

Lightning Never Strikes Twice — Or Does It?

While lightning has been known to strike the same place twice, the odds of it consecutively hitting a test object are incredible. This lack of predictability poses problems for researchers interested in the effects of lightning on buildings, aircraft, or, as in the case of an Army/DOE group, weapons storage bunkers.

A lightning bolt might appear to be harmless to a large, half-buried concrete storage igloo, but the large amplitude and high rate of change of the electrical current caused by a flash as it passes through the structure could induce voltages in electrical circuits that might damage stored weapons. Powerful magnetic fields caused by lightning also can erase magnetized memory systems or scramble digital codes.

Faced with the need to obtain measurements that would verify calculated responses of such structures, the Army's Armament Research, Development, and Engineering Center (ARDEC) at Picatinny Arsenal in New Jersey turned to Sandia's lightning specialists Dick Fisher and George Schnetzer of Electromagnetic Analysis and Test Dept. 2753.

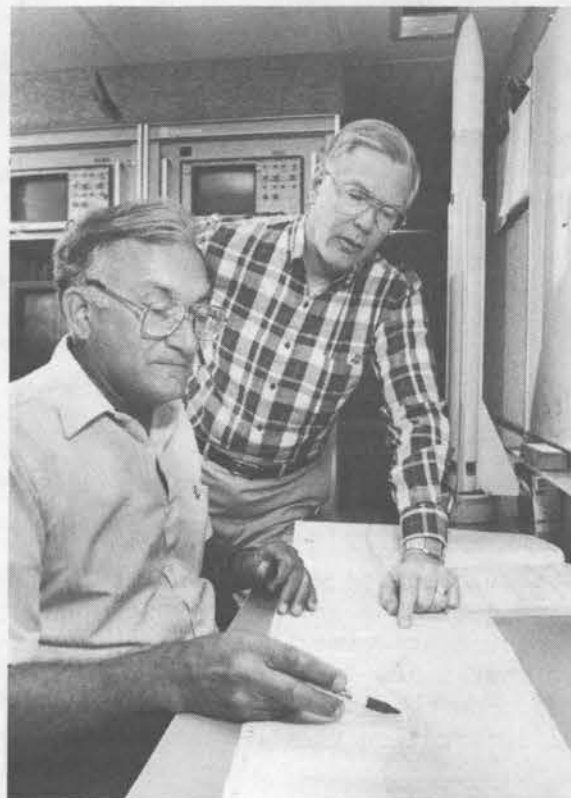
Nothing Like the Real Thing

Though using Sandia's world-class lightning simulator would seem like a good way to test a bunker, Dick says some important things about lightning can't yet be artificially produced with such a facility. Two of these things are the rise time, or rate of electrical current change of the bolt, and the natural distribution of current throughout large test objects.

"You can't make a measurement with this kind of simulator and get a faithful reading on what really happens in such a big structure," he says. "You can get great measurements for smaller things, but for something like a bunker, you need real lightning."

Since real lightning in the right spot doesn't normally occur, Dick and George opted to try triggered lightning, a method similar to that first tested in 1752 by Benjamin Franklin and his kite. Several

centuries more sophisticated, the idea now involves firing small rockets that unspool a fine trailing wire towards electrified clouds. This process not only triggers a lightning release, it also aims the strike at points where it can be evaluated.



LIGHTNING STRIKES — Inside Sandia's Transportable Triggered Lightning Instrumentation Facility, Dick Fisher (right) and George Schnetzer (both 2753) examine data on the effects of lightning on a weapons storage bunker. Next to Dick is one of the French-designed rockets used to trigger lightning and aim it at specific test objects.

Last year, Dick and George did these types of lightning evaluations on a Ft. McClellan, Ala., weapons bunker using the Sandia Transportable Triggered Lightning Instrumentation Facility (SATTILIF) that they had developed for that purpose. When they conduct a test, Dick and George are staked out in a 20- by 20- by 7-ft. steel ocean cargo container converted to serve as SATTILIF's instrumentation shelter. They spend much of their time scanning for local thunderstorms with a National Lightning Detection Network computer ground terminal and weather radar data.

Despite their array of storm-tracking instruments, Dick and George find that sometimes it's best to just use their eyes. George recalls that once while he was inside closely monitoring storm activity, he stepped outside, looked up, and discovered a big, black storm cloud directly overhead.

The presence of such storm clouds means they have less than an hour to ready the target and "set the bait." Within this time, the test area has to be

Magnetic fields from lightning can erase magnetized memory or scramble digital codes.

closed, local commercial power disconnected, the diesel power generator activated, air traffic excluded from the area, data recording systems set and checked, cameras readied, and rockets armed to fire. This done, Dick and George pile into the shielded instrumentation facility where they wait for the storms to come in range of their rockets.

It's "3-2-1-Fire!" when launch finally comes, and normally fire is exactly what they see. Not more than a few seconds into the air, the rocket is

(Continued on Page Four)

How Are We Doing?

ES&H Update: Progress Noted Since Tiger Visit

The Tiger Team finished its work and left Sandia, Albuquerque a little more than a year ago. Since then, the Tiger Team Action Plan has been written and approved, and some actions have already been completed.

To measure the Labs' progress against the action plan yardstick and other criteria, the LAB NEWS recently talked about ES&H matters with Joe Stiegler, Director of Environment, Safety, and Health Center 7700; Dick Lynch, Director of Environment, Safety, and Health Program Management Center 7020; and Dick Traeger, Manager of Environment, Safety, and Health Program Management Office 7022.

Here's some of what they had to say.

LN: Where are we today, a year after our Tiger Team inspection?

Lynch: We have an action plan in place that was approved by the Secretary of Energy March 27, addressing the 340 corrective actions required at Albuquerque, and we're beginning to realize achievements and milestones. In Dick Traeger's organization we've established an intricate tracking process to remind people about upcoming milestones and to provide information DOE requires.

Sandia, Livermore, of course, had a separate
(Continued on Page Six)



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SUN COOKIES — Phyllis Best (contractor) removes a batch of chocolate chip cookies from a solar oven being tested at Sandia for Burns-Milwaukee Inc. The tests, which included design and capability evaluations, were conducted as part of Sandia's Solar Industrial Program aimed at helping industry refine solar products. See story on page four.
(Photo by Randy Montoya)

This & That

Can Old Dogs Learn New Tricks? - The only thing changing faster than the world map these days is computer software. We upgraded our page layout program just before starting this issue, and we hope all goes well during the transition. In this new version, we can even tilt photos and columns of text if we want to, but we're trying to resist the temptation so we don't get accused of "slanted" journalism.

Speaking of Computer Software - Is it my jaundiced attitude, or do the manuals for computer programs get thicker while their bindings make them harder to use? A few years back, the manual for a popular word-processing package came in a looseleaf binder that easily stayed open on my desk. A later version of the program had a wirebound manual, not quite so nice but at least well-behaved in staying at the right page. Now the program features a thesaurus and grammar checker, but the manual's binding is glued and it always flips over to some other page when I'm trying to consult it and work at the computer at the same time.

They Only Look Mizpeld - After being in the word business for many years (don't ask), I still see words and names that look as if they should be spelled differently: preceding, entrepreneur, vacuum, mineralogy, thousandth, restaurateur, Malcolm Baldrige, and La Jolla (if you pronounce it properly). Anyone have others to add?

Overworked Word? - My vote for the most overused word of the young decade around R&D labs is "advanced." We've got our share of "advanced" groups and projects at Sandia, and just about every time I pick up a company newspaper from another lab, I see that a new "advanced this" or "advanced that" group has been established. Now there's an idea - maybe I'll rename this collection of semi-vital information the "Advanced This & That" column.

Take That, Mick Jagger! - LAB NEWS Managing Editor Charles Shirley says that while his family was vacationing recently, they checked the schedule at the theater of a San Diego science museum and found that the usual films about penguins or volcanos were over for the day. All that was left was a special showing of a Rolling Stones concert. So they spent a while looking at the exhibits and browsing in the gift shop. But apparently 7-year-old Christopher didn't understand that the family wasn't going into the theater. He got more and more ill-tempered, and after two or three parental inquiries, finally said with disgust, "I don't want to see a movie about any old tumbling rocks!"

Rude Awakening - I hope this never happens to other men. You lean over to gently kiss the cheek of your sleeping mate and say, "Wake up, Sweets - it's Prince Charming." She rolls over, squints at you through one half-opened eye, and says, "Looks more like his grandpa to me." Of course, this didn't happen to me, but to an older friend.

Oh, Sure! - Is it any wonder that I get a little suspicious of this crew from time to time? A couple of weeks ago, a LAB NEWS staffer left early on a Friday, saying he had a dental appointment. He had his briefcase in one hand and a spin-casting rod and reel in the other. I'll bet he thinks I believe in the tooth fairy, too. ●LP

Process Is on Track

Sandia Contract Competition Announced in CBD

DOE announced in *Commerce Business Daily* (CBD) last week that a request for proposals (RFP) would be issued this fall for a contractor to manage and operate Sandia when the AT&T contract expires Sept. 30, 1993. The July 15 announcement, which contained much of the same information previously released by DOE (LAB NEWS, July 10), is significant primarily because it indicates that the process of selecting a new contractor is proceeding as expected, says Transition Executive Lee Bray (30).

"There's nothing new in the announcement, there are no surprises," says Lee. "It shows that the process is on track. This is an initial announcement, and we expect an expanded version to appear in the next month or so, giving potential bidders more information."

CBD is a daily publication of announcements about areas in which the federal government intends to establish contracts. It is widely read among companies that do government contracting.

The CBD announcement notes that a pre-proposal conference will be held about two weeks after the RFP is issued. Sandia will be working with DOE to host that conference, says Jack Hickman (33), Transition Program Manager. "We estimate that this conference may involve as many as 50 to 100 people representing potential bidders," he says, "and our task will be to give them a thorough understanding of Sandia, from both a technical and a management point of view."

An upcoming major step at DOE, says Lee, is appointment of a source selection officer, who will be responsible for selection of a new contractor and who is expected to be a high-level official at DOE headquarters. "The source selection officer will appoint a source evaluation board," explains Lee, "which will write the formal statement of work for the RFP, develop the criteria for evaluating proposals, and then conduct the evaluations."

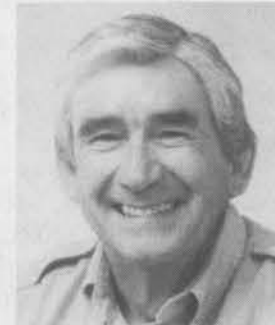
Sandia's transition team is now working primarily with DOE/Albuquerque Operations' Pre-Solicitation Committee, says Jack, explaining that this group is gathering information for development of the RFP. Sandia's team is also identifying and starting activities at the Labs needed for the transition, he says. "It's helpful to the transition effort that we now have an office in Bldg. 800," he says. "I want to thank Jim Davis [of Space and Site Development Dept. 7921] and the people working with him for doing this job so promptly and so well." (The Transition Program Office is located in Bldg. 800, Room 104.)

Anyone wishing to get more information about transition activities, or to ask a question or voice a concern, may do so by calling Sandia Line (845-6789) and choosing option 1 (General Topics). Radio Sandia is airing a transition-related interview with Lee and Jack today (Friday, July 24); a recording of the interview will be available on Sandia Line until approximately July 30. ●CS

Recent Retirees



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7613



Wayne Cyrus
35 2473

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MEET THE ROBOT - Jill Fahrenholtz (1416) shows Barry Daniel, DOE Director of Public Affairs, a robotic system being developed at Sandia that will help disassemble decommissioned nuclear weapons. Daniel, who took his current post in April, saw several robotics projects when he visited the Labs early this month.



Response to 1991 Survey**Newly Formed Group Examines Job-Family Balance**

A Work/Family Working Group has been formed at Sandia, Livermore to deal with child-care issues and concerns that emerged as a result of a survey of Livermore employees last year.

