

WIPP Robots Provide View of the Underground

It looks like something from the "Jetsons": a four-foot-tall metallic creature with a pair of glass eyes, a rotating head, and three electrically driven wheels in place of legs.

This sci-fi-looking robot, named Robo Op, is equipped with a pair of TV cameras mounted on top of its "head." One is for high-resolution black and white images and the other for color. Modified by Sandia, the commercial robot is part of a project at the Waste Isolation Pilot Project (WIPP) site near Carlsbad that helps determine the rate at which the walls and ceilings of underground storage rooms at the WIPP facility collapse due to salt creep (slow plastic-like movement of underground salt).

Room closure, as it is called at the WIPP site, is a natural and desirable process. If things go as planned, the rooms carved out of underground salt beds more than 2,000 feet below the surface will collapse inward slowly and eventually enclose commercial low-level and transuranic waste, some of which could be stored there as early as this year. (No high-level waste is planned to be stored at the WIPP site.)

Salt Is Like Plastic

Once encapsulated, the stored waste will present no threat to the surface environment or the aquifer above the salt layer, says Tom Schultheis, Supervisor of WIPP Site Operations Div. 6343. "The salt is like plastic," he explains. "It moves around, and if there's a cavity such as a waste storage room, the walls move inward as the ceiling moves down and the floor heaves up. This action eventually cocoons the waste."

Although room closure is expected, it has made some special rock mechanics test rooms unstable and too dangerous to be inspected by employees. A mechanical Sandian such as Robo Op, (Continued on Page Five)



GIVING ROBO OP a final inspection before sending the mechanical Sandian into an underground test room are (from left to right) Tom Schultheis (6343), John Ortiz (9325), Mark Lemon (9325), and Tom Rice (2852). Robo Op's two video cameras provide researchers with an up-close view of the walls and ceilings of waste storage rooms that are too dangerous for humans to enter. The cable attached to Robo Op's bottom half carries electrical signals from the video cameras and helps researchers recover the robot if it tips over. (Photo by Jim Conklin, Westinghouse)

Ten Days 'til Tiger Time — See Page Four

NUREG-1150


Study Advances Reactor Safety

For nearly two decades, Sandia has been in the business of helping make nuclear power plants safer and more reliable. Much of that work has involved finding ways to predict what could go wrong in a plant so accidents can be prevented and utility resources can be focused intelligently.

The Labs' latest project in this area is a recently completed landmark study that will be used to aid risk assessments in nuclear power plants worldwide. Sandia was the lead contractor in the 5-year, \$17 million program, which culminated in a three-volume summary document released in December by the Nuclear Regulatory Commission. The document summarizes about 35 volumes of information produced by Sandia.

The methods and information contained in the study will be used by many nuclear power plants as they conduct self-assessments of risk — a crucial step in developing ways to respond to and prevent accidents.

Methods to predict the risks and possible outcomes of severe accidents were developed in the (Continued on Page Seven)

 **LAB NEWS**
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Telling It Like It Is

Anonymous Feedback Program Helps Managers Make Changes

For the first time in Labs history, members of Sandia's Large Staff (directors and above) recently looked at themselves through the eyes of the people who work for them, and what they saw was both sobering and illuminating.

In August, questionnaires were sent to Sandia supervisors, department managers, directors, and VPs, marking the beginning of Phase I of Sandia's Upward Feedback program. The participants

"We don't always see ourselves as others see us."

(employees who filled out the questionnaires) were asked to evaluate their line managers, starting with directors, one and two levels above them. Supervisors evaluated their directors (two levels higher), department managers evaluated their directors and VPs, directors evaluated VPs and Executive VPs, and VPs and Executive VPs evaluated Labs President Al Narath.

Mark James (3533), coordinator of the program, says upward feedback turns the tradi-

tional "one-way street" of feedback flow (usually in the form of downward performance evaluations) into a two-way street by allowing Sandians to comment anonymously about the effectiveness of their managers.

The program also opens communication lines between managers and employees, encourages a spirit of teamwork, and gives managers the opportunity to identify behaviors, both positive and negative, that influence their organization's effectiveness. "We don't always see ourselves as others see us," he says.

Talking Back to the Boss

Once participants completed the questionnaires, results for each manager, and for Large Staff overall, were analyzed statistically by Kathleen Diegert (7223). To maintain confidentiality, no one except the manager being reviewed (called the recipient) received a copy of the feedback. Trained internal consultants (Sandians nominated by their VPs) helped recipients interpret the feedback, if requested.

(Continued on Page Six)

**SANDIA
AND THE FUTURE OF
NUCLEAR POWER**

This & That

Today's "This and That" is by Assistant Editor Charles Shirley.

Dream Jobs - A few years ago, I invested a couple of days in a course called Managing Professional Growth. We defined dream jobs, and I realized that my dream job was free-lance museum evaluator. Not many opportunities opened up, though. I've since figured that another dream job is guest columnist - take your best shot, then forget about filling another column until you're good and ready. So at last, while LAB NEWS editor Larry Perrine is on vacation, my best shot at Dream Job No. 2!

* * *

Sandia's Ohio Connection - The March 22 LAB NEWS included a photo of a solar-powered race car constructed by students at Stark Technical College in Canton, Ohio. At last count, more than 40 Stark graduates had become Sandians because of the annual recruiting trips of Howard Seltzer (9234). Howard's most recent visit, though, was as keynote speaker for the Canton Joint Engineering Council. The occasion prompted the CJEC's monthly publication to print front-page articles on Howard and Sandia, with the gratifying headline "Sandia National Laboratories: American Science and Engineering at Their Finest." All modesty aside, it's nice to see folks get their facts straight.

* * *

New Grammar - Having taught English for a few years, I'm dizzied by the grammatical implications of the following note: "As used in this regulation, words in the singular also include the plural and words in the masculine gender also include the feminine and vice versa, as the case may require." Al Stotts (3163) found it in a volume of federal regulations. We're considering a similar policy for the LAB NEWS: "As used in this publication, misspelled words include the correct spelling and misused words include the proper usage, but definitely not vice versa, as the case may require."

* * *

Job Swapping? - We may need to extend that policy to organization numbers. A photo caption in the March 22 LAB NEWS switched the numbers of Executive Vice Presidents Lee Bray and Orval Jones. Though President Al Narath said in that issue, "I think it's healthy for people to move around the company," he probably had something different in mind.

* * *

Desert Storm Fund Still Helping - The Desert Storm Family Fund is still aiding New Mexico families who have financial hardships because of a family member being called to duty for the Persian Gulf war. Sandians account for about 15 percent of the more than \$90,000 received so far. Herb Pitts (3100) points out that because of volunteer efforts by Sandians, plus other help such as donation of pre-addressed envelopes, there were essentially no costs to Sandia or administrative costs to the fund - all the money is helping people.

* * *

No (April) Foolin' - Since we didn't publish on April 1, here's some belated foolery from *Database* magazine: "Sign-On Message From a Typical Menu Service: Hello. I'm telecommunication node SNA12DB and I'll be your interface this evening. Before you select a database, I'd like to tell you about our specials today. We have an exquisite bibliographic file on Appetizers, with extensive abstracts lovingly prepared by our expert staff, covered with a delicate Boolean sauce . . ." ●CS

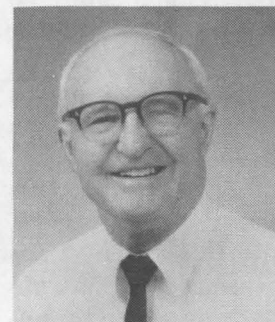
Take Note

The American Indian Outreach Committee is sponsoring a Cultural Diversity Colloquium on Tuesday, April 9, from 2:30 to 3:30 p.m. in the Technology Transfer Center (Bldg. 825). Robert Whitman, Assistant Director of the American Indian Science and Engineering Society (AISES), Boulder, Colo., will show a video about AISES titled "New Beginnings" and discuss the society's history, accomplishments, and goals. He will also discuss the various memberships available (Indian and non-Indian) and tell how to form a local professional chapter. For further information, contact Dean Pershall (3511) on 4-0370.

* * *

On Saturday, April 13, Odyssey of the Mind competitors from kindergarten through high school will work in teams to solve such problems as making and testing balsa wood structures, creating an original scene that takes place in the city of Pompeii, and inventing devices to convey tennis balls into containers. Competition begins at 8:30 a.m. at Albuquerque High School. Parents and interested community members are invited to attend. Several Sandians have volunteered to judge the state tournament. For information, call Kaaren Allen on 243-7811.

Recent Retirees



Elwin Schaefer
7845



Cecil Land
1164

35

Sympathy

To Jackie McWilliams (3151) on the death of her mother in Newark, Del., Feb. 22.

To Ron Hill (7556) on the death of his father in Caro, Mich., March 4.

To Nancy Spencer (142) on the death of her mother in Lewisburg, Pa., March 13.

To Judy Galvan (3731) on the death of her husband and Tony Jojola (7473) on the death of his son-in-law in Isleta Pueblo, March 16.

To Mike (1821) and Maureen (6341) Eatough on the death of his mother and her mother-in-law in Denver, March 21.



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"STRESSFUL" INTERVIEW - Linda Duffy (3330), coordinator of Sandia's TLC (Total Life Concept) Fitness Programs, is interviewed by Bruce Hawkinson (Org. 5) for a show on Sandia's new radio station, KOP 20. Linda discussed ways to cope with the increased stress that many Sandians are experiencing as a result of the longer workdays and pressures brought on by the ES&H initiative and upcoming Tiger Team visit; this show was broadcast on Wednesday. KOP 20 first went on the air March 18. The station normally repeats a 6- to 10-minute show continuously, changing programs at 4:30 p.m. weekdays. The station's 10-watt signal reaches about four miles from the transmitter in Bldg. 957. Tune in at 1610 on the AM frequency.

Women Role Models

Sandia-Sponsored Math & Science Workshop Helps Inspire Teenage Girls to Stay in School

Nearly 600 young women from 45 different schools in the East Bay attended a recent daylong conference cosponsored by Sandia that, in the words of one teacher, may help students choose between being doctors or gang members.

Called "Expanding Your Horizons in Science and Mathematics," the conference was sponsored by Sandia, Lawrence Livermore National Laboratory (LLNL), and the American Association of University Women. It was co-chaired by Mary Rivenbark (8534) and Lori Jensen (LLNL) and held in Pac Bell's offices at the Bishop Ranch business park in San Ramon.

Eight Sandia women presented hands-on workshops; about 40 other Sandians helped with the conference.

Among topics discussed by Sandians were the local geology, presented by Sandy Leo and Sally Raubfogel (both 8542), and the properties of metals and their application to design, presented by Jane Ann Lamph (8441). Mim John, Supervisor of W89/SRAM II Test & Evaluation Div. 8156, played the role of Mystery Woman No. 4, answering questions about her career while students tried to guess what she did. The technical career of each mystery woman was revealed to participants at the end of the day.

