Deep Steam Generator Successful

The first long-term field test of a downhole steam generator to free heavy oil from underground reservoirs has been successfully completed by Enhanced Oil Recovery Division 9755.

The test, conducted in a heavy oil field near Long Beach, Calif., ended with a 106-day run in which the generator operated approximately 75 percent of the time. Downtime stemmed from failure of surface equipment, not the downhole unit located at the bottom of a 2035-foot borehole.

The generator produced up to 800 cubic feet of 500°F steam a minute (1.2 megawatts thermal, 4 million Btu/hour), which was injected directly into a reservoir containing 12½ degree gravity oil—about the consistency of heavy molasses.

The test well was located near the center of a five-acre plot which had production wells at each corner. The field has been producing heavy oil since the late 1920s, most recently with the aid of water flooding to force oil into the production wells.

"The test generator was too small to substantially change production in the field," says Bill Marshall, 9755 supervisor, "although flow in one of the recovery wells did increase near the end of the test period. The test did demonstrate for the first time, however, that it is feasible to operate a downhole steam generator at depth for long periods of time."

The test was conducted in cooperation with the City of Long Beach and the Long Beach Oil Development Company, which monitored test production rates and now plans to continue flooding the field with steam from a larger, commercially available generator.

The commercial unit, based on the Sandia design, is to be developed and fabricated by Enhanced Energy Systems, Albuquerque, and is expected to be in operation by the end of the summer.

Marshall says areas requiring additional work include determining causes of aging in the test generator, determining how carbon dioxide mixed with steam and other gases affects steam flooding, identifying methods of efficiently sweeping more heavy oil from a reservoir, and developing generators that will operate on less refined fuels, thus lowering operating costs.

About 80 percent of the nation's five-billion-barrel proven reserve of heavy oil will have to be freed with thermal techniques, such as steam injection, if it is to be recovered.

Downhole generators are a substitute for large surface generators. Such boilers require scrubbers to keep emissions within acceptable limits, and their effectiveness is confined to depths no greater than 3000 feet west of the impact area, Ken Bauhs (7521) assures that the requested data formats and film coverage of the test are provided from the computers and cameras in the laser tracker and from cameras in another trailer on the east side of the track. This is the slave tracker, connected by microwave link to the laser tracker and computer-controlled to duplicate the photometric test data from a second viewpoint. The laser tracker is instrumented to provide three-dimensional trajectory and velocity data and both the tracker and slave are equipped with high-speed cameras and recording video cameras. The video provides instant playback of the test while computer-analyzed dynamic flight data are available within minutes.

Sandia's laser tracker and slave are unique in the weapons development testing business. Without this advanced instrumentation, the heavy schedule of Division 7555 rocket sled testing in Area III could not be performed. Neither could the free flight rocket/trolley intercept tests or parachute development tests for antitank munitions be conducted at the Coyote Canyon Aerial Cable Site. In the Cable Site tests, the laser tracker and slave are moved to Coyote Canyon and actually control part of the tests. Command signals are programmed to be issued in sequence as certain test conditions and performances are met.

Heart of the laser tracker is a 12-inch-

New Laser Tracker Under Development

Red flame erupts from a bank of rocket motors and the sled shoots down the 5000-foot track, accelerating to Mach 1.6 within milliseconds. Then the test unit riding on top of the sled is tossed skyward and a parachute deploys. The sled sprays a plume of water as its undercarriage brake hits a trough of water between the tracks. Meanwhile, the parachute eases the test unit down into the target area. Elapsed time: less than eight seconds.

Guided a few hundred feet west of the impact area, Ken Bauhs (7521) assures that the requested data formats and film coverage of the test are provided from the computers and cameras in the laser tracker and from cameras in another trailer on the east side of the track. This is the slave tracker, connected by microwave link to the laser tracker and computer-controlled to duplicate the photometric test data from a second viewpoint. The laser tracker is instrumented to provide three-dimensional trajectory and velocity data and both the tracker and slave are equipped with high-speed cameras and recording video cameras. The video provides instant playback of the test while computer-analyzed dynamic flight data are available within minutes.

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Heart of the laser tracker is a 12-inch-

Continued on Page Two

Continued on Page Four
Successful Deep Steam

feet because the steam cools before penetrating to deeper levels.

Downhole generators are expected to operate to depths of 6000 feet and should have much less difficulty in meeting air quality standards.

During the Long Beach test, analysis indicated that most of the pollution-causing combustion gases such as oxides of carbon, nitrogen, and sulfur remained underground and no reservoir plugging was observed.

