defined. There is no doubt that an auditor will expect to find more problems in a sloppy workplace than a tidy one.

First, we must apply Sandia's quality techniques to ES&H. The main element of this approach should be a single, uniform set of ES&H requirements that all employees must satisfy. In addition, we need a policy that employees will not be responsible for ES&H regulations that have not been adequately documented or communicated. We also need an appeals mechanism to challenge unreasonable ES&H regulations.

Brad Wood (5172)

I agree with your quality comment totally, but getting a single, uniform set of ES&H requirements is not so straightforward. Our requirements come from 31 federal, state, and local laws, 41 DOE orders, and six Secretary of Energy notices. In addition, audits frequently require specific action. We have a chart summarizing these requirements, and we're making copies available. [See box on this page.]

As for a mechanism to challenge unreasonable ES&H regulations, we have one. It's called the American political system. I'm not being flippant. The requirements I'm talking about are federal, state, or local laws.

DOE orders are not laws, but they are given force by DOE's oversight authority of its labs. Sandia does not have the authority to pick and choose the laws it will obey. Neither do we as individuals have that authority, but we do have the right to work through the political process. Until the law changes, we must comply.

Rules need to be completely thought out and clearly communicated to employees. Being told to do A, B, and C, which are mutually exclusive, or being told to do A, undo A, and do B instead, destroys motivation and enthusiasm. When a rule is issued, it should be accompanied by a statement explaining the safety issue and the source of the rule (i.e.—DOE, OSHA).

Pauline Ho (1126), Ken Greenberg (1128), Rick Buss (1812)

We certainly need to strive for consistency. We are doing so, but we will try to get better. The 17 ES&H programs that are nearly completed in 3200 will be our most comprehensive set of requirements. The titles of the programs should serve as a guide to their intent.

Give us honest and logical reasons for the ES&H initiatives. The environmental and safety reasons given do not wash — automobile accidents exceed industrial accidents by orders of magnitude and the huge volumes of single-side ES&H memos do not assist the health of the environment.

Frank Horine (contractor)

The honest reason is that it is required by law. The fact that automobiles are more dangerous than working at Sandia is not a license for Sandia to break the law.

We need to support 3200 in training and staffing people to interpret OSHA regulations. The frustration now is that we are all trying individually to interpret and comply with ES&H without adequate information or consistent backing from management and redoing our efforts two or three times.

Elizabeth Sorroche (1832)

I understand and agree. I'm working on this problem right now.

Management at high levels needs to show some public appreciation for the large amount of work that many employees are doing to cooperate with the ES&H initiative.

Joe Woodworth (1275)

I'm a manager at a high level who deeply appreciates the help and cooperation I have received from many Sandians. I can't do without you. And neither can Sandia. Please accept my sincere thanks. I'll repeat this in public whenever I get the chance.

Everyone, including management, needs to take ES&H more seriously. Admiral Watkins is not going to let up; he is responding to intense political pressure to clean up environmental problems. If we want to keep our jobs, we'd better stop arguing and get down to business.

Linda Doran (3162)

God bless you, Linda! You got it just right. You are welcome on my team any time.

Uniformity in the communication chain is lacking. Hierarchical management structure tends to communicate along parallel series lines. As the ES&H initiative has been communicated to lower levels, the message has been distorted with each level. Employees in different vice-presidencies get vastly different perspectives on what to do. Cross-communication follows, with confusion and lastly disgust (poor attitudes) not far behind.

Name Withheld by Request

You're right. Poor communications is a serious concern of mine. I've asked Pace VanDevender (1200) to manage ES&H communications for me. He's agreed to do it. Let's all give him our support. ●LP/LD/JW

Voice Messaging Begins Pilot Test

The Sandia Voice Messaging System (SVMS) is up and running for a pilot test group. Training for the other 1,300 Sandians who have requested SVMS will begin soon. The system has a number of features to increase the productivity of people using it, says SVMS project leader Gary Shepherd (2933). A future LAB NEWS article will tell more.

Speeds Up the Process**Industry Will Benefit from Technology Transfer Agreement among Sandia, DOE, and AT&T**

Sandia's efforts to speed up the sharing of Labs-developed technology with private industry will be expedited through the recent signing of agreements by AT&T, Sandia, and DOE.

Two agreements, provided for under the National Competitiveness Technology Transfer Act of 1989, were signed Jan. 22 by Sandia President Al Narath and DOE Albuquerque Operations Manager Bruce Twining. One of them recognizes technology transfer as a mission of Sandia; the other defines procedures for Sandia to enter into cooperative research and development agreements (CRADAs) with private companies. Earlier, AT&T Vice Chairman and Chief Financial Officer Morris Tanenbaum signed the agreement recognizing technology transfer as a Sandia mission.

The congressional legislation was sponsored by New Mexico's US Senators Pete Domenici and Jeff Bingaman, who worked for four years to formulate and help pass the Technology Transfer Act. The senators are both longtime supporters of expanding the role of Sandia and other DOE laboratories to allow easier transfer of federally supported technologies to the private sector.

Labs-to-Company Negotiation

The legislation is designed to help domestic companies compete in the international marketplace. It establishes a legal framework for the signing of CRADAs between DOE labs and private industry. Under the act's provisions, national labs can negoti-

ate directly with companies, something they could not do previously, and withhold publication of commercially valuable information for up to five years.

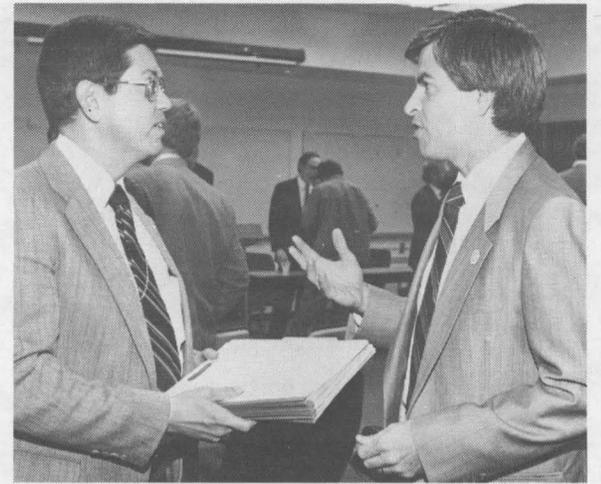
Says Gerry Yonas, Director of Laboratory Development 400 and the person designated to sign CRADAs for Sandia: "We intend to contribute to the nation's economic competitiveness by applying our talents, facilities, and capabilities to the real needs of the marketplace."

"We needed a streamlined process," says Dan Arvizu, Manager of Technology Transfer and Industrial Development Dept. 410. "In many cases, we could not get companies interested in working with us because the process took too long and we could not give them the kind of protection they needed for making substantial investments."

He adds that Sandia currently is talking to approximately 30 companies about projects that could result in CRADAs, but the companies will not be identified until CRADAs are signed.

Al Narath applauds the efforts of the many people at Sandia and DOE who developed the agreements. "It was a task made more challenging by difficult, uncharted waters that had to be crossed in defining a workable arrangement," he says. "I am confident that the agreements will contribute to US economic competitiveness in ways that will fully realize the vision expressed by the architects of the enabling technology transfer legislation."

DOE's Twining says, "Albuquerque Operations is proud to have had a part in this significant



DAN ARVIZU (410, right) receives the first set of CRADAs (cooperative research and development agreements) from Doug Denham of DOE's Albuquerque Operations Office.

event. These agreements with Sandia will lead to increased opportunities for technological development for New Mexico businesses and should attract companies to locate here."

'Green Light' for Sandia

In written statements, both senators praised the agreements.

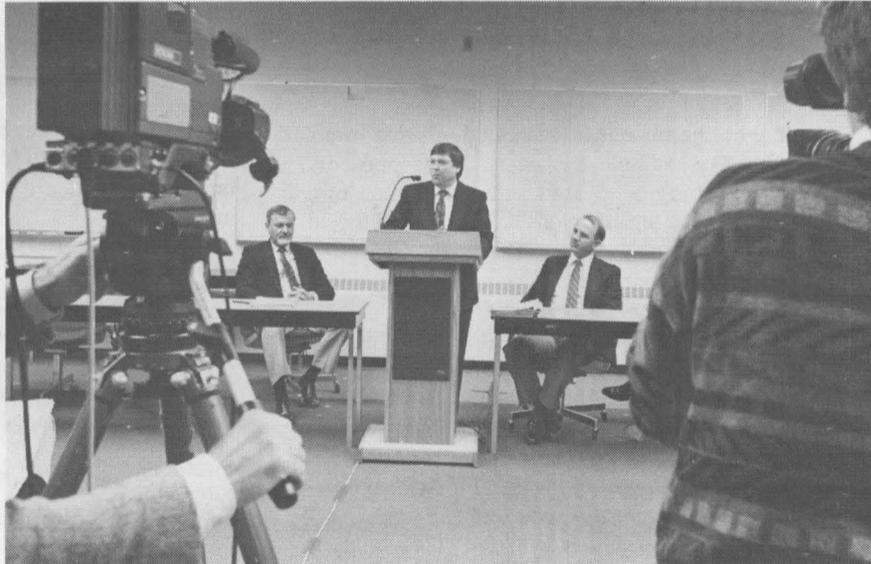
Sen. Bingaman said, "I believe that the future of Sandia depends in great part on working with industries in New Mexico and across the country to help them make new technology products faster and better than our [foreign] competitors. The signing of these agreements finally gives Sandia the green light to build the effective, working partnerships between itself and New Mexico's businesses that will accomplish that goal."

Sen. Domenici said he is pleased that Sandia is actively taking advantage of the technology transfer law. "These cooperative research and development agreements will set Sandia on a course that further enhances its importance to this country," he said.

To avoid conflicts of interest, CRADA participants will be asked to declare any employment relationships they may have with AT&T, Sandia, or DOE, and to declare their intended manufacturing locations. Domestically owned companies manufacturing within the US will be given preference, notes Dan.

•AEtheridge(3161)/LD

FLANKED BY Labs President Al Narath and DOE Albuquerque Operations Manager Bruce Twining (right) is John Hnatio, Branch Chief of DOE's Defense Program Technology Management Group. The three recently announced an agreement among Sandia, DOE, and AT&T that encourages technology transfer and cooperative research and development agreements (CRADAs) between the Labs and US industry.



(Continued from Page One)

Soviet Space Reactor

General Atomic, Rockwell, Space Power Inc., and many others will participate in the research effort, says Frank.

The program is the culmination of several years of effort by Lou Cropp (6465) to develop alliances among New Mexico laboratories that encourage space power research. In February, Dennis Berry (6620), along with Frank and Lou, initiated the formation of an alliance to test the Topaz system.

Dick Verga of the Strategic Defense Initiative Organization (SDIO) began developing the Topaz test program early last year. The program is supported by SDIO, DOE, and the Air Force.