A Teacher's Thanks

One Stockton-area high school teacher, who led a group of students from a "high-risk" school, praised the workshop for its potential impact on students who might otherwise quit school:

"We brought 26 girls from our high school in Stockton. They could never have imagined such a beautiful building. They could not imagine that they could work in such a place. We brought some

"You tell them that you need them and you want them in so many direct and indirect ways."

bright, self-motivated, responsible girls, but we also brought some bright, peer-motivated, blown-by-the-most-popular-breeze, irresponsible girls. I brought one who can't decide if she wants to join a gang or be a doctor. She is a natural leader. If we



NASA AERONAUTICAL education specialist Tom Gates demonstrates the use of a space suit with assistance from a student volunteer. (LLNL Photo)



"METAL MANIA" was the name of the hands-on workshop offered by Jane Ann Lamph (8441). It explored the properties of metals and their application to design. (Sandia photos by Val Pestanas, 8481)



can prevent her from being a dropout, we can probably catch 15 of her friends.

"We lose close to one-half of our freshmen. Some of them were on the bus [that came to the conference]. I bet we don't lose them now!

"They were treated so well at the conference; the workshops were well set up — with hands-on, multiple activities, friendly presenters, helpful guides, beautiful environment, and good food. They got \$50 worth of expanded horizons in the first hour. You tell them that you need them and you want them in so many direct and indirect ways. They talk to real people in real jobs — you are more convincing than I could ever be.

"On behalf of their friends who may not drop out, I thank you. On behalf of the people in the dropout prevention program who will not realize you are the reason for their success, I thank you. On behalf of the teachers who will see more girls in their science and math classes, I thank you. On behalf of the girls who will understand — later on — I thank you.

"As a teacher on the front lines, who has had a chance to see that there are people in the real world who care as much as I do, I thank you. For the organization, for the volunteer time, for the facility, for the workshops, I thank you."

"Just that one response makes it all worthwhile," says conference co-chair Mary Rivenbark. ●BLS



EXPANDING YOUR HORIZONS co-chairs Mary Rivenbark (right, 8534) and Lori Jensen (LLNL) talk over the day's results.



CONDUCTING A WORKSHOP called "Between a Rock and a Hard Place" were Sandy Leo (right) and Sally Raubfogel (both 8542). The workshop dealt with the geology of the valley.

Ten Days 'til Tiger Time

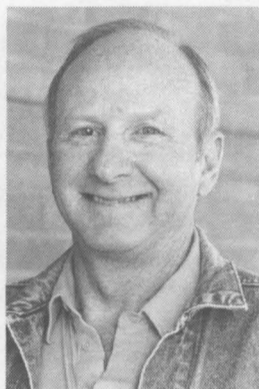
Tigers to Begin with Tour of Labs Facilities

The DOE Environment, Safety, and Health (ES&H) Tiger Team will begin its long-awaited 40-day (but, hopefully, not 40-night) visit to Sandia in just 10 days. Its mission: to conduct an independent oversight compliance and management assessment of the Labs' ES&H effort.

This will be the 22nd of 35 Tiger Team assessments that DOE Secretary James Watkins has directed to be completed by the end of FY92.

Team members will swing into action immediately, boarding buses for afternoon tours that will carry them along the many miles of paved and unpaved roads that crisscross the Labs' 20,000 acres on Kirtland Air Force Base.

Team leader Dave Spence believes the tours will help the assessment get off to a smooth start. "Tours we took last month on our pre-assessment



DAVE SPENCE

visit here convinced us that the entire team should start its Sandia stay by seeing the expanse and scope of your operations."

That pre-assessment, held March 19-21, brought 14 Tigers to the Labs. Besides Spence, leaders of the three sub-teams — Environmental, Management, and Safety and Health — and other

key team members and assessment organizers attended.

Spence says, "Trips to places like the microelectronics and process development labs, the centrifuges, drop towers, solar facilities, Area II, and the reactors, to name a few, helped us see the need for our in-the-field team to be at least 90 Tigers, instead of the 60 or 70 that we'd planned originally.

"Your operations are much broader than I

Hot Line Announced

A Tiger Team Hot Line — 845-7870 — will operate during the team's assessment of Sandia. The line is for anybody — employee, contractor, visitor, or member of the general public — who wants to comment about ES&H practices at Sandia or who wants to raise an issue with the Tiger Team.

The 24-hour line will be controlled and monitored only by members of the Tiger Team. Dave Spence, Tiger Team leader, says the number of hot-line calls for Tiger Team assessments at other DOE facilities has ranged from five to 50 per audit.

thought," he adds. "Although I've been visiting here a couple of times a year for the past five years, and have driven around the facility with Jim Linn [Supervisor of Underground Storage Technology Div. 6257], my interests then were only on a narrow aspect of your operations — geotechnical and security aspects of the Strategic Petroleum Reserve."

Private Discussions

Besides the tours, Spence says another particularly important part of the March pre-assessment was the team's private discussions with local and state regulators, representatives of KAFB, and officials of unions that represent a significant number of Sandians.

Regulators — representatives from the New Mexico Environmental Improvement Division, for instance — probed Tigers about the assessment process.

Union leadership singled out several Sandia ES&H program managers for applause, in particular Glen Cheney (VP 3), Pace VanDevender (ES&H Communications Project Manager, 1200A), Nestor Ortiz (3200), and Dick Lynch (3600). "In some cases, however, this group felt that enlightened management ran out of gas at the first and second levels of supervision," Spence reports. "We'll want to look more into that when we return."

Finally, Spence believes the pre-assessment visit went a long way "toward removing a lot of the mystery and fear about this process" for Sandians who had the opportunity to participate.

Excellence, Not Just Compliance

Echoing that theme, Steve Singal, leader of the Safety and Health Sub-Team, says, "People need not worry that we will be arbitrary during our investigations and interviews. There are published performance objectives and criteria for us to follow. But you need to remember that we'll expect you to be striving for ES&H excellence, not just compliance."



STEVE SINGAL

Singal, whose sub-team will be the largest of the three visiting here, says his group's objectives include:

- identifying areas where margins of safety (and levels of excellence) can be improved by taking reasonable actions;
- identifying underlying root causes for observed weaknesses; and
- identifying noteworthy practices.

Singal will bring along technical experts in organization/administration, maintenance, auxiliary systems, technical support, experimental ac-

tivities, fire protection, personnel protection, medical services, training and certification, emergency preparedness, security/safety interface, facility safety review, packaging and transportation, criticality safety, radiological protection, quality verification, operations, and worker safety issues (OSHA compliance).

"And because of the special nature of your activities," Singal explains, "we'll add experts in firearms and explosives safety."

Donna Bergman, Environmental Sub-Team leader, emphasizes that Tigers will be looking at compliance and evidence that environmental protection programs are in place to ensure compliance. "That means," she says, "we want to see whether you are taking a proactive approach to ES&H. Do you have proper Conduct of Operations, for instance?"



DONNA BERGMAN

Bergman will staff her sub-team with experts in air, surface water, and groundwater/soil; waste management; toxic and chemical materials; quality assurance; radiation; inactive waste sites; and NEPA — the National Environmental Policy Act.

Although it is the smallest group — with an expected 8 to 10 members — the Management sub-team may have the most difficult job of the three, because it must put into perspective its own findings and those of the two other sub-teams, Spence says.

Its leader is Jane Monhart. "We want to interview a representative cross-section of employees," she says. "We'll be interested in talking with budget, administrative, and management personnel in addition to representatives of environmental and safety organizations. We'll look at the adequacy and effectiveness with which you manage your ES&H operations, staff, and resources. We'll be interested in how you communicate attitudes within and throughout the work force, how authority is delegated, and, among other things, how you handle incident reporting and trend analysis." ●RGeer(3163)



JANE MONHART

Team Based in Area IV

The Tiger Team, its support staff, and some of Dody Hoffman's (3600DM) Audit Management Project Team will be sole occupants of Building 980, in Area IV, during the Tiger Team's assessment of Sandia.

"Organization 1200 recently moved out of 980 and Ed Barsis [1400] has graciously postponed moving much of his staff into that building," Dody explains.

Most work spaces in the building will be two- and three-person offices; however, there will be a few four- and five-person rooms.

The building also will house the Tiger Team library. Its documents — more than 1,000 now, with that total expected to almost double before the end of the assessment — include reports of past internal and external audits, reports of lessons learned, and copies of applicable laws, regulations, and policies. There also are Sandia-prepared reports about environmental monitoring quality assurance, hydrogeology of the Sandia Basin, solid waste management activities and procedures, and procedures for handling toxic substances.

"I expect that many of the Tigers will be spending about 20 percent of their time, and many evening hours, at the library," Dody says.

Comings and Goings

The entire Tiger Team won't be on-site at all times during its Sandia assessment. The Environmental and Management sub-teams will arrive April 15 and remain through May 5. They'll then go back to their home bases for a week of Tiger Team office work and research, and return to Sandia May 12 where they will remain until the closeout on May 24.

The Safety and Health Sub-Team will be on-site April 15-19. It will return April 29, remaining through a special Technical Safety Appraisal closeout on May 14 and the full-team closeout on May 24.



(Continued from Page One)

WIPP Robot

however, can provide researchers with an up-close view of the walls, ceilings, and floors of the rooms. Human operators monitor and control the movements of the robot from underground monitoring stations, away from the collapsing rooms. With the robot, researchers can map the inside of each

“The robots will help us monitor experimental rooms without sacrificing human safety.”

room to determine the extent of damage and how fast the rooms are deteriorating.

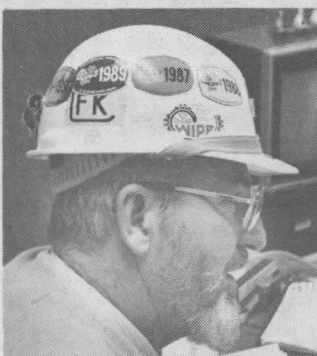
“Some of the rooms are more than 8 years old now,” says Tom. “As expected, the test rooms are slowly caving in, and the roof areas in these rooms are becoming unstable. The robots will help us monitor experimental rooms without sacrificing human safety.” (For more on WIPP safety, see “That Unbeatable WIPP Safety Team.”)

Tom says the robot can also look for cracks in walls caused by stresses on the rooms. Newer versions of the robot may be equipped with robotic arms for picking up samples from inside the rooms or confined spaces. “There are a few other techniques we’re looking into,” says Tom. “We are grateful to Ray Harrington’s robotics group [Intelligent Machine Systems Div. 1414] for providing us with a lot of help and ideas for enhancing the robot.”

Sandia modified Robo Op, a standard commercial robot manufactured by Cybernation, to perform specific underground inspection functions. The PC used to control the robot (which

Hard Hats Are Like Football Helmets

That Unbeatable WIPP Safety Team



Tom Schultheis (6343) with WIPP safety helmet

For the third time in a row, the WIPP facility near Carlsbad, N.M., has achieved 1 million person-hours without major accident or personal injury resulting in lost work days. In recognition of this achievement, the Mining Safety & Health Association (MSHA) awarded the project its second Award of Excellence in November (LAB NEWS, Dec. 7, 1990).

