

Sandia Heads FAA Research Effort To Examine Safety Problems of Aging Aircraft

In 1988, when an aging commercial aircraft lost a piece of its fuselage and one of its crew members over the Hawaiian Islands, the world was rudely awakened to the unexpected structural problems that can occur in old planes.

In operation for 19 years, the damaged Aloha Airlines plane was the second Boeing 737 ever built (the first, a sister ship owned by Aloha, was in the hangar for maintenance at the time of the accident). The ruptured aircraft had accumulated the equivalent of almost 90,000 flights, or 13 a day, well beyond the 75,000 flights associated with its economical design life. This design life corresponds to approximately 20 years service for most transport aircraft.

Yet the Aloha plane was by no means the only aging aircraft that could potentially have suffered a

"It unzipped a part of the aircraft, and off it came."

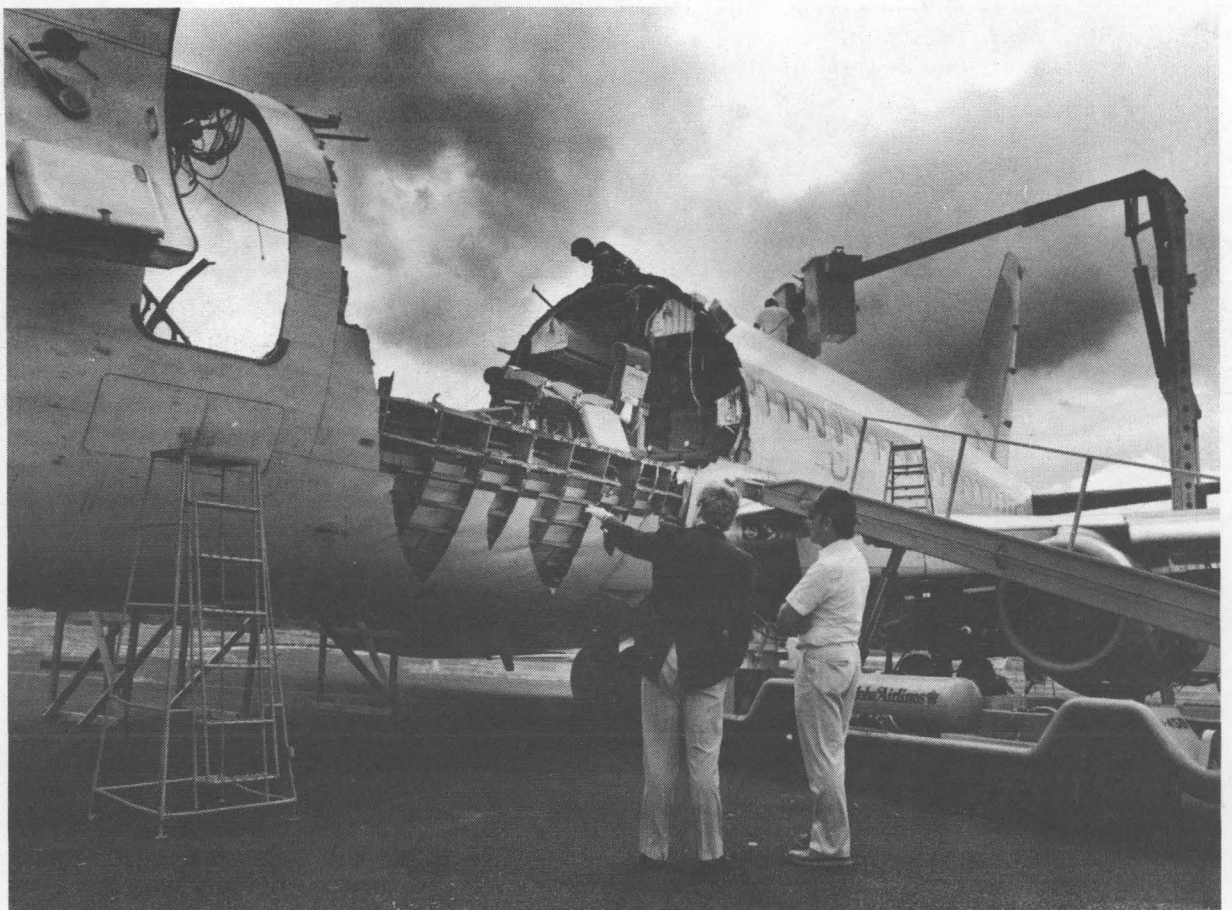
similar fate because of cracking, corrosion, or other structural problems. Today, about 30 percent of the approximately 3,700 commercial transport aircraft in use in the US are 20 or more years old; the average age is 13 years.

In an attempt to prevent such accidents in the future, the Federal Aviation Administration (FAA) ordered replacement of select rivets on older Boeing 737s. The agency has also mandated supplemental structural inspections for 737s and for all transport aircraft when they reach their design life limit.

Congress responded by passing the Aviation Safety Research Act of 1988. The act for the first time mandated the FAA, normally an exclusively regulatory agency with oversight responsibility for all commercial and private aircraft in the US, to conduct research into the problem.

After reviewing various options, the FAA asked Sandia to help facilitate the national research effort by operating a facility called the Aging Aircraft Nondestructive Inspection Development and Demonstration Center. Located at Sandia and the Albuquerque International Airport, the center is managed by Pat Walter, of Aging Aircraft Project Div. 2757.

Collaborating with Sandia in the research are New Mexico State University, recognized for its expertise in holography, and Science Applications International Corp. of San Diego (SAIC), a firm with extensive experience in non-destructive testing. Ruth David (2700) worked for 1½ years developing a partnership with SAIC and NMSU.



RUPTURED PLANE — Inspectors review damage to an Aloha Airlines plane that lost part of its fuselage in midair in 1988. (Photo courtesy National Transportation Safety Board)

Research will initially focus on six inspection technologies for detecting structural problems in aircraft. These include thermography, also known as infrared inspection; radiography or X-rays; visual inspection, typically using a dye penetrant, microscope, or borescope; coherent optics, also known as holography; ultrasonics, a technique

similar to medical ultrasound; and non-destructive inspection (NDI) reliability, including the human factors that influence the inspection process, especially as it relates to the use of eddy current devices (see "One-Stop Shopping," page five).

Besides looking at aging transport aircraft, the
(Continued on Page Four)

Sandians Give Views on Quality — Page Eight
PBFA II Focuses Beam on Targets — Page Six



LAB NEWS

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HELPING SANDIANS CELEBRATE — Children from Christina Kent Day Nursery sang at last week's ceremony marking the 35th anniversary of the Employee Contribution Plan, which has raised more than \$20 million during this time. Seen here are (from left) Monique Gonzales, Megan Lee, Ashley Brito, Amanda Chavez, and Sara Scott-Aragon (see story on page ten).
(Photo by Mark Poulsen, 3162)

Streamlining Sandia

Restructuring Combines Management Levels

Strengthening the Labs' customer orientation, using department managers' experience and skills to enhance program/project management, reducing the administrative load on supervisors, and providing a framework for containing costs are among the goals cited by President Al Narath for his decision to restructure Sandia's management system.

The major effect of the restructuring decision, announced to employees in an Oct. 4 *Sandia Bulletin*, is to reduce the number of management positions in the functional reporting chain from seven to six (see "Transition to Restructure" chart on page seven).

The current department manager level will be renamed manager, level 2. The current division supervisor level will be renamed manager, level 1. In effect, the restructure collapses the current department and division positions into a single position (department). The number of salary levels, however, remains unchanged. When the transition is complete, the new department managers (level 1 and 2) will report either to center directors (directorates will be called centers) or VPs, and no level 1 managers will report to level 2 managers.

Sections will also get a new name — team — and team supervisors will
(Continued on Page Seven)

This & That

Big Day Mañana - The big event - Family Day '91 - is tomorrow, from 9 a.m. to 4 p.m. I hope I don't sound like Mom, but let me remind you to bring your badges, completed family guest list forms, and (if appropriate) forms for access of non-family members. (Forms for both are available at the Badge Office; Q-cleared employees can escort a maximum of eight people.)

The four-page Family Day Planner insert in the Oct. 4 LAB NEWS tells you about everything you need to know. If you've misplaced yours, you may want to borrow one from a colleague and copy it because we're just about out of them. Pocket-sized Family Day brochures with the same basic information will be available tomorrow as you enter the gates.

Family Day is a lot of extra work for many Sandians. If you like what you see tomorrow, you might want to mention that to the folks on duty at the exhibits and to some of the "main cogs" listed on this page along with some last-minute Family Day information.

* * *

Bring a Few Bucks - Family day activities are free, of course, but bring some cash for refreshments (soda, coffee, candy, hot dogs, etc.) that will be for sale in Areas 1, 4, and 5 and at the Solar Power Tower. The Area 1 locations are outside gates 1 and 10 and in the Sandia Cafeteria. The snack shop near gate 1 will also be open.

Bring a few more bucks if you're interested in buying a Sandia cap, T-shirt, or coffee mug for yourself or your guests. These items (for sale every workday at the LAB NEWS office) are \$7 each and will be sold tomorrow at a booth just inside Bldg. 800. All "profit" from the sale of these items goes to charity.

* * *

"Simply Put, They Work Great!" - That's the last line in a recent letter from an officer in the Massachusetts Army National Guard praising the Miniaturized Intrusion Detection System (MIDS) - a sensor system developed at Sandia several years ago. Principal designer is Tom McConnell of Systems Research Div. 5027.

The Massachusetts National Guard used MIDS in a "drug war" operation that monitored some marijuana fields. The letter says, "As a direct result of the outstanding performance of these devices, law enforcement personnel have made several arrests, and several million dollars worth of marijuana has been seized."

* * *

What's Wrong with This Junk Mail? - I recently received a large envelope full of paper hyping a new audio cassette training course. The large type on the front of the brochure: "Special update on executive self-improvement." I was tempted, but didn't take the time to return it and point out that they made two *mighty bad* assumptions when they mailed it to me: (1) that a company newspaper editor could be considered an executive, and (2) that I need improvement.

* * *

I Think I'm Gonna Make It! - Sandia division supervisors who aspire to higher management traditionally have eyed department manager slots. Now it appears that dang near all of us division supervisors are gonna make it under the restructured management system announced Oct. 4 by President Al Narath (see article on page one). Unfortunately for our creditors, though, it's a title change only and not a promotion. •LP

Last-Minute Changes and Updates

Final Reminder: Tomorrow Is Family Day

Sandia and DOE employees bringing visitors to Family Day demonstrations tomorrow are reminded that Q-cleared employees may escort a total of 8 guests, including no more than one pre-approved foreign national family member. Guests are all people other than the Q-cleared employee, whether family members or approved non-family guests.

The Oct. 4 issue of the LAB NEWS contained a special Family Day insert with most of the necessary information. However, there are a few additions and corrections as follows:

- Retirees are reminded that, although they must be escorted by a Q-cleared employee to visit cleared areas, several areas do not require an escort, including the rocket sled viewing area, the water impact viewing area, and the solar tower complex.

- Parking in the lot directly north of Personnel Bldg. 832 (the Family Day Retiree Reception Area) is reserved for retirees and their escorts.

- In addition to food service provided by Marriott Corp., the Snack Bar will be open for business from 8 a.m. to 2 p.m. The Snack Bar is located in Employee Services Bldg. 800A just outside gate 1.

- The tours and demonstrations at the Lightning Simulation Facility (Bldg. 888) will take place at 10 a.m. and 2 p.m. only.

- A glass-blowing exhibit will take place in Bldg. 864. The tour will start at the northwest door, proceed through the building, up the stairs, and out the second-floor exit on the south side of the building.

- An exhibit on Technology Transfer has been added to the exhibits in the Tech Transfer Center lobby, Bldg. 825.

- The title of the exhibit in the Bldg. 836 Atrium, Room 104A, is listed incorrectly in the LAB NEWS Family Day Section and the Family Day brochure. The correct title is "Weapon System Development Displays, Command and Control Display, and System Test Videos."

- The Coyote Canyon exhibit at the Containment Testing Facility and the Plasma Material Test Facility exhibit in Bldg. 6530 are open only to employees of those facilities and their guests.

- All visitors are encouraged to tune in to Radio Sandia, KOP20, at 1610 on the AM dial, for Family Day information, beginning at 4:30 p.m. today.



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Take Note

The first meeting of the 1991-92 season of the American Society of Mechanical Engineers, New Mexico Section, will be held Wednesday, Oct. 23, at the KAFB West Recreation Center (1900 Maxwell Ave. SE, formerly the West Officers Club). Dick Schwoebel (300) will speak about his recent experiences investigating the *USS Iowa* gun turret tragedy. Social hour is at 6:30 p.m., dinner at 7. Cost is \$15 for members and guests and \$10 for students and retirees. RSVP to Glenn Rackley (5166) on 4-8897 by noon on Monday, Oct. 21.

* * *

On Wednesday, Oct. 23, the Robert O. Anderson Schools of Management at UNM will host the Second Annual Quality Day Luncheon, part of a series of events designed to showcase quality success stories in American business. Guest luncheon speaker is John Harless, Director of Industrial Relations and Human Resource Management, Cadillac Motor Car Division, General Motors Corp. In 1990, Cadillac became the first automotive manufacturer to receive the Malcolm Baldrige National Quality Award. The luncheon will be held at the Albuquerque Marriott from noon to 1:30 p.m. Cost is \$20. For reservations, call 277-0880.

Family Day 1991 Planning Committee

Chairman: Jim Mitchell (3160); Family Day Coordinator: Joe Laval (3163); Communications: Linda Doran (3162); Tech Art: Bruce Fetzer and Mike Lanigan (both 3155); Community Leaders Tour: Al Stotts (3163); Security Coordinator: Don Jerome (3432); North Area: Capt. Bill Wolf (3435); South Area: Capt. Gil Chavez (3126); Badging: Ray Chavez (3437); Foreign Visitors: Tim Lucero (3437); Security Plan: Bob Surran (3432); Safety Coordinator: Larry Powell (7732); Medical: Dr. Joe Boyce (3320); Plant Preparation: Jim Winter (7813); Plant Engineering: Joe Archuleta (7823); Motor Pool: Jim Davis (3423); Custodial: Phill Vouterin (3426); Areas III & V: Ernie Nevada (7818); Hospitality Coordinator: Ellen Cronin Evans (1200); Retirees: Suzette Brooks (3543); Hosts: Sally Frew (3524); Tour Planning: Paul Yourick (3401); Rocket Sled Shots: Rob Tachau (2735).