The Soviets had already indicated during previous visits to the space power symposia in Albuquerque that they might be willing to sell the US the Topaz II test assembly if security issues could be resolved. Joe Wetch, president of International Scientific Products in San Jose, Calif., acted as a

middleman for the Soviets. Dick and Earl Walquist of DOE arranged an entourage of US officials to the Soviet Union last May to negotiate the details of the transfer. During their trip, they visited Soviet institutions in Moscow and Leningrad.

Soviets who worked on the transfer included Nikolai Ponomarev-Stepnoi, First Deputy Director of the Kurchatov Institute of Atomic Energy; Vladimir Nikitin, Chief of the Central Design Bureau for Design Building, Leningrad; and Boris Obglobin, Deputy Chief to Nikitin.

Senator Pete Domenici announced the decision this month to establish the test program in New Mexico. He predicts that it will give the state a major role in the future of space technology research.

Most US spacecraft use solar arrays to power their electrical systems and computers. But solar arrays are much larger than reactors, and are susceptible to interruptions if they travel out of sight of the sun. And because of size and mass, solar arrays become questionable at power levels greater than 20 kilowatts of electricity.

Nuclear power systems have several advantages in space, both Dave and Frank point out. Because they are lighter and more compact, they are less expensive to launch. They are also more flexi-

ble, and they have greater potential for survivability in a hostile space environment than solar-powered systems. The advantages improve even more dramatically for power plant sizes of more than 50 kilowatts.

The US hasn't built a space reactor since the 1960s, says Frank, when research was aimed at designing reactors for electric power or propulsion for a spacecraft to Mars, but then was dropped in 1972 for lack of funding and other reasons. Meanwhile, the Soviet Union has continued to develop and fly 38 nuclear reactors in space.

However, even with the Topaz II testing program, it will likely be a decade or more before the reactor technology is ready for use in the US, notes Frank. The current round of testing is just one piece of the overall program to develop a viable thermionic energy system for US space applications. One of the goals is to fly the first thermionic system before the end of the century.

"This new Topaz activity is an important element of Sandia's evolving new thrust in nuclear space technology," says Jack Walker, Manager of Nuclear Technology Development and Application 6460, who is working with Organization 400 to develop a new Sandia initiative in applications of nuclear technology in space.

•LD

Respected Researcher

Cecil Land Honored for Creativity, Years of Service

Last month in Hawaii, the Ultrasonics, Ferroelectrics, and Frequency Control Society (UFFCS), one of IEEE's 33 technical societies, awarded Cecil Land (1164) its highest honor: the 1990 Achievement Award.

Presented at the UFFCS annual ultrasonics symposium in Honolulu Dec. 4-7, Cecil's award recognizes his "creative and innovative research on ferroelectric and electro-optic phenomena in ceramic materials and devices" and his years of service to the society. Cecil joined IEEE in 1959, became a member of the Ferroelectrics Committee in 1971, and served as chairman of the committee from 1978 to 1990.

"I'm most proud of this award because it's from my peers," says Cecil. "I'm told the members of the awards committee felt it was the right time in my career to give it to me."

In 1969, former Sandian Gene Haertling invented a new transparent ferroelectric ceramic material, called PLZT (lead lanthanum zirconate titanate), which would become the focus of Cecil's 35-year Sandia career. Gene and Cecil first described the unique electro-optic properties that made PLZT useful for many new devices.

For example, PLZT ceramics were used in goggles that protect Air Force pilots' eyes from flashblinding, a blinding effect that could result from intense light from a nuclear blast. These goggles can switch from transparent to opaque



REFLECTING on his 35-year Sandia career, Cecil Land (1164) demonstrates the optical properties of his most recent award, the Award of Achievement from IEEE's Ultrasonics, Ferroelectrics, and Frequency Control Society. The award recognizes Cecil's creative ferroelectrics research and his years of service to the society.

20 times faster than the blink of an eye. His more recent work is with PLZT thin films for high-density optical storage.

Cecil has been granted 12 US patents for his work with ferroelectric ceramics such as PLZT. He says the two latest patents granted this year cover a new type of erasable optical storage disk using PLZT thin films. Sandia now has exclusive rights

to this new optical storage technology.

"We are just now getting to the point where we can make good PLZT thin films," says Cecil. "Sandia has been the leader in transparent ferroelectric ceramic research since its inception 22 years ago. The work here is really getting interesting now." ●JG

Oohing, Aahing, and Learning

Glass Becomes a Window into Science

"Hot glass looks the same as cold glass," Ron Snidow (7476) cautions his young audience as they gather around him in a classroom in Albuquerque's South Valley.

Ron and Larry Kovacic (7476) are at Harrison Middle School for a demonstration and lecture on the scientific uses of glass. Their visit was arranged through the Community Relations Division Speakers Bureau at the request of Sandia Science Advisor (SCIAD) Steve Robischon (5213) and Harrison teacher Candy Gruner.

Using a portable bench equipped with a propane-and-oxygen burner, Ron demonstrates basic glass-blowing techniques. He shows how to bend Pyrex™ tubing into a coil to make condensers for laboratory use. The students, who are in Gruner's gifted classes, applaud as Ron blows a glass bubble from another length of tubing. Then he demonstrates the principle of fiber optics by drawing out a thin strand of fused silica glass and heating one end so that a bright beam of light is emitted from the other end.

Supervisor of the Glass Formulation and Fabrication Laboratory, Ron started his career at Sandia as a glass blower 32 years ago. The lab makes glass for electrical components, and glass blowers make laboratory equipment that is used throughout the Labs.

Solid Material, Liquid Structure

Before the demonstration, Larry Kovacic prepared the students by explaining the basics of glass, beginning with its atomic structure: "Glass is an inorganic solid material with a liquid atomic structure. That means the atoms in oxides that form glass stay in the same arrangement whether it's a solid or a liquid. Glass is brittle because the atoms aren't bonded in a nice, ordered fashion. There's always a 'hole' in glass because of this unordered atomic arrangement. Light goes through it, so you can see through it."

After Larry explains that glass is made from oxide powders such as aluminum, iron, and silicon, he and Ron demonstrate by making a small batch of blue glass. They heat oxides in a platinum cru-



HANDS-ON EXPERIENCE for seventh-grader James Toledo is supervised by Ron Snidow (7476). James is in a gifted class taught by Candy Gruner at Harrison Middle School.

cible over the propane and oxygen burner at the glass-blowing bench.

The students are awed by the white-hot mixture that Ron pours into a small mold.

Lesson Behind the Show

"We do this kind of glass-making for glass-to-metal sealing," Larry says. "There's a chemical reaction between the glass and metal, which allows us to make an electrical component. Electricity can't travel through glass — it's an electrical insulator. The glass provides insulation between a metal pin and a metal housing. The glass keeps the pin from shorting out to the body of the component. It can also withstand high temperature and pressure and has a long shelf life."

Larry also explains sol-gel, a form of glass-

making in which oxides are mixed in a liquid solution. After the mixture dissolves and the liquid evaporates, what's left is a glass coating.

After the demonstration, Candy Gruner says, "Both Ron and Larry have an intuitive feel for speaking to the level of my students. The students were very attentive to the presentation and asked really good questions. I think it's wonderful that Sandians can come into the schools like this."

Steve Robischon says part of his job at Harrison Middle School is to help teachers take advantage of resources available from Sandia.

"The Science Advisor program is still in its infancy," he says, "but the potential is limitless. When kids get interested in science through things like this glass demonstration, then it's easier to make them realize that science and engineering careers can be exciting." ●AStotts(3163)

Recent Retirees



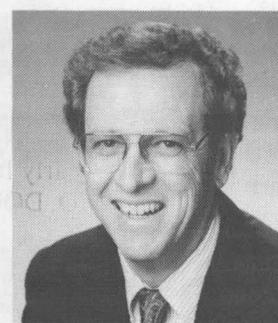
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3426

28



Bill Snyder
6900

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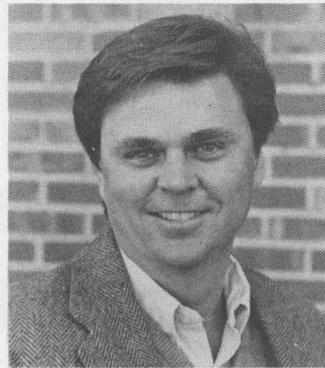
John Cantwell
3150

27

Supervisory Appointments

JOHN LEDWITH to Supervisor of Corporate Change Consultant Division in Corporate Change Management Org. 5.

John joined the Labs in 1985 as a member of the Job Evaluation Division, where he helped develop system models to predict the impact of the MLS 14-level job evaluation system. In 1986, he joined the Compensation Planning Division, where he conducted a study to develop Sandia's compensation philosophy with senior management, researched alternative reward programs, and worked on the Individual Performance Award program. John transferred to the Management and Staff Development Division in 1988, as the organizational effectiveness consultant.



JOHN LEDWITH

He has a BA in sociology from Lehman College, City University of New York, and is currently pursuing an MS in organizational development from Pepperdine University. He is a Certified Compensation Professional through the American Compensation Association. Before joining Sandia, he worked for Digital Equipment Corporation in Albuquerque and Citibank in New York. He's a member of the New Mexico Society for Human Resource Management, the American Compensation Association, and the Organizational Development Network.

John enjoys camping, photography, fishing, and family activities. He and his wife Linda have three children and live in NE Albuquerque.

DORIS MILLER to Manager of Experimental Mechanics Dept. 7540.

Dori joined the Labs in 1978 as a member of the Vibration and Modal Testing Division, where she did structural dynamics diagnostics testing. She transferred to Applied Mechanics Div. IV on a rotating assignment in 1980 and did stress analysis and component specification.



DORIS MILLER

She returned to the Vibration and Modal Testing Division in 1981.

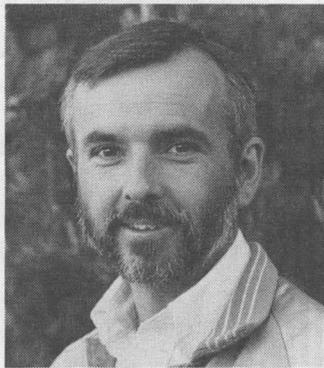
In 1982, Dori was promoted to Supervisor of Experimental Mechanics Division III. That division's work included centrifuge, mass properties, climatic, and electrical functional testing. She transferred to Sensor Systems Division V in 1988 and worked on development of the MIDS (Miniaturized Intrusion Detection System) and other electromechanical systems for the intelligence community. She joined Special Assignment Div. 9249 in July 1990 for a three-month strategic planning assignment at DOE Headquarters.

Dori has a BS in mechanical engineering from UNM and an MS in mechanical engineering from UNM through Sandia's One-Year-On-Campus program.

She enjoys vocal and instrumental music and tennis. Dori has three children and lives in the NE Heights.

MICHAEL KEENAN to Supervisor of Process Characterization Div. 1824.

Mike joined Sandia in 1981 as a member of the Physical Properties of Polymers Division, where he studied polymer cure kinetics and small molecule diffusion in polymers. In 1985, he transferred to the Organic Materials Division, where he studied process analytical chemistry emphasizing chemical control of plating solutions and did desiccant modeling and non-hermetic seal design.