Tom Schultheis, Supervisor of WIPP Site Operations Div. 6343, attributes part of the safety program’s success to small stickers he and his division have been awarding to safety-

conscious employees to stick on their hard hats. WIPP workers wear hard hats whenever they go underground or work in areas where objects might fall.

“I thought the hats resembled football helmets,” he says. “Why not give WIPP safety team players merit stickers for their helmets much as football coaches award stickers to outstanding players? Some employees have four stickers now. Each sticker represents a year without accident or personal injury.

“The stickers help other employees know who to follow when going underground — the person with a lot of stickers is the one who will keep them out of trouble.”

With all the publicity about WIPP, both positive and negative, it’s nice to hear when something truly noteworthy happens at the site, Tom says, and it’s nice to award employees for work well done.

controls radio-frequency signals sent from a remote operating station) was modified, for example. Also, the two cameras mounted on Robo Op’s head were added, and a tether (essentially a steel cable attached to the back of the robot) was added. If the robot malfunctions or tips over, Robo Op can be recovered using the tether.

Robot Visits Local Schools

In February, Tom and other WIPP-site employees displayed Robo Op to junior high school students as part of a Westinghouse-sponsored Engineering Week at Carlsbad schools. The week

was designed to interest young people in engineering, math, and science.

“Robo Op scanned the auditorium and zoomed in on some of the students,” says Tom. “They got a kick out of seeing themselves on video screens through the robot’s eyes [video cameras].”

Sandia conducts research and development experiments at WIPP, with 18 employees and 15 contractors stationed there. Westinghouse, the managing operations contractor, provides another 50 experimental operations employees who work with Sandians to set up and monitor experiments in the mine. ●JG/LD

feed back

Q: An article titled “Practical Guide to Green Design” in the Nov./Dec. issue of International Design Magazine says that “in June 1989, the EPA required federal, state, and local agencies using federal money to begin purchasing paper products with a minimum wastepaper content of 50 percent.”

When I called the EPA Procurement Guideline Hot Line at (703) 941-4452, I was told the guideline defines wastepaper as postconsumer wastes (whereas the magazine article said the EPA allowed agencies to use both preconsumer and postconsumer wastes). I was told the guideline includes photocopying papers and printing papers.

But according to the rep at Dixon Paper Co., our contractor, none of the paper in our Just-In-Time (JIT) stock is made from recycled paper. When does Sandia plan to change its procurement specifications to comply with the EPA guideline?

A: Sandia’s Legal Dept. has determined that Sandia does not fit the definition of being a “federal, state, or local agency using federal money.” On this basis, Sandia is not mandated to purchase recycled paper products in accordance with the EPA guideline. However, Sandia’s contract with DOE does stipulate the use of the Government Printing Office (GPO), which does comply with the EPA guidelines.

Requiring the purchase of recycled paper products from other entities than the GPO is difficult for several reasons, including:

- Some recycled paper does not meet manufacturer’s specifications and could void warranties on copiers and printers, leading to higher maintenance costs.

- Recycled paper is more expensive. When the Dixon contract was awarded last March, recycled paper cost about 20 percent more than new paper. Because contracts are awarded on a

competitive basis, contractors quote those products that meet specifications and are the most cost-effective.

- The removal of ink from postconsumer wastepaper is an expensive, hazardous process that increases costs and decreases quality.

An effort has been made to identify recycled paper products that Sandia could use. Sixteen such products have been added to the office supplies contract, and all boxes used by Dixon are of recycled paper. Efforts are under way to add recycled paper products to applicable JIT contracts and allow the customer to decide what to purchase.

Dixon will soon provide sampler kits with recycled paper. If the products are of sufficient quality and are cost-effective, they will be added to the contract with Dixon.

Bob Zaeh (3700)

Q: Today I received a number of telephone calls that, when answered, sounded like a FAX beep. It appears that someone believes my phone number is a FAX number. I checked with my director’s secretary and she said they had also had the same problem for a time, but she didn’t know how to find out who was trying to access a FAX machine. Do you have some suggestions?

A: With the current central office equipment, there is no way to identify the phone number of incoming calls. Equipment with this capability is available on the market but Kirtland and Sandia do not have it. I suspect that folks trying to contact you will learn by experience that your phone number is not a FAX number.

Ward Hunnicutt (7800)



LEGO™ ROBOTS — Steve Sobolik (6313) teaches an attentive fifth-grade class about the use and programming of robots. The La Mesa Elementary School students watch a small robot built of Lego™ toy blocks perform the commands they programmed for it. The class was part of the Sandia Science Advisor (SCIAD) Program.

(Continued from Page One)

Upward Feedback

The analysis indicated that Large Staff, in general, scored highest in integrity, respect for the individual, and valuing diversity, while scoring somewhat lower in the teamwork, leadership, quality, and communication categories. Mark is careful to point out, however, that the individual qualities of each manager are more important than the overall characteristics of Sandia management.

With their feedback, managers were encouraged to develop action plans for improving behaviors by focusing on their weakest areas. "The idea is to make the information meaningful without getting lost in the numbers," Mark says. "We wanted to give managers a basis for modifying their behavior."

Managers were encouraged to schedule a meeting and share their completed action plans with employees in their own organizations. Mark says this step is the most important part of the program. Such open communication fosters a "we're-all-in-this-together" spirit and encourages continued open dialogue within the organization, he says.

"One manager established a code word," says Mark. "Now, whenever he exhibits a certain kind of behavior, his employees say the code word and they all laugh a bit. Others just put their feedback on a viewgraph and shared it with their people."

Looking Ahead

Because Phase I is a pilot program, both participants and recipients were surveyed to find out what they thought of the program. Most recipients (85 percent) believed Phase I was successful, while only half of the participants felt it was successful. Mark says this difference may be because some managers did not hold feedback meetings and discuss their action plans, the most rewarding and useful part of the program.

The survey also indicated that the content of the questionnaire did not meet some participants' expectations. In the next phase of the program, the questionnaire will be modified to reflect some of the comments made by participants in Phase I.

Other lessons learned from Phase I: Most recipients believed the feedback results were pre-

Next Subject: Change Management

Town Meeting to Be Telecast to Livermore

Dan Hartley, Vice President for Change Management, will be the next speaker in the Management Town Meeting series at the Technology Transfer Center. The hour-long program, about the ways Sandia is addressing the management of large-scale change, will be the first to be telecast live to the Combustion Research Facility auditorium in Livermore. It begins at 9 a.m. (8 a.m., Livermore) on Friday, April 12.

Future appearances will be by Paul Robinson (9400), former US Ambassador to nuclear test negotiations in Geneva and Los Alamos Lab's principal associate director from 1980-85, on "A Newcomer's View of Sandia" (May 17); Heinz Schmitt, Acting VP-5000, on the nuclear weapon program (June 14); and Dan Arvizu (410) on "How Effective Is Technology Transfer?" (July 12).

The late summer and fall program is expected to bring Venky Narayanamurti (1000) and Larry Bertholf (7300), among others, to Town Meeting center stage.

Not Lecture, but Exchange

"The Management Town Meetings series is intended to increase communications within Sandia and help clarify the status of important current Sandia programs," says Nigel Hey (3161), who shares coordination duties with Randy Maydew (420). "It gives the experts an

Living and Learning

Large Staff Responds to Feedback

Here's what some of Sandia's Large Staff had to say about Phase I of the Upward Feedback program. They were asked "What is the one, most important thing you learned from your subordinates' responses to the Upward Feedback questionnaire?"

Herb Pitts (3100): I confirmed my worst fear — my subordinates understand better than I do the things that I must improve.

Jim Powell (9300): I was appreciative that the department managers and division supervisors identified several blind spots in my management of the directorate. We worked together on my action plan.

Al Narath (1): I learned that I'm not doing as good a job as I thought I was, especially in the area of communications.

Orval Jones (20): I learned that I'm not alone. Giving more emphasis to building, and communicating with, the Organization 20 management team can help me solve problems.

Rick Wayne (8400): I discovered that skip-level communication was completely ineffective if it wasn't face-to-face. Passing the information through direct reports, even if done faithfully, did not meet the supervisors' needs to discuss it and get individual clarification from me.

Roger Hagengruber (9000): I learned of their [managers in Organization 9000] willingness and desire to have me provide a vision and

presented in a useful way, and 97 percent felt the internal consultants who helped them interpret the data were helpful. Many of the comments indicated that the program was a good idea but may have been less effective because of the number of initiatives currently under way at Sandia.

Phase II — Bigger and Better

With Phase I essentially complete, the next phase is just around the corner, says Mark. With the Tiger Team visit and the employee perfor-

formance and compensation review imminent, Phase II is scheduled to begin in October and will involve all Sandians through department managers.

Each participant will complete both a skip-level and a direct-level evaluation of his or her line management. This breakdown emphasizes differences between the way employees perceive the manager directly above them and how they perceive the management two levels above them in the organization. Mark expects to receive more than 17,000 responses.

Because of the volume of data in Phase II and the difficulty of number crunching, a few changes will have to be made. Computer-scannable questionnaires will be used, and Jim Stromberg (3532) is creating a set of programs capable of analyzing and presenting the data. Also, the Labs is too large to handle all at once, so each vice presidency will be tackled separately in Phase II. Mark says he hopes the cycle of soliciting feedback and presenting results can be shortened to 3 months, as well.

Criteria on the 50-question questionnaire range from "Communicates a clear picture of where the organization is going" to "Admits when he or she is wrong." As in Phase I, responses will be presented to recipients in terms of number scores for Sandia's corporate values — communication, integrity, leadership, quality, respect for the individual, teamwork, and valuing diversity.

"Expressing management's effectiveness in terms of Sandia's corporate values shows that we're serious about living up to the Strategic Plan," says Mark.

Marv Torneby (3530) says, "Phase I seems to have accomplished the purpose of opening up communication. This really sets the stage for a successful Phase II." (See "Large Staff Responds to Feedback.")

A number of people contributed to the success of the pilot phase. Project committee members included Ralph Bonner (3500, chair), Pace VanDevender (1200), Tom Cannon (2850), John Cantwell (ret.), Jim Jacobs (5200), Dick Traeger (6230), Judy Mead (7200), Paul Brewer (8500), Doris Miller (7540), and Dennis Reynolds (9223). Harriet Morgan (3533) and Mark James served as project leaders.

Jim Jacobs (5200): Frequent, candid interchanges at all levels are extremely important and will lead to a more cohesive and effective management team.

Ralph Bonner (3500): I learned that I spend too much time in meetings and this leads to invisibility. Credibility is as much a function of presence as message. You can't lead from a closet.

Bob Eagan (1800): The clear communication of our [1800] mission needs more attention. In fact, communication across the board needs improvement.

Dan Hartley (5): My communication skills are not as good as I thought. For example, my failure to summarize issues after discussion often left my colleagues with an unclear picture of my position.

Venky Narayanamurti (1000): The Upward Feedback process had a powerful impact on me. I learned the great importance of two-way communication. As a result, active listening is *the* item in my action plan. Now that the ice has been broken, I hope all members of Organization 1000 will continue to give me constructive feedback.