Two-Day Seminar Gets High Ratings

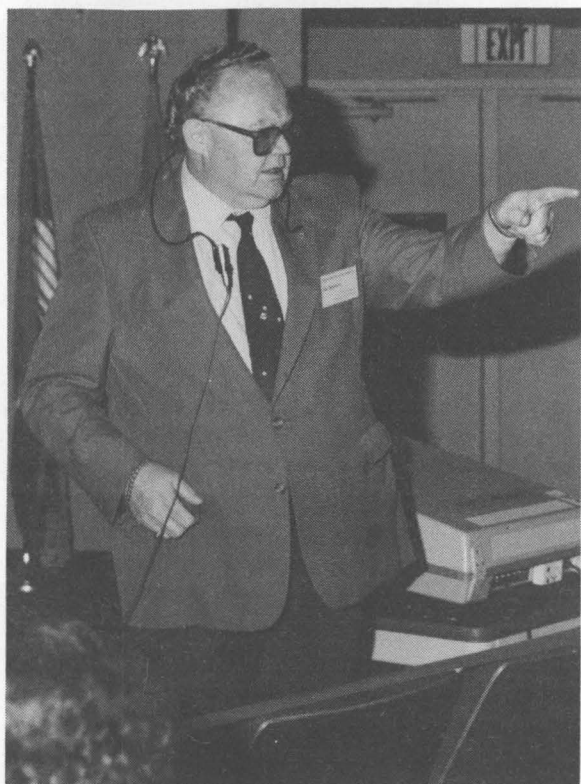
Quality Tools Forum Promotes Teamwork, Problem-Solving, Customer Satisfaction

Like a revivalist inspiring his audience, and with a sense of humor to boot, Del Nelson gave a lively start to the recent Quality Tools Forum at Sandia, Livermore, as he discussed Total Quality Management (TQM).

Nelson is Chairman of the Management Department at American River College and a consultant.

The focal point of Nelson's presentation was a quote from quality leader W. Edwards Deming: "We as a culture have learned to expect poor service and quality and we have gotten what we expected."

Most companies' current approach to doing business, he said, is crisis management — fire-fighting, throwing people at the problem, going around the system to get the job done, keeping people doing it until they get it right, or making



DEL NELSON from American River College stimulated the audience with questions as he promoted Total Quality Management during a two-day Quality Tools Forum at Sandia.

this quarter look good and not worrying about the next quarter until it comes.

Nelson then cited examples from corporate America of companies that are getting superior results by implementing TQM.

"You will know you're in TQM when teams don't have to ask to be empowered or ask for permission to make the changes the teams know are necessary," Nelson said. "Quality should be aimed at the needs of the consumer, present and future, and quality begins with the intent, which is fixed by management," he added.

Identifying and Solving Problems

Discussing the group approach to problem-solving, Nelson listed eight points to follow: (1) identify the major problems; (2) select the ones to work on; (3) identify probable causes; (4) collect

"You'll know you're in TQM when teams don't have to ask to be empowered."

data to verify; (5) analyze to develop solutions; (6) test the solutions; (7) implement the test solution; and (8) repeat the cycle.

Sandia's Quality Improvement Program (QIP) is "of the people, by the people, and for the people, because people aren't a company resource, they are the company," Nelson declared.

Delivering the keynote talk just ahead of Nelson was VP John Crawford (8000), who began by saying, "We are in a time of unprecedented change in many ways, and quality and the way we run our business are changing very rapidly." He outlined three concepts that are needed to make quality work in an R&D environment:

(1) Customer satisfaction — one of the precepts of modern quality. Know who the customer is — someone to whom we deliver a product or service or someone who provides our funding. Both kinds are equally important.

(2) Do the job right the first time — take the

appropriate amount of time to think the process through, enabling all of us to save time by not having to rethink the process or do the job over.

(3) Strive for continuous improvement — focus on processes.

"Our corporate strategy is very specific: We intend to be a national leader in quality and quality progress, and we have dedicated ourselves to meet that goal of quality," said John. "Toward this end, we have formed the Livermore site Quality Improvement Team. We own the quality implementation process, establish objectives, recognize achievements, and act as a positive role model for all people at this site."

Other speakers at the two-day forum included Susan Kelley from AT&T, who spoke about team-building; Alan Oppenheim of Quality Alert, who discussed statistical process control; Cynthia Butler of Improvement Professionals, who talked about experiment design; and Tom Hughes of Allied-Signal Automotive and Jim Bartel (8441), who spoke about Quality Function Deployment and Process Quality Management & Improvement.

Jim, Mike Hardwick (8446), Jack O'Connor (8445), Mary Clare Stoddard (8445), and John Didlake (5375) coordinated the forum. Henry Hanser (8440) introduced speakers and gave an overview.

Jim said participants gave high marks to the forum. A sampling of their comments:

- "Great speakers all. Sandia Quality Function Deployment cases showed great creativity and innovation in applying tools. Should really be an inspiration to all."

- "I found the program to be entertaining and fun, which made me want to be part of a learning process."

- "I liked the fact that this workshop indicated that SNL is committed to quality and change is inevitable. However, it will take lots of time to get where we want to be."

- "Very good speakers, knowledgeable, good examples; Nelson makes learning fun."

- "Outstanding. Excellent management support." ●BLS

First Woman Supervisor

Verity Recalls Days Gone By

The first woman division supervisor at Sandia, Livermore, Carol Verity, retired this month and took time out to reminisce about her early experiences in the once "all-male world" of management.

Carol started at Sandia in 1969 as a library clerk, with a master's degree in English. Because there were no relevant jobs available at the time in her field, she was glad to get the Sandia job.

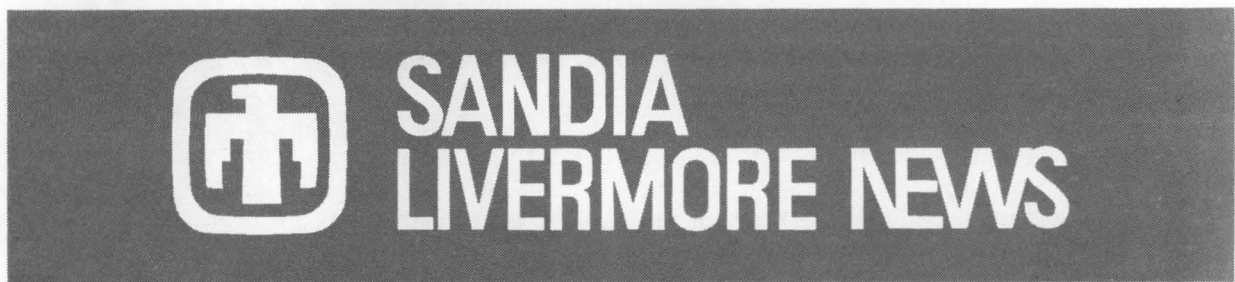


CAROL VERITY

female director at Livermore.

After a few months as a library clerk, Carol applied for a composition job in the Publications (Continued on Page Twelve)

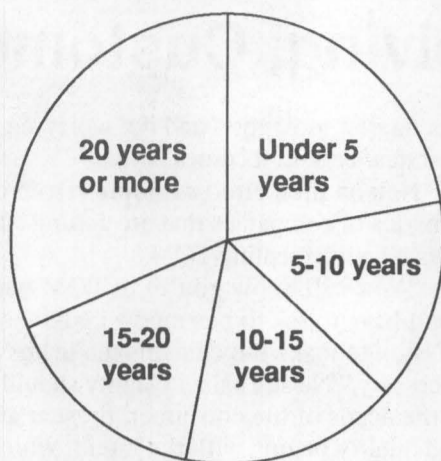
Before retiring after 22 years, Carol was one of nine female division supervisors, one female department manager, and one



LOOKING OVER A MODEL of the Defense Engineering Lab, to be completed next spring, are retired managers and supervisors of Plant Engineering Dept. 8510, guided by current Dept. Mgr. Bob Johnsen (right). With Bob are (from left) John Pearce, Bill Little, Les Rowe, Lee Davies, Ralph Cozine, and Ken Finders.

**DEMOGRAPHY OF U.S. FLEET
(TRANSPORT CATEGORY AIRPLANES)**

| ATA FLEET AIRCRAFT AGES | |
|-------------------------|--------------------|
| AGE | NUMBER OF AIRCRAFT |
| <5 Years | 968 |
| 5-10 | 702 |
| 10-15 | 627 |
| 15-20 | 541 |
| >20 | 1078 |
| TOTAL | 3916 |



Source: Aviation Research & Support Aircraft Utilization Database
Data Date: (Varies by Manufacturer) May 1990 - September 1990

AGING FLEET — Statistics from the Air Transport Association, a consortium of aircraft operators, show that nearly 30 percent of all US planes carrying 30 passengers or more are at least 20 years old.

a lap joint (lap joints are overlapping pieces of the thin aluminum skin held together by rows of rivets and special adhesives). The smaller cracks went undetected during normal inspection, and later, during flight, suddenly connected into a larger crack, loosening an entire forward section of the hull. "It unzipped a part of the aircraft, and off it came," says Bill Shurtleff, Non-Destructive Testing Technology Div. 2752.

This has become known as the "zippering effect," or more formally, Multi Site Damage (MSD).

For economic reasons, aircraft inspections are usually done at night when planes are out of service. Airlines often operate on a 2- to 3-percent profit margin, notes Bill, compared to an average profit margin of more than 5 percent for most US industries, and the airlines are understandably reluctant to pull a plane from service.

Although more accurate, highly sophisticated inspection technologies do exist — such as a \$75 million X-ray and neutron radiography facility at McClellan AFB in Sacramento, Calif., manipulated entirely by robots — the cost of such methods is prohibitive. From the standpoint of commercial aviation, they would drive plane fares so high that most customers simply could no longer afford to fly, adds Pat.

"Normally, 90 percent or more of inspections are done visually," says Bill. "The typical non-destructive inspection involves checking one by one" (Continued on Next Page)

(Continued from Page One)

Aging Aircraft

partnership has also been asked to review the inspection reliability of commuter aircraft (those carrying fewer than 30 passengers) and to work with SAIC to develop new inspection techniques

for non-rotating parts in aircraft engines as a means of eliminating some causes of in-flight engine failure. The causes of these failures were recently analyzed by SAIC using FAA's database in Oklahoma City.

The Zippering Effect

In the Aloha rupture, a series of small cracks developed around individual, consecutive rivets in

Examining the Examiners

Human Reliability Is a Key Factor In Aircraft Safety Inspections

Imagine inspecting an entire aircraft by hand, carrying a portable testing device to check 5,000 rivets, one by one.

Any one of those rivets could be the starting point for cracks in the fuselage caused by stress or corrosion. It takes about four hours to check 400 of them under the best of conditions, to say nothing of complications caused by operator fatigue, inadequate training, or bad working conditions.

That most people would find such a task tedious and tiring is a bit of an understatement.

"When you're talking about inspecting something the size of an aircraft, you're talking about a long inspection that involves scaffolding, ladders, and a lot of time from start to finish," says Floyd Spencer (323), the statistician in charge of analyzing inspection reliability in the testing of aging aircraft for the FAA (see "Sandia Heads FAA Research Effort," page one).

"What is the ability of the inspectors from start to finish in a process like this? Do they get lackadaisical because they've inspected 1,000 rivet holes and not found a single crack? What are the chances that they will detect the cracks that are beginning to appear next to Rivet No. 1,001?"

Those are the kinds of questions that Floyd and a team of Sandians will address for the FAA under a Congressionally mandated research project aimed at making the use of aging aircraft safer. The team will work with Boeing; Science Applications International Corp., a firm with a lot of experience in non-destructive aircraft inspection; and AEA Technologies, a British firm.

Concerns about human factors were raised after normal inspection techniques failed to detect cracks in an Aloha Airlines plane that ruptured in midair in 1988. The National Transportation Safety Board (NTSB) concluded that the cracks might have been detected with more



LOOKING FOR FLAWS — USAir employees apply an eddy current device to detect flaws that cannot be seen by the naked eye. (Photo courtesy USAir)

careful inspection techniques and better interpretation of equipment readings.

William Hendricks, the FAA's Director of Accident Investigations, noted after the accident that a passenger who had boarded the plane at its origination point reported noticing a crack in the fuselage on the outside of the plane at about her eye level.

Probability of Detection

The Sandia-led team will conduct experiments to quantify the probability of detection of a flaw. To do this, researchers will ask aircraft inspectors at perhaps 10 to 20 inspection facilities, including those of major airlines and cargo carriers, to examine flawed lap joint specimens (see "Sandia Heads FAA Research Effort," page one).

The parts will either be torn apart after the testing is finished to determine the actual number and location of the flaws to compare them with test results, or the parts will be built with predetermined flaws already in place.

Inspectors will be asked to use whatever test equipment and procedures are normal for their facility. That will enable Sandia researchers to compare the effectiveness of different kinds of equipment as well as different inspectors. The focus of the experiment will be eddy current inspection techniques — since they are the ones used most often by the aircraft industry for detecting small cracks.

In the eddy current technique, a probe is used to apply a magnetic field to a conductive test specimen to produce an electric skin current. The resultant electric field is then displayed on an oscilloscope or measured by a meter. Cracks automatically change the oscilloscope pattern or alter the meter reading. Still, the analysis of the results is very subjective, because it is based on the viewer's interpretation of

the pattern, the calibration of the instrument based on a "standard crack," and whether the test probe is positioned correctly.

Researchers will also gather information on inspectors' level of training, which may have some bearing on the usefulness of instituting a national certification program for aircraft inspectors.

Floyd says he would like to gather data from 50 to 100 inspectors, at least three at each site. That way, if there are 20 to 30 cracks of a certain size, the experiment will produce a sample of at least 1,000 inspections of a certain length of crack. Since the probability of detection varies greatly with the size of the crack, it is important to have a fairly large sample for each size.

Ultimately, he adds, the information gathered could influence the writing of inspection procedures for the entire aircraft industry. "I think we have to design the experiment to do more than measure the probability of detection. I think what we have to do is try to understand the processes that go into the probability of detection."