MIKE KEENAN

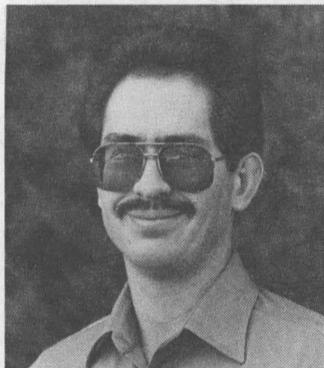
He was named Distinguished Member of Technical Staff in 1990 "for his contributions to Sandia's mission in the area of plating-bath control methodology, and for developing a predictive capability for encapsulant cure rates and producing a model for predicting the behavior of moisture in sealed electronic packages."

Mike has a BS in chemistry from the State University of New York and a PhD in physical chemistry from the University of Illinois. He is a member of the American Chemical Society.

He enjoys woodworking, computer programming, and classical literature. Mike and his wife Ginny have one child and live in NE Albuquerque.

ANTHONY BACA to Supervisor of Utility Systems Div. 7811.

Anthony joined Sandia's Facilities Engineering Div. IV in 1983, where he performed facilities design and wrote the electrical specific design criteria for the strategic defense facility. He transferred to Facilities Engineering Design Division V in 1986, where his responsibilities included planning and designing portions of the exterior high-voltage system.



ANTHONY BACA

He was project leader for the construction portion of the standby electric generating plant restoration in Bldg. 862 and project leader for the 115kV transmission power line and two new substations. He was also chairman of the Electrical Standards Committee for the Facilities Directorate.

Anthony has a BS and an MS in electrical engineering from New Mexico State University. Before joining the Labs, he worked at the Salt River Project in Phoenix. He's a New Mexico Registered Professional Engineer.

Anthony enjoys basketball and skiing. He and his wife Frances have three children and live in the NE Heights.

JERRY ALLEN to Manager of Firing and Safety Electronics Dept. 2360.

Jerry joined the Labs in 1981 as a member of the Hostile Environments Division, working on radiation effects system design and testing. In 1982, he joined the Radiation and Microelectronics Division, doing radiation effects testing and analyses of semiconductor devices.



JERRY ALLEN

Jerry was promoted to Supervisor of the Digital Subsystems Division in 1985. That division developed command and control hardware, software, weapon programmers, and trajectory sensors.

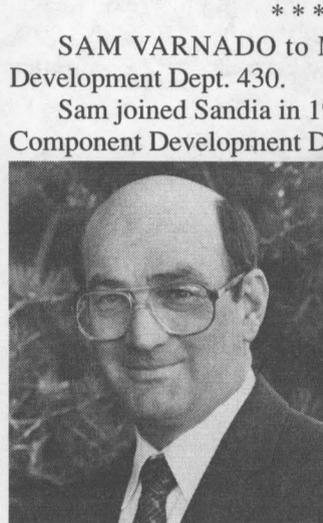
He has a BS and an MS in electrical engineering from the Air Force Institute of Technology and

an MBA from Auburn University. Before joining Sandia, he worked with the Air Force on MX and Advanced Airborne Command Post projects. He's a member of IEEE and is a New Mexico Registered Professional Engineer.

Jerry enjoys hiking, four-wheeling, computers, and gardening. He does volunteer work through Sandia's Volunteers In Action program and with the American Field Service. He and his wife Nadine have two children and live in Sandia Heights.

SAM VARNADO to Manager of Programs Development Dept. 430.

Sam joined Sandia in 1963 as a member of the Component Development Division, where he engineered firing sets. After participating in Sandia's Technical Development Program, he was assigned to the Field Test Instrumentation Division. He joined the Instrumentation Division in 1969 and the Systems Studies Division in 1972.



SAM VARNADO

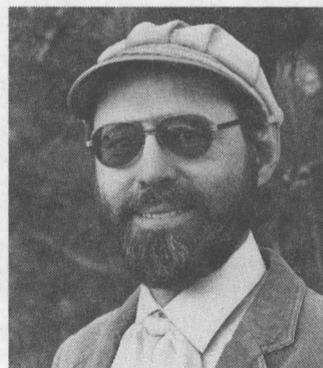
Sam was promoted to Supervisor of the Systems Studies Division in 1975. In 1978, he transferred to the Drilling Technology Division. He left Sandia in 1980 to work in private industry. He worked for NL Industries in Houston from 1981 to 1987, then joined the Titan Corporation in 1987. He returned to Sandia in 1990 as Supervisor of the Technology Applications Division.

He has a BS from Mississippi State University, an MS from UNM, and a PhD from the University of Texas, all in electrical engineering.

Sam enjoys hiking and reading. He and his wife Mary have two daughters and live in NE Albuquerque.

BRUCE HANSCHKE to Supervisor of NDT Technology Div. I 7551.

Bruce joined Sandia in 1969 as a member of the Coyote Canyon Test Complex Department, where he provided instrumentation support for explosives experiments. In 1971, he transferred to the NDT Technology Division. He joined the Imbedded Computing Division in 1987 and returned to the NDT Technology Division in 1988, where he worked on holographic interferometry, image processing, and solar mirror testing. His speciality is coherent optics. He was named Distinguished Member of Technical Staff in 1990 "for his leadership and technical excellence in the development of nondestructive testing technology."



BRUCE HANSCHKE

He has an MS in electrical engineering from Stanford University, through Sandia's One-Year-On-Campus program, and a PhD in the same field from the University of Michigan, through Sandia's Doctoral Study Program. He's a member of the Optical Society of America and Tau Beta Pi and Eta Kappa Nu honorary fraternities.

Bruce enjoys building houses, banjo music, and sport aviation — he is currently building an experimental airplane. He and his wife Chris Husted have two children and live in the East Mountain area.



feed back

Q: I understand Sandia often uses small local businesses (for example, Strong's Office Products or SATO) to provide materials and services such as JIT, a travel agency, and vending machines. But what happens when these businesses lose their Sandia contracts? I am assuming that smaller companies have to expand their entire operations and employ many more people to satisfy the demands of the 7,000 or so new customers at Sandia. When such companies no longer have contracts with Sandia, don't they have to lay off employees and drastically cut their operations? This seems more unfair than not changing contractors on a regular basis.

(I only use Strong's and SATO as examples; I have no connection with either company, nor am I knowledgeable about fair business practices. But I would like this issue clarified.)

A: The commercial firms you mentioned have, in fact, successfully maintained their businesses even after losing their Sandia contracts. Sound business practices require both large and small companies to maintain a diversified customer base, and Sandia encourages its suppliers to sufficiently diversify so that they are not dependent on Sandia business.

Sandia's purchasing policies and practices are based on AT&T policies and federal regulations. These policies require us to maximize competition in awarding contracts. Our JIT contracts are awarded for three years, with two options to renew the contract for a year. Before the end of the contract period, the contracts are again put out to bid and a contractor is selected based on specific criteria. One of the firms you mentioned, Strong's, was able to expand its business while it had a Sandia contract, and although the company did not win the subsequent competition, it remains a viable Albuquerque business.

SATO is a travel organization comprising airline employees assigned to work there. The group continues to provide travel services to several government agencies on Kirtland AFB and has commercial offices at Gibson and Girard SE.

By promoting competition for these contracts, Sandia ensures maximum economic value and service to its employees.

Vending services at Sandia are provided by New Mexico Services for the Blind (NMSB), which in turn subcontracts its services to a local business. The recent change in vending company at Sandia was a decision made by NMSB. The arrangement between Sandia and NMSB is in accordance with federal laws regulating vending services in government buildings.

Bob Zaeh (3700)

Q: How should older printed material be handled that is no longer needed, such as books, equipment manuals, software manuals, or old Sandia reports? The folks in Reapplication have told me that in the past, they have thrown these things away. Some of these materials must have value in the eyes of others at Sandia or elsewhere. To simply discard them is a terrible waste of information if someone else can use them; knowledge is a terrible thing to waste. What is Sandia's policy regarding this matter, and does it adequately address these concerns?

A: The information you received from Property Reapplication (3414) regarding the handling of excess books, manuals, and reports is correct. However, Property Reapplication only handles a limited amount of the kind of published material you mention; any book or report that is no longer required by a Sandian can be sent to the Technical Library (3140) for review for possible inclusion in the library collection. Items not retained by the library are then made available to other Sandians for work purposes, and items remaining after that are donated to the University of New Mexico.

The Technical Library gives these materials to UNM approximately once a quarter.

Your concern about published materials leads us to mention that the library is also the point of collection for other internal documents of value.

Complete equipment manuals and usable software manuals not accompanied by the software (due to licensing agreements and the possibility of classified information being copied surreptitiously) also might be included in the UNM gift program — your question has led us to research this possibility with the Technical Library.

Property Reapplication will continue to discard most other kinds of printed material. First, most of it has been exposed to weather while awaiting shipment or processing, and a large portion of it is incomplete, such as manuals that have been split down the spine or binders that have pages missing. Second, the sheer volume of excess property requiring documentation, inspection, classification, sorting, and staging makes it virtually impossible to review all of the printed material for usability. However, Property Reapplication will continue to make unopened software packages available to Sandians; employees need only check now and then to see what is on hand.

Finally, as in the past, if an equipment manual or set of manuals is included with a piece of property sent to Reapplication, the information will remain with that piece of equipment through its final disposition.

Jim Martin (3400)

Q: Now that we are not issuing the Yellow Pages to everyone at Sandia, perhaps we can stop sending an INTEC catalog to every staff member.

A: We have implemented your suggestion by:

1. Sending advance notification of the release date for new catalogs to each person on the INTEC mailing list and publishing a notice in the *Weekly Bulletin*.

2. Sending one catalog to each division with a request to route it.

3. Making other catalogs available in INTEC "show racks" at strategic points around the Albuquerque site (Livermore publishes a separate catalog).

The implementation of your suggestion is expected to save Sandia several thousand dollars and several trees each year.

Ralph Bonner (3500)

Q: With all the emphasis on ES&H, why can't Sandia's Industrial Hygiene or Health Physics group identify the brands of paint being used to safeguard Sandia employees? How high is the mercury level in the paint Sandia uses for buildings?

A: For about 15 years, Sandia's design specifications have specified Wellborn paint or the equivalent for use in Sandia facilities. Sandia's Design Department estimates that 70 to 80 percent of the paint currently in use is Wellborn Paint. The other 20 to 30 percent comprises Sherwin Williams, Benjamin Moore, Pittsburgh Paints, and miscellaneous brands.

Contacts at the Texas Tech University Health Science Center National Pesticide network hotline, at (800) 858-7378, say their records show Wellborn has not used mercury for the past two years, but they think the company actually stopped using mercury sooner. Wellborn representatives in Albuquerque inform us that they stopped using mercury in their paint about 10 years ago. TTU records show mercury has not been used in Sherwin Williams paint since 1975, in Benjamin Moore since 1971, and in Pittsburgh Paints since February 1990.