The test generator is 4\(\frac{1}{2}\) inches in diameter and 9\(\frac{1}{2}\) feet long, including a 3\(\frac{1}{2}\)-foot combustor and vaporizer section and a 6-foot instrumentation package containing pressure and temperature devices. The instrumentation section also controls the entry of air and diesel fuel into the combustion chamber and water into the vaporization chamber.

Air and fuel are fed through tubing into the combustion chamber, where the fuel/air mixture is ignited with a diesel engine glow plug or with a pyrophoric liquid that burns when exposed to air.

The instrumentation package is connected by cables to surface equipment such as air compressors, valves, pumps, and flowmeters and to computers that control the entire operation. All downhole components are designed to operate continuously in a 500°F, 1400 psi environment.

Development of the downhole steam generator is part of DOE's Project DEEP STEAM established in 1978 to identify techniques for recovering heavy oil from reservoirs below 2500 feet. Sandia manages the project.

"A major accomplishment of the project has been stimulation of new interest in downhole steam generation, an idea that dates back to the 1960s," says Marshall. "Now, several companies are working on units and displaying hardware at oil industry trade shows."

**Supervisory Appointments**

BOB TURMAN to supervisor of Pulsed Power Research Division 1252, effective June 1.

Bob has been at the Labs since June 1980 as an MTS in his current division. Bob's group is responsible for the pulsed power research on the PBFA-II accelerator and the Gigajoule Project that uses explosive generators and fast-opening switches for pulsed power applications.

Before coming to Sandia, Bob was in the Air Force for 11 years. His last assignment was at the AF Academy where he was a physics instructor. He earned his BS and PhD in physics from the University of Texas at Austin. Bob is active in his church and enjoys jogging and hiking. He and his wife Carol have two children and live in NE Albuquerque.

... * * *

BOB BARTON to supervisor of Vehicle Maintenance Section I 5421-1, effective June 1.

Bob has been a mechanic at Sandia for 15 years. Before joining the Labs he was a mechanic with local firms and served as a shop foreman for eight years at International Harvester.

He enjoys fishing and driving his dune buggy. He and his wife Wanda have three children and live in SE Albuquerque.

... * * *

JOHN LEDMAN to manager of Development Laboratories Department 7470, effective June 16.

John joined the Labs in 1962 as an MTS in the materials and processes group. His organization was concerned with joining development for components and structures with the study of fracture mechanics in materials development. In 1989 he was promoted to supervisor of the Process Metallurgy Division. For the past couple of years, John's division has been concerned with the behavior of materials at elevated temperatures. His personal work has been to apply modern fracture control theory to pressure vessels. John is a member of Sandia's Pressure Advisory Committee which has developed a training program and a safety practices manual.

John earned a BS in metallurgical engineering from the Illinois Institute of Technology and a PhD in metallurgy from Rensselaer Polytechnic Institute. He is a member and past chapter president of the American Society for Metals. John enjoys fishing, camping, hunting, and playing bridge. He and his wife Judy have two children and live in the NE heights.

**GSA Vehicle Sale**

Scheduled June 30

A GSA vehicle sale will be held June 30 at 10 a.m. at the KAFB-West theater, Bldg. 485. Enter the Base at Truman Road gate from Gibson Rd. SE, turn right at the first signal light, then drive two blocks to the theater.

Vehicles may be inspected at the GSA Interagency Motor Pool, 1800 12th NW, on June 28 and 29 from 8:30 a.m. to 3:30 p.m., and on June 30 from 8 to 9:15 a.m. Vehicles to be offered include: sedans, school buses, vans, pickups, stake trucks, flatbed trucks, forklifts, and a non-operating John Deere tractor. All items are sold "as is."
Combustion-Related Materials Research

Applied Physics Division 8324 is developing new in-situ diagnostic techniques to study materials at elevated temperatures in combustion environments.

"Operating combustion devices at temperatures higher than today's levels could have large payoffs in terms of efficiency and costs," says Peter Mattern (now 8510). "DOE's Office of Basic Energy Sciences is funding our work to develop and use new methods to increase our understanding of corrosion, such as that attacking turbine blade materials and coatings at temperatures reaching 1100°C."

"To better understand failure mechanisms," Peter continues, "we need to identify and characterize chemical species in materials and coatings, as well as in the surrounding gases. In addition, measurements of structural symmetry, stoichiometry, impurity content, and temperature are required. To be of practical application, our experimental techniques should have high overall sensitivity and good spatial and temporal resolution. Such diagnostics would enable us to make more accurate and reliable evaluations of the corrosion resistance of materials for particular applications."