(Continued from Preceding Page)

one the thousands of rivets that hold the lap joints together, usually with an eddy current probe." (See "Human Reliability," page four).

Before the Aloha accident, lap joint inspections were conducted every 15,000 cycles; after the accident, the FAA reduced that number to 4,500. The agency has asked Sandia to study some of the factors that went into this decision to determine its reasonableness.

Design Limit Measured in Cycles

Similar to an old automobile, an aging airplane can still be operated safely beyond its design limit with regular maintenance and repair. Throwing away good parts at fixed intervals because of their age (known as retirement for time) rather than using them until they wear out (retirement for cause) can be expensive. The research program emphasizes inspection as a means of locating flaws early.

By definition, an aging aircraft is one that has exceeded its design limit, explains Bill. This limit is usually defined by flight hours or by the number of cycles an aircraft can be expected to complete — that is, the number of times the plane is pressurized, exposed to wind gusts, and depressurized. These are the major stresses that occur during take-off, flight, and landing.

In addition to performing specific tasks, the FAA has asked Sandia to: develop proposals for research projects; lease a hangar to house an aging transport aircraft at Albuquerque International Airport for validating new technologies (Sandia is negotiating with the city to lease the former US Customs Department hangar); and maintain a reference library to house the FAA's collection of 60 or so cracked, corroded, or defective aircraft parts.

Based on years of experience in the laboratory, in the field, and in non-destructive testing (the kind that does not require an object to be destroyed or taken apart) for weapons research, Sandia researchers have already suggested that aircraft inspection can be simplified by developing small probes that transmit signals back to a single location, rather than lugging bulky inspection equipment all around the plane.

Other ideas are offshoots of commercial approaches to inspection. For example, in the old days, before smoking was banned on domestic flights, inspectors used to find cracks by searching for nicotine stains on the outside of the aircraft, says Pat. Since this method was fairly effective, Pat has suggested that it may be possible to fill the plane with a light gas so cracks can be detected by an instrument outside the plane.

No matter what inspection techniques are ultimately selected, the instructions will have to be easy to follow and the equipment easy to use, notes Bill. This is because older planes are often sold to other countries that lack both funds for sophisticated equipment and experience in its use.



BRUCE HANSCH (7551) uses laser interferometry to inspect a section of an aluminum aircraft wing. When the wing surface is stressed with vibration, heat, or pressure, flaws manifest themselves by causing larger displacements of the laser beam.

Project Management at Work**'One-Stop Shopping' Gives FAA Easy Access to Inspection Technology**

If FAA officials in the aging aircraft research program need information, all they have to do is contact one of six project managers in charge of various technical areas. "I call it one-stop shopping," says Pat Walter (2757).

Gary Phipps (2756) is in charge of research into thermography, a technique that uses a heat lamp to thermally stimulate a large area of an aircraft. Corroded and disbonded areas don't absorb heat as well, and these areas can be identified in images acquired from an infrared camera.

Lutz Dahlke (8316) is in charge of radiography, which like medical radiography uses X-rays to "see" inside an object.

Rich Shagam (2756) heads the group studying visual inspection. In the airline industry, this may involve dye penetrants, portable microscopes, or borescopes.

Bruce Hansche (2751) is in charge of the coherent optics project. Also called holography, this method produces two laser-light images on a single film — before and after a structure is deformed; the images are then inspected for indication of deformation irregularities. An advantage of holography is that it allows inspectors to view a large area of the aircraft rather than checking it rivet by rivet. Corrosion, for example, is better located by large-area inspection. Sandia will evaluate different ways to achieve this temporary deformation, such as by pressurizing the aircraft, applying a small vacuum, or applying a vibration stimulus.

John Gieske (2752) heads research into ultra-

sonics, the analysis of sound waves reflected from flaws and cracks.

Floyd Spencer (323) is in charge of NDI reliability (see "Human Reliability," page four).

Each of these methods has advantages and disadvantages. For example, a disadvantage of the ultrasonics method is that it will not transmit signals across an air gap. Radiography will, but ultrasonics provides better analysis of certain materials.

Other Sandians working in the research program are Bill Shurtleff (2752), deputy program manager; Dennis Roach (2743), a project consultant in structural mechanics; and Navy Lt. John Limm, assigned to Sandia for the next three years to facilitate technology transfer from DoD. Other near-term or potential future Sandia contributions will be in the areas of fracture mechanics, image processing, and robotics.

One of Sandia's principal responsibilities will be to gather input from scientists, airline operators, aircraft manufacturers, and the FAA, and combine that information into an effective, affordable inspection program.

In preparation for this task, team members have completed a variety of courses on such topics as metal fatigue and corrosion; familiarized themselves with the various FAA documents, advisories, and publications that govern the aircraft industry; and visited Mesa Airlines in Farmington several times to observe nighttime inspections and pose exploratory questions. This month, they are visiting USAir's inspection facility in Pittsburgh.

Another research center established by the FAA at Iowa State University will concentrate on providing basic research for aircraft inspection. If promising new technologies are developed, it will be Sandia's job to convert them into practical tech-

niques that are affordable and usable in the commercial arena.

"Sandia's goal is to apply new or existing technologies to aircraft structures as soon as possible," says Bill. ●LD

For One Sandian, Tragic Flight May Have Been a Near Miss

When Ron Hill (2750) returned to Albuquerque April 28, 1988, from a trip to the Kauai Test Facility, little did he know that the airline he had flown that morning from Kauai to Honolulu had experienced a tragic accident in which a plane lost part of its fuselage in midair.

He later discovered it was not only the same airline, but probably the same plane.

After returning to Albuquerque and hearing about the accident, Ron did some checking of the Aloha Airlines flight schedule for all the Hawaiian islands on that day. Using an official airline guide that lists all flights worldwide, he followed the schedule of the aircraft he had boarded in Kauai. After dropping him off at Honolulu on the island of Oahu, it appeared that the same plane went on to Maui, then back to Honolulu, then back to Kauai, and then to Hawaii — to the city of Hilo, before the ill-fated trip back to Honolulu.

None of the schedules of the other eight aircraft owned by Aloha Airlines coincided with the schedule of the plane that ripped apart.

"I can't tell you 100 percent that it was the same plane," says Ron. "But I have an awful uneasy feeling that it was."

It is typical of Aloha Airlines that individual flights are quite short, because the airline only offers service between the Hawaiian islands. An average flight takes about 25 minutes, says Pat Walter (2757); each plane takes off and lands about a dozen times each day.

Like Ron, Pat figures that at some time preceding the accident, he, too, had been on the ill-fated plane. Both men worked in Kauai at the time, and frequently flew Aloha between Honolulu and Kauai. Since the airline only owned nine planes, the odds were pretty good that both had ridden on the damaged aircraft.



SANDIA RESEARCHERS Ron Hill (left, 2750) and Pat Walter (2757) figure the chances are pretty good that they both had previously flown on the Aloha Airlines plane that ruptured in midair in 1988. Pat is head of the Aging Aircraft Non-destructive Inspection Development and Demonstration Center, managed for the FAA by Sandia.

Pea-Size Targets Imploded by Ion Beam**PBFA II Experiments Erase Doubts about Obtaining Data**

The first major target experiments have been successfully carried out on Sandia's powerful PBFA II particle beam fusion accelerator.

The series, in August and September, included the first experiments on PBFA II aimed at heating and imploding ICF (inertial confinement fusion) ignition-size targets. The types of targets tested included foam targets for diagnosing target heating and spherical targets for diagnosing hydrodynamic response.

PBFA II produces extremely powerful pulses of electrical current that are converted by a diode in the center of the machine into a beam of light-weight charged atomic particles called ions. In the recent experiments, hydrogen ions (protons) struck a tiny target.

The experiments were recorded with sophisticated diagnostic instrumentation, and this resulted in achieving high-quality target data.

"The quality of the data was just superb," says Don Cook, Manager of Fusion Research Dept. 1260. "The target experiments show we're on the right track."

A National Academy of Sciences review committee declared in September 1990 that over the ensuing two years Sandia should emphasize both improved ion-beam focusing and "well-designed and well-diagnosed target physics experiments" at increasing power concentration.

Don says the recent experimental series shows conclusively that high-quality data can be obtained from target experiments on PBFA II.

More Hard Work Ahead

The hard work and long hours that brought the PBFA II team this success are far from over, Don emphasizes. "It's like running a marathon after you've just run a marathon," he says. "And now we still have to keep running."

During the next year, work will concentrate on improving the focusing and therefore increasing the intensity of the giant accelerator's ion beam. Experiments during this period will use lithium ions.

The goal is to bolster the intensity of the accelerator's ion beam to 10 trillion watts (10 terawatts) per square centimeter and then do further target experiments with that beam. It will be a difficult task, says Don, but if it can be accomplished, Sandia's PBFA II program will be in good position for the

next National Academy of Sciences review of technical progress, in late summer 1992.

That major review will determine whether the beam-focusing issues have been resolved and whether or not PBFA II should be upgraded to higher energies to make it possible to achieve fusion ignition.

New Targets Much Closer to Goal

Some preliminary target experiments were carried out in 1989 and 1990, but the series conducted this August and September involved two new kinds of targets that Don says are much closer to those of real interest for fusion. They are about a quarter inch in diameter, near the dimensions that would be required for achieving ignition with a suitably intense lithium ion beam.

One type was a cylindrical target filled with an extremely-low-density hydrocarbon foam. As the foam is heated by the ion-beam energy to very

"The target experiments show we're on the right track."

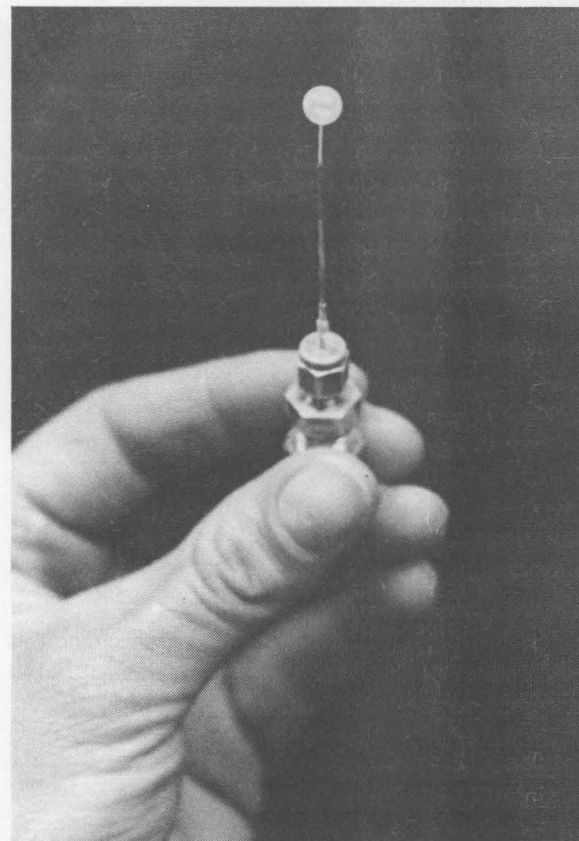
high temperatures, it gives off X-rays. The experiments successfully recorded the spatial distributions and intensities of these X-rays.

The second type of target was spherical. It consisted of a shell 6 millimeters in diameter — about the size of a pea — made of 0.1-millimeter-thick plastic. Inside this capsule was deuterium (heavy hydrogen) gas. These were the first target experiments using deuterium ever conducted on PBFA II. (Tritium, a still heavier isotope of hydrogen and a second necessary ingredient for achieving fusion, has not yet been added to the capsules.)

The intent was to have the proton beam heat the shell directly from all sides, resulting in an implosion of the target and compression of the fuel. The collapse of the target was accurately recorded by X-ray imaging diagnostic instruments. In these first-ever hydrodynamic target experiments on PBFA II, the material was indeed imploded by the ion beam.

The data were of good quality, allowing successful comparisons of theoretical calculations with experimental outcome — one of the goals of the experiments.

The experiments are significant for several



TINY SPHERICAL TARGETS were used in recent PBFA II experiments for diagnosing hydrodynamic response to being struck by hydrogen ions. The experiments showed that high-quality data can be obtained in target experiments.

reasons, says Don.

"There has always been a question whether we would be able to get high-quality target data out of the harsh environment of this accelerator," he says. "We've proved that we can get the data."

And he says the proton beam was focused and controlled well enough to significantly heat the foam material in the cylindrical target experiments and to implode the deuterium-containing capsule in the spherical target experiments.

"We've made some major progress," says Don. "I think we have a good chance of meeting our goals, and that would open up the question of upgrading PBFA II to generate higher energies for attempts at fusion ignition." ●KFrazier(3161)



GORDON CHANDLER (1273, front) holds a target chamber used in inertial confinement fusion experiments at Sandia's powerful PBFA II particle beam fusion accelerator. He and a team of Sandians, including Paul Rockett (back left) and Mark Derzon (both 1273), recently completed the first series of target experiments.

Experiments Took 'Exemplary Team Effort'

The new achievements in target experiments on PBFA II are the result of "an exemplary team effort" by Sandia researchers, diagnostics experts, and operations personnel, says Jim Rice, Manager of Target Research Dept. 1270, who adds that he has high praise for the teamwork that has brought the program to this point.

Among those who deserve major credit for the work, according to Don Cook, Manager of Fusion Research Dept. 1260, are Gordon Chandler, Target Experiments Div. 1273, principal experimenter for the target experiments; other Division 1273 members Mark Derzon, Paul Rockett, Jose Torres, John Hunter, Jack Pantuso, and Supervisor Keith Matzen; Radiation and Hydrodynamics Theory Div. 1271 members Rick Olson and Tom Hussey; David J. Johnson of Beam Experiments Div. 1264, for proton beam focusing; Target Fabrication Div. 1276 members Jim Aubert (Supervisor), Dora Derzon, and Patti Sawyer; Diagnostics Div. 1267 members Jim Bailey, Alan Carlson, and Carlos Ruiz; Diagnostic Theory Div. 1262 members Tom Mehlhorn and Ray Dukart; Jim Rice, Manager of Target Research Dept. 1270; and all the members of PBFA II Operations.