Based on this information, it appears that the majority of the interior paint at Sandia does not contain mercury. There may be isolated cases where paint containing mercury was used. If you have a concern about any building at Sandia,

please contact your ES&H coordinator; it will have to be handled on a case-by-case basis.

Nestor Ortiz (3200)

Q: Now that Sandia is involved in a paper recycling program, it seems we should expand the effort as well as try to reduce the use of non-recyclable paper as much as possible. Some suggestions:

- Stop printing bulletins on colored paper.
- Require JIT contractors to print their catalogs on recycled paper.
- Use recyclable covers on Sandia's Computing Newsletter.
- Eliminate green engineering pads that can't be recycled and replace them with white ones.
- Expand waste paper recycling to include all of Sandia. As a government-funded operation, Sandia should set the example in curbing government spending.

A: We are pleased by the interest in recycling shown by you and others at Sandia. The use of colored paper in Sandia's printing operation constitutes less than 1 percent of all printed matter and we expect notices of special interest or with time constraints to continue to be printed on colored paper. Several organizations are, however, considering the use of white paper for their bulletins.

Purchasing informs us that the number of office products manufactured from recycled paper has grown, and a list is being put together for the JIT catalog that will give employees the option of choosing recycled products. We have referred your request for white engineering pads to the buyer.

We expect to expand the collection of waste paper for recycling Labs-wide by the end of FY91. Thanks for the memorandum.

Jim Martin (3400)

Q: Now that the turnaround has been completed south of Gate 10 and the cars have a nice place to drive, I have been wondering where a new sidewalk will be constructed from the south parking lot. The lot is split, cracked, uneven, rocky, and contains such low spots that when it rains it becomes a swimming pool and when it freezes the surface becomes slick and dangerous.

I hope that the walkway is not an oversight and plans are in place to build one. I know everyone who has to walk across this lot feels the same way.

A: The size and configuration of the existing parking lot south of Bldg. 825 make it presently impractical to construct a sidewalk for this lot. Typically, a sidewalk that serves a parking lot is built along the perimeter, but here, the only realistic location is the west side of the lot. However, a walk at that location would not provide the most direct route to the gates and would not receive enough use to justify the expense. People using the walk would be crossing through more traffic than necessary, creating a safety problem.

As to the surfacing of the lot, regular maintenance is performed to repair potholes once they are discovered. The general surface of the lot is not unlike other parking lots at Sandia or in Albuquerque. The average life of an asphalt surface is 20 to 30 years. Since it costs approximately \$1 million to put in a 2-inch overlay and restripe the lot, Sandia will surely try to get the maximum life out of this lot before proceeding with an overlay.

Ward Hunnicutt (7800)

Congratulations

To RoseMary (2832) and David Baca, a daughter, Dabetta Rae, Jan. 5.

To Pamela and John (1545) Pott, a daughter, Rebecca Noelle, Jan. 6.

To Winola and Chris (7818) Saavedra, a daughter, Brandy Lee, Jan. 13.