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(Continued from Page One)

Reactor Safety

early 1970s. For the past 15 years, Sandia has been one of the leading institutions with the responsibility to update risk analysis methods using new computational models and the latest technology for analyzing the physical processes of severe accidents.

'Snapshot in Time'

The landmark report, called NUREG-1150, is a "snapshot in time" of the actual risks at five nuclear power plants in Virginia, Illinois, Tennessee, Pennsylvania, and Mississippi. It compiles more than 10 years of research since the NRC's 1975 Reactor Safety Study and is intended to serve as a resource for investigating where safety improvements might be pursued at all nuclear power plants and the cost-effectiveness of possible plant modifications.

Much of the study consisted of updating and refining existing methods. However, new methods were developed to analyze accident progression and characterize uncertainty of risk assessments. Many of those methods are already being implemented in nuclear power plants.

"We think the methods we have here represent the state of the art for risk assessment," says Allen Camp, Supervisor of Reactor Systems Safety Analysis Div. 6412. Operators of each of the nation's 108

NUREG-1150 is a "snapshot in time" of the actual risks at five nuclear power plants.

operating plants are being encouraged to use similar methods to do their own risk assessments, he says.

Though the goal of NUREG-1150 is primarily to update risk assessment methods, it also produced a number of significant findings. In general, NUREG-1150 found that the risks to the public from operation of the five plants are lower than 1975 estimates for the two plants studied at that



MORE THAN 50 Sandians had a hand in the work documented by the 35-volume NUREG-1150 report. Looking over the report are Allen Camp (left, 6412) and Fred Harper (6413).

time. The risks to an individual living near the plant were determined to be well within NRC safety goals. The chances of accidents themselves were found to be less than previously expected.

"What we found from the plant assessments is that the risks of severe accidents were extremely low," says Fred Harper, Supervisor of Reactor Modeling and Regulatory Applications Div. 6413. The chances of a malfunction or system failure proceeding to meltdown were predicted to be about one in 100,000 per year for each plant. Fred and Allen believe that the project increased the safety of the studied plants because of the scrutiny to which they were subjected. Some potential problems were identified and cleared up as the study proceeded.

Computer Modeling To Estimate Risk

NUREG-1150 is founded on a technique called probabilistic risk assessment (PRA), which

can be used to evaluate risks associated with any activity that involves a potential hazard. For a nuclear power plant, PRA involves making a list of events with the potential to trigger an accident and then calculating whether they could lead to a reactor core meltdown and release of radioactivity. An "event" could consist of such happenings as loss of power to the plant, a fire, or component failure. If the event or a sequence of events could result in a meltdown, computer modeling is used to develop accident scenarios and calculate "source terms" — the amount, type, and timing of radioactive releases.

Teams of scientists and engineers, primarily from national laboratories, compiled the risk assessments after close examination of plant documentation, practices, and equipment. More than 50 Sandians, primarily from the Systems Safety and Reliability Dept. 6410 and Nuclear Energy Sciences and Materials Technology Dept. 6420, were involved in the project and participated in the assessment of four of the five nuclear power plants (see "What Might Go Wrong — And How Likely?").

NUREG-1150 now can be used as a foundation to develop and conduct individual plant examinations and accident management studies. Though the study's methods apply directly to light-water reactors (the only kind used commercially in the US), possible vulnerabilities identified in the study may be applicable to plants of similar design, such as heavy-water reactors or high-temperature gas reactors. The study already has the backing of the American Nuclear Society, an alliance of industry, academic, national laboratory, and government representatives.

"NUREG-1150 is expected to be a valuable tool for the industry for years to come," Allen says.

●JClausen(3161)

Looking for Accidents to Prevent Accidents

What Might Go Wrong — And How Likely?

Study teams that included more than 50 Sandians undertook four types of analyses for the nuclear power plants included in the NUREG-1150 report: accident frequency analysis, accident progression, source term analysis, and environmental consequences. All the analyses assumed a reactor was operating at full power when the event triggering the accident occurred.

The accident frequency analysis identifies what could go wrong and how likely it is to occur. After identification of all the ways a plant's safety systems can be challenged — such as pipe breaks, earthquakes, and human errors — models are developed and run on a mainframe computer to assess the probability that the plant will not respond as designed. The results reveal the likelihood that an event will proceed all the way to a fuel-core meltdown.

The accident progression analysis identifies accident scenarios that might occur once fuel in the reactor core begins to melt. These scenarios may involve steam explosions, hydrogen combustion, or interactions between molten fuel and the reactor's concrete floor. Having studied these phenomena in extensive experimental programs, members of Dept. 6420 provided valuable information to risk analysts in Dept. 6410 during the course of the study.

Logic of Containment Failure

The risk analysts used available experimental and analytical information to construct detailed logic models that estimate the probability that a certain accident scenario will occur.

"What we consider in this stage are all the possible pathways, and their respective probabilities, that could lead to reactor vessel breach and containment failure," says Fred Harper (6413).

Containment failure means that the concrete structure housing the reactor and other equipment is breached in some way, releasing radioactivity into the environment. In 1979, the Three Mile Island reactor containment building withstood severe accident conditions without failing.

The analysts perform a source-term analysis to determine how much radioactivity is released into the environment, the energy associated with the release, and the timing of the release for all of the possible accident pathways. These parameters are important for predicting what the health effects will be after the breach. Using simplified algorithms, researchers are able to calculate the amount of fission products present in the reactor under different conditions, track their progression through a variety of pathways, and determine the amount released from the containment building.

The last step in the assessment is to calculate the off-site consequences of a severe accident. Releases of radioactivity to the atmosphere can result in a variety of early and delayed health problems, land damage, and economic losses. Calculations are made of the doses received by the exposed populations via inhalation, ingestion, and other pathways, taking into account emergency response actions such as evacuation and decontamination.

Earnings Factors December 1990

Long-Term Savings Plan for Management Employees (LTSPME)	Earnings Factors
AT&T Shares	.9481
Government Obligations	1.0138
Equity Portfolio	1.0292
Guaranteed Interest Fund	1.0072
South Africa Restricted Fund	1.0375

Long-Term Savings and Security Plan (LTSSP)

AT&T Shares	.9478
Guaranteed Interest Fund	1.0072
South Africa Restricted Fund	1.0371
Equity Portfolio	1.0290
Employer Stock Fund	.9576

Sandians Flaunt Their Talents**Foot-Stomping Music Rouses Young and Old**

At Saint Mary Rest Home in Albuquerque, an old man taps his feet, softly at first, while a live band plays some spirited tunes. Soon, he begins tapping his feet more boisterously as his upper body begins to move, keeping time to the music. At last, unable to resist the urge, he stands up and starts to dance (Enid Sterling [9145], one of the musicians, joins him).

This is the kind of audience the 20 or so members of the Mountainside Jug Band, who count among themselves several current and former Sandians, most enjoy — listeners whose lives are visibly transformed, even if only for a short time, by their performance.

Of course, the band has such a foot-stomping selection of old-time, country-style, and home-made instruments, it's hard not to be moved. In addition to the standard instruments such as banjo, fiddle, harmonica, and guitar, the group plays bass tub, washboard, dulcimer, autoharp, balalaika, ukelele, mandolin, and every conceivable kind of noisemaker — tin whistle, slide whistle, train whistle, duck call, jew's harp, wooden spoon, kazoo, bicycle horn, jingle bells.

Added to this is a large array of heavy, ceramic jugs (the moonshine variety), from which the band takes its name. Jug player Gene Church (7231)

"We go anywhere. We even played once for a horse."

blows into the jugs at the appropriate moments, making sounds with different pitches depending on the size of the jug.

"I found the biggest one at an antique shop in New Jersey," says Gene, "and hand-carried it on the plane."

He also has a special kazoo — band members removed the insides when they discovered he couldn't carry a tune, notes Enid.

"They're all just jealous," retorts Gene. "I happen to be the only one in the band with a perfect voice — a monotone."

'We Go Anywhere'

Dressed in overalls and blue jeans (and bow ties if the occasion requires), band members play at nursing homes, retirement homes, hospitals, rehabilitation centers, the state prison in Los Lunas, and once, they played at a mental institution. They play at parades, religious gatherings, carnivals, schools, and community events. They generally will perform for anyone who asks, free of charge (donations, though rare, go for gasoline and sheet music).

"We go anywhere," notes Harriet Mason Goodness (5261), who plays a banjo that belonged to her grandmother. "We even played once for a horse," she adds. The animal had just won a major horse show, and its owners held a champagne party in its honor.

Though most of the band's members belong to Mountainside United Methodist Church in Cedar Crest, anyone is welcome to join. No particular talent is required, except a desire to sing and have fun.

The group's repertoire is a mixture of gospel and folk music. Band members usually end each performance with "Amazing Grace." Other titles include: "She'll Be Comin' 'Round the Mountain," "I'll Fly Away" (a favorite with prison inmates), "Peoria," "Uncle Walter (Dancing With Bears)," "I'm in Love with a Big Blue Frog," "Red River Valley," "This Little Light of Mine," "Gimme That Old-Time Religion," "Get on Board, Little Children," "Simple Gifts," and "When the Saints Go Marchin' In."

George Trever (9215) plays a bass tub that he made himself. It consists of a large, metal washtub turned upside down with a long pole on top of it,



THE MOUNTAINSIDE JUG BAND plays down-home-style music, complete with washboard, bass tub, banjo, and a host of other instruments. Among those performing recently at the Highland Senior Citizen Center in Albuquerque are (from left) George Trever (9215), Judy Trever (seated), Jo Ann Cahill, Harriet Goodness (5261), Anna Marie Mowrer, Mona White, Lewis Pearsall, Dorie Rogers, and Enid Sterling (9145).

cable clamps, and telephone wire for a string. On its side is written, "WERSHTUB."

"It plays better in the keys of C and G. I have a dickens of a time with the key of D," he says.

Among other decorations, the tub sports a bicycle horn. "This little horn is another K-Mart blue light special," says George. The arrangement makes it possible for him to toot the horn, play the bass, and blow a whistle all at the same time.

"It's akin to walking and chewing gum," jokes Harriet, "but if you asked him to shake hands, too, that's out."

Meet Lots of Interesting People

Other Sandians in the jug band include Tom Moody (ret.), who plays mandolin, harmonica, and train whistle; former Sandian Patti Simari, who plays guitar; and Bob Dawirs (ret.), who plays jew's harp. His wife, Elsie, plays the washboard. George's wife knows American sign language, and sometimes translates songs for folks who can't hear.

One of the band's favorite places to go is the Montosa Cowboy Camp, an annual religious revival near Magdalena. The jug band has been singing there for the past 10 years.

In addition to having a good time, band members meet a lot of interesting people wherever they play, notes Harriet.

Recently, when the band played at St. Joseph Rehabilitation Center, an old man in the front row sang his heart out. It turned out he had been a Baptist minister for 27 years, and was recovering from a stroke he'd suffered while visiting New Mexico. The walls of his room were plastered with get-well cards from his congregation.