(Continued from Page One)

Management Restructuring

report to level 1 or 2 managers. In some cases, managers will be supported by non-supervisory team leaders.

Detailed Plans by Year's End

Al followed the Oct. 4 announcement with a series of five one-hour employee meetings Oct. 7 in the Technology Transfer Center, which were televised live to Sandia, Livermore. Speaking before packed-house sessions, Al said he has allowed up to a year for the transition to be completed, but expects vice presidents to produce restructuring plans by the end of 1991 and to put them into effect as soon as possible.

Al made his restructuring decision after studying a report produced by a team of Sandians that he formed in April. The 27-member team, led by VP Dan Hartley (6000) and composed of representatives from each vice presidency, examined the Labs' management structure and structures of similar organizations in government and industry.

During the Oct. 7 employee meetings, Al thanked the team for its hard work, dedication, and enthusiasm, and for suggesting several possible restructuring alternatives, but stated that he takes complete responsibility for the restructuring deci-

sion. "The Management Restructure Study Team did a fine job, but I made the final decision, and will hold myself alone accountable for the consequences. I hope and expect that the restructure will yield the desired improvements in operating efficiency. With all of your support, we will make it work," he said.

Dan will continue as sponsor for implementation of the new structure, with Dick Shephardson, Manager of Compensation Dept. 3550, taking responsibility for coordinating the project. People issues, system issues, and other change management issues will be dealt with by an implementation team under Dick's leadership.

"What we have now is a restructuring architecture — a vision — not a plan," Al explains. "Each VP now has the responsibility to produce a detailed plan for adapting the architecture to his organization and its particular needs. The SMC [Sandia

"Each VP now has the responsibility to produce a detailed plan for adapting the architecture to his organization and its particular needs."

Management Council] must concur with each VP's plan before it can be instituted."

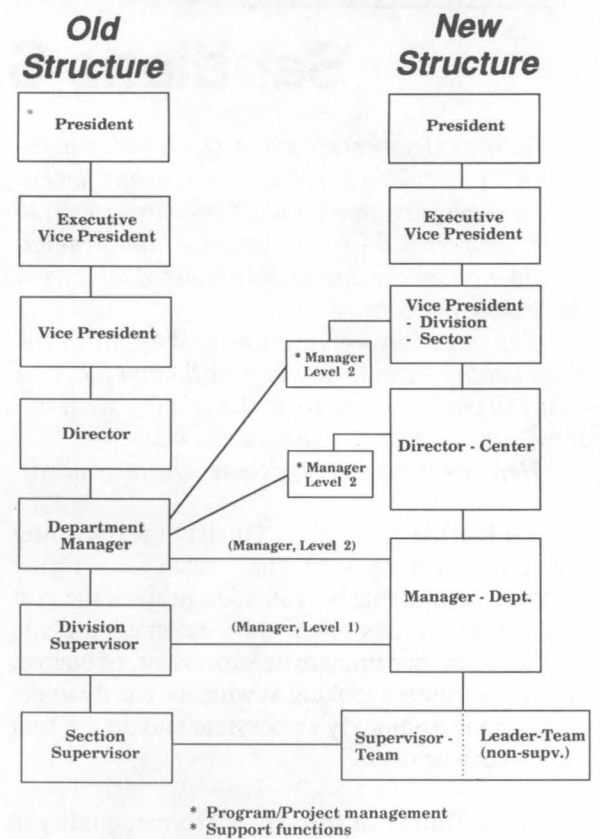
In formulating their plans, VPs may form implementation teams to ensure that appropriate issues within their groups and Labs-wide issues are addressed before their plans are submitted to the SMC.

A 'Workload Avalanche'

Al acknowledges that the changing times, increasing emphasis on customer development and interfacing, the need for rigid compliance with DOE orders, and recent Labs' initiatives [ES&H, Quality, Strategic Planning, Project Management] have all combined in recent years to place a heavy administrative burden — a "workload avalanche," he says — on current supervisors, particularly the 615 or so division supervisors who on average supervise more than 14 employees.

"These folks have spent many hours on these important issues and done lots of associated paperwork on top of their traditional supervisory duties

Transition to Restructure



Employee Input Is Encouraged

During his Oct. 7 meetings with employees, President Al Narath said Sandians are welcome to submit their specific restructuring ideas to Labs vice presidents. "What we have now is a framework — an architecture — for management restructuring," he said, "and our VPs will be working for the next several months to formulate detailed implementation plans. These plans should incorporate the best ideas from throughout the Labs, so I encourage everyone to take empowerment seriously and, within the framework that I've outlined, let your VP know if you have specific ideas."

Restructuring Brings New Duties for Current Department Managers and Staff

What will current department managers and their staff be doing under the new management structure announced by President Al Narath early this month? (See main story.)

That question can't be answered specifically for several months yet, until Labs VPs complete their specific restructuring plans and get Sandia Management Council concurrence. However, there are several options for the DMs who become level 2 managers under the new structure.

The possibilities (see "Transition to Restructure" chart) include: remaining in charge of a department under the new structure and reporting to a center director; performing sector program/project management functions (program development and customer interfacing, for example) in association with center directors and VPs; and providing management support functions for various initiatives and activities (strategic planning and ES&H, for example) in association with directors and VPs.

Also mentioned by Al during his Oct. 7 meetings with employees (but not indicated on the chart), some DMs could be promoted to director. Al says new centers (directorates under the existing structure) could be formed in the future to help "flatten" the management struc-

ture and relieve the pressure on some directors who might otherwise have too many people reporting to them under the new structure.

In line with this, Al says that Sandians can expect some additional reorganization as the restructuring plans unfold. "I know we're just getting used to the major reorganization that went into effect on Aug. 1. The restructuring will undoubtedly result in a need for refinements and some rearrangements in our organizations, but the August reorganization produced an appropriate framework for implementing the new structure."

Al emphasizes strongly that moving current department managers and their support staff to new jobs is in no way a negative reflection on them. "To the contrary," he says, "we are striving to use their expertise and experience to the Labs' advantage in new, creative ways.

"I expect our VPs to restructure their organizations in ways that will ensure that our current DMs and their support staffs will be used to make the Labs more responsive to the changing times. As we continue our strategic planning and diversification efforts and emphasize program/project development activities, our experienced managers will help lead the way."

to ensure that our products and services get produced," Al says, "and frankly we need to give them some relief."

"The management restructuring architecture recognizes that," continues Al, "and I expect our VPs to take that into account as they make their detailed plans. By strengthening staff support for directors and VPs, we expect to move the action level on many of our plans and initiatives higher in the organization. In the future, many of these action items will be managed by level 2 managers on special assignment to VPs and directors."

Possibly Confusing?

Al announced another change at the VP level. The functional organizations managed by VPs will collectively be called "divisions," and three VPs will also be responsible for managing programmatic "sectors," which were established in August as part of the Labs-wide reorganization.

The three sectors and responsible VPs are Defense Programs, Roger Hagenruber, 5000; Energy and Environment, Dan Hartley, 6000; and Work for Other Federal Agencies, Gerry Yonas, 9000.

Al acknowledges that using "division" to describe organizations managed by VPs is going to be confusing for a while because "division" has been used at Sandia for years to denote organizational units just below department.

"In most large organizations, a division is used to denote a large group that encompasses a number of smaller organizational units," explains Al. "Although we'll all find the new designation confusing at first, this change will make our organizational names similar to those used by other large government and industrial groups. I'm sure we'll get used to it in time." ●LP

Welcome

Albuquerque — Yvonne Foflygen (21-1); Other New Mexico — David Wheeler (1811).

Congratulations

To Julie and Scott (2855) Nicolaysen, a daughter, Lindsey Elizabeth, Sept. 20.

To Catherine and Randy (3162) Montoya, a daughter, Laura Elena, Sept. 23.

To Barbara Cordova and Mark Howard (9123), married in Albuquerque, Sept. 28.

To Nancy Russell (6321) and Dave Gelet (2312), married in Albuquerque, Sept. 28.

Informal LAB NEWS Poll**Sandians Say What Quality Means to Them ...**

Because October is National Quality Month, the LAB NEWS decided to ask some non-management Sandia employees what the word "quality" means to them. LAB NEWS writer Linda Doran opened a Sandia directory and randomly selected folks from throughout the Labs.

The question we asked was: What does the word quality mean to you in your Sandia job, and — if you care to share some thoughts — what are some things you do to make quality happen?

Here are the answers of those who responded:

Ed Ratliff (1221) — "Quality means doing the best that can be done. That's what we're trying to do — the best that we can do to turn out the best product for our customer. Our customers include the Navy and our immediate supervisor, of course, and we are always looking at what we can do to get things done as quickly as possible and do the best job that can be done."

Dave Holcomb (6232) — "To me, quality is doing it right the first time every time and doing it a little bit better every time you can. So I sort of see this idea of evolution in quality — you always have a moving target, in other words, in terms of doing it better every time."

Cass Gowins (5144) — "Quality to me means teamwork. It seems to me that a good working relationship with everybody promotes quality, and so does being happy in my job. What I do to promote quality in myself — this is something I'm just

starting — is I'm actually listing on paper the goals I want to achieve in the coming year, sort of like a project plan for the year. And I try to obtain each one of my goals and stick to my project plan. I'm starting that now for the coming year, and I hope that it's going to improve myself."

Laura Draelos (7853) — "Quality is how well the output meets customer expectations. My job concerns ensuring that facility designs mechanically meet industry codes, standards, and regulations. Quality comes into play when a code/standard/regulation violation is recognized in the design and prevented, rather than being corrected in the field after the design has been built. Prevention rather than correction is just one facet of quality."

Melanie Miller (8430) — "To me, quality means serving my customer in an efficient and timely manner. One way I try to do my job in a quality manner is by trying to stay a step ahead of my boss."

Brett Coningham (7824) — "I think that quality is meeting your customers' needs in terms of getting a product to them on time and meeting all requirements. We feel it's part of our job to meet with our clients at the beginning of a project to make sure that we understand what they need, they understand what they need, and they understand what they're getting. To me, quality is meeting the terms you agree to at the price the customer

is willing to pay. And that may not necessarily be in terms of money — it may mean special training that the customer has to get in order to use computer software and hardware."

Debbie Johnson (4520) — "Quality to me is doing my job in any capacity — any task I'm asked to perform — the best I know how, and knowing that my customer is going to be happy with the job when I'm done. In the publications group I work in, I assist the scientific editors in proofreading, and quality can involve little things like, after you've looked at something 50 times, it's always nice to have another eye. I'm asked repeatedly to serve in that capacity. I think I am providing assistance people find very helpful and reliable."

Mary Gonzales (1821) — "Quality means that conscious thought and effort are expended to turn out a product. The thought determines what can be done to get the job done and done well; the effort involves taking the time to do the job right. I try to turn out a product that meets the basic expectations of the requestor plus contribute whatever else I can to further enhance that effort. Part of that enhancement is communicating, so the other person does not feel forgotten or overlooked. Like the Golden Rule, I try to give what I would like to receive."

Richard Chavez (4343) — "My definition of quality is the achievement of the best you can do, excelling in a job well done while satisfying both yourself and your customer, and setting the standard for excellence by delivering the best product possible while regulating time and money. Quality means a lot in my job at Sandia because I work in a service organization and good customer relations are important. Proper interaction with customers and listening to what their requirements are is priority one. I want and need to satisfy their needs so that I, too, may be satisfied."

Rick Wetzel (9231) — "Quality to me means doing your best to do your job right the first time on time. I'm relatively new at Sandia (less than three years). Sometimes my best effort is not good enough because of a lack of experience. To make up for this, I use a lot of informal peer review to evaluate my work."

Andy Peterson (6342) — "Quality is meeting or exceeding customer requirements or expectations. Quality in work is providing correct analyses with appropriate documentation to address issues of concern to our customers."

Ed Barger (5021) — "Quality to me is pleasing the customer in as cost-effective a way as I can do it. That means meeting all requirements — and maybe even unstated requirements."

Mae Lambert (2172) — "What quality means to me is to do a good job the first time, and to do it right. That's the way I implement quality."

Jim Goodnight (3435) — "Quality is being aware of your own relation to your job, your surroundings, and maintaining a professional attitude toward your job, as well as a professional appearance — that to me is quality. That's what I do personally."

Al Mederios (5361) — "Quality on the job, I think, is taking your time, doing proper research in your job, thinking things out completely. Don't act hastily, and discuss what you're doing with others to have it approved by other people — work with

(Continued on Next Page)

Consider the Humans, Please**Making It Easier to Push the Right Button**

Many people complain about sleek-looking videocassette recorders studded with rows of tiny buttons and operated by pushing the buttons in obscure sequences. In the commercial marketplace, consumers suffer the unfortunate results when designers' enthusiasm hasn't been intelligently channeled — when values like visual appeal overwhelm ease of use.

Sandia doesn't design VCRs, but the same kinds of issues arise in such typical Labs products as weapon controllers and testers, rocket-launch control panels, and equipment for manufacturing integrated circuits. The layout of knobs, dials, and computer-screen displays can either help or hinder an operator.

"All Sandia systems are designed, built, maintained, and used by people," says Bob Easterling, Supervisor of Statistics, Computing, and Human Factors Div. 323, a group of specialists who are helping to ensure that Labs designs are suited to human scale. "Sandians want to delight the Labs' customers," says Bob, "and to be delighted, each customer must be able to readily use our products."

"We deal with sizes, shapes, sequencing of actions, and alarms or signals," Bob continues. "We give a fair amount of advice about computer displays, sometimes even down to the level of what abbreviations to use."

Sleuthing Out Variability

The key to good human-factors design, like good quality in general, says Bob, is to consider it early in the design process. That's also true of statistical issues — the organization's other major area of responsibility.

Quality problems are often caused by variability in material, procedures, people, or environments. Statistical methods provide tools for

identifying the causes of variability and measuring their effects.

"To design quality into our products," says Bob, "we have to understand what the effects of variability will be, and then create a design that's insensitive to variability in both manufacturing and use. We can do statistical experimentation that reveals the sources of variability and helps eliminate them. Similarly, by integrating human-factors considerations at the design stage, we can 'design out' human-related defects or errors that might otherwise appear much later."