The recently formed group is looking closely at recommendations outlined in the survey report, done for Sandia by the consulting firm Burud & Associates. The group will advise management of the feasibility of these recommendations, taking into consideration their usefulness to employees, costs, and ease of implementation, as well as the Labs' business needs.

"Work/family programs can help employees balance the demands of job and family," says Jo Sandelin (8522), chair of the working group. "They're necessary to attract and retain skilled workers, especially as the work force becomes more diverse and includes more women. By becoming 'family friendly,' companies acknowledge that productivity is affected by benefits such as child care, elder care, and family leave."

Corporations with high marks for family friendly policies include AT&T, IBM, DuPont, Dow Chemical, and Hewlett-Packard. DOE is an example within government — for example, it operates the Energy Child Development Center at its headquarters in the Forrestal Building in Washington, and is planning a similar center at Germantown, Md.

Child Care Touches Work Effectiveness

The Livermore Quality Plan includes among its commitments to employees' well-being an effort in day care, deviated-schedule, and flex-time programs. The 1991 survey about such issues was made in response to the Quality Plan. The survey report, *Dependent Care Needs Assessment and Recommendations for Sandia National Laboratories, Livermore*, is available by contacting Jo or any Livermore department manager.

Surveys were returned by 54 percent of Livermore employees. Two major findings are that 40 percent of the responding parents have changed child-care arrangements in the past year or plan to change them in the next six months, and 35 percent of the parents say they or their spouse have considered quitting their job because of child-care difficulties.

Jo points out that other issues mentioned in the



SANDIANS INVOLVED in the Work/Family Working Group are seen with their children at the Hacienda Child Care Center. Parents are (from left) Eric (8353) and Celeste (8341) Rohlfing, Ed Hathaway (8522), and Dean Buchenauer (8347). The Hacienda center on Chabot Drive in Pleasanton was established by the Hacienda Business Park.

survey are work days missed due to child-care problems or ill children, the effect of child-care difficulties on work operations, and managers' sensitivity and flexibility. "Parents were asked which child-care options they would use if they were available," says Jo. "The most popular were an emergency/irregular day care service, a summer

DOE operates the Energy Child Development Center at its headquarters in Washington.

program for school-age children, and a child-care center onsite or near Sandia."

Other suggestions in the report include a corporate philosophy statement about work/family issues, supervisor training in work/family issues, brown-bag work/family seminars, a child-care reimbursement policy for travel, and a direct subsidy for a portion of employees' child care expenses.

Another suggestion is a child-care center sponsored and subsidized by Sandia, with a

before- and after-school program for school-age children. Finally, the report recommends an ongoing evaluation of new dependent care services and policies.

"The information obtained in the survey and the ongoing efforts of the Work/Family Group will help Sandia meet the challenge of finding ways to balance work and family," says Bev Kelley (8522), a member of the group. More participants are being sought, and anyone interested can contact Jo on 294-2073.

The group is sponsoring brown-bag seminars on work/family issues. Upcoming programs are "Finding and Keeping Good Child Care" on Aug. 11 and "Quality Time: Connecting with your Adolescent" on Sept. 15. Both will be held at noon in the Bldg. 904 auditorium.

Supervisory Appointment

JAMES COSTA to Manager of Organic and Composite Materials Dept. 8711.

Jim joined Sandia, Livermore in 1985 as a metallurgist involved with hydrogen-in-metals



JAMES COSTA

studies for the Materials Department. He later worked in the W89 program as a materials engineer. In September 1990 he was named Acting Supervisor of the Organic and Composite Materials Division. Before joining Sandia, Jim worked for Titanium Metals Corporation of America in Henderson, Nev.

Jim has a BS from Brown University and an MS and PhD from Carnegie Mellon University, all in materials engineering. He is a member of the TMS (a minerals, metals, and materials society), American Society of Metals, and Sigma Xi. He received the DOE Award for Excellence in 1989 for his support of the W89 program.

Jim and his wife Dorothy have two children and reside in Livermore. He enjoys family camping, skiing, and squash.

**SANDIA LIVERMORE NEWS**

DEMONSTRATING an air bearing on a frictionless rail — and teaching Newton's three laws of motion — are (at far right) Dick Steeper (8364) and Pam Barr (8362). They were part of a Sandia team that conducted one component of a Summer Technology Institute for elementary and junior high teachers in conjunction with LLNL. The Sandia module was "Physical Sciences — Force & Motion." The teachers also toured the Combustion Research Facility. Other Sandia instructors included Vera Revelli (8742), Jay Keller (8364), and Marv Kelley (8007).



(Continued from Page One)

Lightning Tests

struck and its trailing wire vaporized as a blinding flash of lightning hits its mark. Data pours into the shelter from test points via fiber optic transmission links. Activity at this point becomes frenzied as data is downloaded, cameras reset, and instrumentation readied for the next shot.

"We built a good system," Dick says. "Though SATTILIF contains nothing that hadn't already been invented, it allowed us to make the first measurements of the responses of a full-scale building under real lightning."

During the Ft. McClellan tests, nine lightning flashes were triggered to the bunker and responses measured at 24 instrumented test points located throughout the structure. Each test point had a specific technical purpose, says George.

Where Lightning Goes

"Measurements at various test points, including currents in concrete rebar elements, currents in the lightning protection system, voltage differences between different areas of the structure, and electric and magnetic fields, tell us a lot about where lightning goes when it hits something," he says.

"Part of the success of the SATTILIF project," he says, "was demonstrating the utility and practicality of using rocket-triggered lightning for spe-

Researchers Seek a Genuine Shock

Sandia engineers responsible for lightning testing have long worked to produce an exact replication of the real thing. Thanks to triggered lightning, they just might get their wish. Over the past two years, the Sandia Transportable Triggered Lightning Instrumentation Facility (SATTILIF) has been used to expose metal samples to real lightning and to measure the current that produced the resulting damage. The damage spots from these samples are now being used for comparison purposes in developing better laboratory simulation techniques.

According to lightning phenomenologist

and test engineer Dick Fisher (2753), "You can know what real lightning damage to a variety of materials looks like, but unless you also know the characteristics of the lightning that caused it, it's hard to simulate those effects properly in the laboratory."

"Our triggered lightning data allows us to work backward with the simulator until we can match the SATTILIF sample damage using the same currents that we know caused it. This provides us with the right way to test similar materials in the future."

cialized test applications. These applications include tests of objects either fixed or too large to transport to a conventional test facility as well as those involving characteristics of natural lightning that can't be properly simulated in the lab."

Though lightning was shown to pose no threat to storage bunkers like the one at Ft. McClellan, Dick says this research is far from done. New triggered lightning projects are scheduled to begin next summer when SATTILIF will be used to test the effects of lightning on a normal building. Tests will include such things as lightning distribution and building responses as well as the effects of

putting in and taking out various lightning protection devices.

Fishing for Lightning

So while many Sandians will be on vacation next July fishing for trout, Dick and George will find themselves at work again fishing for lightning. When asked if they mind trading a mountain cabin for SATTILIF's steel cargo container and a fish for a 50-kiloamp flash, they just laugh.

"As far as I'm concerned," says George, "it's one of the most exciting assignments I've ever had." ●DT

Testers Eat Solar Treats

New Solar Ovens May Be Hot Stuff In Third World Countries

Sandians aren't the only ones baking in the New Mexico heat. Recently businessman Tom Burns served members of Solar Thermal Test Dept. 6215 and Solar Thermal Technology Dept. 6216 sun-cooked chicken, cookies, and bread made in his solar ovens during a two-day test visit to Sandia.

Lunch was only one of several evaluations conducted on the ovens as part of Sandia's Solar Industrial Program designed to help industry maximize the heat capacity and retention, sturdiness, and efficiency of solar products. Mark Ralph (6215) says the oven could prove to be a very useful solar invention for its "niche market."

The ovens are being sent to Third World countries where a lack of fuel causes increased deforestation. "The situation in Haiti is so bad," Burns says, "that no sooner than they plant a seedling, it is pulled from the ground and used for fires."

"A solar oven can save a small area more than 100 pounds of wood a day," he says. "The sun is the best renewable resource we have."

The Burns-Milwaukee solar ovens come in two sizes: small and huge. The small oven weighs only 21 pounds and easily folds up to be carried around like a suitcase. The larger oven, called the Villager, weighs about 700 pounds and looks like a huge satellite dish. In an hour, the Villager can bake up to 50 loaves of bread, purify hundreds of gallons of water, or sterilize a small hospital's supply of medical instruments. Temperatures inside the oven can reach up to 400 degrees F in about 10 to 15 minutes.

For small countries where contaminated water and unsterilized medical equipment are all too common, the portable oven could be a dream come true. Models are presently being shipped to and tested in more than 100 countries including Mexico, Haiti, Sudan, Guatemala, Nicaragua, India,



THE VILLAGER — Patricia Cordeiro (6215, right) and Phyllis Best watch Lindsey Evans (both contractors) remove cookies from a Burns-Milwaukee Villager Sun Oven being tested at Sandia. This oven can bake up to 50 loaves of bread in an hour. It may be used to help feed large groups in areas where conventional power isn't available.

Zaire, Bolivia, and Egypt.

"Lindsey Evans [contractor] and Earl Rush [6215] have been a big help," Burns says. "They ran my oven through the paces and gave me a lot of good suggestions on possible improvements."

Burns-Milwaukee Inc. is currently seeking support for quantity production so that the small oven, which now costs \$139, can be sold for less than \$50 in the future. ●DT

Spotlight on Quality

Who's Your Favorite Internal Supplier?

All Sandians will have an opportunity to nominate an internal supplier for the 1992 "Spotlight on Quality" recognition. These awards focus on people and groups that have exemplified quality principles in providing products or services to their internal customers.

The first "Spotlight on Quality" awards were made last year.

"We're all customers and suppliers," says Judith Mead, Manager of ES&H Customer Liaison Office 7203. "It just depends on which process we're considering. As a customer, which internal suppliers have ensured that your wants and needs are understood, negotiated into requirements, and met? Have you had a supplier who gave you feedback, handled your complaints or feedback quickly and responsibly, and provided that extra bit of service?"

How to Nominate Suppliers

If so, says Judith, you can nominate that Sandia supplier (an individual or a team of not more than 10 persons) by obtaining a nomination form from your Center Quality Coordinator or from Judith.

Nominations can be turned in to Judith any time before Oct. 1.

Take Note

To help mature women find employment, the YWCA Career Services Center, in conjunction with the American Association of Retired Persons, will conduct a series of eight workshops from Aug. 3 through 27 at the YWCA at 7201 Paseo del Norte NE. Each workshop will train participants in a specific aspect of job-seeking, such as deciding on a career, identifying transferable skills, and establishing job-search strategies. The \$10 fee covers the cost of materials. For more information and to register, contact the YWCA on 822-9922.



Retiree Deaths

Jack Travis (61)	June 7
W. G. Vander Laan (70)	June 11
Harold "Hap" Kindschi (81)	June 11
Willie Robertson (85)	June 16
Richard Andres (63)	June 18
Alton Purington (73)	June 18
Jack Lawrence (68)	June 19
Andrew Ellingson (74)	June 22
Isaias Chavez (97)	June 22
Hiram McKinney (77)	June 26
Palmer Landis (60)	June 27

*Dividend from Duane's Diligence***Easier Export Helps Keep Nuclear Materials Out of 'Wrong Hands'**

Few people would argue with the idea that nuclear materials everywhere should be safeguarded with the best available technology to ensure that they don't get into the "wrong hands." But until about a year ago, exporting US-developed nuclear safeguards equipment was a time-consuming and sometimes frustrating business.

Regulators in the departments of Commerce, State, and Energy, in the Nuclear Regulatory Commission, and in other federal groups have overlapping rules — in some cases, conflicting ones. In short, too many federal export rules by too many different groups were making life too difficult for nuclear safeguards developers and equipment manufacturers.

Sandia Classification Manager Dick Craner (7180) realized a few years ago that something should be done about restrictive rules that caused delays in delivery of safeguards technology to customers such as the IAEA (International Atomic

"It paid off last July when the general export license became law."