"Those are the places where you hope not to see the same faces twice," says George.

Another place where they don't always see the same people — depending on circumstances — is the state prison in Los Lunas. The band has a standing invitation to perform there every two months, notes Harriet, but the last time they were there, a man who had previously recorded their

performances had apparently been released.

On another occasion, after a performance at the Albuquerque Rescue Mission in downtown Albuquerque, an old, ragged-looking man told Harriet — and he was perfectly serious — where she could get a free meal on Thanksgiving. •LD

Recent Patents to Sandians

Jerry Brannon (1128) and Don Cowgill (8343): Laser-Triggered Vacuum Switch.

Carol Ashby (1126) and Scott Reed (7476): Sol-Gel Antireflective Coating on Plastics.

Harry Hardee (6230): Fluid Driven Torsional Dipole Seismic Source.

Harry Hardee (6230): Rotary Pneumatic Valve.

Ken Ward (1821), David Haaland (1821), Mark Robinson, and Robert Eaton (both UNM): Method of and Apparatus for Determining the Similarity of a Biological Analyte from a Model Constructed from Known Biological Fluids.

Len Beavis (7471), Janda Panitz (1834), and Don Sharp (1841): Photovoltaic Cell Assembly.

Bob Hughes, Tony Ricco (both 1163), Jay Snelling (1141), Tom Zipperian (1141), Charles Kelsey, and Richard Lane (both UNM Cancer Center): Methods of In Vivo Radiation Measurement.

Ron Andreas (9130), Mike Heck (2330), Stew Kohler (2334), and Al Watts (9132): Wellbore Inertial Directional Surveying System.

Terry Guilinger (1841), Mike Kelly (1824), Sam Martin (2541), Joel Stevenson (1841), and Sylvia Tsao (former Sandian): Porous Silicon Formation and Etching Process for Use in Silicon Micromachining.



feed **feedback**

Q [submitted in early January]: Well, it has happened again, another 1-1/2 weeks of paid holidays wasted at home while the weather is miserable and the roads so bad you hate to drive. I understand that energy conservation is a real concern, but I also think other factors should be considered when imposing the "Christmas shutdown":

- *Most people I have talked to would rather have time off during the spring, summer, or fall, when they can be outdoors doing things. Morale of the troops should be a consideration.*

- *Has a study ever compared the energy savings of a winter shutdown vs. a summer shutdown, when air conditioners are going full blast?*

- *Though Sandia saves energy, most employees consume somewhat more energy during the shutdown because they are home all day and must keep their furnaces turned up, rather than setting them back to a lower level while they are working.*

- *Sandia graciously gives us enough vacation days to allow those who want to take off at this time to do it.*

Thank you for listening. I hope it doesn't sound like I should sign this, "Bah Humbug."

A: Thank you for your feedback. Your thoughts caused us to think about the appropriateness of a practice we have come to take for granted. The holiday shutdown is common in industry and within the DOE family because employee requests for time off make staffing difficult and because holiday distractions tend to lower productivity.

Your views on energy savings are essentially correct. Remember, DOE looks at the amount of energy used at Sandia, not the changes in home energy use. DOE's reporting requirement is rooted in its national energy conservation mission. DOE energy reporting does not consider costs like freezing damage, which approached \$100,000 during the shutdown, offsetting much of our energy savings.

I am sure there are other employees who share your preference to work during the holidays, but we have seen no widespread support for changing policy. Union representatives have not asked for a change, implying their membership likes the current practice. About 20 percent of our employees are represented by unions, and any change to the holiday schedule would have to be bargained with the unions. It would make no sense to have different shutdown periods for represented and non-represented populations.

In conclusion, the shutdown does save energy, breaks even at best on cost, and is probably desired by a majority of employees. If a significant majority wants a summer shutdown or no shutdown, management would be willing to consider such a change.

Lee Bray (30)

Q: After reading Al Narath's memo to all Sandians about the Better Air Campaign, I was a little distraught. Why only one week a year? And why is it necessary to provide a "challenge" to Sandians? Is carpooling so repulsive that a competition is required to provide incentive? Maybe Sandia's management should provide the needed encouragement all year long. When only a competition can provide the drive necessary for ridesharing, we are in a sad state of affairs.

A: Several questions were raised during this year's "Better Air Campaign Clean Air Challenge Week." The questions concerned different aspects of the competition, such as Sandia's cost vs. the benefit received, why it is held in the winter, the way the challenge is tallied, and why we endorse an activity that should last all year. These matters are addressed below:

Carpooling, busing, hiking, etc., are important ways we can help our environment. Sandia has participated in Albuquerque's Clean Air

Challenge for the past three years to show support for environmental issues. The rules, dates, and duration of the challenge are set by the city. Presumably, the challenge is held in winter due to increased public awareness of air pollution. Prizes, posters, and media coverage are paid for by the Ridepool Association. In light of other priorities, little was done this year in the way of advance publicity or ceremonies. But please note that we are participating in this program to increase awareness of an issue that is much more important than a contest of short duration.

The city arranges such promotions in a spirit of volunteerism — no coercion is tolerated. The idea is to get people involved on a year-round basis in energy conservation. It is hoped that Sandians will participate. Sandia tries to make employees aware of environmental and transportation information and assistance.

Employees who want additional information on vanpooling, carpooling, bus ridership, or bike routes and trails may call Linda Stefoin (3543) at 844-RIDE.

Ralph Bonner (3500)

Q: For the past 10 years that I have worked at Sandia, the secretary has been responsible for filling out our weekly time cards. Because of the timing involved in getting the cards to Payroll, we end up signing our time cards before they are completely filled out. I have trouble with signing a blank time card to be filled in by someone else later — I would think this violates some sort of government or corporate accounting procedure. It has resulted in me signing a time card that later had an error put on it by someone else, yet I was the one held responsible by Payroll. Should we be required to sign time cards before the fact?

A: Your concern is valid. By your signature, you are attesting to the validity of data on any document you sign. I understand the pressure placed on your organization to submit time cards to Payroll as required. Unfortunately, until a more efficient means of time recording is developed, our schedule for time card submission must be maintained. Though difficult, it remains the responsibility of your organization to coordinate proper time card validation and timely submission.

Paul Stanford (100)

Q: Since it has been so long I can't remember when I last had a filling, I was shocked at the paucity of Sandia's dental benefits. A benefit of 29 percent for a fee that is very competitive for the service provided makes me wonder if Sandia is indeed subscribing to the best plan available.

A: The Dental Expense Plan is a self-insured plan, meaning that Sandia designs the plan and pays all claims from the general funds of Sandia Corp. The plan administrator, in this case Metropolitan Life Insurance Co., follows Sandia's instructions and advises Sandia on the amount of claims paid so the funds will be available. Although the administrator may change when it is necessary to put the contract out for bid, the plan format remains intact. Sandia's plan, including the reimbursement schedule and updates, is patterned after AT&T's Dental Expense Plan.

The percentage of reimbursement for any scheduled restorative procedure varies depending on the dentist's charge for the procedure (as detailed in Appendix B of the Dental Expense Plan booklet). Procedure 2332 (filling) carries an average charge of \$76.27, ranging from a low of \$40 to a high of \$148, with an average reimbursement ratio of 57 percent. This is based on Metropolitan data for a 24-month period ending December 1990. Of approximately 400 dentists in the Albuquerque area, 365 were represented during that time period. This information is made available to

Sandians through the Dental Fee Inquiry System, located in Benefits Bldg. 832E.

Sandia initiated the Preferred Dental Program to provide a stable fee based on an average charge for dental procedures. Dentists in the program agree to a set fee (also published in Appendix B). As of November 1990, the fee for Procedure 2332 is \$71, or very near the average charge for all dentists who treated Sandians.

Louise Loudon (3545)

Q: I would like to know how, in these times of budget cuts, Sandia can justify approving contracts with local companies that provide overhead for raises of 5 percent plus bonuses of 8 to 9 percent for their employees (green badgers who work here full time). I don't believe Sandia gave average raises and bonuses to its own employees in the 13- to 14-percent range. (I personally received a zero raise and less than 3 percent IPA this year.)

A: You raise a timely concern about cost containment in Sandia contracts. Purchasing is well aware that it plays a major role in restraining operational costs. An *Albuquerque Journal* article on Dec. 17, 1990, describes some of the steps Purchasing is taking to ensure that costs associated with contract services are in line with the local marketplace. In addition to formalizing market-based adjustments to current contracts, Purchasing is placing greater emphasis on describing generic contract needs to increase the number of interested and qualified bidders, and on awarding contracts competitively. The marketplace itself will ensure that Sandia pays a reasonable price for services.

Bob Zaeh (3700)

Q: Area IV needs a US mailbox.

A: We have sent a request to the US Postal Service to install a mail collection box in Area IV, outside Bldg. 960's north main entrance. We have not yet received a reply, but we assume our request will be granted, hopefully in the near future.

Herb Pitts (3100)

Q: Despite the fact that my Sandia function is totally office/clerical in nature, I was required to attend a class on how to lock out and tag high-powered electrical equipment. While such information is interesting, I will never use this knowledge. By contrast, first-aid classes that could benefit all employees are optional, but are scheduled only at the discretion of one's supervisor. Why aren't such broad-reaching classes mandatory?

A: We realize there has been some confusion concerning what ES&H training an individual requires. The new ES&H Training Program addresses this problem. The ES&H Directorate, the Medical Directorate, the Fire Protection Organization, and the Emergency Preparedness Division are each responsible for identifying training needs related to their areas of interest and translating them into Sandia requirements. For example, technical experts in the ES&H Directorate have studied federal and DOE regulations addressing lockout/tagout training and have determined that two lockout/tagout training courses are required at Sandia — a brief awareness course for employees who may enter areas where locks and tags are used, and a more detailed course for employees who actually use locks and tags.

The number of ES&H training courses mandated by regulation is daunting, to those who both provide and attend the training. Though important, courses such as the First Aid Awareness class that are not mandated by ES&H will remain optional. However, if an individual is responsible for maintaining the first aid kit, then training is mandatory. All employees are certainly encouraged to get such training.