Bob says that designers often do their own statistics and human-factors analysis — sometimes without clearly recognizing that's what they're doing. If statisticians and human-factors specialists are included on a project team, important issues in these areas are less likely to be overlooked, and other team members can concentrate on their own specialties. "Early involvement is best," Bob says. "We can help from the conceptual or proposal-writing stages all the way to the report-writing stage. We work at all sorts of levels, from telephone consultation to extended, full-time involvement on project teams."

The human-factors engineers, statisticians, and computing specialists in the division teach INTEC classes as well as special classes and seminars for individual organizations. "Often it's appropriate for designers to do their own statistics and human factors," says Bob. "Training will help them do it better. It will also help them recognize when they need help from professionals."

Sandians who are interested in consulting these specialists may call Bob on 4-5997. •CS

(Continued from Preceding Page)

others, get their opinion. What I do to make quality happen is — I work on flow charts, and once I complete a flow chart, I have it proofread by other people, I have the engineers take a look at it. I think working with other people and having them check what we do makes quality happen. Communication is very important.”

Ron Farmer (6451) — “Doing the job right the first time on time. I work with the Annular Core Research Reactor. When we go out there to do someone’s experiment, we don’t have a choice but to do it right the first time. We set up the reactor, review the customer’s experiment, make sure we know exactly what he’s trying to do and that we can do it, and then radiate or heat his sample as required. We really have no choice — we do it right the first time or else we waste a lot of time, effort,

and expense on the customer’s part. We’re into quality out here in a big way.”

Patsy Jones (5400) — “To me, quality means meeting the customers’ expectations, or the expectations of the people you’re working for, by doing what it is they want and how they want it. You come to an agreement on what that is, and then you strive to give them that. It’s not necessarily the best job you can do, because it involves what the customer wants, and you give them that.”

Vicki Paustian (3153) — “Quality means doing every job with a caring, conscientious attitude, assuring that all requirements are met within a reasonable time frame.”

Arlyn Antolak (8341) — “Quality, to me, means understanding my customer’s problem, defining what the customer really needs, develop-

ing a theoretical model to resolve the underlying physics in the problem, using the theory to sort out key issues, and offering subsequent assistance when additional related questions arise. I make quality ‘happen’ by maintaining a close interaction with my customer and following this through to the resolution of the problem.”

P.J. Spellman (4341) — “Quality is a way of life. It starts with regarding your customers as personal friends. When you provide a service or do a task, it’s performed as you would do it for a good friend. Quality also means being willing to go that extra step, put forth that extra effort, and take time to do it right the first time. If you don’t have time to do a good job the first time, when will you find time to do it over? Perhaps quality is in the tradition of some of the old-time artists and craftsmen who took great pride in their work.” ●

From the Top**... and the President Says What It Means to Him**

Earlier this year, President Al Narath shared some of his ideas about “The New Quality Philosophy and Management’s Role” in a talk he gave at the Nuclear Weapons Complex Top Management Quality Symposium in Florida. In recognition of National Quality Month, the LAB NEWS is publishing some excerpts from Al’s talk. He began his comments with the following observation:

“This talk is about leadership. Leaders are people at every level in an organization who believe in change and are energized by it. They understand the difficult realities of competitive existence. They motivate and challenge. They provide positive reinforcement, but are never satisfied with their achievements because opportunities for further improvement are never exhausted.”

After summarizing the growing national awareness that global competitive pressures are forcing American industry to achieve higher levels of performance, Al offered the following views about what it takes to succeed:

“The key to sustained success is to maintain customer delight through continuous process improvements. Ultimately, the key is to do the right thing right the first time every time. It is an ideal we will never achieve, but it is one we must al-

“The key to sustained success is to maintain customer delight through continuous process improvements.”

ways strive for. Today, quality takes on a much larger meaning than it has traditionally. It is attention to cost, schedule, and product performance that characterize the modern Quality ethic.”

Al noted some of the similarities between Sandia and AT&T’s Bell Labs, both of which played dominant roles in developing new technologies after World War II, and both of which later struggled with the need to be more competitive — Bell Labs following the divestiture of AT&T and Sandia as a result of declining resources for defense R&D.

Sandia Past and Present

“I recall the decade of the 1960s as a period of dramatic progress in support of an urgent national security need. Many of us remember the heady experience of those earlier days. It created a special culture not only in the Laboratories, but throughout the entire complex. The central thrust became the accelerated introduction of advanced technology into the stockpile at any cost. ... Since financial resources were generally not limiting, we usually delivered on time, and the product tended to meet the specified military characteristics. Importantly, the government trusted us when we

stated our resource needs. These conditions created within the Laboratories a state of relative isolation — we were a world to ourselves and tended to assume we were the ‘best.’ In short, we took excellence for granted.”

In 1984, shortly after the divestiture of AT&T, Al joined Bell Labs, where the company was suddenly faced with much stiffer competition, even though the work force still had the same amount of exceptional talent as before.

“I came to the realization that technical excellence alone is not enough. Rather, it is teamwork and the ability to adapt quickly to changing operating conditions that spell the difference between

“I came to the realization that technical excellence alone is not enough.”

success or failure in a competitive environment. The Bell System had enjoyed a monopoly for many years, and ‘technology-push’ rather than ‘market-pull’ had become the focus. After divestiture, it soon became clear, however, that AT&T management processes lacked the efficiencies and robustness needed to satisfy the Quality expectations of increasingly demanding customers in the new, tough environment. Almost overnight, the corporation had to adopt a more sharply focused customer-oriented, market-pull approach. Speed of delivery and price competitiveness became as important as technical innovation. Given a choice of suppliers, it was the customer who now set the terms, not AT&T Bell Laboratories.”

Learning from AT&T

And yet, despite the obstacles, it is possible to succeed, notes Al, citing the following example:

“I like to tell the story of the STU III telephone development of the mid-1980s. The feature-rich AT&T secure voice and data terminal was a success from a technical point of view. However, in comparison with competing products from Motorola and RCA, it reached the market too late and was too costly both in development and production. ... A very recent design, executed by a much smaller, but highly motivated and empowered team employing improved development methods, succeeded in the course of only a year in delivering a new generation of AT&T STU-III terminals that are better, smaller, and less costly. This remarkable turnaround attests to the power of the Quality Way!”

Al discussed some of his ideas on how to apply the important lessons learned at AT&T to Sandia in order to make the Labs more competitive in the face of shrinking budgets.

“The DOE community is every bit as competent on average, perhaps more so, as comparable

groups elsewhere. What is wrong, in my view, is that we are suffering frequently unrealistic and unsteady requirements, ambiguities in management responsibilities, poor teamwork, and many other Quality deficiencies. Demoralization is widespread and fear of failure is impeding decision processes. ... The only way to assure more support in the long haul is to gain credibility through improved performance. First comes the respect of customers and sponsors. Then we can make a stronger case for additional resources. For now, the answer lies in Quality!”

On returning to Sandia in 1989, Al was struck by the similarities between AT&T and DOE’s weapons complex. The following year, management created a strategic vision for the Labs, based on three principal elements of Quality, Leadership, and Empowerment.

“On the one hand, even empowered employees cannot achieve positive results unless there is some formality of processes. On the other hand, efficiencies cannot be mandated; they depend on a sense of ownership at all levels in the workforce, based on personal involvement, participatory decision-making, effective teamwork, trust, and so on.”

National Leader in Quality

It is Al’s goal to make Sandia a national leader in quality by meeting and surpassing the same standards that are used in private industry.

“At Sandia, we have established a set of near-term Quality goals. We intend to become a national leader in Quality. We are not eligible for the Baldrige Award [which focuses on private industry] but have set our sights on the AT&T Chairman’s Award, which follows the Baldrige criteria. To win the AT&T Gold Medal requires a score in excess of 800 points on the Baldrige scale of 1,000 — very tough.

“The ultimate objective of our Quality initiative, however, is not to win an award. The award only represents a performance milestone. Our true objective is customer delight in DOE and elsewhere.

“The elements of our Quality improvement process emphasize management commitment and leadership. I don’t believe that a Quality ethic can be turned into a functioning reality in the absence of commitment. For such commitment to endure requires passion and superior support systems. The need for passion is self-evident. Unless leaders communicate strong convictions, Quality is likely to remain a slogan.

“... In summary, let me repeat my simple message. The role of modern managers is to set the course, coach, encourage teamwork, and above all, live the Quality ethic!”

Sandians Contribute \$20,000,000!

Mayor Proclaims 'ECP Day' at Anniversary Celebration

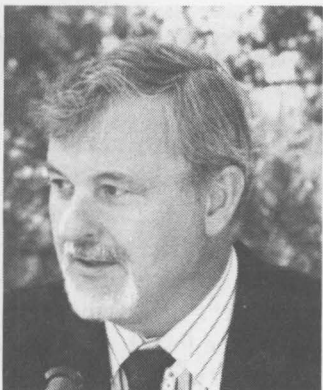
Albuquerque Mayor Louis Saavedra proclaimed Oct. 8 Sandia Labs Employee Contribution Plan Day and thanked Sandians for their generosity over the years at a special gathering last week celebrating the 35th anniversary of ECP.



LOUIS SAAVEDRA

At the ceremony on the Technical Library mall, Mayor Saavedra presented President Al Narath with a special City of Albuquerque Executive Order. It reads:

"Whereas, the employees at Sandia National Laboratories have been generous and committed supporters of the United Way Fund Drive in our city; and



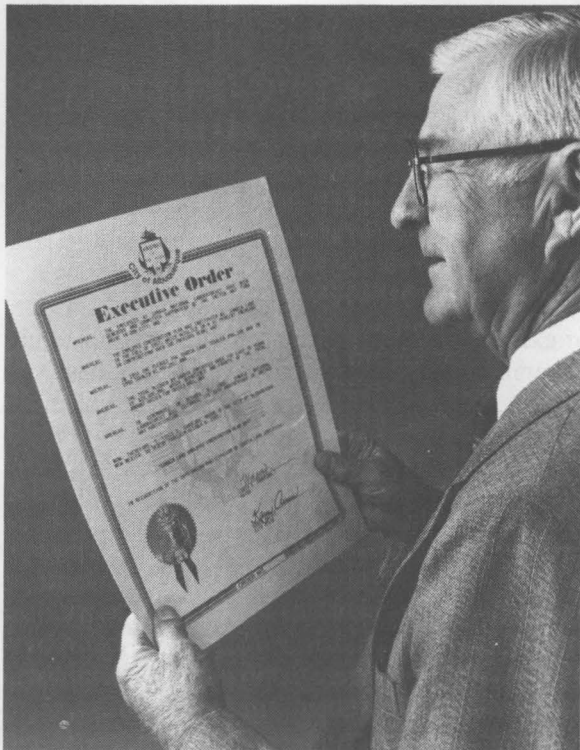
AL NARATH

"Whereas, the Employee Contribution Plan was instituted at Sandia Labs in the fall of 1957, which resulted in a 35-percent increase in contributions over the previous year; and

"Whereas, in 1957 the pledges for Sandia Labs

totalled \$96,100 and in 1990 totalled \$1,497,202; and

"Whereas, the total pledged by Sandia employees over the last 35 years is \$20,000,000,



TED SHERWIN (ret.), who was one of the original committee members in the planning of ECP, reads Albuquerque Mayor Louis Saavedra's executive order proclaiming Oct. 8, 1991, as "Sandia Labs Employee Contribution Plan Day." Ted was Manager of Sandia's Public Relations Department when he retired.

which represents one-fourth of the total amount raised for United Way; and

"Whereas, in ceremonies on October 8, 1991, Sandia National Laboratories will celebrate its 35th anniversary of United Way participation;

"Now, therefore, I, Louis E. Saavedra, Mayor of the City of Albuquerque, New Mexico, do hereby proclaim October 8, 1991, 'Sandia Labs Employee Contribution Plan Day' in recognition of the outstanding participation of Sandia Labs Employees."

Recent Patents To Sandians

Dan Gregory (2744), Tom Priddy (5500), Dave Smallwood (2744), and Tommy Woodall (4061): Composite Slip Table of Dissimilar Materials for Damping Longitudinal Modes.

Roger Clough (1811), Cliff Renschler (1812), Tim Shepodd (8311), John Gill (Mound Labs), Dan Hawkins (Univ. of Alaska, ret.), and Mike Smith (Allied Signal): Solid-State Radioluminescent Compositions.

Bob Biefeld (1154), Greg Hebner (1128), Kevin Killeen (1126), and Steve Zuhoski (former summer employee): UV Absorption Control of Thin Film Growth.

Lars Roose (1244): Remote Control for Anode-Cathode Adjustment.

Roger Chaffin (dec.), Gordon Osbourn (1155), and Tom Zipperian (1322): SLS Complementary Logic Devices with Increased Carrier Mobility.

Going to DOE Headquarters Soon

Tiger Team Action Plan Reaches Major Milestone

More than 200 Sandians have been working since June to develop a final Tiger Team Action Plan for Sandia, Albuquerque that will be submitted this winter to Energy Secretary James Watkins. To date, they have generated five major versions of the Tiger Team Draft Action Plan, which details Sandia's response to findings that resulted from last spring's Tiger Team visit.

Version five was reviewed by several groups at

DOE, and their comments are now being incorporated into a draft Final Action Plan, due in Washington Oct. 25 for additional review by DOE personnel, says Ed Graham, Manager of the ES&H Project Management Office Dept. 7020. Other members of Ed's team include Frank Bacon, Kathy Bjornberg, Larry Buxton, Pat Murphy, Jim Wadell, and Yvonne Lassiter Heinze (all 7020).

"I give this group a lot of credit for what's been accomplished so far," says Ed. "They have worked extremely hard. But it was the plan 'owners' and authors who came up with the actions to be taken. Many of them were 'counterparts' during the Tiger Team visit. They're the ones with the technical knowledge about how to respond to the findings."

Twenty-one "owners" are responsible for the 350 planned actions that make up the bulk of the 1,100-page document. There are 100 authors, many of them working collaboratively across organizations. Many other Sandians have provided reviews and quality checks, says Ed: Financial Org. 100, financial reviews; Corporate Quality Dept. 4310, quality checks; Legal Dept. 210, legal support; Technical Communications Dept. 3150, document production. "Susan Lacy of DOE/Kirtland Area Office and Dan Pelligrino of DOE/Albuquerque Operations provided valuable review of the drafts," Ed adds.