Energy Agency) and EURATOM (European atomic energy group).

In late 1989, Dick piled the regulations on new employee Duane Landa's desk and asked him to start digging and to come up with some recommendations. (Classification and Sensitive Information Review Dept. 7180 is responsible for determining which export licensing requirements apply to Sandia exports of information, hardware, and software.)

Now a three-year veteran of Department 7180, Duane proved that patience and persistence pay. More than a year after he, Dick, and Dennis Mangan (Manager of Containment and Surveillance Dept. 9249) began searching for a solution, a

new law went into effect (July 23, 1991) creating a Department of Commerce general export license for nuclear safeguards technology. (Appropriately, the license is named "SAFEGUARDS.") Duane had a big hand in it by convincing the right folks in government that it was needed and then expediting its creation.

"I spent many hours poring over the regulations and problems, pitching solutions to various government officials, and getting them to talk to one another," says Duane. "Finally, it paid off last July when the general export license became law."

During the same time the Sandians were working on the general license, the Commerce Depart-

Need Expert Export Help?

The general export license applies only to a unique set of equipment and technical data that Sandia exports. Classification and Sensitive Information Review Department 7180 has distributed export licensing and information to Sandia's staff to make everyone aware of the export laws and Sandia's policy to abide by them. Sandians with any questions about export license requirements should contact Dept. 7180. In Livermore, contact Jack Martinell in Dept. 8535.

ment's Bureau of Export Administration was working with other nations to totally rewrite its export regulation control list, further complicating matters, Duane notes.

A big bonus of the year-old law, explains Dick, is that the license applies to all DOE groups doing international safeguards work and to US companies that produce safeguards equipment. "It has made life easier for a number of folks — here, at Los Alamos, at DOE Headquarters, and in commercial companies," he says. "Plus, our interna-

tional safeguards customers are delighted with the license because they can get items in a timely manner and can re-export them to countries where they're needed."

Both the IAEA and EURATOM are prime customers for Sandia-developed safeguards technology used at nuclear reactor sites and other nuclear facilities. The IAEA, headquartered in Vienna, Austria, is a multinational wing of the United Nations, whose basic purpose is to monitor civilian nuclear facilities and ensure that materials and technology used in them are not diverted to military uses — for nuclear weapons, in other words. EURATOM is a nuclear regulatory group representing 13 Western European nations, headquartered in Luxembourg; it sets and enforces civilian nuclear regulations and is similar to the US Nuclear Regulatory Commission.

Duane says before the general export license went into effect, US regulations made it difficult for the IAEA and EURATOM to acquire US safeguards items and then re-export them to member nations. For example, after the IAEA got needed items, it had to go back to the Bureau of Export Administration to get permission to ship the items to nuclear facilities in its member countries. Of particular concern were the communist bloc countries and embargoed nations — Cuba, Libya, Vietnam, and North Korea, for example.

"The irony is that it definitely is in everyone's best interests that nuclear materials in all countries be safeguarded," says Duane. "It doesn't matter whether a nation is friendly or not. The world will be safer if nuclear material stays out of the hands of terrorists and potential troublemakers in all countries."

Dick, Duane, and Dennis Deal

Primary benefactor of the license at Sandia is the Monitoring Systems and Technology Center 9200, particularly Containment and Surveillance Dept. 9249. Department Manager Dennis Mangan says Duane's dedication and diligence have made his department's dealings with the IAEA and EURATOM go much more smoothly.

"Soon after Dick Craner told me that Duane was going to be working in export controls, I started talking to him about these difficulties and our sponsors' concerns, in the Energy and State departments as well as at IAEA and EURATOM," says Dennis. "Duane was soon up to speed and began making lots of contacts with folks in Washington at the Commerce, State, and Energy departments.

"He identified people there who were convinced of the need for the license and were willing to serve as 'sponsors' for it. Without going into great detail, I'll say that Duane worked hard and carefully to see that every group's needs were met. Several trips to Washington, dozens of letters, and hundreds of phone calls later, we got what we really needed. Duane deserves lots of credit. With Dick's support and encouragement, he made a real difference."

Duane is now trying to get changes made to the Department of State's International Traffic in Arms Regulation (ITAR). He's working through DOE for changes that will simplify Sandia exports controlled by ITAR. With the expected increase in Sandia and other DOE labs participating in technical exchanges with the Russians for safe, secure dismantlement, says Duane, simplified export regulations for nuclear-weapon-related activities would help the Labs and DOE. ●LP



PROTECTING NUCLEAR MATERIAL — Duane Landa (7180, left) and Dennis Mangan (9249) look at a Sandia-designed Modular Integrated Video System (MIVS). To ensure that nuclear material is being used for peaceful purposes only, the MIVS is used for surveillance at sites monitored by the International Atomic Energy Agency (IAEA). Duane has worked to have the US government provide for easier export of safeguards equipment such as this. MIVS is manufactured by an Albuquerque firm, Aquila Technologies; about 200 units have been or will be installed worldwide. Other Sandia-designed safeguards and security hardware includes the Cobra fiber-optic seal, in use by the IAEA and EURATOM; information authentication monitoring systems installed in two facilities in Japan; and (in a collaborative project with Los Alamos National Lab) a system that combines radiation detectors with video surveillance, installed in the United Kingdom. The two latter systems are undergoing field tests.

Sympathy

To Diwiatt Barker (2712) on the death of his wife in Las Vegas, Nev., July 6.

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ES&H Progress

Tiger Team review in the spring of 1990, and its action plan — approved in February '91 — called for 221 corrective actions. More than half of those have been completed.

About 40 of the remaining corrective actions at Livermore have to do with corporate plans for ES&H and overlap the Albuquerque plan. They've been reworked a bit and are being incorporated into the Albuquerque plan. Our goal is to have one plan, at some time in the not-too-distant future.

Traeger: We're aiming for October 1.

Lynch: We want to integrate the two separate plans into one as soon as we can, so we can reinforce the single-lab concept and conserve resources between the two sites.

LN: Livermore's corrective actions have been reduced by about half?

Lynch: About half. At Albuquerque, so far only a few; about 19.

LN: How long will the corrective actions be going on?

Lynch: A few run out into the next century.

Traeger: The 340 actions of the Albuquerque Action Plan involve some 2,100 milestones. We are scheduled to complete more than 90 percent of the milestones and 80 percent of the actions within five years. The last actions are scheduled for completion in 2003.

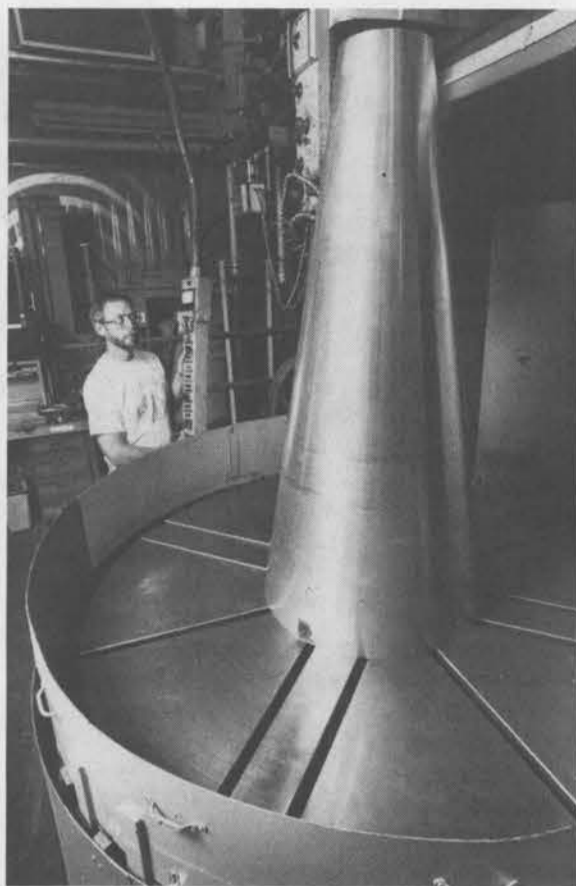
LN: Are we on schedule now?

Traeger: We're on schedule with completions of corrective actions; we're a little behind on about five percent of the milestones.

The way the system works is that we finish an action and notify the DOE/Kirtland Area Office. They review and audit the action, and if they determine it's sufficiently complete, they send us a notice of closure, and the action is closed. That process takes at least a year after completions. So even though we have completed more than 19 actions here in Albuquerque, none have been closed out yet.

LN: We were probably already working on these actions before the plan was approved, but is there any difference in the pace of work before and after approval?

Stiegler: From my perspective, there's been no difference in the pace. We were working on the



SAFER LATHE — Rick Anderson (2482) operates a vertical turning lathe (VTL) with improved safety features in Sandia's Bldg. 840 machine shop. The VTL, which does external and internal contour work for metal substructures and heat shields, was cited as a Category I Violation by the DOE Tiger Team in 1991. The violation was the only Category I — the most serious — type to be cited during the visit and was corrected even before the audit was complete by adding increased shielding, electrical interlocks, and a keyed switch to prevent accidental start-up.

(Photo by Randy Montoya)

actions even before we had an approved plan because, on many of them, we were sure there had been enough interaction between ourselves and the DOE — both the local office and headquarters — to know they were going to approve most of our corrective actions. So, we started work almost immediately.

LN: How are these actions funded?

Lynch: Funding comes from our indirect budget in most instances — actions that require a one-time physical fix are exceptions — and funding is

negotiated each year as part of Sandia's internal budget process. We have to look at the overall availability of funds and long-term milestones in the plan, and if adjustments appear to be needed, we have to negotiate that with DOE.

LN: We hear Sandia is taking some actions that aren't part of the plan. What sort of actions are they?

Lynch: Safety engineering support is one example; others are health physics, industrial hygiene, and protective environment in the laboratory — ordinary day-to-day activities to maintain a safe and healthful work place. If we were already doing things acceptably, there was no Tiger Team finding. But we have to keep doing those things acceptably.

Traeger: Our first responsibility is for the health and safety of our staff, and for the environment in the community. We take care of that first, whether it involves Tiger Team actions or not. We work toward meeting compliance issues and regulations and laws, but that is part of doing the most important job — protecting people and our environment.

Stiegler: Environmental laws, in particular, are complex and we're finding new things that must be done quickly — things we hadn't planned on doing. That takes resources that, from time to time, impact Tiger Team actions, because if you're not in compliance, you may be liable for fines and penalties.

LN: Do you think the process itself has made everybody look a little harder at ordinary, everyday working conditions?

Lynch: I think all Sandians are much more aware of ES&H than before the Tiger Team came, and the result is that people are spotting problems and wanting to find solutions for them. People are just more aware of the need for integrated solutions to general ES&H problems.

Stiegler: There is heightened awareness toward compliance with all the requirements we face, from the time we start a project. There is upfront thinking, for example, about waste management issues that will be involved in a project before we accept new work.

LN: Proper disposal of mixed waste is a problem that Los Alamos National Lab complained about recently, saying the lack of an acceptable disposal facility has halted a number of work projects.

(Continued on Next Page)

Premier Presentations

ES&H Award Winners Cited for Contributions

The first winners of the Corporate ES&H Award Program have been announced and recognized for their accomplishments by President Al Narath, just four months after he approved implementation of the program.

Al presented the first round of awards at a Sandia Program Council meeting earlier this week. Recipients were cited for having demonstrated "outstanding Labs-wide contributions to ES&H."

The second group will be recognized by their respective vice presidents and Dick Lynch, Director of ES&H Program Management Center 7020, for "noteworthy contributions to ES&H."

Receiving awards from Al were:

- Gary Nordyke (361) and Ross Yingst (5512) — For using quality processes in the development of procedures to avoid the generation of mixed waste during Joint Test Assembly operations, which allowed the continuation of operations critical to national defense, in compliance with environmental and other regulations.