Ralph Bonner (3500)

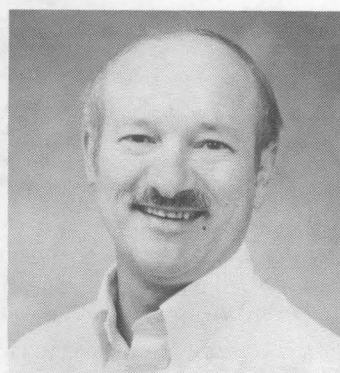
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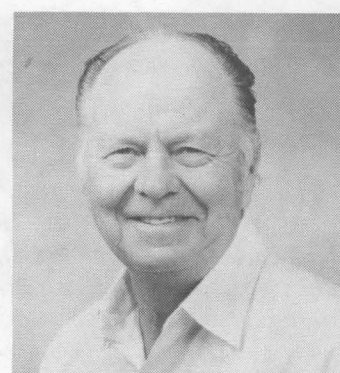
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Robert Scharrer
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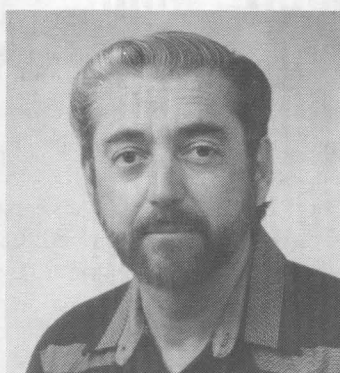
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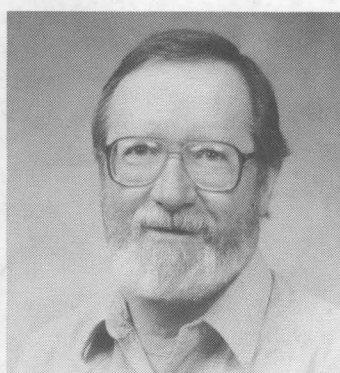
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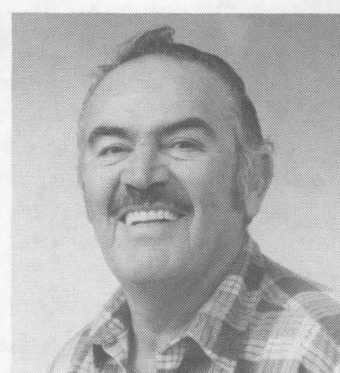
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Nelson Sexson
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Wes Pfarner
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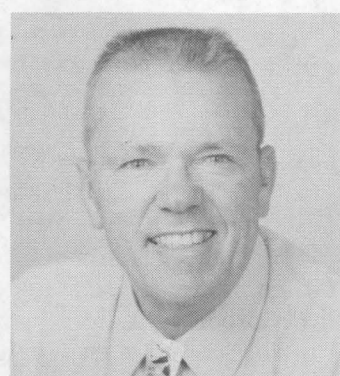
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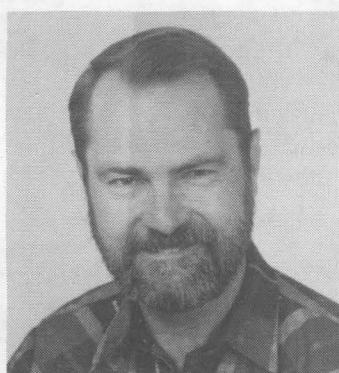
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Priscilla Spahr
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Jerry Huntting
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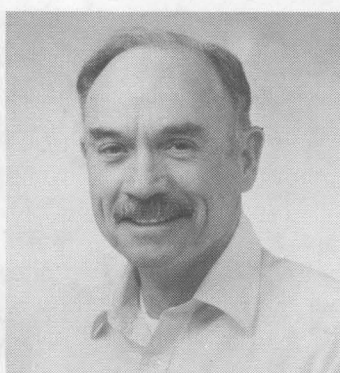
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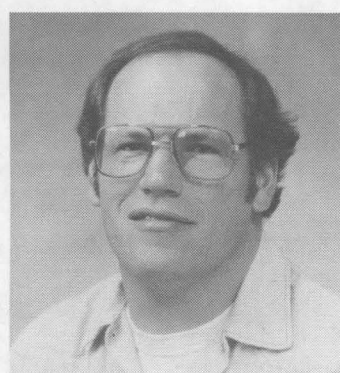
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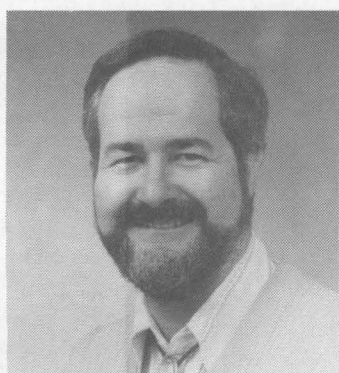
Bill Emrick
9242 30



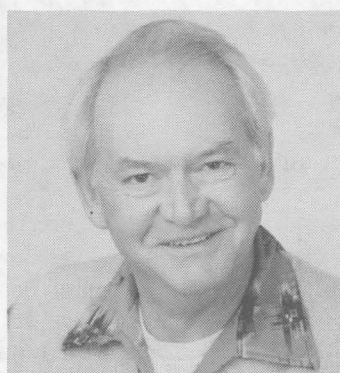
Chester Claghorn
5127 30



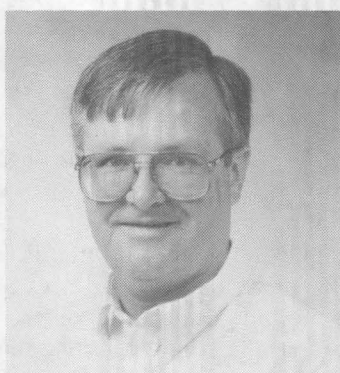
David Dellinger
3423 15



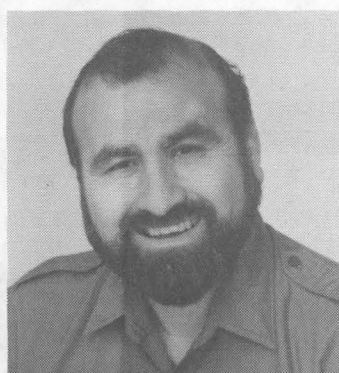
Dick Casey
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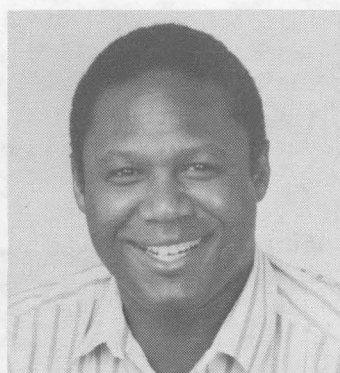
Bill Kent
8361 25



Richard Fitak
2342 15



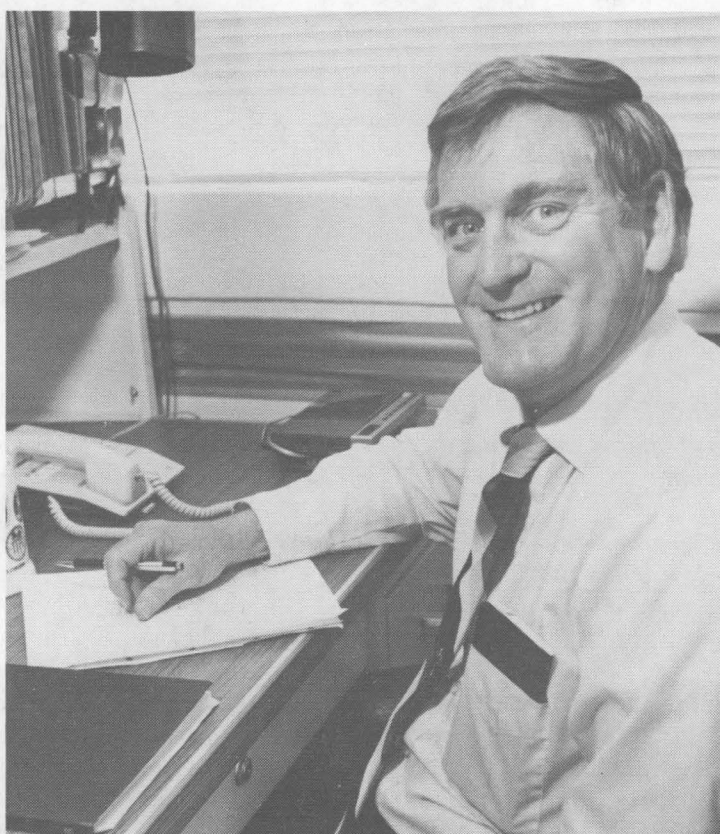
Andy Cardiel
8284 25



Jeff Moore
8451 15



Doug Buck
155 25



Herb Filusch
9216 35

Take Note

Advance registration is now open for the Ideas in Science and Electronics (ISE) '91 13th Annual Exposition and Symposium to be held in Albuquerque May 14 to 16. More than 1,500 companies will show the latest measuring and recording instruments, power supplies and conditioners, control systems and components, computers and peripherals, CAD/CAM/CAE systems, semiconductor devices, data communications and networking equipment, security systems, industrial and process control equipment, and various electronic components and services. Admission is free to both the exhibits and technical program for those registering in advance. However, the keynote lunch costs \$20 and

the technical program (proceedings) book is \$20. For information and registration, contact Becky Rouse Martin on 262-1023.

Hawkwatch International, a locally based non-profit organization whose mission is to monitor and preserve birds of prey, their habitats, and the global environment, is offering a spring seminar titled "Soar with Eagles and Hawks" on Wednesdays and Thursdays, now through April 18, from 7 to 9 p.m. Cost is \$35 (membership in HWI included) and includes an optional field trip. Registration is required. For information, registration, and seminar location, call 255-7622.

Fun & Games

Motorcycle Trials — An Observed Trials Nationals Event sponsored by the New Mexico Trials Association will be held April 13 and 14 in an area one mile north of San Ysidro, N.M., on NM Highway 44, past the Jemez exit towards Cuba (entrance will be marked by ribbons and signs). Observed motorcycle trials could be characterized as the gymnastics of motorcycle competition. Precise balance, control, concentration, and finesse count for more than speed and wildness. This event will feature top riders from across the nation competing for 1991 season rankings. For more information, call Clay Pryor (7212) on 294-6980 or Jeff Boggs on 293-0372.

UNCLASSIFIED ADVERTISEMENTS • UNCLASSIFIED ADVERTISEMENTS • UNCLASSIFIED ADVERTISEMENTS • UNCLASSIFIED ADVERTISEMENTS

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

Ad Rules

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

MISCELLANEOUS

- SCOTTY TRAVEL TRAILER, 17-ft., tandem axle, 4 mos. old, 20-mo. warranty, lightweight, \$8,000. White, 892-2316, leave message.
- MUZZLELOADERS, Thomson Center Hawkens, rifle w/shooting bag, 50-cal., \$250; pistol w/stand, 50-cal., \$175; Whirlpool spa, unused, \$40. Johnson, 293-3864.
- LAWN MOWER, Sears Craftsman, 20-in. cut, \$80. Beer, 828-2755.
- COUCH & LOVE SEAT, bone-colored, \$100 OBO. Salgado, 291-9460, leave message.
- ANTIQUA SOFA, Duncan Phyffe, \$350. Castillo, 294-5182.
- OLD VACUUM TUBES w/2-digit number (26, 27, etc.). Thalhammer, 298-8521.
- SHARP WIZARD ELECTRONIC ORGANIZER, model OZ-7000, w/calendar, calculator, 3 phone/address directories, case, manual, PC-link cable, & software, \$235 OBO. Zaorski, 281-9194.
- BACKPACK; 2 pack frames; 12' x 12' dining cover; 10-in. radial saw; 2 cartop carriers; small trailer. Greene, 293-4997.
- CAB-OVER CAMPER, for long-bed mini or mid-size truck, used once, \$1,200, w/jacks, \$1,300. Gilbertson, 869-3468.
- LANDSCAPE RIVER ROCK, 3 or 4 truck loads, you haul, free; 2 arborvitea evergreens, 5-ft. & 8-ft. tall, you haul. Morrison, 299-4757.
- DEACON'S BENCH, seats 2 people easily, 3 cozy, \$25. Henry, 266-6467.
- AIRLINE TICKET, to San Jose, Calif., April 10-17, \$100. Rael, 345-2084.
- VCR UNIT, RCA, on-screen programming, automatic channel search, 4-head stereo, cable-ready, \$250. Sturgeon, 281-9035.
- GOLF CART, golf bag, set of Lynx clubs. Worden, 881-4486.
- GAS RANGE, O'Keefe & Merrit, electric ignition, gold color, \$125; full-size bed, frame, box spring, & mattress, \$40. Vargo, 294-8226.