We'll All Be Affected

Even though Sandia, Livermore has a separate Action Plan, drafts of the Albuquerque plan have been available in Livermore for review. Both plans are to be integrated over the next 12 to 18 months.

"The average Sandian may not have seen much of this process so far," says Ed, "but it will affect all of us at some point. When the Action Plan is complete, that's when the work really begins. We'll all have to do our jobs in a different

way. We must be more knowledgeable and responsible about ES&H. Eventually, we'll be required to make monthly reports on the status of milestones identified in the Action Plan. Once the Plan is approved, the dates become Sandia commitments that can't be changed without the approval of DOE Headquarters."

Actions Already Under Way

Even though the final Action Plan isn't completed, Sandia is already moving toward the first set of milestones that the plan will require.

"This is a parallel effort," says Ed. "We're taking the first step toward coming into compliance and evolving toward our goal of excellence."

The ES&H Project Management Office will continue to manage the Action Plan after it's signed by Watkins. The people in 7020 will also manage corrective actions for other ES&H-related audits of Sandia by agencies such as the New Mexico Environment Department, the Environmental Protection Agency, the Occupational Safety and Health Administration, and other DOE offices.

•AStotts(3163)

Chernoff Thanks Sandians

The following letter was recently sent to Al Narath from Kirtland Area Office's Manager Al Chernoff:

"I want to express my appreciation to Glen Cheney [VP-7000] and to the staff that worked on the Tiger Team Action Plan. I know how much effort has been expended, not only in getting ready for the Tiger Team and in accomplishing a successful review, but also in the follow-up, and Glen deserves a great deal of the credit.

"The plan was received on time, and although some changes will ultimately have to be made, I want to express to you my sincerest gratitude for the superb support we have received.

"We have an excellent relationship, and one that merits trust and resourcefulness to solve the many problems facing both SNL and the Department of Energy.

"Please convey to Glen and your staff my appreciation and continued support for the good working relationships we have."

Tiger Team Action Plan Timetable

Oct. 21 — Current draft to Kirtland Area Office.

Oct. 25 — Preliminary Final Action Plan to DOE Headquarters.

Nov. 23 — Additional comments from DOE Headquarters.

Dec. 23 — Final Action Plan to DOE Headquarters.

Jan. 7-14 — Points of concern negotiated with DOE representatives.

Feb. 1 — Final Action Plan signed by Secretary Watkins.

Sandia News Briefs

Sandia Magma Exploration Well Will Soon Reach 7,500 Feet

In August, researchers in Sandia's Geothermal Research Div. 6252 resumed drilling in California on what will someday be the deepest well ever drilled into an active caldera. The well — part of an ongoing magma exploration project — will eventually reach a depth of 20,000 feet (nearly four miles) or a temperature of 932 degrees F, whichever comes first.

By drilling into hot rock near the deep molten magma, the Sandians hope to learn how to tap a cheap, environmentally sound, and virtually inexhaustible source of energy. If exploration is successful, the hot rock will eventually be used to turn water (or other fluids piped from the surface) into steam, which will drive a turbine back on the surface. The 17-1/2-in.-diameter well is currently 6,800 feet deep, or about 1-1/4 miles.

Work was halted for two years starting in 1989 because of budget restrictions, but a \$1.5 million grant from the California Energy Commission and matching funds from DOE made further work possible. To complete the current phase of drilling, the researchers must drill down another 700 feet. The next phase of drilling (to 14,000 feet) is planned for 1993.

Project leaders John Finger and Ron Jacobson (both 6252) say some of the biggest challenges of the project are keeping the drilling fluids cool, replacing worn drill bits (approximately every 500 feet), and keeping the hole from getting crooked. "A 5-1/2-in. drill stem that is 6,000 feet long is pretty limber," says John. "The most deviation we've had from vertical is 2-1/2 degrees."

Janet Williams Receives Alumni Achievement Award

Janet Williams, ES&H coordinator for Environmental and Manufacturing R&D Programs Org. 6600, was presented the Alumni Achievement Award from the University of Missouri at Kansas City's School of Engineering on Sept. 20. Alumni Achievement Awards are given annually to one graduate from each of the University's nine academic departments.

Janet's award is based on her career achievements as a Sandia facilities customer representative as well as her record of service to the community. Janet was a member of the first field engineering team in Facilities Construction Management and was among the first group of facilities customer representatives appointed at Sandia. Most recently she was project manager for construction of the new Integrated Materials Research Lab.

Janet's award also recognizes her volunteer work with the Society of Women Engineers encouraging young minority women to pursue careers in engineering. She received her bachelor's degree from UMKC in mechanical engineering in 1983.

Hugh Jones Receives 'Augustus McCrae Award'

Hugh Jones, a contracting representative in Purchasing Div. 3726, is the third recipient of the Captain Augustus McCrae Award, an award made periodically to an employee (or group of employees) in Purchasing and Materials Management Org. 3700 who exhibits outstanding customer service.

The award is named after Captain Augustus McCrae, a fictional character from Larry McMurtry's novel *Lonesome Dove*. In the novel, McCrae uses his fist to teach a rude bartender a lesson in good customer service.

Earlier this year, Hugh and a technical and audit support team negotiated and awarded several contracts as part of a multi-million dollar DOE/Sandia photovoltaic project. Org. 3700 Director Bob Zaeh acknowledged that their negotiations of these contracts saved the Labs more than \$6 million. "This award was really a team effort," says Hugh. "I share the credit with the rest of the team."

Send potential Sandia News Brief items to LAB NEWS, Div. 3162.



USING a cardboard box to test Sandia's whole arm proximity sensor (WHAP) is Frank Caiati, Executive Director of General Motors' Advanced Engineering Staff. He and 13 other GM executives (several seen here) visited Sandia Oct. 3 and 4 to see Labs technologies in action and hear about technology transfer opportunities. Jim Novak (1414, center) describes the WHAP sensor, which enables a robotic arm to detect obstacles in its path and avoid collisions.

feed back

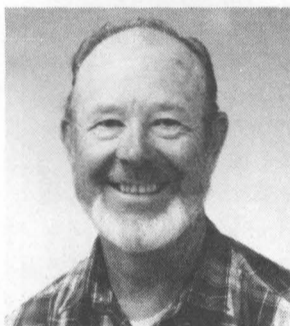
Q: I would like some clarification on Sandia's policy for having the Transportation division move material between buildings. I'm tired of being hassled when I am carrying a 10-pound instrument across a street for use in an experiment that is already on progress. I understand that moving large instruments, consoles, large amounts of material, and furniture is the job of these people, and that they have the proper equipment to do the job. But when I have an experiment running and I need a meter or an amplifier from a lab across the street, I can't wait two or three weeks for Transportation to move the instrument for me. Is there some guideline as to the size or weight of an object that a regular employee can move in order to carry on the work of the Labs, and as to the cutoff point where scientific work must halt until Transportation gets around to doing its job?

A: SLI 6950 offers guidance on hand-carrying property and material; size or weight is not defined by corporate policy. However, the Agreement between Sandia and the Metal Trades Council (Article 36 and Exhibit XI) prohibits supervisors and other employees not represented by the Council to do work that is normally assigned to represented employees. This prohibition covers activities such as material transportation and handling.

The Metal Trades Council recognizes that in an emergency situation, some degree of flexibility is needed in assigning employees to meet the emergency. However, this does not mean you can have an emergency every time you run an experiment. A suggestion might be to improve planning and to work closely with Transportation Services Section 3423-1. The section moves approximately 4,000 items a week. If your material movements are not handled in a timely manner (three days at the most), please contact Supervisor Jim Davis on 4-5703 for assistance.

Jim Martin (3400)

Recent Retirees



Chuck Peeples
1834 25



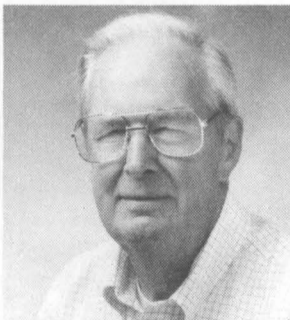
David Brice
1111 28



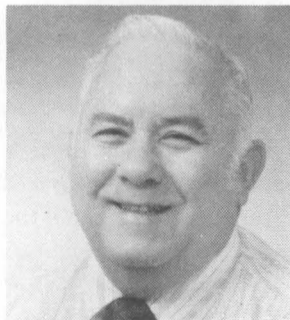
Hilda Hennessee
9230 25



Frank Speakman
2411 42



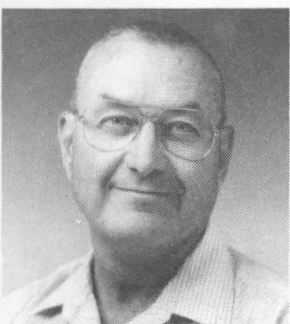
Richard Sager
2473 11



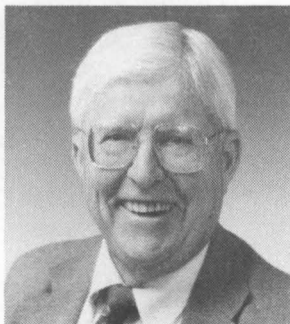
Herschel Rogers
5127 40



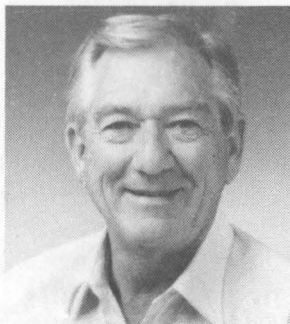
Abbie Williams
3153 27



Gerald McCoach
9545 27



Randy Maydew
4520 38



Hank Mullin
5147 26



Take Note

The American Vacuum Society, New Mexico Chapter, is offering a Short Course Program Dec. 9-13 at the Amfac Hotel in Albuquerque. Courses include Basic Vacuum Technology, Operation and Maintenance of Vacuum Pumping Systems, and Vacuum Safety. Scholarships are available. To apply, contact AVS/NM Scholarship Committee Chairman Ralph Dawson (1154) on 5-8920. Application deadline is Nov. 15. To register for the program, call Jay Fries on 1-438-8081.

Sandia employees are reminded that they may use licensed family day-care homes on KAFB for child care purposes, without an MWR card. Lists of licensed day-care providers can be obtained through the Main Child Development Center. In addition, interested parents may pick up the Family Day Care Handbooks that inform them of provider requirements. For more information, call Jackie Barsis or Lynette Essman on 6-6886.

The 1991 Apple & Arts Festival sponsored by All Faiths Receiving Home Auxiliary is today, Oct. 18, from 9 a.m. to 3 p.m. at the First Presbyterian Church (215 Locust NE). Activities include a traditional chile luncheon, arts and crafts sale, bake sale, silent auction, raffle, and apples. The grand prize is a Hawaiian vacation for two. Proceeds go to the All Faiths Receiving Home Crisis Shelter. Admission is free; luncheon cost is \$4.50. For information, call 294-0251.

MAX KOONTZ (left), Director of DOE's Systems and Technology Division in the Office of Arms Control, inspects a seismometer package that forms part of a Designated Seismic Station (DSS). James Pacini (Seismic Verification Systems Div. 9233) points out features of the package and its shipping container. DSSs will be sent to the USSR in support of the Threshold Test Ban Treaty each time tests above 50 kilotons are conducted. The seismometer packages will be lowered about 100 meters into boreholes at three designated sites in the USSR. Sandia is part of a government-industry team developing and building the DSS.



Retiree Deaths

| | |
|---------------------------|----------|
| Bertha Williams (75)..... | Sept. 1 |
| John Puhara (75)..... | Sept. 13 |
| John Budlong (75)..... | Sept. 13 |
| Bert Neumon (70)..... | Sept. 14 |
| Ann Medley (74)..... | Sept. 21 |
| Ira Ward (79)..... | Sept. 23 |
| Owen Thomas (66)..... | Sept. 25 |
| Fred Brown (75)..... | Sept. 29 |

feed iiback

Q: I suggest that Sandia look into getting an automatic blood-pressure measuring apparatus and putting it in an easily accessible location for employees. Because high blood pressure can exist with no other symptoms, I believe it would be advantageous to have a simple, quick, convenient way to check it. Several months ago, I visited Los Alamos National Lab, where I saw such a device in the lobby near the cafeteria.

A: Thanks for your suggestion. In the past, we have examined various options for providing employees with frequent blood pressure checks and guidance as to interpretation and intervention. Currently, Sandia's Medical Organization takes the blood pressure of any employee who visits the clinic and also has a monitoring program next to the waiting area. This gives employees a quick "in-and-out" option for checking blood pressure, recording the data, and generating a report documenting their medical history, which may be of use to their primary care physician. Sandia's TLC Program also provides ongoing educational information about hypertension and management options.

Finally, while automatic blood pressure machines may appear attractive, they are not as useful as the above-noted options and have historically been somewhat plagued by reproducibility problems. We will, however, continue to examine this option for the future.

Dr. Larry Clevenger (3300)

A CLASS ACT — Class has been out for 10 years for these Sandia apprentice program graduates, but they got together recently to pose for a 15-year milestone photo. Graduates of the five-year materials processing, electronics, and machinist apprentice programs include: front, Ken Ystesund (9249) and Carla Chirigos (2476); back (from left), Fred Hooper (2473), Joe Padilla (2485), Joe Kubas (2742), and Brett Bedeaux (9323). Other members of the class not pictured include Johnny Rice (2412), Stephen Barnard (2412), Gilbert Lucero (2414), Dave Sparks (2414), and Carl Brezowski (2512).



(Continued from Page Three)

Verity Recalls Early Days at Livermore

Division, where she set copy on electric typewriters, including an IBM Executive that justified lines with proportional spacing. She did her own layout and pasteup by hand on drawing boards. Today, she notes, technology has changed the publishing business so much that computers do just about everything except write the copy.

In 1971, Carol moved up to an editor's job in Publications. In 1978, she moved to the Personnel Division as Affirmative Action coordinator, and in 1981 became the first woman to supervise a Sandia, Livermore division — the Benefits, Medical, and EEO Division. Shortly after that, Miriam Hall (now Manager of Purchasing Dept. 3720), was named Supervisor of Purchasing.