- Robert Hawk (2482) and Debbie Tricoglou (2483) — For establishing, refining, and implementing a chemical management system that manages more than 500 chemicals routinely used by departments 2482 and 2483.

- J.F. Nagel (5711) — For writing the Management Surveillance ES&H Standard Operating Procedure, using extensive customer input in a quality process.

- Eloy Gutierrez (5501) — For intensive effort in producing user-friendly software and providing customer service to help in the completion of Integrated Project requirements Labs-wide.

Receiving awards from their vice presidents will be:

- Gerry Zawadzka (9301) — For identifying and reviewing orders applicable to the hazardous environment of particle accelerators and managing the development of a formal worker qualification-training process that has been published and shared with others.

- Herb Myers (7601) — For leading the development of an internal appraisal program for packaging and transportation safety, and exercising initiative that led to adoption of the appraisal program by seven Sandia sites.

- Paul Merillat, Tanya McMullen (both 5701), and Michael Sjulín (5711) — For developing the document Line Practices for the Conduct of Operations and producing it in written and software format so it could be widely shared and

contribute to Labs quality and cost effectiveness.

- 9800 Explosive Operations Self-Assessment Team: Dannie McNeill, David Preston, Don VanZuiden (all 9811), E.E. Alexanderson (9812), Wilson Brooks, Joe Lucero (both 9813), and Gerald Hochrein (9816) — For development and application of an innovative template structure to document and standardize Explosive Self Assessment activities in their organization, and working to extend its impact to other organizations.

- Management Integration and Implementation Project Team: Chuck Gibbon (2204), Nicole Andrews, Tom Perea (both 2251), Larry Andrews (2551), Yolanda Caballero (2818), Ken Adams, Art Trujillo (both 4313), Don Mitchell (6412), Stan Love (7001), Allison Davis, John Holmes (both 7024), Vicky Gonzales (7723), and Larry Dalton (7731) — For sustained and intense group effort to develop and implement a program for Labs-wide adoption of Conduct of Operations and Quality Assurance practices.

The awards program advisory committee will ask for nominations for the next quarter about August 1, and will then accept nominations through September 4. Additional information will be provided in an upcoming *Weekly Bulletin* announcement.

ects. Do we face similar problems? [Mixed waste contains both radioactive waste and other hazardous wastes.]

Stiegler: Our problems are identical. They are the result of DOE requirements. Essentially, we were asked to stop all generation of mixed waste until we could be sure that we had a way of processing or disposing of it, and there is no way of doing that right now. That impacted a number of our programs, and we have to figure out ways in which we can continue performing adequate work while observing the prohibition.

LN: There's still no answer to the disposal problem?

Stiegler: We're still working on a solution.

LN: Have any significant new concerns materialized since the Tiger Team inspection and the drafting of the action plan?

Stiegler: Some things have occurred, especially in the environmental area. The mixed waste activity was one of them; it wasn't specifically covered by the Tiger Team Action Plan. We've also discovered some problems with our septic systems and have had to stop using most of them.

I suspect those kinds of things will continue to crop up. Incidentally, we recently assessed our compliance with DOE orders, line by line, and we found some noncompliances. But we found that most of the areas in which we were not in compliance had been identified in the Tiger Team Action Plan and corrective actions were addressed there.

As thorough as the Tiger Team assessment was, it didn't cover everything. We're going to find things that the team didn't find.

LN: Some of the Tiger Team process was to assess past performances and determine clean-up needs, but is it also a way of alerting everyone that we must avoid these kinds of problems in the future?

Stiegler: The major thrust of the Tiger Team effort was not just to go back and see what was wrong and get it cleaned up. It was to look at the DOE facilities to see whether there were proper management processes in place to properly protect people and the environment.

Lynch: I think improvement in management processes, particularly self-assessment, was the real intent of Secretary of Energy [James] Watkins, when he started the Tiger Team process. It was hoped that, as the Tiger Teams went from site to site, results would be shared by the appraised facilities. I think he hoped that by the time the Tigers reached the last of their appraisals, they would find that the self-assessments required as part of the process were revealing everything the Tigers themselves found.

Well, the goal of 100 percent was never realized, but the later reviews indicated that the sites were becoming quite proficient at self-assessment. And those skills acquired in preparing for the Tigers' visits are still being used. That's why we continue to find things we hadn't noticed before, things the Tigers themselves didn't notice when they were here.

LN: You mentioned earlier that the process has generated greater concern and care about workplaces. Does that include everyone?

Lynch: I think so. I think you see an awareness at all Sandia levels of staff.

LN: Considering environment, safety, and health as three separate components of the whole, is any one of them of greater concern than the others?

Stiegler: The environmental area gets a lot of attention, because if you're not in compliance, in many cases you're breaking the law, and that carries direct penalties, both civil and criminal. Therefore, DOE is paying a lot of attention to that. We also have five people here from the New Mexico Environmental Division, on site with us as we do our environmental monitoring. The environment gets a lot of attention, and rightfully so.

There are other areas as important, though, such as health physics, industrial hygiene, and traditional safety engineering. Industrial hygienists,

Effort Pre-Dates Tiger Team

Council Gets Praise for New Way Of Handling Hazardous Material

A concern discovered before the Tiger Team started looking into the nooks and crannies of Sandia's ES&H activities more than a year ago has led to a revamped program that is winning the Labs praise from DOE.

During the Pre-Tiger Team Self Assessment (PTTSA) period, assessors found problems in the Labs' packaging and transportation activities.

"The PTTSA showed that hazardous materials packaging and transportation methods at the Labs were fragmented," says Dody Hoffman of Program Management Office for Logistics Management Center 7601. "We needed to pull the packaging and transportation activities together at the corporate level to promote compliance, consistency, and safety."

That discovery and resolve led to formation in April 1991 of the Packaging and Transportation Safety Council (P&TSC), an organization chartered to formalize methods of packaging and transporting hazardous materials that comply with applicable laws and regulations.

During the intervening 15 months, much has been done to improve and standardize the handling of hazardous materials.

"Our appraisals and internal assessments team just finished its first independent internal assessment, at Livermore," says Dody, "and it was a big success. DOE gave us high marks, so we're getting off to a good start."

The council's objectives are to propose actions that comply with laws, regulations, and orders governing packaging and transportation safety and integrate management control of those activities at all Sandia sites, taking into account unique site-specific operations.

It also provides consultation and support to line organizations that package and transport hazardous materials and maintains communications among all the organizations involved in packaging and transportation activities, including DOE and Sandia security services.

"Vital to the success of P&TSC and to meeting Tiger Team Action Plan milestones was the way the organizational activity representatives and compliance team champions pulled together so effectively," Dody says. "But congratulations for its success should go to many folks. The project couldn't have been accomplished without the cooperation and help we got from all the line organizations."

for example, are getting more and more calls to investigate things, because people are more inclined now to call and ask for help and opinion, or investigation.

LN: Has all this self-assessment and Tiger Team inspection, and the publicity it has generated from outside Sandia as well as inside, been good or bad for us? Do we need this much attention focused on us?

Lynch: Yes. I think a necessary condition for Sandia, necessary for success in the future in interacting with the community, is for everyone to know we're doing our very best to maintain safe and healthy working conditions for our employees and protecting the environment. So I think the increased activity is healthy.

In addition to being careful to be sure we are squeaky clean, we also need to be much more interactive with the public, to let them know what it is we do, our lines of work, why our work is important, how we do it, and specifically, how much of our effort goes into painstaking care to protect their safety and health and the environment.

We have established a group under Michael DeWitte [ES&H Program External Interface Office 7026] to do that very task, to organize a long-term

effort that is basically reaching out to the public and to the regulatory community so they understand what we're doing and why we're doing it.

Stiegler: That is especially important since a lot of our normal environmental activities involve public processes, public hearings, and so forth, so it's more and more important that we increase our communication with all members of the public.

Lynch: Sandians have put a lot of effort into the ES&H area over the past several years, and I want to say how much we appreciate it. We don't often get a chance to thank everybody at the same time, but we'd like to do just that.

It may not always appear this way, but we're working as hard as we can to make our ES&H program as cost effective and as efficient as possible, and we appreciate everyone's patience and support.

Stiegler: That's a very good point. I'm glad you said that.

Even though Sandians have been cooperative, there's been a lot of frustration as we try to understand and come into compliance with laws that are very complex and sometimes contradictory. It has created some frustration, not only in our organization, but in line organizations all over the Labs. So I certainly want to add my thanks. ●HK

ES&H Should Be Advantage for Labs, Says ES&H VP Cheney

Expressed in business terms, my vision for ES&H and, indeed for all of Internal Programs Division 7000, is that we are a source of competitive advantage to Sandia. Now, I understand that such an idea is foreign to many Sandians. But increasingly, in US industry, and throughout the world, excellent ES&H performance is being seen by industry leaders as a source of business advantage.

I like to divide that advantage into two parts — avoiding the downside and enjoying the upside.

The downside Sandia seeks to avoid is described by notices of violation (of environmental laws), civil and criminal penalties, poor public perception, unsafe working conditions, loss of programs, etc. Businesses whose man-

agement is occupied with these sorts of distractions are ones whose management is failing to plan and invent the future. Coping with the current crisis is about all they get done.

The upside Sandia can enjoy is described by customer, employee, and community confidence that Sandia programs are conducted responsibly and with sensitivity to preserving our environment and protecting both employee and public safety and health. In that environment, both management and employees can devote themselves fully to enhancing the security, prosperity, and well-being of the nation by conducting productive R&D programs.

In today's and tomorrow's world, that's competitive advantage!

Glen Cheney, Vice President, 7000

Favorite Old Photos

Sandian Recalls Last of US Atmospheric Nuclear Tests

It's been 30 years since the US conducted its last series of atmospheric nuclear tests in the Pacific, but eyewitness Paul Phipps (9206) remembers like it was yesterday.

Twenty-one-year-old Paul had just graduated from college in January 1962 when Sandia asked him to be part of its engineering crew on Christmas Island, located about 1,400 miles south of Honolulu. By the end of July, the wide-eyed young scientist had witnessed more than 20 nuclear air bursts.

Sandia was heavily involved in atmospheric testing during the 1950s, until a moratorium was established with the Soviets in 1958. By late 1961, the Soviets had broken the moratorium, and the US was eager to resume testing. The final series of tests ever conducted by the US, called "Operation Dominic," began in March 1962 and ended later that year.

Onlookers Felt Blast

During a typical test, a B-52 dropped a nuclear device 10 to 20 miles away from the island just before dawn, when lighting conditions



LIFE ON Christmas Island wasn't all work. A young Paul climbs one of many palm trees on the island, which were introduced to the island by British coconut plantation owners many years before. Paul says he and the other temporary islanders often gathered lobsters on the beach and barbecued them. The coconut husks that littered the island also made great charcoal, he says.

were exactly right for photographing the fireball. The resulting explosion was far enough away to protect the onlookers from harm, but close enough for them to feel the heat and pressure from the blast, says Paul.

"Because of the humidity, we could see the shock wave coming toward us," he says. "For the smaller bombs, we could feel a little heat and some blast. For the bigger bombs, we could feel a lot more heat."

The pressure from one explosion caved in a wall of the island's mess hall, a minor inconvenience compared to the later collapse of the island outhouse, says Paul.