The main thrust of the research team—Bob Benner, John Hamilton (both 8342) and Alan Nagelberg (8313)—is to adapt a laser light scattering technique called spontaneous Raman spectroscopy to the in-situ study of combustion-related materials and environments. Post-exposure surface analyses supplement the in-situ Raman spectroscopic measurements.

Using apparatus instrumented for Raman spectroscopy, in which light from an incident laser beam is scattered from a sample and then analyzed, the team is investigating oxides and other compounds that form on the surface of some materials in high-temperature combustion environments. The shift of the scattered light to a frequency different from that of the incoming laser light fingerprints specific species; this, combined with the intensity of the scattered light, helps to determine the molecular composition and structure of the surface. The laser beam penetrates several tens of nanometers into the material, characterizing surface oxides or material changes in the surface during oxidation to this depth. Such data are important, for instance, in evaluating the effectiveness of new zirconium and yttrium ceramic coatings for turbine blades.

"These coatings function as thermal barriers that protect the turbine blade surface," Peter says. "The coatings reduce the surface temperature and limit interaction of corrosive species in the hot gas with the metallic substrate. Improving these coatings would bring the goal of higher, and therefore more efficient, operating temperatures a step closer."

In these and other studies, the researchers are working closely with companies like Pacific Gas & Electric and Westinghouse. Industry is also very interested in studying corrosion of materials in molten-salt and in nuclear reactor environments, to which similar techniques apply.

"The basic techniques we are developing have applications in a wide range of problems," Peter adds. "As we refine the diagnostic tools and add theoretical modeling and analysis, we can make major contributions."

Sympathy

To Jose Ignacio (8257) on the death of his father in San Jose, April 10.
Laser Tracker-II
diameter mirror in a gimbal mount driven by high-speed torque motors. A five-watt laser beam is directed through a system of mirrors onto a reflective target mounted on the test unit. The beam is reflected back to the gimbal mirror and onto the surface of an image dissector which continually corrects the angle of the mirror to keep the target centered. The image from the mirror is also directed to the high-speed cameras and the video recording camera by beam-splitting optics.

The constant moving between Area III and Coyote Canyon is one of the reasons behind the decision to build a second laser tracker (LT-II). The $1.7 million project is centered in Digital Systems Development Division 1521 under Jack Mortley.

"It takes about a day to relocate the laser tracker and its three support trailers," Jack says. "Relocation is particularly time consuming when the unit ping-pongs between the track and the Canyon. Constant adjustment of the unit’s precision optical and electronic systems is required.

"The new LT-II will eliminate this problem. In addition, it will provide a three-fold increase in performance. The LT-II is being designed to support weapon development tests for the coming decade."

The LT-II will build upon technology developed for the LT-I, a commercial unit purchased in 1986. The unit never met design requirements, and a settlement was made with the supplier.

Sandia reworked the instrument until it became operational with limited reliability in 1972.

"It worked, but there were drawbacks," Ken Bauhs says. "The data acquisition was minimal, and all data were only recorded. The tapes went to a data processing center for reduction, and several days could elapse before we had test results. I got the job of second-generation design/development to bring the tracker up to its current capabilities of tracking and control. The slave tracker was also built as part of this effort."

Don Thalhammer (7581) is the project leader for LT-II development.

"The most necessary improvements in the current design," Don says, "are to increase the gimbal’s dynamic performance, make the control system more intelligent and adaptive, and enhance the human engineering of system operations. With these improvements, we could track faster rockets and projectiles from advanced air guns. We can also add an acquisition-on-the-fly capability for locking onto free flight rockets or aircraft.

"The LT-II is also being designed to operate as a test command center with the LT-I and slave as extensions. This will increase the range of testing. At Coyote Canyon, for instance, we could use one tracker to control the test until a mountain or other obstruction gets into the field of view, then ‘hand-off‘ control and tracking to the second tracker.

"If the 5000-foot sled track is lengthened," Don continues, "we could cover the longer sled run using both units."

The most important features of the LT-II are a larger mirror and new drive motors. The larger mirror area will provide more light for the cameras and greater tracking stability at large mirror angles.

Other improvements:
- Automatic leveling of the optical bench.
- Improved position encoders and ranging electronics for greater three-dimensional coordinate accuracy.
- Addition of five microcomputers to the electronics systems to provide automatic focusing, zoom control, and adaptive gimbal control plus safer control of the laser beam. (The beam will not illuminate programmed exclusion areas.)