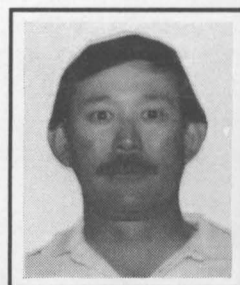
Commenting on the organization where she first worked, Carol said things were much more structured and confined in the "old days." The library workers, for example, had formal 10- or 15-minute breaks each morning and afternoon,

where "you left your work station and relaxed, but then exactly on the clock you returned and never socialized again until the end of the day." She has also noticed a change in employee involvement in how the Labs operate. There used to be less input from the rank-and-file, very few all-employee meetings, and the words "empowerment" and "evaluating management" were not in the corporate vocabulary.

Carol says she and her husband John, who retired from Lawrence Livermore National Lab a year ago, plan to spend more time at their second home in Carmel. Carol hopes to take some "fun" courses in such topics as French, art, and music appreciation, and wants to get back into volunteer work, something she enjoyed previously as a participant in MATCH, a visitation program for the elderly in the Livermore Valley. •BLS



Employee Death



WAYNE YOSHIMOTO

Wayne Yoshimoto of Coil Fabrication and Apprentice Training Sec. 2412-3 died in a motorcycle accident Oct. 7. He was 44 years old.

Wayne had been at the Labs since 1976.

He is survived by his wife, one son, and two daughters.

Sympathy

To Kathleen Mitchell (3441) on the death of her brother in Albuquerque, Sept. 22.

To Jim Clabaugh (5115) on the death of his wife in Albuquerque, Sept. 22.

To Danelle Tanner (9351) on the death of her father in Eunice, La., Sept. 24.

To John Orman (2818) on the death of his father in Albuquerque, Oct. 2.

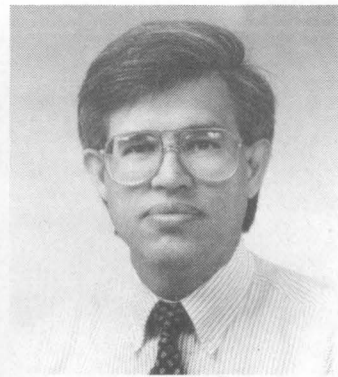
MILEPOSTS

LAB NEWS

October 1991



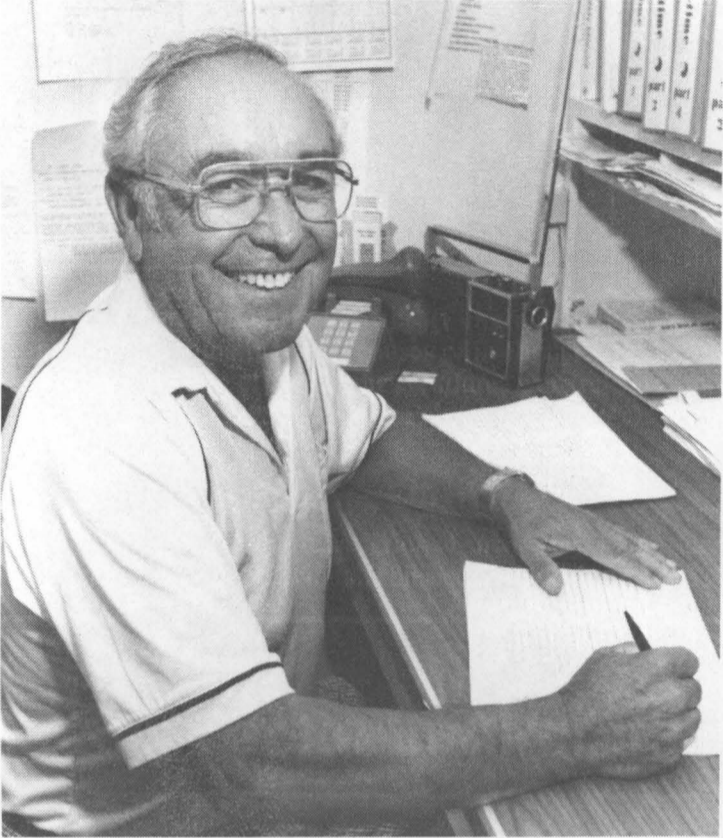
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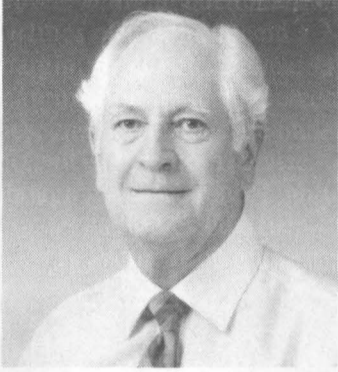
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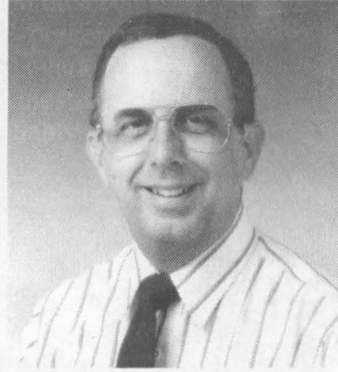
Gladys Sheldon
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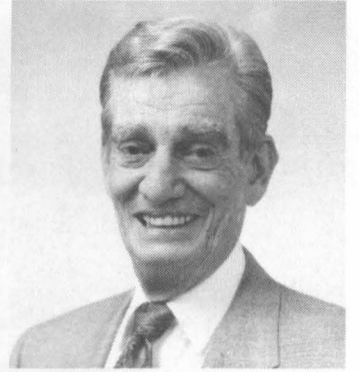
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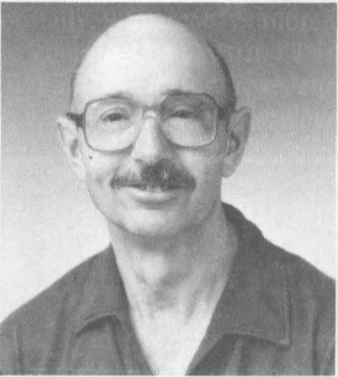
R. L. Terwilliger
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Robert Ewing
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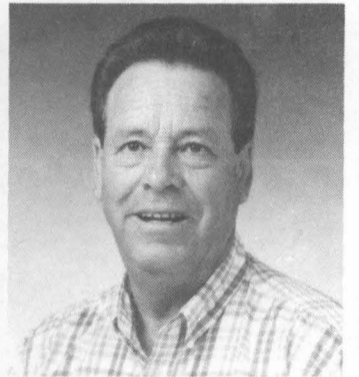
H. M. "Brick" Dumas
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Richard Bryant
2473 25



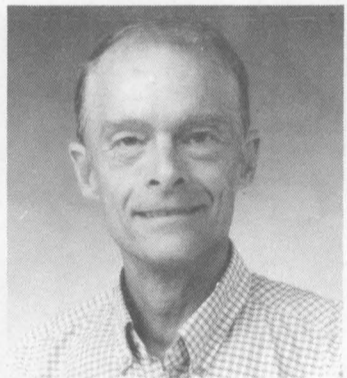
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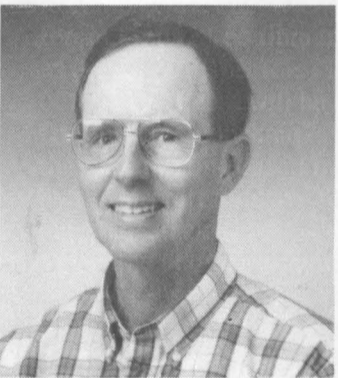
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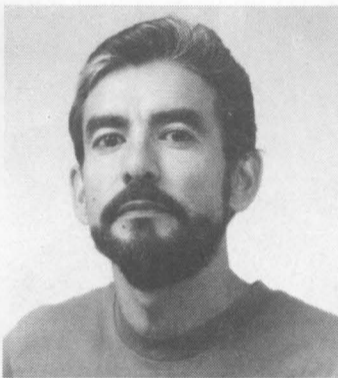
Elveta Bishop
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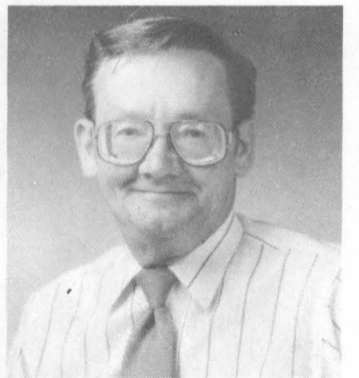
Tom McConnell
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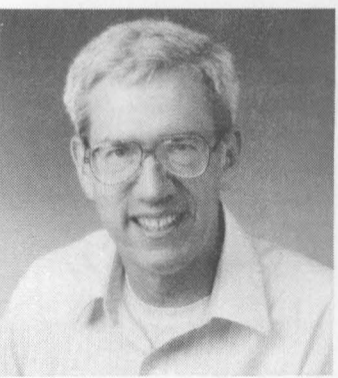
Lowell Jones
9241 25



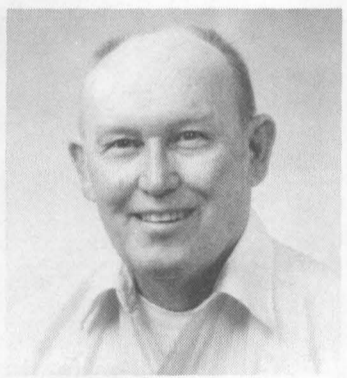
Margarito Crespín
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Ken Gentry
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Jim Moreno
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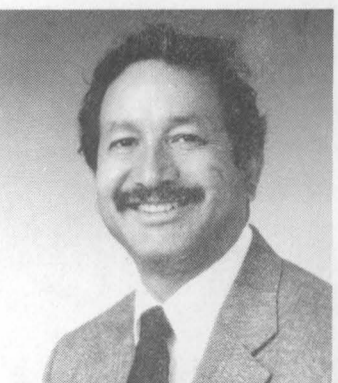
Edgar Boeck
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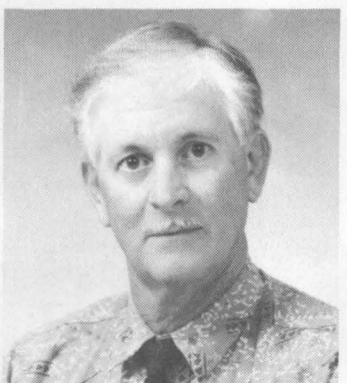
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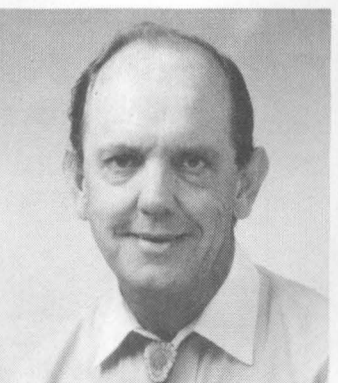
Denny Gallegos
3743 25



Frederick Norwood
1542 25



Don McGinnis
3128 25



David Williams
6402 25



Johnny Biffle
1425

25



Demmy Edwell
342

15



Doug Smathers
5174

25



Johnny Rice
2412

15



Roscoe McGee
3123

25



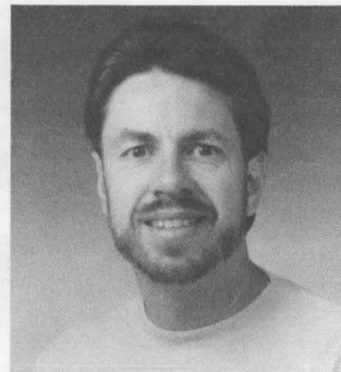
Rose Ann Schultz
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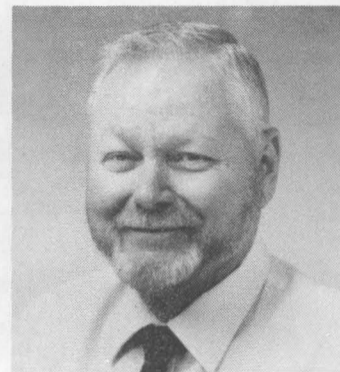
Joe Brown
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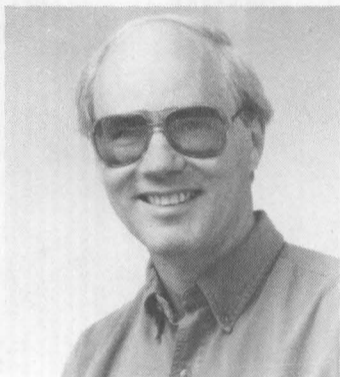
Stephen Barnard
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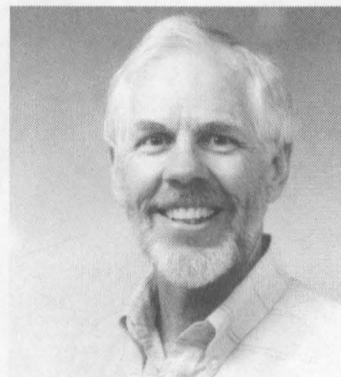
Leo Doyal
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Jerry Bollig
1944

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Terry Herther
5031

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Rita Martinez
2800

15



George Allen
6461

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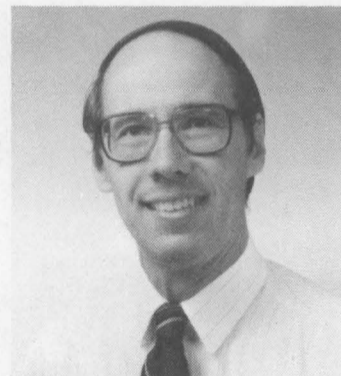
Nick Nolasco
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Sue Tenbroeck
3301