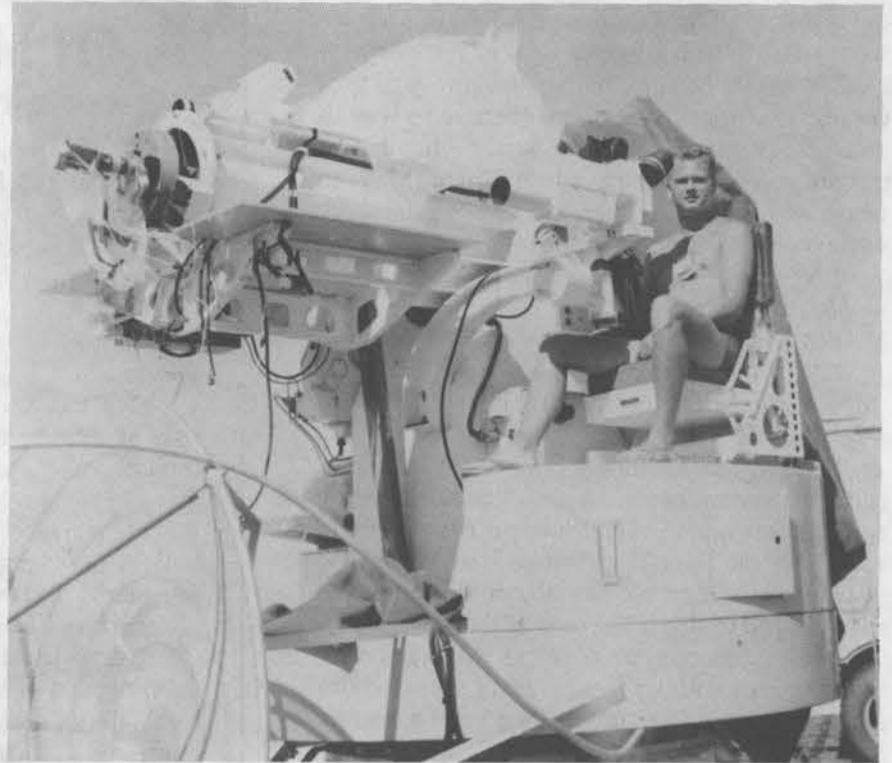
During the tests, the onlookers wore goggles to protect their eyes from the initial flash. They also wore radiation badges, of course, but no measurable exposure ever showed up, says Paul.

After the explosions, planes often flew through clouds in the area to measure the airborne radiation. When they landed, crews removed on-board sample filters, which were flown to Albuquerque or Los Alamos for analysis. The sampling planes were then hosed down to remove any contamination.

Now, That's Clean!

Life on Christmas Island was as unusual as the work being conducted there, says Paul. The standard uniform was shorts or swimming trunks, often without a shirt. Because fresh water wasn't available, workers used distilled water for everything, including showers. "I've often wondered what the dollar value of a shower in distilled water would be," he says.

Paul says that when he was shipped out to Christmas Island, he was told cameras would not be permitted because of the sensitive nature of the tests. "But when I got there," he says, "I discovered

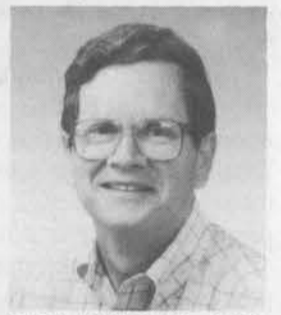


STANDARD UNIFORM — Wearing only shorts and a Sandia badge, 22-year-old Paul sits atop a tracking telescope on Christmas Island. During several months in 1962, Paul and about 30 other Sandians inhabited the island, gathering test data from the final series of atmospheric nuclear tests ever conducted by the US, called "Operation Dominic."

that the store on the island sold cameras and film."

Although the Island looks like a Pacific paradise in some photos, it's really an unattractive desert outcropping, says Paul. Small shrubs and five-foot-tall trees, called "no-goodnik" bushes by the Sandians, were the only natural vegetation on the island. The coconut palms were not indigenous.

The only other life forms were fish, birds, lobsters, and a lot of sand crabs, says Paul. "The sand crabs wound up in people's beds a lot, but I don't think they ever crawled there," he says. "I was known to plant a few in beds myself." ●JG



PAUL PHIPPS in 1991



feed **liback**

Q: Recently we were all formally asked to ask our regular external correspondents to add or update our organization numbers to the mail they send us. The implication is that our failure to notify the several hundred correspondents some of us have each time an organization changes is the cause of slow mail delivery. This fails to address the root cause of poor mail service. I have evidence that a piece of internal mail (properly addressed, with correct org. number) before restructuring took 15 days to reach me. Second, it is simply not feasible for scientific journals, after publishing one of my articles, to publish all my address changes: Numerous requests for reprints will be directed to my org. number that was in effect before restructuring.

Uppermost management needs to change our numbers less frequently and give up some "flexibility" for efficiency. Better yet, abolish numbers and use a stable mail-stop system. And please, don't cite a contractual requirement to resemble Bell Labs; I know the contract permits deviations from Bell Labs in order to foster good business practice.

A: I appreciate your suggestion that we substitute a stable mail stop system for the existing organization number system. I support it and it is the system the Mail Services organization would very much like to use. I also know the details of our AT&T/DOE contract and agree that this is not a concern in implementing a mail stop system. The proposal has been made to the recently formed Mail Services Quality Action Team and, hopefully, will be implemented in the very near future.

In the short term, we are asking all our customers to help in solving the mail service problems, and asking for notification to correspondents of organization number changes is part of that process. Meanwhile, the Mail Services team will do its best to make timely deliveries of mail addressed to old organizational numbers.

Dick Shepardson (7600)

Congratulations

To Ann (103) and Ofie Gutierrez, a son, Lee Thomas, June 25.

Welcome

Albuquerque — Andrew Ambabo (7825), Sonoya Ebara (7715), Kevin Kartchner (7211), Nancy Morreale (7221), Sheila O'Neill (154), Ricardo Ortiz (7946), Diana Rutan (154), Susan Vosburg (7715), Eva Wallace (7222); *Other New Mexico* — Carol Anderson (154), Jessica Glicken (6904), Imelda Martinez (7141), Betsy Neuhaus (7713).

Elsewhere: California — Nancy Davis (7216), Kevin Kalinowski (7941), Frank Lujan III (7212), Robyn Petersen (7722); *Indiana* — Daniel Sherman (7945); *Hawaii* — Phil Smith (122); *Texas* — Maritza Lecavalier (9127).

Fun & Games

Flag Football — The flag football season is near. The Sandia Football Association will hold a meeting on Wednesday, Aug. 5, in the Coronado Club Sandia Room at 5 p.m. All team captains and new players interested in joining a team or forming a team of their own are encouraged to attend. For more information, contact Ed James (5166) on 265-4015 or Jim Zipay (2335) on 266-2348.

Sandia News Briefs

Sandia Researchers Demonstrate CFC-Free Soldering Process

Sandia researchers have demonstrated a no-clean soldering process that eliminates ozone-depleting solvents from electronics manufacturing and is at least as reliable as conventional rosin-flux, solvent-based soldering. Solvent-based cleaning of electronic equipment accounts for at least one-fifth of the worldwide consumption of chlorofluorocarbons (CFCs), a chemical that depletes the atmospheric ozone that protects living organisms at Earth's surface from harmful ultraviolet solar radiation.

Sandia has overall management responsibility for the program, which is funded by DOE. Motorola's Government Electronics Group and Los Alamos National Laboratory also are involved in the research.

The new process uses adipic acid, a food industry ingredient that gives tartness to gelatin, rather than rosin flux to prepare surfaces before soldering. The soldering is done in a sealed chamber containing nitrogen gas and formic acid, a substance that breaks down into carbon dioxide and water.

Ron Iman of Manufacturing Systems Reliability Modeling Dept. 6613 says the process is a money-saver because it eliminates the need for a cleaning machine, which can cost as much as \$200,000 a year to operate and maintain. Ron says tests show that the no-clean process exceeds all military specifications, which are often the benchmark used by commercial enterprises.

Domenici-Gore Bill Promotes Environmentally Friendly Technology

Senators Pete Domenici and Al Gore have introduced legislation that would direct the DOE laboratories to take the lead in negotiating agreements to share environmentally friendly technology with developing nations. "The labs will be able to use their technical and human resources as catalysts to help other nations improve their environmental standings," Domenici says. The bill's intent, he explains, is to recognize that different countries have different technological needs and that if they are to benefit from US help, that help must be tailored to their needs.

Stormont Wins '92 PhD Thesis Award

John Stormont of Environmental Restoration Technologies Dept. 6621 has won the US National Committee for Rock Mechanics' 1992 PhD Thesis Award. John's thesis, "Gas Permeability Changes in Rock Salt During Deformation," was cited as a significant, original contribution to rock mechanics integrating laboratory testing, field measurements, and numerical studies.

John earned his doctorate in geological engineering and engineering mechanics from the University of Arizona through Sandia's Doctoral Study Program.

DOE Fires Up Alternative Fuels Hotline

DOE has installed a toll-free Alternative Fuels Hotline to field questions from individuals and industry about fueling vehicles with something other than gasoline. By calling 1-800-423-1363, anyone interested can get information on subjects such as performance characteristics of methanol-fueled cars, availability of natural gas refueling locations, and converting a fleet to an alternative fuel. A variety of publications also can be ordered by calling the toll-free number, which is available from 10 a.m. to 6 p.m. Eastern Time.

'MotorMaster' Offers 7,000 Options to Electric Motor Users

Funding from DOE and the Bonneville Power Administration for a project by the Washington State Energy Office has produced a computer software program comparing the energy efficiency of more than 7,000 electric motor models. Michael Davis, DOE Assistant Secretary for Conservation and Renewable Energy, says MotorMaster is part of a government program to encourage using energy-efficient electric motor systems. The data base covers most three-phase motors sold in the US ranging from one to 500 horsepower.

Send potential Sandia News Briefs to Editor, Dept. 7162.



COMPUTE THIS! — Jessica Habashi and Darren Eggett (right), members of a winning SuperQuest supercomputing team from Bountiful, Utah, discuss a project with mentor David Greenberg (1423) during a three-week summer institute hosted by Sandia to study supercomputers and the application of computational techniques in current research. Of the 101 teams from 51 schools that participated in the fifth national SuperQuest competition, 20 winning teams were selected to attend a summer institute at one of five SuperQuest centers and to receive computing systems that will be used to electronically link schools to these centers. Sandia is the only DOE laboratory to be designated a regional SuperQuest Center. Dick Allen (1422) coordinates the Sandia center.

Sorry about That, Vic and Harold

From the Editor: In the July 10 issue, for the first time during my three-year-plus sentence — er, ah — tenure as LAB NEWS editor, we switched two photos. On the Supervisory Appointments page, the pictures of Victor Johnson (324) and Harold Stewart (1324) were swapped. Maybe it had something to do with the similarities of their organization numbers, and maybe they are just such equally good-looking fellows that in our haste we couldn't tell them apart. Regardless of the reason, our apologies to both of them. Here they are again — correctly identified this time. ●LP



HAROLD STEWART



VICTOR JOHNSON

this month in the past...



40 years ago . . . How times change! In a LAB NEWS feature that asked employees what they'd do if they suddenly received \$100,000 tax free, one fellow said, "The car I've always wanted to own is a Rolls Royce. They cost \$20,000, but that's the first thing I'd buy . . ." Another said, "One thing I'm sure of. If I suddenly came into \$100,000, my circle of friends would enlarge tremendously." (Some things don't change.) And finally, the LAB NEWS swimsuit model — back to some things *definitely* change — in the July 18, 1952, issue was a lovely lady named Eleanor Unflat (we are not making this up).

30 years ago . . . Computer simulation was a big thing at Sandia even 30 years ago. A story featuring now-retired Sandian Jim Allensworth discussed the work Sandia was doing on the CDC 1604 computer to simulate bomb drops, rocket launches and flights, and satellite flights. The Coronado Club featured Prince Pokii and his Royal Polynesians at its annual Hawaiian Luau.

20 years ago . . . Sandia's work on the first IMP (Interplanetary Monitoring Platform) spacecraft was featured. At the time, the satellite had been in orbit for about 16 months, working perfectly all the while. It was exploring both the magnetosheath (where the solar wind from the sun interacts with the earth's magnetic field) and the magnetotail (the elongation of the earth's magnetic field caused by solar wind flow).