- NINTENDO, 6 mos. old, w/4 games, \$100. Wanya, 891-0018.
- LEATHER COUCH, off-white, \$600 OBO; coffee end tables, \$25/ea.; floor lamp, \$15; color TV, \$25. Atkins, 821-7989.
- COUCH & LOVE SEAT, camel, \$450; bedroom furniture: queen bed, dresser, chest-of-drawers, nightstand, \$350. Marks, 275-3274.
- BRASS TRAVERSE DECORATOR RODS, 3, extend to 125 inches, \$18/ea.; soft-gold custom drapes, 84" x 112", \$50. Biffle, 293-7043.
- WALL UNIT, cherrywood, by Hooker, 117" x 76" x 21-1/2", originally \$2,200, sell for \$900. Frear, 293-2791.
- SIMMONS CRIB, oak finish, mattress; Cosco Sure-Step walker; Kolcraft stroller; high chair. Cashwell, 275-0708.
- AIR COMPRESSOR, Quincy, 1/2-hp, 12-gal. tank, regulator, \$150; shop manuals: '77 Pontiac; '84 Buick; '68 Honda 450cc motorcycle. Fink, 292-8197.
- TELEQUIPMENT OSCILLOSCOPE, type D61 (made by Tektronix UK), solid-state, dual-trace, 10MHz, w/manual, \$140. Meikle, 299-4640.
- DYNASTAR VERTICAL ASSAULT SKIS, 195cm, Sol 857 bindings, used 3 times, best offer. Fine, 294-3524.
- DAY BED, brass & white, complete w/trundle, mattress, & cover set, \$175. Tipton, 293-9285.
- HIMALAYAN CAT, declawed, fixed, 5 yrs. old, seal-point color, free to good home (moving). Lunsford, 275-0158.
- FUTON, black, full-size, w/black 3-position frame, \$150. Greer, 831-0019.
- DESK & matching chest-of-drawers, \$50; keyboard drawer (fits under CPU or monitor), \$15. Holloway, 296-6354.
- MICROWAVE, \$100; Sears Power Mate vacuum, \$200; Singer sewing machine, auto free arm, \$250. Stanfill, 255-6652.
- DOORS: 30-in., interior (LH), \$15; 2 48-in. bypass, \$15; Fisher Price high chair, \$25; guitar amp, \$75. Wilcoxon, 296-8295.
- ELECTRIC TYPEWRITER, Remington Rand, cleaned & reconditioned 2 yrs. ago, 2 new ribbons, \$30 OBO. Burke, 294-7548.
- WHIRLPOOL MICROWAVE, 700-watt, \$100; Roper electric range, double oven, \$50; 4 outdoor lighting fixtures, \$20. Aubert, 296-4173.
- SYMPHONY TICKETS, 2, Fri., May 10, cost \$48, sell for \$38 or trade for "table" seats at May 18 Pops Symphony. Barr, 821-5870.
- LEATHER MOTORCYCLE JACKET, Hein Gerliche, size 42, \$110; leather dirt-riding boots, \$20. Turner, 281-4264.
- OAK CRIBS, 2, cost \$375, sell for \$250 OBO. Serrano, 298-2807, leave message.
- LAWN MOWER, Sears rotary, self-propelled, used less than 1 season. Shortencarier, 857-0107.
- EXERCISE BIKE, \$30. Mesibov, 292-1249.
- DIAMOND ENGAGEMENT RING, 1K TW, unique setting, 3 pear-shaped diamonds, 14K yellow gold, \$4,000 new, asking \$2,100 firm. Ryburn, 897-1733.

- MOVER'S BOXES (40): includes 3.1-cu.-ft., 4.5-cu.-ft., 5-cu.-ft. (dish barrel), 6-cu.-ft., 6.1-cu.-ft., and mirror boxes; must take all, \$20. Caskey, 298-6428.
- HITACHI CAMCORDER, VM2000A, 6-1 zoom macro, auto focus, TV/VCR attachments, carry case, \$550 OBO; weed burner, \$35 OBO. Bray, 292-2410.
- NEIGHBORHOOD YARD SALE, Sat., April 6, 9 a.m.-3 p.m., furniture, toys, baby stuff, more, 700 block of Gold SE. Rosales, 243-0789.
- PC/XT/AT SOFTWARE, unopened: WordStar Professional 5.0, \$35; PC-Paintbrush, \$15; PC-USA, \$10; BSR Serial Mouse w/driver, \$25. Hyde, 268-2885.
- TRUMPET, bugle, bow and arrows, dartboard, hand-held electronic games, turntable, backpack, board games, popcorn popper, albums, cassettes. Davis, 294-1048.
- PARAGON ELECTRIC KILN, complete, \$350; ceramic molds; Staube piano, \$650; Victorian love seat, \$200; canopy bed. Mills, 299-2130.
- TOW DOLLY, Demco Model KK-260, 1987 model, new departure hubs, 2 sets straps, \$850; Scout II drive shaft, transfer case. Brooks, 299-1884.
- COLOR TV, Zenith, 19-in., cable-ready, \$145. Ricco, 828-1997.
- GARAGE SALE, Sat. & Sun., April 13-14, 5431 Timberline NW, Taylor Ranch. Gallegos, 898-7757.
- TEN-DRAWER CHEST, \$35; child's desk, \$15. Young, 884-7836.
- GREAT PYRENEES PUPPIES, AKC-registered, born March 10, available April 21, both parents on premises, \$275. Wrobel, 891-8409.
- PRINTER, wide carriage, Star Microcs Gemini 15, \$50. Kimberly, 293-5835.
- ROTOTILLER, 5-hp, front tines, 1 yr. old, \$250; lawn mower, 3-hp, gas, new blade, 20-in., \$50. Kiekel, 294-6547.
- CANON EOS 750 CAMERA, w/35-70mm f4.5A lens, gadget bag, \$320. Christiansen, 299-8319.
- LEVOLOR MINI BLINDS, 3, aluminum, 1-in., eggshell color, inside mount, 6-ft. wide, 4-ft. high, \$25/ea. Booker, 299-3554.
- DOUBLE BED, w/wood headboard, \$100; sofa sleeper, \$100; swivel rocker, \$50; Kenmore electric dryer, \$100 OBO. Parr, 892-5618.
- PROVINCIAL BEDROOM FURNITURE: desk w/bookcase, vanity, chest-of-drawers, \$140; storage bench, \$65; TI Speak & Read, \$25; Speak & Math, \$20. Levan, 293-0079.
- '89 ACURA INTEGRA LS, power sunroof, 4-wheel discs, 28-mpg city, tinted windows, \$10,200. Smith, 888-7928.
- '88 DODGE SHADOW, take over payments. Rokisky, 271-1179 after 6 p.m.
- WOMAN'S VOLKCYCLE BIKE, 10-spd., \$50. Pierce, 883-2617.
- '88 GMC JIMMY, 4x4, aspen blue, 2.8L V-6, 5-spd., off-road package, AC, PS, PB, 38K miles, \$10,500 OBO. Sterk, 299-7669.

TRANSPORTATION

- '86 CLASS-A MOTORHOME, self-contained, 13K miles, paid \$40,000, asking \$25,000. Montoya, 881-6898.
- '82 HONDA SABRE MOTORCYCLE, 750cc, V-4, 5K miles, adult-ridden, \$1,650 OBO. Abbin, 296-7678.
- CHEV. BLAZERS: '81, 2-WD, 6-cyl., \$2,800; '83, 4-WD, 8-cyl., \$5,600; both AT, AC, PS, & AM/FM cassette. Cooper, 881-1329.
- '83 EAGLE, 4-WD, PS, PB, AT, tilt wheel, AC, PW, PL, roof rack, \$2,495. Muirhead, 281-2925.
- PARTS for '88 Ford Ranger XLT pickup. Darnold, 275-8085.
- '76 MG MIDGET CONVERTIBLE, \$1,750. Peterson, 883-8463.
- '89 KAWASAKI NINJA 600R, black, 4,600 miles, \$3,300. Nelson, 884-7713.
- '89 NEW YORKER LANDAU, 37K miles, loaded, electronic dash/computer, extended 70,000-mile warranty, \$14,500. Helton, 897-4560.
- '89 FORD XLT LARIAT, 2-WD, standard 302 V-8, 4-spd., long-bed, PS, PB, AC, tilt, cruise, dual tanks, \$10,350. Burke, 299-2793.
- '79 HONDA CX500 STREET MOTORCYCLE, needs some work, \$200 OBO. Aragon, 899-8093.
- '89 KAWASAKI BAYOU 300 ATV, 4-wheeler, red, 2-WD, 6 hours riding time, \$2,700 OBO. Chavez, 899-8695 or 884-7909.
- '69 VOLKSWAGEN BUG, \$2,200 or trade for collectible project car. Shaw, 296-2531.
- '88 MAZDA 626 LX, AT, AC, silver, loaded, \$6,800. Wilcoxon, 296-8295.
- '82 FORD BRONCO, full-sized, 4-WD, 302 V-8, 4-spd., AM/FM cassette. Richards, 281-9471.
- WOMAN'S RALEIGH BIKE, \$100. Aubert, 296-4173.
- '78 VOLARE WAGON, AT, PS, PB, AC, AM/FM, \$600 OBO. Andracka, 294-2618.
- '79 CHEV. K10 BLAZER, 4x4, 78K miles, 4-spd., V-8, \$2,750 OBO. Bray, 292-2410.
- '86 CHEV. 3/4-TON TRUCK, 4x4, 350 engine, AT with overdrive, AC, PS, PB, dual tanks, passes emissions, \$6,200. Romero, 281-9423.
- '80 YAMAHA XS1100G, shaft drive, Pacific full fairing, saddlebags, running lights, AM/FM stereo cassette, 13K miles, \$1,100. Caffey, 296-1942.
- '78 CHEV. IMPALA, 4-dr., PB, PS, AT, AC, 46K miles on rebuilt 350 engine, new starter, battery. Spencer, 292-8241.
- TEN-SPD. BIKE, \$75. Mills, 299-2130.
- '79 VOLKSWAGEN RABBIT, 4-dr., AC, tow bar, \$700 OBO. Adams, 823-1845.
- '87 FORD RANGER XLT, 4x4, supercab, seats 5, AC, 5-spd., 56K miles, \$7,700. Turpin, 281-5933.
- '82 CELICA GT, silver-gray/black, 96K miles, 5-spd., AC, cruise, sunroof, supra trim, \$2,600. Martinez, 296-2292.
- '85 CAMARO Z-28, AT, T-tops, 59K miles, \$5,475. Mounho, 888-1975.
- '81 FORD FUTURA, AT, AC, PS, PB, tilt, AM/FM stereo, 97K miles, \$1,350. Stevenson, 299-3510.
- '80 MAZDA B-2000 SUNDOWNER PICKUP, 61K miles, 28-mpg, rebuilt carburetor, \$1,800. Moore, 345-4030.