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Rudy Jungst
2525

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Al Foster
9123

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Geoffrey Mueller
2341

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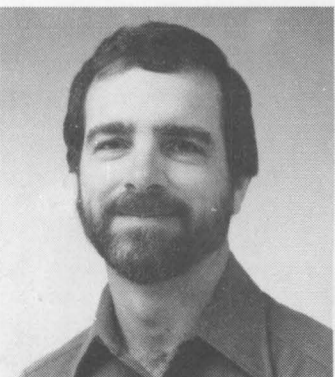
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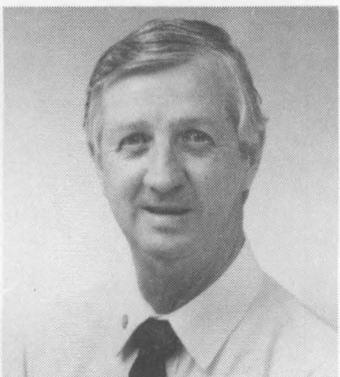
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Gary Kellogg
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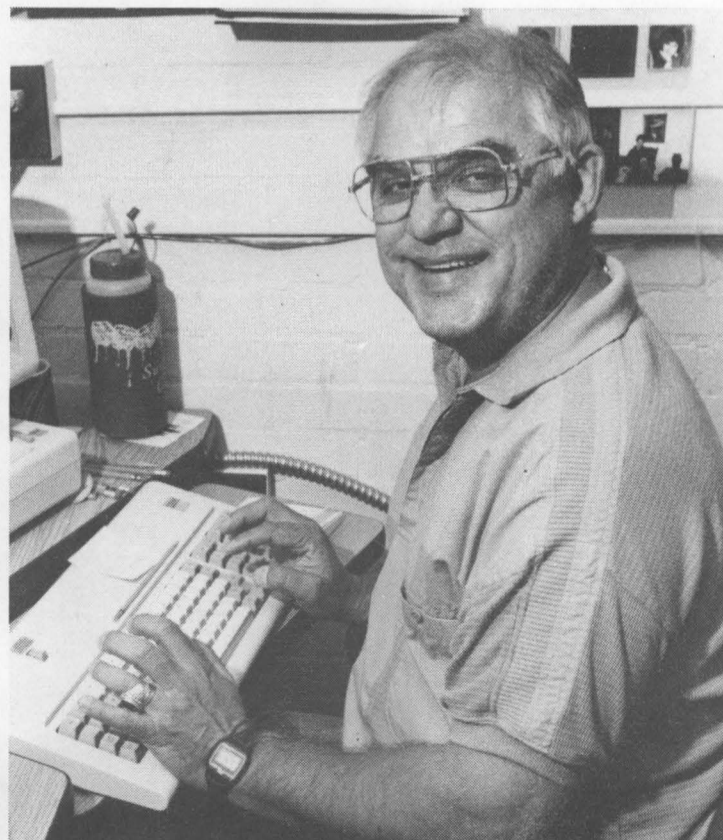
James Tichenor
2565

35



Louann Grady
9227

15



Sal Gabaldon
3141

25

Coronado Club Activities

Where Do Singles Mingle? Why, at the C-Club

SANDIA SINGLES INVITED — At the Single Mingle tonight, Oct. 18, it's music & dancing, pingpong & volleyball, darts & dining (and you don't have to be a C-Club member). The band, Joe Sais & Showcase, is making its first Club appearance. Joe and his group will play a variety of good sounds for everybody from 6 to 10 p.m. The buffet line will be open from 5 to 7.

GRAND MUSIC, GRAND MENU — Next Friday, Oct. 25, Trio Grande returns to the Club. Along with great music, expect a great menu: roast prime rib or grilled halibut (two-for at \$16.95), Cajun-style catfish, chicken breast, or filet mignon. Dinner is from 6 to 9 p.m., music from 7 to 11. Reserve your place now!

CALLING ALL KIDS: It's gonna be Halloween soon, and the Club's annual party is just right for ghosts, ghouls, goblins, and other grisly creatures. Tell your folks to bring you on Sunday,

Oct. 27, from 6 to 9 p.m. There'll be games, prizes, and special events the whole evening. Win a prize in the costume contest! Tour the Haunted House (if you dare)! Enjoy a show by Richard the Magician! The low-cost buffet from 6 to 8 p.m. will feature ghastly goodies such as Frankenstein Wieners, Dracula Burgers, Skeleton Bones, and Vampire Beef. Admission to the party is \$1.50 for kids, free for accompanying moms & dads.

THAT'S ENTERTAINMENT — "Entertainment 92" discount books are now available from the Thunderbird Retirees in the Club lobby during lunch hour. Take a look at this great discount deal. For more info, call T-Birders Dale Buchanan on 299-7487 or Art Hasenkamp on 255-8946.

WATCH THIS SPACE for news about the Club's membership drive next month — bonuses for new members and for current members who bring in a new member.

Take Note

Technical papers are being solicited for the 14th Annual Ideas in Science and Electronics Exposition/Symposium (ISE '92) to be held May 12 through 14 at the Albuquerque Convention Center. ISE seeks papers — particularly those involving applications — in 11 general topic areas: advanced amateur radio, artificial intelligence and neural networks, communications, computer graphics (virtual reality and scientific visualization), data and signal processing, environmental technology (hazardous materials, measuring, monitoring, treatment, disposal), instrumentation and testing, medical/biomedical instrumentation/optics/electro-optics/optoelectronics, plasma-aided manufacturing, and sensors/imaging/data fusion. Send a one-page abstract to John Gill, ISE, Inc., 8100 Mountain Road NE, Suite 109, Albuquerque, NM 87110 (phone 262-1023) by Dec. 15. Selected authors will be notified by March 1; completed papers are due by May 1. Papers must be unclassified, have unlimited distribution, and be company/government-cleared before submission.

Events Calendar

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

Oct. 18-20 — "Martin" by Jimmy Santiago Baca, an epic about an abandoned New Mexican boy caught between modern and traditional, urban and rural, and Spanish and Indian cultures, presented in English by La Compañia de Teatro de Albuquerque; 8 p.m. Thurs.-Sat., 2 p.m. Sun.; KiMo Theatre, 242-7929.

Oct. 18-20 — Storyfiesta: The Magic of Story in the Land of Enchantment, 7th annual session of entertainment and education with US and international master storytellers, presented by Storytellers International; call for times, Madonna Center (4040 St. Joseph Pl. NW) and other locations, 897-0713 or 843-6060 (category TELL).

Oct. 18-20 & 25-27 — "The Legend of Sleepy Hollow," full-length narrated ballet presented by the New Mexico Ballet Company; 8:15 p.m. nightly, 2:15 p.m. matinees; Popejoy Hall, 277-3121 or 299-7798.

Oct. 18-Nov. 10 — Exhibit, five paintings created in a 35-year period by New Mexico painters Gene Kloss, Carey Walker Hayes, the late Joseph Fleck, and the late Emil Bistram, on 25-year loan from the Veterans Administration Medical Center; 9 a.m.-5 p.m. Tues.-Sun.; Albuquerque Museum of Art, History, and Science, 243-7255.

Oct. 19 — Pageant of Bands: high-school marching band competition featuring 14 New Mexico bands (including 10 APS schools) and the UNM Spirit Band Drum Line; 9 a.m.-4 p.m., Wilson Stadium (Lomas & Chelwood); \$3/adults, \$2/kids K-8; 293-4037.

Oct. 19 — Valleyfest '91: Horse-A-Thon, trail ride along the eastern river levee from Central Ave. to Alameda Blvd.; call for time, 265-0732.

Oct. 19-20 — Matachines Dances, colorful and mysterious dances marking the turning of the year; call for time, Indian Pueblo Cultural Center, 843-7270.

Oct. 20 — Symphony in the Sunshine Series: New Mexico Symphony plays the music of Rodrigo, Mayuzumi, and Mauldin; 3 p.m., Sunshine Music Hall, 842-8565.

Oct. 22 — People of the Southwest Lecture, "Myth, Metaphor, and Mimbres Art," Jerry Brody, former director of the Maxwell Museum of Anthropology and Professor Emeritus in the UNM Art History Dept., will take an in-depth look at the various images depicted in Mimbres pottery paintings, discussing their meanings in terms of world view and harmonious daily living; 7:30 p.m., Maxwell Museum of Anthropology, 277-4404.

Oct. 23 — Lecture, "Modern Navajo Rugs at Auction: An Auctioneer's View," by Herman Coffey, long-time Crownpoint auctioneer, an introduction to the Crownpoint Rug Auction Field Trip scheduled for Fri., Oct. 25; 7:30 p.m., Maxwell Museum of Anthropology, 277-4404.

Oct. 24 — Lecture, "New Mexico Minutia," by John Aragon, part of "Hispanic Culture: World, National, & New Mexico Views," a Quincentennial Lec-

ture Series sponsored by the Hispanic Culture Foundation; 7 p.m., South Broadway Cultural Center, 831-8360.

Oct. 24-26 — Willow Creek: A Craft Faire; 5-8 p.m. Thurs., 9 a.m.-6 p.m. Fri., 9 a.m.-5 p.m. Sat.; 1205 Lawrence Ct. NE (two blocks east of Tramway and two blocks south of Lomas), 299-3403.

Oct. 25 — Crownpoint Rug Auction Field Trip, bus trip to Crownpoint Rug Weavers Association Auction, co-sponsored by the Albuquerque Archaeological Society & UNM Leisure Services; 4 p.m., Maxwell Museum of Anthropology; to register, call Laura Montoya on 277-4347.

Oct. 25-Nov. 9 — "Cabaret," musical, long-running Broadway hit, exposes the scintillating underground world of Berlin before World War II; 8 p.m. Thurs.-Sat. (7 p.m. opening night Oct. 25), 2 p.m. Sun.; Albuquerque Little Theatre, 242-4750.

Oct. 25-Nov. 17 — "Waiting for Godot," tragicomedy by Samuel Beckett about two tramps waiting on a country road for the man they think will save them, presented in celebration of the Vortex Theatre's 15th anniversary; 8 p.m. Fri.-Sat., 6 p.m. Sun.; Vortex Theatre, 247-8600.

Oct. 26 — Flintknapping Demonstration, by Pete Ainsworth, UNM anthropology undergraduate, part of continuing series of monthly demonstrations on the last Saturday of every month; ongoing demonstrations from 11 a.m. to 3 p.m.; Maxwell Museum of Anthropology, 277-4404.

Oct. 26-27 — "Halloween Wizardry: An Electrifying Performance," 30-minute presentation courtesy of Albuquerque electronic wizard Carl Noggle and friends, performances involve a variety of devices that create beautiful effects and educate viewers about electricity and general principles of physics, "sparktacular" effects combined with thunder, volcanic rumblings, and

appropriate music evoke a spooky atmosphere akin to Frankenstein's laboratory; 10 & 11:30 a.m., 1:30, 3, & 4:30 p.m.; New Mexico Museum of Natural History and Science, 841-8837.

Oct. 26-27 — 21st Chrysanthemum Show, judged in accordance with the standards of the National Chrysanthemum Society; 2-5 p.m. Sat., noon-5 p.m. Sun.; Albuquerque Garden Center (10120 Lomas NE), free, 296-6020.

Oct. 27 — Lecture, "Dia de los Muertos," by Mariana Murguía de Ferrer of Mexico City, presents a cross-cultural look at the traditional days of harvest, Halloween, Dia de los Muertos, and the ancient new year; 2 p.m., Albuquerque Museum of Art, History, and Science, 243-7255.

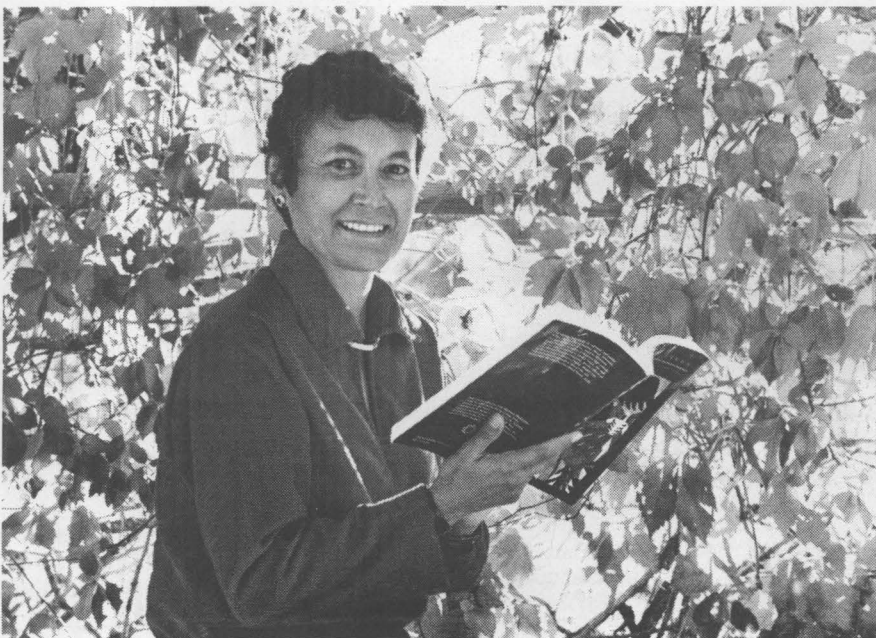
Oct. 27 — Crafts for Christmas, arts & crafts by New Mexico artisans, benefit for New Mexico Heart Charities, presented by Alpha Phi sorority; 10 a.m.-4 p.m., Ramada Classic Hotel.

Oct. 27 — Christmas Arts Festival, 10 a.m.-7 p.m., KAFB Arts and Crafts Center (West Recreation Center, off Maxwell), 846-1067.

Oct. 28 — "Babes in Toyland," presented by American Theatre Arts for Youth; 10 a.m.-2:30 p.m., Kiva Auditorium, 1-800-523-4540.

Oct. 30-31 — "Three's A Charm," UNM dance ensembles present ballet, flamenco, and contemporary dance directed by Bill Evans, Joetta Jercinovic, and Eva Enciñas; call for times, Rodey Theatre, 277-4402.

Oct. 30-Nov. 10 — "Brilliant Traces," by Cindy Lou Johnson, New Mexico Repertory Theatre presentation of a wacky romantic comedy about a young bride who leaves the altar, drives to Alaska, and is caught in a blinding snowstorm where she finds shelter in the house of a stranger who is also running away from life; 8 p.m. Tues.-Sat., 2 p.m. Sat. & Sun.; KiMo Theatre, 243-4500.



ACCOMPLISHED POET — A poem by Juanita Sanchez (2481) was recently published in *Braided Lives*, an anthology of multi-cultural American writings for use by high school teachers and students. The poem, titled "Ciprianita" (the name of Juanita's grandmother), deals with the relationship between a girl and her grandmother. Juanita has had her poetry published in numerous anthologies; this latest poem was selected (from another anthology) for its literary merits.