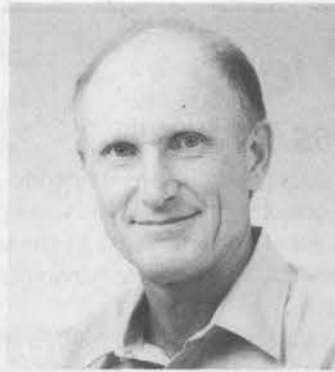
10 years ago . . . A liquid-sodium receiver, designed to generate 2.5 megawatts of thermal energy for producing electricity or industrial process heat at "solar power towers," had achieved a 90 percent conversion efficiency in tests at the Central Receiver Test Facility.



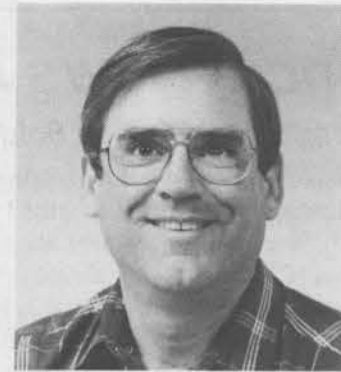
MILEPOSTS

LAB NEWS

July 1992



Ron Madsen
9531 30



Billy Brock
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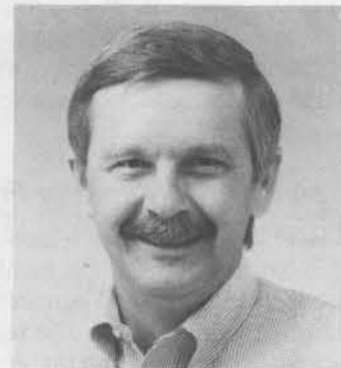
Felipe Chavez
2551 35



Pete Stirbis
1562 35



Kathleen McCaughey
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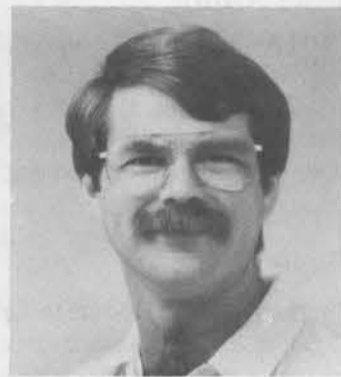
Francis Sieradzki
2251 25



Bob Longoria
2611 15



John Duncan
361 30



Gerry Mitchell
6514 15



George Novotny
334 25



Lawrence Allen
2512 25



Haskell Woodall
1273 35



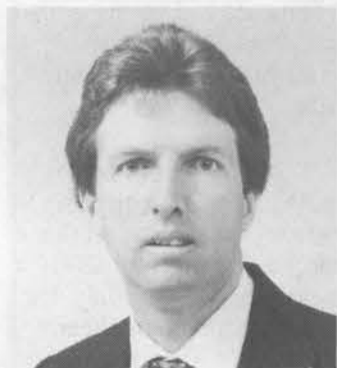
Renee Foster
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William Mantelli
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Jack Bartberger
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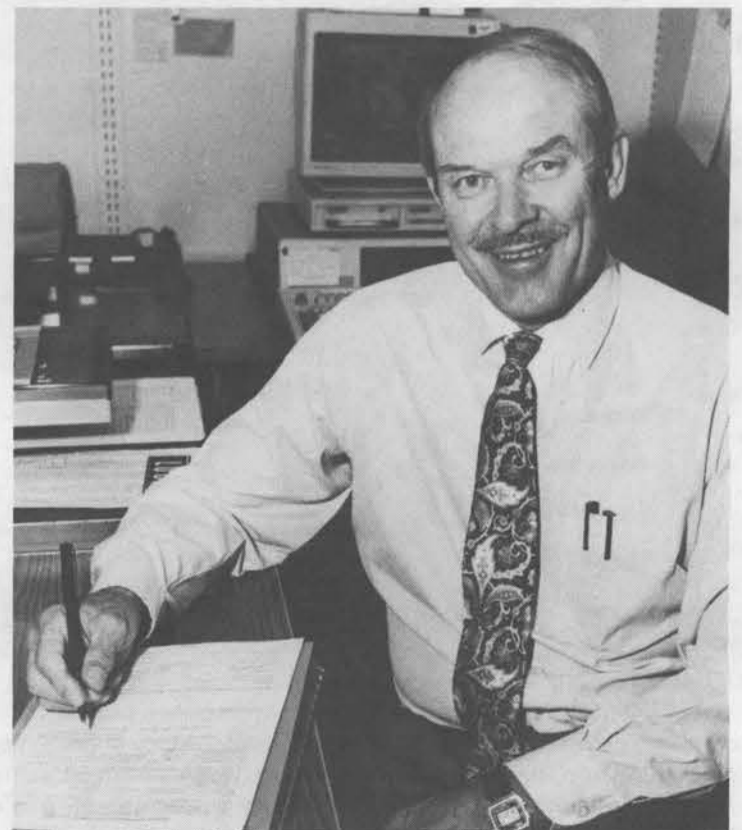
Larry Walker
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Ken Prestwich
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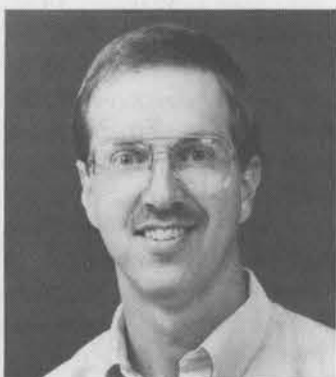
Joseph Allen
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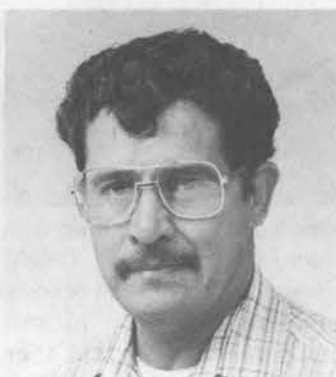
Ken Flynn
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Rondall Jones
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Arlen Weishuhn
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Ramon Villegas
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Q: Recently I had occasion to be sitting in one of the examining rooms at Medical and was horrified to see two pro-abortion leaflets in the rack on the wall. Whatever one's views, it is obvious that this is a controversial issue, and one which it is clearly inappropriate for Sandia to even appear to endorse, either pro or con.

If Medical is going to put out material touting the ease and safety of abortion, then they should also put out pro-life material that lets women know about the serious psychological damage abortions

frequently cause. Better yet, remove the material entirely. This is not to say that, if asked, a doctor couldn't provide information to a patient.

This kind of material could generate embarrassing publicity for Sandia, something I'm sure we all agree we don't need.

A: The medical organization provides a wide array of patient information brochures on many different topics. We have not routinely provided such information about abortions, although that issue is discussed with patients on a confidential

basis when appropriate. I have identified the one-page information sheet in one of our examination rooms that discusses pregnancy options and removed it.

I appreciate the sensitivity of this topic and am sorry that this information was found offensive to you. For others, it is important to note that the option to discuss pregnancy remains open in the medical organization.

Larry Clevenger, MD (7030)

UNCLASSIFIED ADVERTISEMENTS • UNCLASSIFIED ADVERTISEMENTS • UNCLASSIFIED ADVERTISEMENTS • UNCLASSIFIED ADVERTISEMENTS

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

Ad Rules

1. Limit 20 words, including last name and home phone (the LAB NEWS will edit longer ads).
2. Include organization and full name with each ad submission.
3. Submit each ad in writing. No phone-ins.
4. Use 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.
13. "Work Wanted" ads limited to student-aged children of employees.

MISCELLANEOUS

- SUPERSINGLE WATERBED, 3 drawers below, comes w/mattress, heater, liner, & pad, \$85. Sanchez, 836-2782.
- DISK SANDER-POLISHER, 6-in., Sears Craftsman, 2-spd., double-insulated, like new, \$40. Schuster, 296-9334.
- COUCH, LOVE SEAT, & CHAIR, earth-tones, good condition, \$300. Kallenbach, 869-5237.
- POWER MOWER, Jacobsen Lawn Prince #18, good working order, \$30. Southwick, 281-3782.
- "PUSSYCAT" GLYDER KIT, 2-channel, w/RC digital control, never used, \$50. Stuart, 265-7315.
- ROUND WROUGHT-IRON TABLE, large, seats 6; Sears exercise bike, like new; rebounding aerobic trampoline. Kelly, 255-7226.
- MICHELIN RADIAL TIRES (4), 145SR13, \$50; sheepskin bucket seat covers, \$45; desk, \$25; brass mirror, \$15. Gutierrez, 899-1021.
- POODLE-CROSS DOG, 4 yrs. old, has all shots, recently groomed, free to good home. Kottenstette, 299-1922.
- KOHLER VANITY SINK, vanity top, car seat, booster chairs, portable closet. Baca, 262-0596.
- ELECTRIC PUMPS, 1-1/2-hp & 1-hp, \$75/ea.; exercycle, \$75; broken VCR, free; stereo receiver, amp, & speakers, \$100. Maxam, 898-2435.
- TWO TWIN BEDS, complete; king headboard; chest of drawers; good condition. Baca, 265-2881.
- CHAIR, Ethan Allen, colonial, med. green, good condition, \$60; Kirby vacuum cleaner, good condition, \$65. Lenz, 884-4835.
- PATIO COVER, large, sheet metal, disassembled, free, you haul. Mozley, 299-4204.
- ROYAL PORTABLE TYPEWRITER, new charcoal/water smoker, Westinghouse upright freezer, fluorescent light fixtures. Kruse, 881-4169.
- SEARS BEST WATER SOFTENER, twin bed frame & inner springs. Riley, 869-2119.

- SHEETROCK, 3 sheets, free. Lott, 296-8071.
- GREAT PYRENEES, female, AKC-registered, 16 mos. old, has shots, fixed, good-natured, good w/kids, \$200. Stewart, 296-3375.
- BABY ITEMS: walker, REI backpack, high chair, portable crib, guard rail, playpen, play gym, stroller, more. Baca, 299-4875.
- OUTBOARD MOTOR, 15-hp, '86 Sea King w/tank, excellent condition, \$700. Lee, 281-5496.
- ELECTRIC MOTORS, 1/3-hp & 1/2-hp, \$15 & \$20; 70-amp rebuilt Delco alternator, \$55; machinist's cart, \$35. Silverman, 298-1308.
- B.F. GOODRICH TIRES (4), 32x11.50, very good used tires, \$60/all. Marquez, 836-5153.
- TABBY CAT, gray male, declawed, neutered, sweet disposition, friendly & affectionate, can't keep, free to good home. Chadwick, 275-2368.
- WASHER & DRYER, 7 yrs. old, Sears, washer in very good condition, dryer needs timer, \$150/both. Woodall, 299-6729.
- TWO CONSOLE STEREOS, desk, TV, china cabinet, GE video camera, Bentley Super 8 movie camera & projector. Rainey, 294-8642.
- NINTENDO, \$35; car radio/cassette player, \$45; toilet guard rails, \$18; queen bedframe; rabbit hutch, Habitat & accessories. Glaser, 293-8110.
- OAK ENTERTAINMENT CENTER, "Leather and Oak," for TV, VCR, & stereo equipment, cost \$450 new, sell for \$225. Kelly, 271-9589.
- HI-END SNELL K-2 SPEAKERS, w/Granite stands, \$400; Infinity 100-watt subwoofer, \$375; Yamaha M-45 125-watt amplifier. Norton, 299-3763.
- BETA VCR, Sanyo 4-head, works perfectly, fast-forward, reverse, slow-motion, freeze-frame, remote, 20 Beta tapes, \$95. Chapman, 296-4321.
- KITTENS (4), born June 7, free to loving homes. Williams, 266-6552.
- MOVING SALE: bar stools, patio furniture, oak kitchen table & chairs set, end table, cocktail tables, lamps, desk, etc. West, 292-2271.
- CLARINET, \$50; comet, \$100; Black & Decker electric lawn mower, \$20. Stirbis, 299-8442.
- KING-SIZE WATERBED, oak, headboard, 6-drawer pedestal, sheets, firm mattress pad, \$300. Salmi, 255-6555.
- GAS DRYER, Kenmore, Sears best, used 1 yr., excellent condition, \$400; electric mower, 18-in. Black & Decker, excellent condition, \$40. MacCosbe, 281-0775.
- LOBO BASKETBALL TICKETS, \$541; double bed, \$30; bookcase, \$30; coffee table, TV cart, lamps, \$15/ea.; small electric appliances. Drebing, 293-3335.
- AT&T 6300, 10-MB drive, 5-1/2-in. floppy, color monitor, dual floppy system, Citizen dot-matrix printer. Freshour, 256-9168 after 6 p.m.
- RELOADING DIES: 9mm carbide dies, \$25; 308 Win. dies, \$15. Lesperance, 298-5203.
- GARAGE SALE: Sat., July 25, 8 a.m., Danish chairs, gizmos, home items, 9105 Hannett NE (near Moon/Indian School). Spires, 275-3655.
- H-R SUPERIOR SOLDERING MACHINE, for jewelry fabrication, instructions & carbons w/cables, 115 VAC, \$70. Henry, 266-6467.