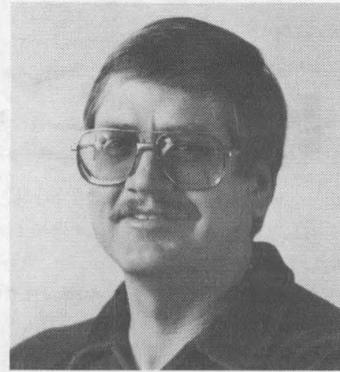
MILEPOSTS

LAB NEWS

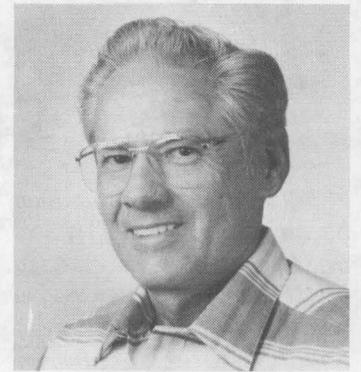
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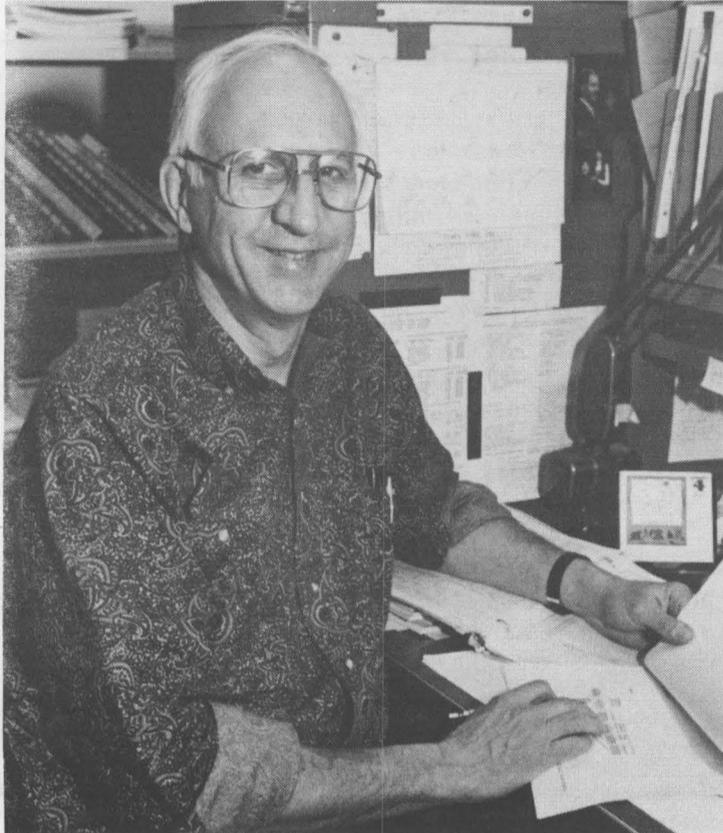
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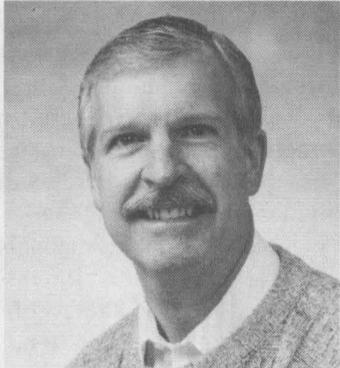
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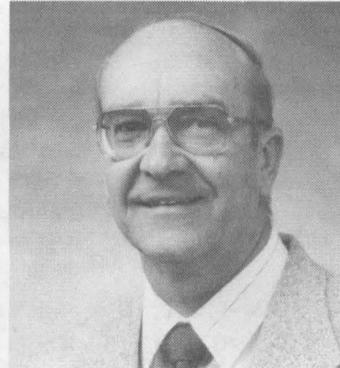
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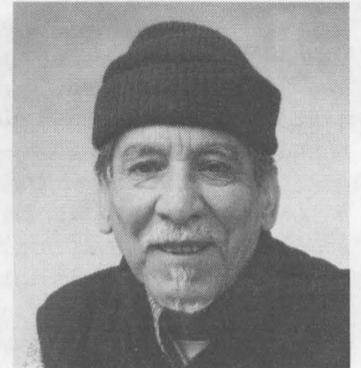
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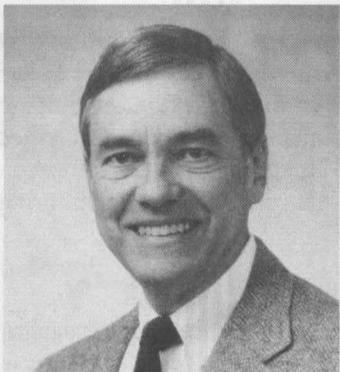
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Dick Craner
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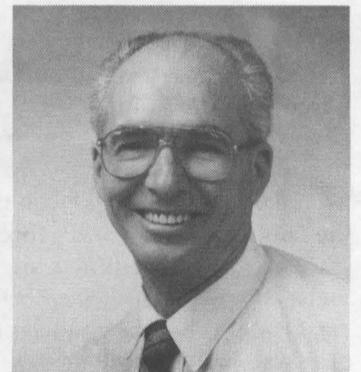
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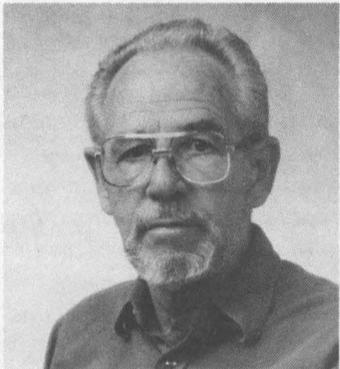
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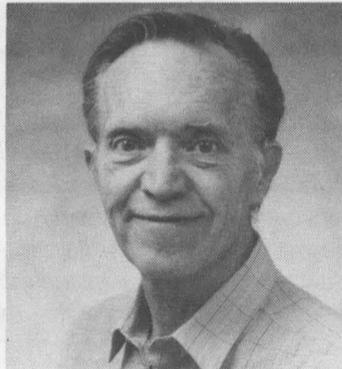
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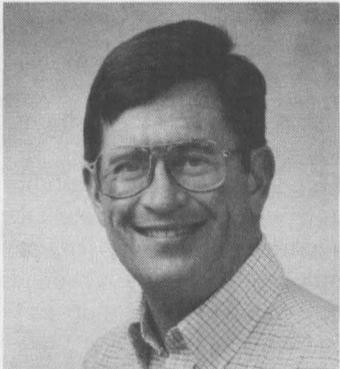
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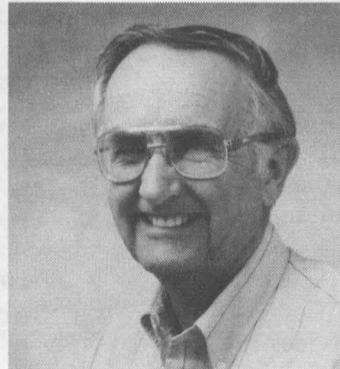
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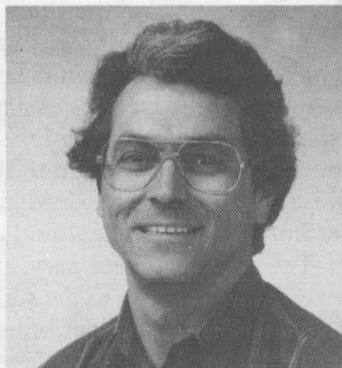
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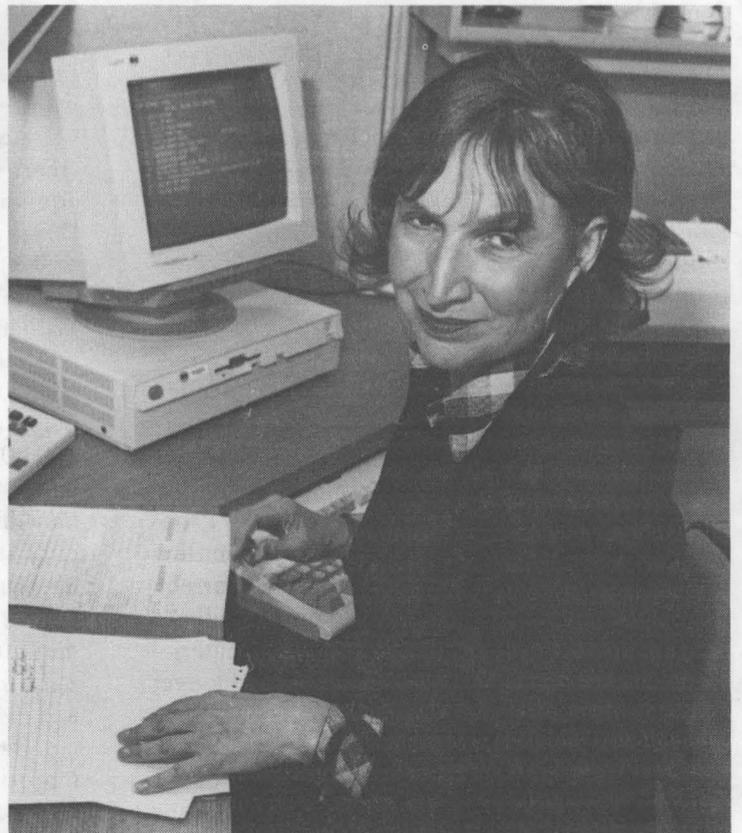
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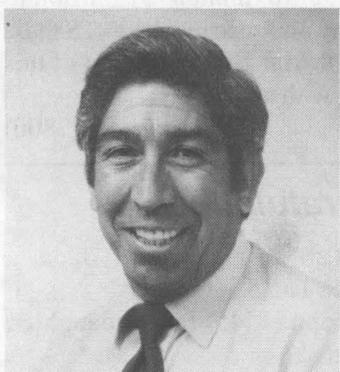
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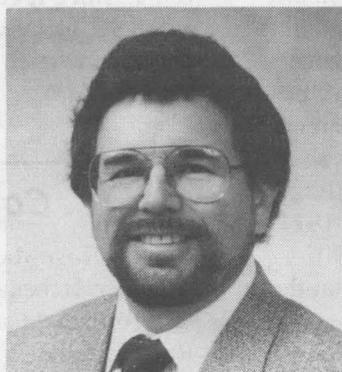
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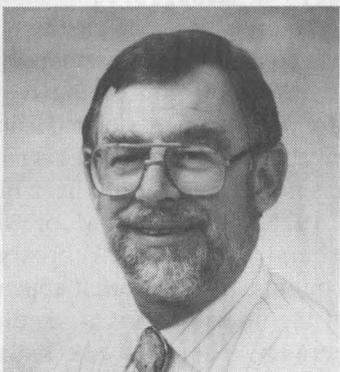
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Nestor Zamora
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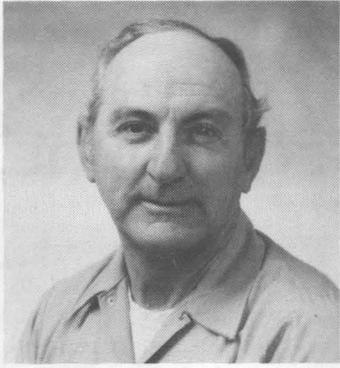
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Mike Zapach
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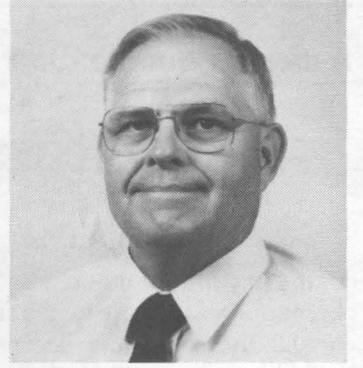
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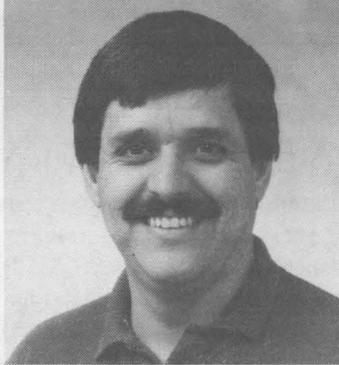
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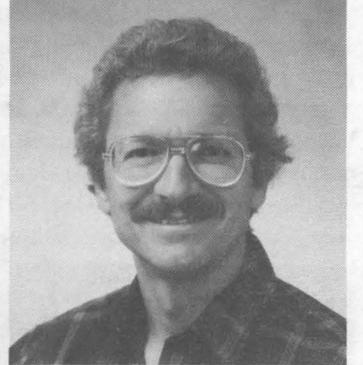
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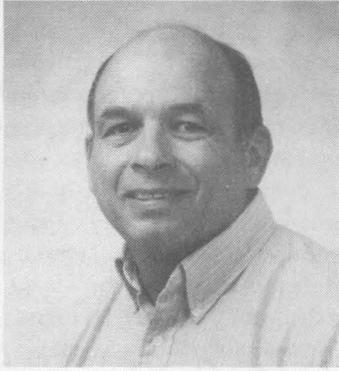
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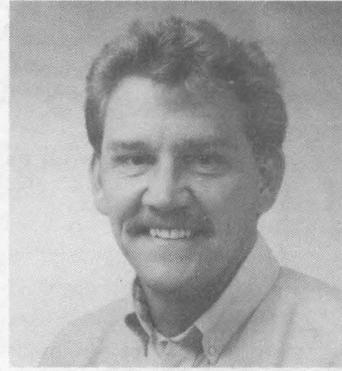
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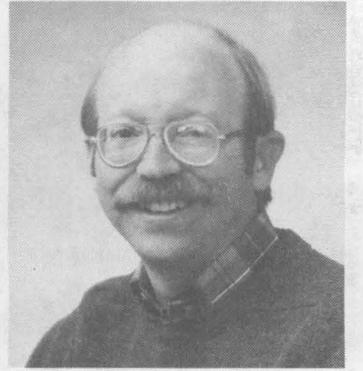
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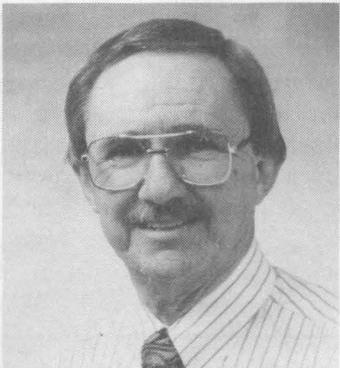
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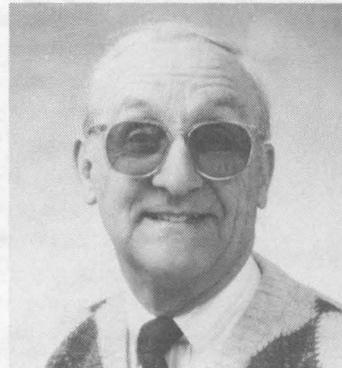
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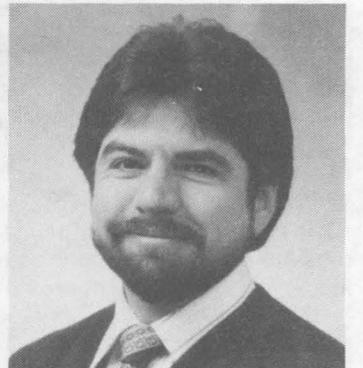
Otto Erdman
7814



Jeanne Bando
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Marvin Guier
142



Richard Phelps
3716



INSPECTING THE "CROWN," a precision machined part used to test new automated edge-finishing techniques in Sandia's robot sensor lab, are (from left) US Representative Steve Schiff (N.M.), Pat Eicker (1410), and US Representative and Ranking Minority Member Robert Walker (Pa.). The three toured Sandia's robotics lab Jan. 7 as part of a Labs technology briefing. Rep. Walker is a member of the House Committee on Science, Space, and Technology.



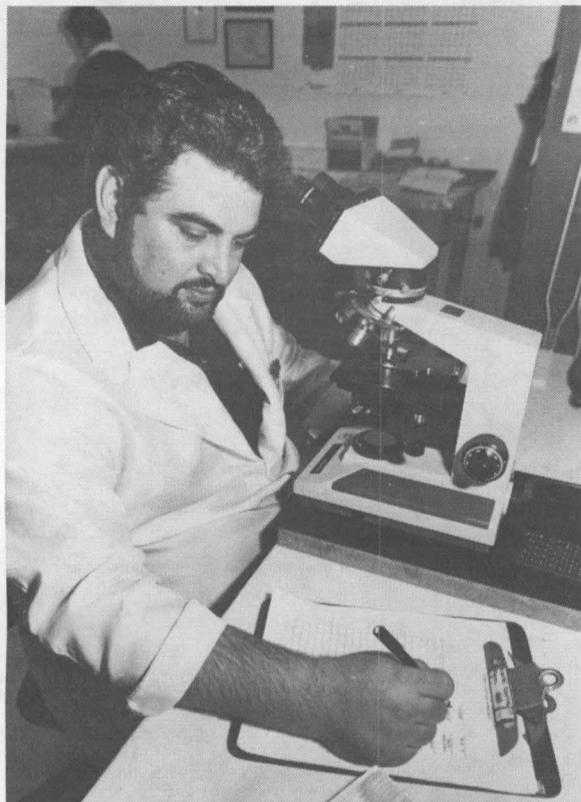
"SEIZE THE DAY" were the words of encouragement from lawyer Patricia Russell-McCloud (right) to a crowd of several hundred Sandians at the Martin Luther King Day celebration last Friday at the Technology Transfer Center. Black Outreach Chairperson Patricia Salisbury (3511) discusses the positive reaction of the crowd. "You must make a deposit in your life," says McCloud. "This is the only way you can expect a return."

Asbestos Update: Don't Panic, Be Patient

Asbestos Plan Focuses on Safety, Regulations, and Cost

On the wall of Jerry Hands' office hangs a computer printout that reads: "For the customer, perception is all there is; perception is reality," a particularly useful motto because part of Jerry's job as Supervisor of Facilities Safety and Environmental Engineering Div. 7853 is to deal with people's perceptions — and misconceptions — about asbestos.

Sandians should be concerned about asbestos, says Jerry, but they should also keep in mind that Labs buildings are monitored by Environment, Safety, and Health Org. 3200. To date, measurements have shown that not a single Labs building exceeds exposure limits set by the Occupational Safety and Health Administration (OSHA) for airborne asbestos (see "Asbestos: Facts vs. Fiction"). Labs employees



ASBESTOS ANALYST Dominic Zarrella examines asbestos air samples under a microscope for an Albuquerque-based Sandia contractor. The samples are analyzed to determine whether asbestos levels in a specific work area exceed OSHA limits.