- '84 BUICK CENTURY STATION WAGON, loaded, 115K miles, \$1,900; '84 Olds. 98 Brougham, loaded, \$3,900. Hartwigsen, 865-7836.
- '83 DATSUN 280 ZX, 83K miles, T-tops, AC, PS, PW, PB, \$4,500. Martinez, 292-6009.
- '70 VOLKSWAGEN BUG, AM/FM radio, 40K miles on rebuilt engine, \$1,750. Levan, 293-0079.
- '89 DODGE DAYTONA, 31K miles, \$7,150. Mills, 881-7874 or 881-1608.
- SCHWINN 10-SPD. BIKE, \$25. Atkins, 821-7989.
- '85 CHEV. ASTRO CS VAN, 8-passenger, AT, AC, AM/FM cassette, cruise, tilt, 62K miles, \$6,200. Matzen, 294-8734.

REAL ESTATE

- 2.5 ACRES, w/tall trees, S-14 & Raven Rd., appraised at \$19,500, sell for \$17,500. Swahlan, 292-3598.
- 3-BDR. HOME, 1-3/4 baths, 2-car finished garage, new built-in microwave & dishwasher, new stucco, near Tramway/Lomas, \$86,000. Burke, 294-7548.
- 3-BDR. HOME, NE Heights, 2 baths, fireplace, dishwasher, garage opener, landscaped, \$59,000. Coulter, 275-2183.
- 3-BDR. TOWNHOUSE, SE Heights, 1-3/4 baths, garage, renovated inside and outside, neutral decor, fully landscaped, \$54,900. Restrepo, 275-3370.
- 3-BDR. CONCHAS LAKE HOUSE, near lake, lake view, 1-3/4 baths, garage, covered deck, 2-1/2 hours from Albuquerque. D'Antonio, 293-4043.

WANTED

- WORKING PRINTER for Commodore 64; flute. Simmons, 293-9294.
- CAMERA, Yashica or Roliflex twin lens, 120 format. Montoya, 296-4268.
- TO BORROW OR RENT: Arabian full-dress costume to be used in horse show in May by a responsible and most grateful lady. Freshour, 256-9168.
- IVER JOHNSON ENFORCER PISTOL. Greene, 293-4997.
- WALKING CANE. Gregory, 275-3855.
- STEEL CLOTHESLINE POLES. Vanderheide, 842-9568.
- "HAPPY HOLLISTER" BOOKS by Jerry West, partial or complete set. Torczynski, 292-7191.
- BICYCLE TRAILER, for carrying 2 small children. Kimberly, 293-5835.
- APPLE MACINTOSH SE30 COMPUTER, 40MB HD, 1MB RAM, keyboard, mouse, laser printer; fax machine. Moss, 298-2643.

LOST AND FOUND

- PRESCRIPTION EYEGLASSES found in Bldg. 821 dumpster. Wagner, 4-1635 or 4-7641.



Coronado Club Activities

Tonight, the C-Club Ain't Foolin' Around

NO FOOLIN' — April Fool's Day is done, and the C-Club really gets down to business tonight, April 5, with foot-stompin' music by the Isleta Poor Boys from 7 to 11 p.m. Menu items include deep-fried shrimp or prime rib (two-for-one price \$15.95), poached halibut, steak Neptune (both \$8.95), and snow crab (\$8.50). Dinner is served from 6 to 9 p.m. Reservations recommended (265-6791).

BINGO BUFFS, YOUNG AND OLD — Regular bingo for you bingo regulars is going strong, but new faces are always welcome. Card sales and buffet begin at 5:30 p.m., and early-bird games begin at 6:45 every Thursday this month. For the younger set, kids' bingo takes place April 7, with a buffet starting at 1 p.m. and bingo at 2. Cost to play is \$2.50.

IT'S ALMOST TAX TIME, so blow off some steam at Members Night, when dancing and dining are free to members. Friday, April 12, from 5 to 7 p.m., the C-Club serves its members a slice of pizza, spaghetti with meat sauce, salad, and garlic bread (guests pay \$2, and second helpings are \$1 for everyone). D.J. Ron "R.C." Casias will play dancing tunes from 6 to 10. No reservations required.

RISE AND SHINE and bring the family to the C-Club's Sunday brunch, April 14, from 10 a.m. to 1 p.m. The usual selection of brunch goodies will be served, and adults get a free glass of champagne with their brunches. Cost is \$5.95 for adults (\$6.95 for guests), \$1 for children (4 to 12 years old), and free for toddlers. Make reservations, please.

Fun & Games

Bowling — SANDOE Bowling Association Bowlers-of-the-Month for January were: Scratch — Ron Van Theemsche (2851), 751; and Margaret Tibbets, 559; Handicap — Fidel Perez (7485), 647, 731; and Cissy Padilla, 542 and 662.

February Bowlers-of-the-Month: Scratch — Thomas Archuleta (7485), 634; and Micki Archuleta, 592; Handicap — Ron Husa (2314), 599, 671; and Cindi Laughlin, 421 and 661.

Winners of the No-Tap/Scotch Doubles Tournament held at Fiesta Lanes Feb. 23 and 24: Wayne Yoshimoto (7412) and Gilbert Anaya with a 1483 handicap series. Second place went to Mike and Roni Montoya with a 1479 handicap series.

Winners of the Four-Game Mixer Doubles Tournament held at Fiesta Lanes on March 16 and 17: Reyes (7412) and Trinie Chavez with a 1494 handicap three-game series. Second went to Mel Mefford (3531) and Mark McAllaster (6322) with a 1450 handicap three-game series.

The next and last of the 1990-91 season tournaments is a four-game, no-tap to be held at Holiday Bowl April 13 and 14.

Running, Walking, Jogging — Runners, walkers, and joggers are invited to participate in the inaugural Directorate Challenge Relay sponsored by the Sandia Labs Track and Field Club. The race will be held April 23 (rain-out day is April 24) at noon starting at KAFB's Hardin Field (parade ground). The 5.4-mile relay consists of a 0.6-mile walk, a 1.1-mile run, and a 2.0-mile run. The main emphasis of this race is fun and fitness, not high-level competition.

Each team must consist of five members and register by Friday, April 12. To be eligible for prizes, all team members must be from the same directorate. Prizes will be given for the best team overall, the first all-women team, the first all-men team, the first team with an average age over 40, the first team of "red badgers" (all uncleared), and the first coed team (minimum of two men and two women). For more information and registration forms, contact Dave Womble (1422) on 6-6918 or Kathy Hansen (7223) on 4-6551.

Events Calendar

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

April 5-6 — "A Festival of American Theatre Dance," second annual contemporary dance ensemble production, UNM Department of Theater and Dance presentation; 8 p.m., Rodey Theatre, 277-4402.

April 5-13 — "Rosencrantz & Guildenstern Are Dead," Tom Stoppard comedy about Hamlet's college chums caught up in the madness at Elsinore, Theatre-in-the-Making production; 8 p.m., CenterStage (3211 Central NE), 260-0331.

April 5-May 5 — "Frankie and Johnny in the Clair de Lune," romantic comedy by Terrence McNally; 8 p.m. Fri.-Sat., 6 p.m. Sun.; Vortex Theatre, 247-8600.

April 6 — Annual Pillow Concert, for children and their parents, Chamber Orchestra of Albuquerque, bring a pillow; music includes the 1st movement of Mozart's "Violin Concerto in D Major, No. 4"; the 3rd movement of the Wieniawski "Violin Concerto No. 2"; and the 3rd movement of the Vivaldi "Concerto for Two Trumpets"; 2 p.m., St. John's United Methodist Church (2626 Arizona NE), 881-0844.

April 7 — Classical Guitarist Bill Baker, featuring works by Sanz, Pujol, De Falla, and Tarrega, plus original pieces; 3 p.m., UNM Continuing Education Conference Center, 277-2527.

April 9 — "Romeo and Juliet," presented by John Houseman's Acting Company; 8 p.m., Popejoy Hall, 277-3121.

April 9 — "World Music: Pop Staples, Johnny Shines, and John Hammond," legendary masters of the rural Southern blues & gospel traditions; 8 p.m., KiMo Theatre, 764-1700.

April 12-13 — Classical Concert, New Mexico Symphony Orchestra, featuring "Fantasia on a Theme by Thomas Tallis" by Vaughan Williams; "Piano Concerto No. 22 in E-flat Major, K. 482" by Mozart; "Symphony No. 4 in C Major, Op. 47," by Prokofiev; and "Bolero" by Ravel; 8:15 p.m., Popejoy Hall, 842-8565.

April 13 — Oregon, with Ralph Towner (ranked in top 10 acoustic guitarists by 1990 *Downbeat* Reader's Poll), New Mexico Jazz Workshop presentation; 8 p.m., Sunshine Theater, 255-9798.

April 14 — Borodin String Trio, from the Soviet Union; 4 p.m., First United Methodist Church (4th & Lead SW), 243-5646.

April 18 — Tony Jojola, Native American storyteller, celebrating Native American Month; 1 p.m., South Broadway Cultural Center, 848-1320.

Earnings Factors January 1991

Long-Term Savings Plan for Management Employees (LTSPME)	Earnings Factors
AT&T Shares	1.0821
Government Obligations	1.0094
Equity Portfolio	1.0512
Guaranteed Interest Fund	1.0074
South Africa Restricted Fund	1.0556

Long-Term Savings and Security Plan (LTSSP)

AT&T Shares	1.0825
Guaranteed Interest Fund	1.0074
South Africa Restricted Fund	1.0542
Equity Portfolio	1.0511
Employer Stock Fund	1.0757



Favorite Old Photo



1912 HOMETOWN BASEBALL in Saltfork, Okla. — My father, Howard Ingram (front row, second from right) was 21 years old and played on a local team coached by my grandfather, George Ingram (black hat and suit). My grandmother and two aunts are in one of the carriages. I still have a Saltfork Team baseball that my father gave me, made by Spaulding and patent-stamped "Aug 31, 1912." Grandpa "made the run" into the Cherokee Strip (northern Oklahoma) from Milan, Kans., in 1893, staking his claim on what became a 160-acre wheat farm near Saltfork. My father's seventh-great-grandfather, who came from Friesland (northern Holland), used ships' timbers to build what is now the Wyckoff House Museum in Brookline, N.Y., believed to be the oldest standing frame house in the US.

— George Ingram (9118)