- DANISH DINING TABLE, 2 leaves, 6 chairs, 3-shelf lighted china cabinet, dark wood, \$500; 4-ft. round table, 4 chairs, \$150. Koskovich, 299-4908.
- WASHER & DRYER, 3 yrs. young, white, \$350; Cat Condo, never used, white fur, \$40; refrigerator, ice/water in door, almond, \$750. Epperson, 299-0789.
- ETHAN ALLEN TRI-WAY BEDS (bunk, twin, or trundle), excellent condition, \$350; 2 maple bar stools, \$75/pr. Henderson, 299-6083.
- HOTPOINT REFRIGERATOR, brand new, almond, 15.6 cu. ft., \$400. Myers, 867-5688.
- FULL-SIZE BED, mattress, box spring, frame, \$60; skis, bindings, 180cm, \$40; size 9 boots, \$20. Martel, 293-1892.
- COMPUTER DESK, w/matching printer stand, shelves, drawer, dark wood, \$45; miniature terrier-mix puppies, good family pet, free. Thornberg, 897-3785.
- PICNIC HAMPER, by Royal Ascot of England, complete set, brand new. Wagner, 823-9323.
- MOBILE RADIO, VHF-FM transceiver w/antenna & mike, \$200; .38 Special pistol, holster, case, \$200; Wurlitzer Funmaker electronic organ, \$300. Wehrle, 299-2959.
- ENTERTAINMENT CENTER, solid oak, Thomasville, \$125. Drayer, 821-4017.
- WEIGHTS, GYM PAC 1000, bench, all accessories, extra weights to 198 lbs., \$100. Bouchard, 265-8148.
- NEW PC SOFTWARE, still in shrink wrap, Microsoft mouse, \$80; Windows 3.1, \$80; Word for Windows 2.0, \$300. Peterson, 883-8463.
- HITACHI COLOR TV, 19-in., excellent condition, \$125; tonneau cover for short, wide-bed pickup truck, new, \$50. Aragon, 881-4795.
- GRACO STROLL-A-BED, new, box never unpacked, \$55; Bassett crib, walnut, \$65; swing: combination cradle, carrier, regular seat, \$35. Davis, 298-3277.
- WEDDING & ENGAGEMENT RING SET, new, 54-pt. center diamond w/16 4-pt. diamonds, TCW 1.14cts., appraised at \$2,500, sell for \$1,400. James, 883-8784.
- WALNUT DINING ROOM TABLE, 40" x 60", extends to 96", 6 chairs, china cabinet, excellent condition, \$495. Schamann, 298-5192.
- FRIGIDAIRE REFRIGERATOR, 18.0 cu. ft., frost-free, almond color, will deliver, \$200 OBO; recliner, best offer. Biskis, 281-2584.
- MINOLTA 9000, 35-70 & 70-210 lenses, Vivitar flash, all new, \$600; Martin 12-string guitar, w/case, excellent condition, \$800. Crenshaw, 296-8948.
- YARD SALE: Sat., July 25, 8 a.m.-2 p.m., bicycles, toys, supersingle waterbed (\$125), dog kennel (\$110), field fencing, 9409 Las Calabazillas NE. Davis, 294-4614.
- GUITAR AMPLIFIER, 10-watt, \$60; electric guitar, \$60; effects pedals, \$15/ea. Dean, 275-7084.

TRANSPORTATION

- '81 KAWASAKI LTD 550, runs well, \$250; '73 Yamaha TX500, needs TLC, \$25. Mozley, 884-3453.
- MOUNTAIN BIKE, 17-in. Nishiki Colorado, 18-spd., w/computer, \$225. Tyner, 294-5289.

- MAN'S 10-SPD. SCHWINN BICYCLE. Kruse, 881-4169.
- '78 PONTIAC GRAND PRIX LJ, white, 2-dr., 1 owner, \$1,600. Cano, 296-6955.
- '65 MGB CLASSIC, restored, BRG, \$7,000. Stewart, 296-3375.
- '79 CHEV. CAPRICE, less than 90K miles, 8-cyl., AM/FM cassette, AT, AC, very dependable, \$750 OBO. Sobolik, 292-3959.
- NISHIKI 12-SPD. TOURING BIKE, 22-in., \$150 OBO; VW snow tires; trailer hitch; roof rack; ski rack; bike rack. Leeman, 299-9149.
- '74 SUBARU STATIONWAGON, 4 new Michelin tires, runs well, \$350. Kavet, 299-1793.
- '81 PLYMOUTH HORIZON, 4-dr. hatchback, 4-spd., 1 owner, \$400. Spulak, 869-0235.
- '69 DODGE CHARGER, completely new, 440, AT, console, PS, PDB, deluxe interior, factory restoration using many lifetime warranty parts, \$12,900 OBO. Pantuso, 892-3641.
- '90 YAMAHA RT180A TRAIL/DIRT BIKE, Monocross Year suspension, Leading-Axle fork, Reed Valve 2-stroke engine, \$1,050. Stuart, 265-7315.
- '69 FORD PICKUP, 3/4-ton, w/Travel-queen camper, 80K miles, \$2,500. Stirbis, 299-8442.
- '80 GMC 4x4 PICKUP, 6-cyl., AT, PS, PB, new tires, AM/FM cassette, camper shell, sunroof, dual tanks, tilt wheel, alarm, \$3,000. Magnuson, 821-5330.
- '87 CORVETTE COUPE, hard & glass tops, 2-tone silver, AT, leather, low miles, other options, great condition, \$17,500. Raymond, 822-4700.
- '68 FORD MUSTANG, 289 V-8 engine, \$2,800 OBO. Chavez, 864-4893.
- '81 HONDA CB-650 MOTORCYCLE, good condition, 16K miles, \$700 OBO. Vandewart, 298-4741.
- '76 FORD VAN, w/built-in bed & storage, good for fishing or camping, \$1,500. Ercole, 299-1980.
- '88 FORD BRONCO II XL, 4-WD, 5-spd., 40K miles, off-white w/tan interior, very clean, \$7,000. Dudley, 255-7907.
- '73 BUICK ELECTRA 225, 86K miles, AT, AC, PW, PS, black paint, 455 engine, runs great, \$2,000 OBO. Fagan, 877-7878.
- '72 DATSUN 240Z, runs well, needs some TLC, \$1,850 OBO. Zownir, 256-3753.
- '69 FORD FALCON, \$200 OBO. Myers, 867-5688, ask for Jeremy or Bruce.
- BOY'S 10-SPD. BICYCLE, 24-in., \$50; girl's 10-spd. bicycle, 24-in., \$50; both in excellent condition. Witek, 296-5198.
- '91 MAZDA NAVAJO LX, 4-WD, white, fully loaded, warranty transferrable, \$15,900 OBO. Bando, 292-2452.
- SCHWINN VARSITY 10-SPD. BICYCLE, red, 27-in., \$40. Wagner, 823-9323.
- '85 CHEV. PICKUP, standard shift, PS, canopy, 3/4-ton, 5.0 engine, 58,451 miles, \$5,300. Lewis, 255-5436.
- '87 SEA RAY 268 SUNDANCER, front/aft cabin, shower, AC, kitchen, below appraisal, \$25,000 OBO. Bland, 344-9969.
- '86 CORVETTE, 2-51 handling option, new tires, low miles. Sanchez, 255-5515.
- '90 HONDA ACCORD, automatic, air, tinted windows, AM/FM cassette, charcoal gray, great condition, 35,000 miles, \$10,000 OBO. Perrine, 293-1429.

- '87 TOYOTA PICKUP, 4x4, 5-spd., AM/FM, AC, PS, PB, alloy wheels, chrome bumpers, low miles, excellent condition, \$6,900. Eldredge, 298-3905.
- '86 CHEV. S-10 BLAZER, 4x4, standard transmission, AC, PS, PB, priced below book, \$5,700. Drayer, 821-4017.
- '83 HONDA XR350R ENDURO, excellent condition, \$1,200. Crenshaw, 296-8948.
- '81 CHRYSLER LEBARON, 225 cu. in., 4-dr. sedan, new vinyl, \$950. Roth, 881-3824.

REAL ESTATE

- 3-BDR. RIO RANCHO HOME, 1-3/4 baths, 1,520 sq. ft., fireplace, security system, shade trees, covered patio, sprinklers, 2-car garage, \$86,300. Bryan, 892-6848.
- 13.7-ACRE MOUNTAIN CABIN SITE, 20 miles south of Angel Fire, Trumbull Canyon, wooded, quiet, private, \$12,500. Myer, 298-1778.
- 3-BDR. CUSTOM HOME, 2-story, in Academy Acres, 3 baths, large lot, many custom features, see to appreciate. Tockey, 822-0358.

WANTED

- QUEEN-SIZE BED, in good condition, will pay cash or trade king-size waterbed. Lenberg, 266-8988.
- FILING CABINET, 4-drawer, good quality, w/lock; child's minibike, Suzuki, Yamaha, or Honda, late model, in very good condition. Baca, 262-0596 or 298-7748.
- RELIABLE COMPANION for elderly man recovering from stroke & still unsteady on his feet, M-F, references needed. Coe, 266-6579.
- SWING SET. Riley, 869-2119.
- OLD METAL SIGNS, beer, oil, soda, what have you, collector offers cash or trade. Bailar, 865-1518.
- ROOMMATE to share 3-bdr. home, 1-3/4 baths, furnished, w/cable TV & telephone, 5 min. from Sandia, \$300/mo., includes utilities. Gabaldon, 292-7340.
- DIGITAL LASO SERIAL PRINTER & cable if available; 2 metal bedframes (twin). Klamersu, 299-5235.
- ROOMMATE to share expense of double-wide trailer, located between Tijeras & Edgewood, \$250/mo. Draper, 281-2663.
- SITTER, for 6-mo.-old baby, 3 days/wk., 10-12 hrs./day, South 14 area. Beutler, 281-4561.
- '81-'85 HONDA ACCORD or '83-'85 Toyota Celica or Supra. McConahy, 884-5071.

WORK WANTED

- BABYSITTING, Sandia High School student willing to babysit in the NE Heights area. Davis, 294-4614.

LOST AND FOUND

- LOST: Rawlings softball glove, Manzano field parking lot, July 8, between 5 and 6 p.m. Semonisck, 883-4212.
- FOUND: Engineering notebook in Bldg. 802, Conf. Rm. 3372, during week of 5/26, to claim, come to Bldg. 802/3362D. Sanchez.

Coronado Club Activities

Family Buffet and Kids' Bingo Tonight

FRIDAY FAMILY FUN — For guaranteed fun and possible prizes, haul the offspring to the Club this evening, July 24, for a buffet and bingo. The buffet is open from 5 to 8 p.m. — kids 12 and under can choose spaghetti or a corn dog (with accompaniments and soft drink) for 99 cents. Bingo starts at 6 p.m. and features a Nintendo Game Boy as the grand prize.