Asbestos Questions? Ask ES&H

If you have specific questions or concerns about asbestos in your building or work area, contact your building's ES&H coordinator. He or she will answer your questions or refer you to someone who will.

have been moved temporarily, however, when the potential exists for exceeding these limits.

First and Foremost, Safety

One of the biggest problems Jerry and his colleagues face every day is common fears about the dangers of asbestos. Tim Petersen (7853), asbestos program manager, says employee safety is always the first priority of Sandia's Facilities Asbestos Management Plan.

The dangers of asbestos arise when people breathe in small airborne fibers, which become trapped in lung tissue. The presence of asbestos alone does not constitute a health hazard, however. Larger fibers that cannot become airborne are not health threatening. Therefore, removing asbestos is often more hazardous than leaving it in place if it's well-contained and fibers cannot become airborne.

"Many people want us to remove asbestos from their work area immediately," says Tim. "But if the asbestos cannot become airborne, then it's probably safer if it's left alone. When you start tearing asbestos out or disturbing it, that's when it can become dangerous. We will not disturb asbestos unnecessarily or without taking proper precautions, which usually means relocating people during removal."

Employees in buildings containing (or suspected to contain) asbestos must take precautions not to drill through walls or remove barriers that keep these fibers from being released into the air. Asbestos contained in such things as floor tiles can also create a hazard if someone drills through it or strips fibers away by abrading the surface. Again, if employees take precautions, asbestos fibers that cannot become airborne do not pose a health threat, says Tim.

Jerry compares asbestos management to managing electricity in our homes and offices. "We re-

spect electricity as a potential safety hazard," he says, "yet we are not frightened at every wire or outlet we see because we know electricity flowing through an insulated wire presents no threat, as long as we are not exposed to the current. The same is true of asbestos fibers. If they are contained in a vinyl or hardcast matrix, such as floor tile, roofing cement, adhesives, or insulated pipe fittings, then they present no health threat."

Expect Management, Not Magic

Asbestos, a naturally occurring mineral, is present almost everywhere. It is impossible to eliminate all asbestos from Labs work areas. The primary goal of the asbestos program is to protect employee health. While the OSHA limits may be conservative, Jerry says, they still provide the best measuring stick for determining whether a real health hazard exists in Labs buildings. Therefore, employees will be relocated if limits might be exceeded in a specific area.

Regulations regarding asbestos have become increasingly complicated, and because managing asbestos is costly and time-consuming, other types of Facilities work may have to be postponed or discontinued to accommodate requirements, says Mike DeWitte, Manager of Facilities Construction and Environmental Engineering Dept. 7850.

Also, it will probably take longer for Facilities to respond when more urgent work requests need to be filled. "Our goal, first and foremost, is to protect the health and safety of employees," says Mike. "Sometimes this requires removal of asbestos. Most of the time, it doesn't."

Mike says the value of all work-area modifications is carefully weighed against the potential hazards before any work is done. Employee safety always takes precedence over laboratory experiments and equipment installations. If a choice must be made, Facilities work affecting safety will be done first.

"Construction activities may simply have to take a back seat," says Mike. "We may not be able to take out walls and ceiling panels to accommodate new walls and lighting layouts if it might create a hazard. We must work together." ●JG

Charlemagne's Tablecloth

Asbestos: Facts vs. Fiction

In different ways, Sandians have shown their concern about asbestos in Labs work areas. A few facts can help identify real asbestos hazards.

Asbestos is a mineral mined from the ground, present in small amounts in the air we breathe and water we drink. Asbestos fibers can be dangerous if inhaled or ingested in large amounts over a period of time. Therefore, federal regulations permit workplace exposures to asbestos that are below the levels considered dangerous by the Occupational Safety and Health Administration (OSHA).

Asbestos was first used in Roman times to strengthen building materials, such as bricks. In the 8th century, King Charlemagne, it is rumored, had a tablecloth made from asbestos, which he used to entertain his banquet guests. After a lavish feast, he threw the food- and drink-stained tablecloth into the fire. When he recovered it from the flames (asbestos does not burn), it was clean, and his guests were amazed. Later Marco Polo discovered "salamander wool" in the far east. It was, of course, asbestos.

Widespread use of asbestos began in the late 1800s, with the beginning of the industrial revolution. Its durability, strength, fire resistance, and heat-insulating properties made it an ideal building material. Since then, asbestos has been used in au-

tomobile brake pads, floor and ceiling tiles, wall insulation, and in a host of other products. At the Labs, says Jerry Hands (7853), it's most commonly found around heating and cooling ducts and in walls, rocket casings, protective gloves, and pipe insulation. But, he says, its widespread use means there's no predicting where it will turn up next.

Studies have shown that three types of lung disease can be caused by long-term exposure to high levels of airborne asbestos fibers — asbestosis, lung cancer, and mesothelioma. Nobody knows whether such diseases could result from short-term, low-level exposure to asbestos from ordinary sources in the workplace because data are not yet available regarding this kind of exposure. What's more, reliable health data regarding workplace asbestos will not be available for perhaps another 10 to 20 years.

Data are difficult to compile because lung diseases associated with asbestos can take up to 40 years to show up in humans. Still, there is reason for caution until the statistics do exist, says Jerry, and OSHA has established three limits for asbestos exposure that reflect this cautious approach.

The first, called the "Action Level," equals one-tenth of an asbestos fiber per cubic centime-

ter of air, averaged over an 8-hour time period. If asbestos levels inside a work area rise above this level, the employer must take corrective action. If a work area can't be modified to protect employees, then the employer must provide training, respiratory protection, and medical surveillance to people working in the area.

The second limit, called the "Permissible Exposure Limit" (PEL), is twice the Action Level (that is, two-tenths of a fiber). If asbestos levels inside a work area exceed the PEL, the employer violates OSHA regulations and must protect the employee or be subject to sanctions, including fines.

The third limit, called the "Excursion Limit," defines how much asbestos a worker can be exposed to in a short period of time. It equals one fiber per cubic centimeter during any 30 minute period, and is not likely to occur unless specific work-area modifications disturb asbestos above the ceiling or inside air-conditioning ducts. Sandia's policy is to relocate employees in these areas or choose not to perform work that will disturb asbestos when proper safety precautions are not feasible.

Again, to date, measurements from Labs buildings have shown that no Sandia facility exceeds OSHA levels for airborne asbestos.

Take Note

The American Cancer Society recognizes that the needs of the person caring for a cancer patient are frequently neglected but are an important part of the healing process. The Albuquerque Unit of the Society has started a support group for caregivers. The weekly support group meets at the American Cancer Society office (5800 Lomas Blvd. NE, between San Mateo and San Pedro) from 5 to 7 p.m. For more information about the group or to sign up for a session, call 262-2333.

James Burke, writer/host of PBS television specials "After the Warming," "The Day the Universe Changed," and "Connections," will be at the Kiva Auditorium on Wednesday, Jan. 30, at 7 p.m., to discuss "The Year 2050: After the

Warming." Ticket price is \$10.50 for reserved seating. This is a KNME-TV community fund-raising event. For additional information, call KNME-TV on 277-2121 or stop by the station at 1200 University Blvd. SE.

Retirement Seminar

Guy Trujillo of SunAmerica Securities presents "What You Should Know About Retiring Before You Retire." This talk, which discusses estate and retirement planning, including IRA rollovers, takes place on Wednesday, Jan. 30, at 5 p.m. in the Coronado Club Eldorado Room. RSVP on 294-6655. Spouses are welcome.

Sympathy

To Jack Smith (2858) on the death of his sister in Tampa, Fla., Dec. 4.

To Bob Longoria (5219) on the death of his father-in-law in California, Dec. 6.

To Ruth Varga (3730) on the death of her father and to Ken Varga (2542) on the death of his father-in-law in Johnson City, N.Y., Dec. 15.

To Ronald Oelsner (7267) on the death of his mother in Albuquerque, Dec. 18.

To Jim Plimpton (9310) on the death of his mother and to Steve Plimpton (1421) on the death of his grandmother in Albuquerque, Jan. 6.

To Sharon Mahkee (3221) on the death of her sister in El Paso, Jan. 6.

To Francisco Sanchez (7818) on the death of his father in Albuquerque, Jan. 10.

UNCLASSIFIED ADVERTISEMENTS • UNCLASSIFIED ADVERTISEMENTS • UNCLASSIFIED ADVERTISEMENTS • UNCLASSIFIED ADVERTISEMENTS

Deadline: Friday noon before week of publication unless changed by holiday. Mail to Div. 3162.

Ad Rules

1. Limit 20 words, including last name and home phone.
2. Include organization and full name with each ad submission.
3. Submit each ad in writing. No phone-ins.
4. Use 8 1/2 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.

MISCELLANEOUS

GE VIDEO CAMERA and tripod, \$200 OBO. Taylor, 869-2934.
CEDAR FENCING, used, 56" H x 3-1/2" W, approx. 200 pieces, \$75 OBO. Arco, 268-6605.
DINETTE SET, 5 pieces, harvest finish, upholstered seats, \$275. Muchow, 299-1813.
MAYTAG WASHER, 1 yr. old, large capacity, \$425; electric dryer, \$325 OBO. Mathews, 881-7368.
LHASA-APSO PUPPIES, AKC-registered, 2 males, 2 females, parents on premises, 15 weeks old, shots, housebroken, raised w/kids, \$250. Kuehn, 281-2727.
SANDIA PEAK SKI AND TRAM SEASON PASS, reasonable. Kavet, 299-1793 or 602-282-3361.
RAILROAD TIES, 8-ft., ask about free delivery, \$5/ea. Gutierrez, 865-9542.
POLAROID SX-70 CAMERA, flash attachments; Commodore 64 CPU, game cartridges; chain saws: Homelite 14-in. and Mac 10-in.; all OBO. Schaub, 821-7242.
REFRIGERATOR/FREEZER, 1987 GE, 13.6 cu. ft., \$200 OBO. Potter, 869-4716.
ELECTRIC RANGE, Whirlpool, self-cleaning oven, 30-in., white, \$120 OBO. McKee, 268-3529.
SKIS: Atomic RS, 203-cm; GS racing ski w/Tyrolia 390R bindings. Davis, 298-3342.
HEWLETT-PACKARD 45 CALCULATOR, w/charger and original manuals. Haaker, 298-7415.
HONDA 4KW GENERATOR, w/dolley, electric start, unleaded gas, \$995; Cress electric kiln, no furniture, \$200. Benson, 268-9727.
MINOLTA X370 SLR CAMERA, 50/1.7 MD and MD28-70/3.5-4.8 zoom lenses, 118x flash, case, \$300. Lewin, 898-2303.
MAGNAVOX COLOR TV CONSOLE, 25-in., \$200 OBO. Simon, 898-9018 after 6 p.m.