NEXT FRIDAY — Fiddlin' Doc Gonzales and the Orange Blossom Express Band will play some great western swing next Friday, July 31, from 7 to 11 p.m. This Santa Fe group regularly entertains at the State Fair. The Club's kitchen crew offers some favorites for the evening: shrimp scampi (\$9.95), filet mignon (\$10.95), steak Neptune (\$11.95), or the fabulous all-you-can-eat buffet (\$6.95). Reservations recommended; call 265-6791.

BRUNCH AND BEST — Best Shot Band, that is, playing for the Club's Tea Dance on Sunday, Aug. 2, from 1 to 4 p.m. Before the dance, enjoy the champagne brunch from 10 a.m. to 1 p.m. Reservations required; call 265-6791.

SPLASHDOWN REMINDER — Remember, the pool is open until 9 p.m. on Thursday and Friday evenings, and there's an a la carte buffet from 5 to 8, with a 10-percent member discount on Thursdays. The snack bar offers a pool pass special — this month, it's a corn dog, french fries, and soft drink for 99 cents.

POOL CLOSED THIS WEEKEND — The pool and patio will be closed all day July 25 and 26 and will reopen at 5 p.m. on Monday, July 27. The Club is hosting a swim competition.

Earnings Factors May 1992

Long-Term Savings Plan for Management Employees (LTSPME)	Earnings Factors
AT&T Shares	.9827
Government Obligations	1.0098
Equity Portfolio	1.0059
Guaranteed Interest Fund	1.0067
South Africa Restricted Fund	1.0109
Long-Term Savings and Security Plan (LTSSP)	
AT&T Shares	.9826
Guaranteed Interest Fund	1.0068
South Africa Restricted Fund	1.0108
Equity Portfolio	1.0059
Employer Stock Fund	.9826

Events Calendar

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

July 24 — Santa Fe Desert Chorale presents "Masterworks" along with a pre-concert lecture; 8 p.m., Sunshine Music Hall, 1-800-244-4011.

July 24 — Choral Conversations, "Masterworks of Two Ages"; 7 p.m., free, La Posada, 1-800-244-7505.

July 24 — Youth Ballet Company presentation of "2nd Act Coppelia," "Imagine," and "Opus 111"; 8 p.m., KiMo Theatre, tickets available at Ticketmaster or at the KiMo Box Office.

July 24 — "Grupo Muy Muy," Latin and North American folk music; 8 p.m., South Broadway Cultural Center, 848-1320.

July 24-25 — "Pinocchio," children's classic presented by the Albuquerque Children's Theatre; 10:30 a.m. & 1:30 p.m. Fri., 1:30 & 3:30 p.m. Sat.; Rodey Theatre, 898-6679.

July 24-30 — Latin American Film Festival, featuring guest scholars, film makers, and screenings of outstanding films (subtitled in English) that suggest the cultural and artistic wealth and diversity of Latin America; 7 p.m., UNM Main Campus and Student Union Bldg. Theatre, call for schedule, 277-6262.

July 24-26, & 31 — "The Night of San Juan," by Laverne Lizon, New Mexico premiere presentation by San Juan Productions, romantic comedy with the first act set in Spain and the second in Albuquerque; 8 p.m. Fri.-Sat., 2 p.m. Sun.; Silver Bear (6921 Montgomery NE), 881-6203.

July 24-Aug. 2 — Exhibit, "Peruvian Photography 1900-1930," Santa Fe resident Ed Ranney traveled to Peru to make prints from early 20th-century photographic negatives of Martin Chambi, Miguel Chani, and the Vargas Brothers (many have never been seen in the US); 9 a.m.-4 p.m. Tues.-Fri., 5-9 p.m. Tues., 1-4 p.m. Sun.; UNM Art Museum, 277-4001.

July 24-26 & 31, Aug. 2, 7, & 8 — "Grease," fourth longest-running Broadway show; recounts the '50s through rose-colored memories; 8:15 p.m. (2 p.m. Sun.), Popejoy Hall, 345-6577.

July 24-Aug. 16 — "A Late Snow," by Jane Chambers, story about five women stranded in a mountain cabin during a snowstorm, all are connected in some way with one woman; 8 p.m. Fri.-Sat., 6 p.m. Sun.; Vortex Theatre, 247-8600.

July 24-Aug. 16 — Exhibit, "Thanks for the Mimbres," an investigation of how anthropologists and tourist promoters have transformed religious images into popular culture icons representing "otherness" of the Southwest; 9 a.m.-4 p.m. Tues.-Fri., 5-9 p.m. Tues., 1-4 p.m. Sun.; UNM Art Museum, 277-4001.

July 24-Aug. 16 — Exhibit, "Our Land/Ourselves," works on paper by Native American artists focusing on the land and its inhabitants through metaphysical, metaphorical, allegorical, and political perspectives; 9 a.m.-4 p.m. Tues.-Fri., 5-9 p.m. Tues., 1-4 p.m. Sun.; UNM Art Museum, 277-4001.

July 25 — Ballet Theatre of New Mexico presentation of "And," "Lamented Echoes," and variations from "Sleeping Beauty," "Raymonde," and other ballets; 8 p.m., KiMo Theatre, tickets available at Ticketmaster or at the KiMo Box Office.

July 25 — Monthly arts and crafts demonstration,

Oaxacan crafts; 11 a.m.-3 p.m., Maxwell Museum of Anthropology, 277-4404.

July 25 — Baila! Baila! Dance Extravaganza; 7 p.m., UNM Continuing Education Center (1634 University NE), 277-1160.

July 25-26 — Mountain Discovery Days, fun activities all over the Sandia Mountains with guided hikes, displays, demonstrations, ski lift rides, and appearances by Smoky Bear and Woodsy Owl at Sandia Peak Ski Area's Day Lodge; call for times and locations, 281-3304 or 243-3696.

July 26 — Arts in the Parks: Jazzfest, family entertainment; 2-5 p.m., Netherwood Park (Princeton & Morrow NE), free, 768-3483.

July 29-Aug. 1 — Kachina Regional Morgan Classic, all Morgan horse show featuring classes in English riding, Western riding, driving, hunt seat, and conformation; 9 a.m.-10 p.m., free, Horse Arena, NM State Fairgrounds, 897-0087.

July 30 — "Kangaroo Katie," storytelling activity for children; 10 a.m., free, South Broadway Cultural Center, 848-1320.

July 30-Aug. 1 — "Pedro Y El Capitan," presented by Sociedad Amigos Del Teatro, two typical Latin Americans degrade and elevate the human spirit; 8 p.m., South Broadway Cultural Center, 848-1320.

July 31 & Aug. 1, 7, & 8 — "Kegger," play that deals with the issues of teenage alcohol consumption, presented by Theatre-in-the-Making's Youth Performance Workshop; 8 p.m., Center-Stage (3211 Central NE), 260-0331.

July 31-Aug. 2 — "Mariachi Spectacular," concert featuring eight Mariachi bands including Mariachi Sol de Mexico, Yolanda Del Rio, and Mariachi Vargas; Old Town Plaza and Tingley Coliseum, call for times, 277-5095 or 277-6945.

Aug. 1 — Summerfest: Cajun/Caribbean/French Night; 5-10 p.m., Civic Plaza, 768-3550.

Aug. 1 — "La Llorona," storytelling activity for children; 10:30 a.m.-12:30 p.m., Maxwell Museum of Anthropology, 277-5963.

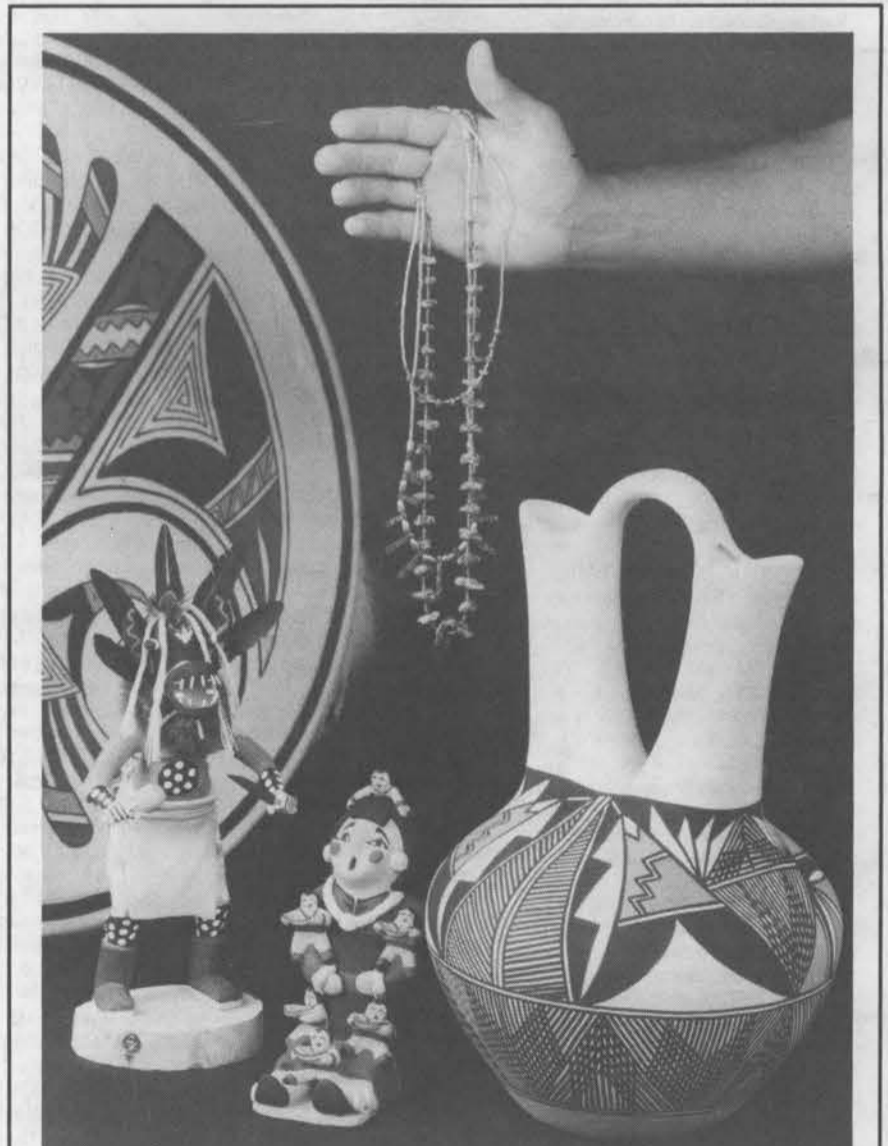
Aug. 1-2 — "Clowning Around Winrock," Pal Clown Alley, 116 members provide walk-around entertainment,

balloon animals, and facepainting in celebration of National Clown Week (Aug. 1-7); noon, 2, & 4 p.m. Sat., 2 p.m. Sun.; Winrock Shopping Center.

Aug. 6 — Native American Senior Citizens Day, Indian dances, crowning of senior king and queen, arts & crafts, displays, event by and for seniors; 9:30 a.m.-3:30 p.m., Indian Pueblo Cultural Center, 843-7270.

Aug. 7 — "Koryak's Spear," storytelling activity for children, story is about the adventures of Koryak and his family who lived 9,000 years ago, children will make a pouch to take home like the one in the story; 9:30 -11:30 a.m., Maxwell Museum of Anthropology, 277-5963.

Aug. 7 — "Classic Meets Jazz," Santa Fe Desert Chorale, with a pre-concert lecture; 8 p.m., Sunshine Music Hall, 1-800-244-4011.



PRIZE POSSESSIONS — Seen here are some of the items donated by Sandians to be raffled by the American Indian Outreach Committee (AIOC) at its AIOC employee picnic on Saturday, Aug. 22. Proceeds from the raffle will be donated to the American Indian Science and Engineering Society scholarship fund. Bonnie Skenandore (7155), Maggie Henry (157), and Evans Craig (contractor) are coordinating the raffle. Bonnie also made the drum seen here. Juanita Yepa (7615) crafted the Indian storyteller.