MIKASA STYLECRAFT DISHES, service for 8, extras, Blue River pattern, \$150; glass-top and pedestal coffee table, \$60. Burstein, 821-6688.
SHOP MANUAL, \$10; brown dash mat, for 1984 Nissan Stanza, \$10. Holmes, 292-0898.
MODEL AIRPLANE, radio-controlled, accessories, Goldberg Eaglet, Futaba 7-channel FM radio, field box, more, \$250 OBO. Lambert, 293-8825.
IBM MATH CO-PROCESSOR CHIP, for AT and PS/2, \$100; modem, 2400-baud internal for IBM w/Procomm software, \$100. Snyder, 293-3611.
OVERLOAD SPRINGS for 1/2-ton pickup, part-time type, \$85; electric trailer brake unit, \$30. Kallenbach, 293-6916, leave message.
ANTIQUE PIANO, needs work, \$400 OBO. Alexander, 291-8028.
PEREGO DOUBLE STROLLER, \$275. Boyd, 821-4780.
COMMODORE C-64, w/floppy drive, joystick, games, \$125/all; Contax 139-Q camera, w/case, flash, 85-300 zoom/macro, make offer. Furry, 281-2548.
LOP-EAR BUNNY, free; cage, cost \$25 new, sell for \$15. Pardo, 884-8638.
TWO SNOW TIRES, 5.60-15, on 5-hole VW wheels, \$80; 18-ft. 4x4, \$15; 3 rolls fiberglass, 6" x 23" x 25", \$21. Leeman, 299-9149.
MADAME ALEXANDER DOLLS: 8-in. Ireland, Robin Hood, \$30/ea.; 1988 10-in. Melanie, \$60; Lady Hamilton, \$50. Van Deusen, 291-8196.
GOLD VELOUR SOFA, 96-in., 2 matching green/gold chairs, 3 matching tables, \$500. Lisotto, 884-7331.
ROSSIGNOL EDGE 190 SKIS, w/Salomon 647 bindings, \$150; men's small Lift 7 ski bib, \$30. Oglesby, 296-5361.
QUEEN-SIZE SOFA BED, matching love seat, \$350; Lowery organ, \$250; guinea pig w/cage, \$25. Everett, 296-8786.
DOG-WARMING PAD, can be used for birthing puppies, flexible-steel electric cord, hard plastic pad, \$35. Jones, 899-0642.
REFRIGERATOR, Kenmore, 24 cu. ft., white, frost-free, ice maker, used 5 months, 2-year service contract, \$750 OBO. Hunt, 275-9608.
CAP for small pickup, \$100. Winkelman, 271-0221.
STEREO EQUIPMENT: dual turntable, \$20; Crescendo speakers, \$10; Kenwood receiver, \$40; 4 Sony speakers, \$50; Marantz amplifier, \$20. Anderson, 897-2772.
PHOTO ENLARGER, easel, trays, unused, \$20. Lippis, 898-8429.
IRON DOUBLE-BED FRAME, restored, w/rails, sandblasted, finished in antique gray, \$140. Stephens, 766-6674.
EPSON GENEVA LAPTOP COMPUTER, C/PM, printer, modems, disk drive, software, built-in tape drive & RAM disk, manuals, cables. Ashlock, 294-9849.
BABY CRIB, Child Line, w/mattress, \$70; changing table w/pad, \$20; Gerry backpack carrier, \$15. Almquist, 294-5651.

WHEELS FOR '84 VOYAGER, 14-in., w/P205/70SR14 M&S tires, tires: \$50; 2 wheels: \$70; all four: \$110. Greulich, 281-5424.
GERMAN SHEPHERD CROSS, 1 yr. old, spayed female, free to good home. Simmons, 891-2475.
COMPUTER, 386AT clone, 16MHZ, VGA color monitor, 3MB RAM, 40MB HD, math coprocessor, modem, software, \$3,000. Ellis, 869-3582.
REFRIGERATOR, Ward's Admiral, frost-free, tan, 21.7 cu. ft., ice maker, 6 mos. old, textured doors, \$650 OBO. Reuss, 889-3641.
CASSETTE DECK, JVC TD-R411, quick-reverse, Dolby B/C, full logic control, \$100. Herther, 298-4823.
SAMOYED PUPPIES, AKC-registered, born Dec. 10, fluffy, white, ready for new home, \$200. Wymer, 892-7395.
FILL DIRT, approx. 2 cu. yds., free, you haul, will help load. Hall, 242-5119.
SLIDE-IN CAMPER, Mitchell fishing hut, furnace, ice box, 2-burner stove, water tank, jacks, \$800. Eisenberger, 877-7041.
WHIRLPOOL GAS DRYER, \$150. Orand, 275-2255.
COCKER SPANIEL PUPPY, AKC-registered, male, black, \$120. Anderson, 281-5086.
CD STORAGE UNITS, 100-disk capacity, unfinished solid pine, 2 available, \$40/ea. Pfarnner, 299-6521.
COLOR TV, 17-in., RCA, \$60; Pioneer, SX-850 stereo receiver, 65 w/ch, \$40. Chael, 294-8757.
MATE'S BED, w/3 sets of twin sheets, mattress pad, 3 drawers, 4 shelves, \$125. Etheridge, 888-2633.
GAS RANGE, 30-in., white, \$130; GM ignition module, new, \$14. Bentz, 299-3448.
SINGER FEATHERWEIGHT SEWING MACHINE, w/table, \$150; recliner, \$30; overstuffed living room chair, \$30. Daniel, 268-8335.
LITTON MICROWAVE, 1.5 cu. ft., 1,000 watts, countertop, \$110 OBO; console stereo, AM/FM/Hi-Fi, oak, 48" W x 29" H x 17-1/2" D, \$75 OBO. Stang, 256-7793.
BERETTA AUTOMATIC PISTOL, 25-cal., \$125; movie camera, Revere Straight Eight; Atari w/approx. 10 games, make offer. Schowers, 822-8494.
QUEEN-SIZE WATERBED, heater, semi-waveless mattress, \$95. Vanecek, 299-3472.
TAPPAN ELECTRIC COOKTOP, 22-in., \$95. Wrons, 275-0856.
JACUZZI HOT TUB, w/accessories, Caressa model, 110v, above ground, \$2,000. Adams, 823-1845.
COMMODORE 128 COMPUTER SYSTEM, RGB monitor, 1571 disk drive, Gemini 10x printer, word processor, spreadsheet, more, \$450 OBO. Harrington, 899-1277.
ELECTRONIC AIR FILTER, Oster, \$50. Guttman, 888-5114.
EXECUTIVE DESK CHAIR, blue fabric, adjustable, w/ottoman, \$150. Fianning, 298-0743.
GOLDEN RETRIEVER PUPPIES, 7 weeks old, \$50; packing material: boxes, protective cartons, paper, free. Hallman, 899-2336.

TRANSPORTATION

'86 CHEV. 4x4 SILVERADO PICKUP, loaded, AT, w/overdrive, 31x10.50 tires, bed liner, 51K miles, V-8 5-liter, \$10,995. Lackey, 869-9333.
'79 OLDS. 98, 4-dr., all power options, 6.6L engine, needs TLC and new transmission, \$400 OBO. Arco, 268-6605.
'74 BMW BAVARIA 3.0S SEDAN, 4-dr., 4-spd., \$2,950 OBO; '30 Model AA Ford flatbed, \$1,800 OBO. Schaub, 821-7242.
'81 VOLVO WAGON, 4-cyl., 5-spd, overdrive, AC, AM/FM radio, \$3,750. Garcia, 293-7373.
'82 CHEV. CITATION, 4-dr. hatchback, AT, PS, PB, AM/FM tape, cruise, 88K miles, one owner, \$1,200 OBO. Cummings, 292-0524.
'89 CHEV. SILVERADO PICKUP, extended cab, 4x4, loaded, 26K miles, blue on white, bed liner, \$14,000. Roberts, 299-5671.
'86 MERCURY TOPAZ, 5-spd., PS, AC, 34K miles, one owner, AM/FM cassette, cruise, tilt, \$4,400 OBO. Fraley, 296-6795.
'84 JEEP CHEROKEE, Chief package, loaded, 2.8 V-6, 91K miles, \$4,700 OBO. Alexander, 291-8028.
'77 F250 SUPERCAB, over-cab shell, w/couch/bed, boat carrier, equipped for trailer towing, \$3,000. Pardo, 884-8638.
'86 CHEV. PICKUP, 4x4, 3/4-ton, AC, PS, PB, AT, w/overdrive. Romero, 281-9423.
'89 FORD TEMPO GL, 4-dr., AM/FM cassette, cruise, tinted windows, tilt, \$8,150 OBO. Cartwright, 836-6957.
'77 BUICK ELECTRA, one owner, cruise, new tires, new upholstery, AT, PS, PB, PW, new radiator, \$1,500. Hammond, 294-2045.
'80 DATSUN 310 GX, 2-dr., 5-spd., AC, 35-mpg hwy., \$1,200. Aragon, 294-9957.
'77 VW BUG CONVERTIBLE, blue/white top, new clutch, battery, engine seals, \$5,900. Gutierrez, 275-9345.
'84 OLDS. DELTA 88 ROYALE BROUGHAM, 4-dr., loaded, 62K miles, 2 extra wheels w/snow tires, \$5,100. Tedesco, 888-1068.
'88 ISUZU TROOPER, 4-WD, AC, PS, 5-spd., fuel injection, 4-cyl., AM/FM cassette, 5-dr. Wilcox, 899-8356.
'73 CADILLAC SEDAN DeVILLE, 4-dr., \$600. Appel, 292-0463.
'81 CHEV. BLAZER, general-purpose, 2-WD, AT, AC, PS, AM/FM cassette, one owner, \$3,000. Cooper, 881-1329.
NISHIKI ALL-TERRAIN BICYCLE, 19-in. frame, Shimano components, 10-spd., \$120. Romero, 821-9743.
'84 PLYMOUTH COLT "E," 2-dr., 4-spd., 85K miles, \$1,200 OBO. Stinebaugh, 869-2270.
BMX REDLINE BICYCLE, for ages 9-12, \$65. Wrons, 275-0856.
'77 SUBURBAN, 4x4, 350 V-8, AC, PS, PB, 4-spd., hitch, 40-gal. tank, 9-passenger, original owner, \$2,250. Gido, 823-6697.
'83 PONTIAC 6000 STE, loaded, \$2,500 firm. Ahrens, 294-8986.

'84 JEEP WAGONEER, loaded, leather, all highway miles, \$6,900 book, sell for \$6,395. Davidson, 275-0098.
'90 FORD LARIAT XLT, king cab, 4-spd., stereo, AT, auto lock, \$14,500. Matsu, 836-6241.
'84 HONDA ACCORD, 4-dr., charcoal gray, AT, AC, PS, AM/FM cassette, cruise, 57K miles, \$5,800. Cloer, 296-5244.

REAL ESTATE

5-BDR. HOME, 3 baths, wrought-iron, near KAFB and airport. Hendren, 883-5070.
2-BDR. TOWNHOUSE, Spain & Juan Tabo area, 1,200 sq. ft., 2-car garage, 1-3/4 baths, fireplace, skylights, covered/brick patios, landscaped, \$79,900. Trembl, 292-9219.
2-BDR. MOBILE HOME, 12' x 60', remodeled, appliances, w/10' x 9' shed, partially furnished, near Nature Center. Marquez, 345-9324 or 839-0996.
4-BDR. HOME, 2-1/2 baths, 2,585 sq. ft., Four Hills, swimming pool, hot tub, RV parking, \$149,900. Hudson, 298-3935.

WANTED

NORDICTRACK EXERCISER. Tapia, 299-1941.
LIONEL TRAINS AND ACCESSORIES: 027-gauge engines, cars, transformers, and operating accessories. Burchard, 294-8788.
PRINTER, Apple Macintosh ImageWriter. Nelson, 268-0208.
CROSS-COUNTRY SKIS and size-5 boot for 5-ft. female. Ishimoto, 294-4721.
GENERATOR, approx. 10KW, electric start, gas or diesel, prefer trailer-mounted and weather-proofed. Soden, 867-3872.
OFF-ROAD MOTORCYCLE, Honda XR200, Yamaha TT225, or Yamaha TT250, any year. Romero, 821-9743.
ROOMMATE, female, nonsmoker, share 3-bdr. house, furnished, Wyoming and Paseo del Norte, large yard, double garage, \$350/mo. Montoya, 821-4503, ask for Jeanette.

LOST AND FOUND

LOST: 14KT gold-nugget pinkie ring, 1/2 KT diamond in center. Lippert, 766-2303 or 281-5866.
FOUND: set of keys, found Jan. 3, Bldg. 802. Hunter, 4-2444.

SHARE-A-RIDE

CARPOOL WANTED, Rio Grande & Griegos area to Area I (Bldg. 802), 8 a.m. to 4:30 p.m. Krantz, 345-4075.



Coronado Club Activities**Fiesta Your Eyes on Friday Night's Fiesta Feast**

GREEN CHILE JUNKIES — Tonight, Jan. 25, from 7 to 11 p.m., the C-Club offers a Mexican food menu that'll tame your taste buds: chicken or beef fajitas (\$6.95), beef burritos, carne adovada, and chicken breast smothered with green chile (all \$5.95). Afterwards, dance to the music of the Bourguet Brothers and try tonight's fiery fiesta drink specials: jumbo margaritas (\$2.50) and Mexican beer (\$1). Reservations recommended (265-6791).

SPEND SUPER BOWL SUNDAY, Jan. 27, in the lounge watching the big game, winning great prizes, and playing bingo. The doors open at 1 p.m., bingo begins at 2, and a free buffet is served from 3 to 6. A color TV is being given away at halftime, and Marlon, the Club's bartender, has concocted some extra-special drinks for the occasion: "Referee's Revenge" or "Quarterback Sneak" (\$1), "Uprights" (\$2.50),

and football-size pitchers of draft beer. Non-alcoholic drinks are available at half price.

BIGGER BETTER BINGO for you bingo buffs takes place every Thursday night. Card sales and buffet line begin at 5:30 p.m., and early-bird games begin at 6:45. Starting the first Thursday in February, the Club staff makes your bingo game even better. With each bingo packet you buy, you'll receive a chance to win a VCR. The more you buy, the greater your chances of winning. The first drawing will be held Thursday, Feb. 14.

SHARK BAIT — T-Bird Card Shark membership is growing, and Jim "Jaws" McCutcheon, Shark's organizer, wants you to be the next new member. February's meetings take place, as always, the first and third Thursday of the month, Feb. 7 and 21, from 10 a.m. to 3 p.m.

WOOFERS AND TWEETERS are on the menu Friday night, Feb. 1, starting at 5 p.m., as disc jockey Chuck Avery returns to play your tune. Other menu items include hot dogs, hot dogs, and more hot dogs, with your choice of chile, relish, jalapenos, sauerkraut, or cheese (dancing and dogs are free for members and \$2 for guests).

"C" IS FOR champagne brunch and **"CC Flying Circle."** On Sunday, Feb. 3, parents get a glass of champagne and kids (3 years old and younger) get a C-Club frisbee with their brunches. Menu items include eggs, omelets, potatoes, bacon, baron of beef, turkey, ham, vegetables, salad, green chile stew, deserts, and juices (\$5.95 for adults, \$1 for children 4 to 12 years old, and free for kids under 4).

Events Calendar

Events Calendar items are gathered from various sources. Readers should confirm times and dates of interest whenever possible.

Jan. 25-Feb. 3 — "Lisbon Traviata," by Terence McNally, play follows emotional pursuits of a man concerned with growing too old to attract a mate; 8 p.m. Fri.-Sat., 2 p.m. Sat., 7 p.m. Sun.; Vortex Theatre, 247-8600.

Jan. 25-Feb. 3 — Exhibit, "Margo Humphrey at Tamarind," lithographs, exhibit presented by the UNM Art Museum in recognition of the contributions and outstanding talents of African-American artists in the visual arts and an acknowledgement of Black Awareness Month; 9 a.m.-4 p.m. Tues.-Fri., 5-9 p.m. Tues. & Wed. evenings, 1-4 p.m. Sun.; UNM Art Museum, 277-4001.

Jan. 25-Feb. 3 — "Sexual Perversity in Chicago," by David Mamet, presented by Theatre-in-the-Making, recommended for mature audiences, evening's bill includes Mamet's "Duck Variations"; 8 p.m. Fri.-Sat., CenterStage (3211 Central NE), 260-0331.

Jan. 25-Feb. 20 — Exhibit, "First Encounters: Spanish Exploration in the Caribbean and the United States, 1492-1570"; 9 a.m.-5 p.m. Tues.-Sun. (closed Mondays), Albuquerque Museum, 243-7255.

Jan. 25-March 17 — Exhibit, "Robert M. Ellis: A Painter's Space," oils on canvas, lithographs, charcoal drawings, aquatints, and oils on photolinen by New Mexico artist and professor emeritus of UNM's Art and History Dept.; 9 a.m.-4 p.m. Tues.-Fri., 5-9 p.m. Tues. & Wed. evenings, 1-4 p.m. Sun.; UNM Art Museum, 277-4001.

Jan. 25-March 17 — Exhibit, "Interrogating the Essence," joint exhibition featuring recent work of Stuart Arends and Allan Graham, four pieces that are non-representational, psychological, and spiritual; 9 a.m.-4 p.m. Tues.-Fri., 5-9 p.m. Tues. & Wed. evenings, 1-4 p.m. Sun.; UNM Art Museum, 277-4001.

Jan. 25-April 14 — Exhibit, "Wolves and Humans," from the Science Museum of Minnesota, provides comprehensive picture of the social, biological, and mythological relationships between wolves and humans; 9 a.m.-5 p.m., New Mexico Museum of Natural History, 841-8837.

Jan. 26 — Chamber Players Series: "Metropolis," silent film by Fritz Lang (1926), musical score by Gottfried Huppertz, New Mexico Symphony Orchestra, third annual presentation of films with live musical accompaniment; 8:15 p.m., Sunshine Theatre (Central Ave. & 2nd St. SW), 842-8565.

Jan. 26 — Svirka Women's Balkan Chorus, songs of Eastern Europe, the Balkans, and Russia, Corrales Cultural Arts Council Series; 8 p.m., San Ysidro Church, Corrales, 877-4430.

Jan. 27 — "Mozart's Birthday Concert," benefit for Friends of Music Scholarship Fund, featuring a variety of artists; 4 p.m., Keller Hall, 277-4402.

Jan. 27 — "Burns Night," St. Andrews Society of NM celebrates the birthday of Scottish poet Robert Burns; entertainment includes the Shrine Pipe and Drum Band and local Highland Dancers; 6 p.m., Sheraton Old Town, 292-5812 or 821-5232.

Jan. 28 — "Anything Goes," revival of the great musicals of the 1930s; 8:15 p.m., Popejoy Hall, 277-3121.

Jan. 30 — Jackie Torrence, professional storyteller, for all ages; 10 a.m. & 7:30 p.m., South Broadway Cultural Center, 848-1320.

Feb. 1-16 — "Charley's Aunt," comedy by Brandon Thomas; 8 p.m. Mon.-Sat., 2 p.m. Sun.; Albuquerque Little Theatre, 242-4750.

Feb. 2-3 — "Puss in Boots" and "Peter and the Wolf," children's play and mime show, presented by Albuquerque Children's Theatre; 1:30 & 3:30 p.m., Popejoy Hall, 898-6679.

Feb. 3 — Chamber Players Series: New Mexico Symphony Orchestra plays the music of Mansurian, Kolodub, and Schnittke; 3 p.m., Sunshine Theatre, 842-8565 or 842-8566.

Feb. 4 — Monday Lecture Series: "Hopi Wedding," Jean Call, member of the Hopi Tribe, tells story and shows film of her sister's Hopi wedding; 10 a.m., Indian Pueblo Cultural Center, 247-4907.

Feb. 8 — Mardi Gras Dance, costume dance presented by the Albuquerque Parks and Recreation Dept.; 8 p.m.-midnight, Albuquerque Convention Center, 768-3490.

Feb. 8-9 — Pops Concert Four, New Mexico Symphony Orchestra, featuring Emmy Lou Harris; 8:15 p.m., Popejoy Hall, 842-8565 or 842-8566.

Feb. 9 — "An Evening of Chinese Music," traditional Chinese songs performed by the Albuquerque Chinese Chorus; 8:15 p.m., Keller Hall, 296-8067 or 828-3680.

Fun & Games

Camping — The Roadrunners RV Club, one of the Coronado Club's "Thunderbird" organizations, invites retirees to rally with its 45 members at the next RV outing. During 1990, the 45 retirees and their spouses traveled a total of 62,500 miles to reach the Club's 11 outings. At each rally, Roadrunners hold at least one potluck dinner and play bridge, poker, bingo, or relax around the camp fire. Morning meetings keep members apprised of new business and rally activities. Call Bob Butler on 299-5626 or Art Hasenkamp on 255-8946 for information.

Bowling — SANDOE Bowling Association Bowlers-of-the-Year for the 1989/90 season were announced recently. They are: Scratch — Gary Cochrell (9115), 578; Cheryl Barton, 542; Handicap — Paul Sands (2932), 508, 595; Micki Archuleta, 536, 632; and Dorothy Castro (DOE/AL), 442, 632.

November Bowlers-of-the-Month include: Scratch — Reyes Chavez (7412-2), 697; Dolores Schumpert (DOE/AL), 555; Handicap — Gary Cochrell (9115), 667, 697; Lea Long, 521, 665.



"MUGGING" FOR THE CAMERA — These black and gold beauties are now on sale for \$7 at the LAB NEWS office (Bldg. 814). T-shirts and caps bearing the Sandia logo are also available for \$7. Most profits go to the South Highway 14 Village Project. In 1990, \$1,025 was distributed in amounts of \$100 to \$250 to needy families living along South 14 to help with holiday-season expenses. Other profits from the fund go to the Salvation Army, the Albuquerque Rescue Mission, the Ron Light Fund, and other charitable organizations.