Don reports that the contract for the LT-II mirror, its gimbal mount, and drive motors is placed for final development and fabrication. The LT by 40-foot trailer that will house the LT-II is being modified by a supplier. The new LT-II should be operational in late 1984.

Jeff Campbell (7521) is developing part of the computer and digital system. Gary Phillips (7550) is responsible for the electro-optical systems. Bill Love (7523) is handling control system design and Bob Hughes (7556) is performing mechanical design.

Computerized Personnel Record

All Employees Will See Their Files

Ever wonder what’s in your personnel file as it now stands in Sandia’s computerized system? You’ll get a chance to see a printout, make corrections, add information, or ask questions during the next few months.

Mailings of individual records start today to people in the 7100 and 8100 organizations. The schedule calls for mailings to the remainder of 7000 and 8000 in the next few weeks, then to 2000, 3000, 1000 and 9000 in sequence through December.

"Employees are asked to review and check this document carefully," says Jennie Tischhauser (3552) who heads the Employee Record Review Project. "This printout contains the information that will be the basis of all your personnel actions starting next fall. If you bid on a job, this record will be the one your prospective supervisor will see and use (along with those of your competition) to select interviewees for a job opening. It is extremely important that the record be accurate and as complete as possible."

NOW THAT most employee personnel files are computerized, much bulky paper and manual filing are eliminated. Jennie Tischhauser (3552) urges all employees to check carefully the printout of their file which they will receive shortly.

ARTIST’S SKETCH of Sandia’s new Laser Tracker-II shows optical bench at left with its automatic leveling features, computer banks and control desk in the center section, and staff work area at right. The laser beam originates at the component at the base of the optical support bench, traverses a path to the gimbaled mirror, then to the target. The target image is analyzed continually to drive the mirror, keeping the target centered. The new LT-II, under development by Division 7521, will be operational in late 1984. Paul House of Tech Art made the drawing.


**Take Note**

Photos from the Retiree Picnic will be posted in the Coronado Club on July 6 and will remain on view throughout the month.

Clockwatchers: On June 30 your day will be a bit longer than usual. That's because the minute between 5:59 and 6 p.m. (or 4:59 and 5 for our Livermore contingent) on that day will contain 61 seconds. And that's because in order to keep broadcast time (as in the time tick at 120 on your phone) in step with the rotation of the earth, it's necessary to add a second. That, in turn, is because the rotational motion of the earth around its own axis is slowing—very slightly, to be sure, but enough that when compared to atomic time (more properly, Temps Atomique International), it needs adjustment every year or so. Thanks, Grover Hughes (1246), for help with this one.

The American Lung Association of New Mexico has established an annual award to be given to the outstanding volunteer in the area of prevention and control of lung disease in New Mexico. The new award will be called the Clinton P. Anderson Award in memory of the former U.S. senator who founded the New Mexico Tuberculosis Association in 1917. Nomination forms for the award are available at the Albuquerque office of the Lung Association at 216 Truman NE (265-0732).

A garden tiller that locks in reverse gear can plow up feet along with gardens. If you own one of certain heavy duty models of "Roto-Spader" or "Giant-Tiller" marketed by Sears or Roper, you can call a toll-free number for a replacement clutch control and linkage that will eliminate the locking-in-reverse-gear problem. Jot down your tiller's model number and bring it to LAB NEWS to check it against a list of Sears and Roper models for which free replacement kits are offered.

**Fun & Games**

Sharpshooting—Results are in for the 1982 NESRA-NRA national pistol matches. Sandians were led by the 22 pistol team of Daven Bennett (9415), K. K. Ma (2331), Bob Davis (4221), and Dick Vivian (7211), which finished fourth among 39 teams entered. The precision air pistol team—Bennett, Ma, Vivian, and Ray Mosteller (7132)—finished second among 15 entries. A total of eight individual awards were collected by Ma, Davis, Bennett, Mosteller, and George Edgerly (7471), shooting pistols, and by Dave Overmier (7585), shooting the precision air rifle. Thirty-four Sandians or dependents participated in this year's competition.

Golf—The team of Leo White and Gus Krause (both retired) took top honors at the first SEGA-sponsored Retirees/Seniors Tournament played June 16 at the UNM South Course. The format was two-man best ball. Thirty-two golfers participated. Glen Morter (ret.) was tournament chairman.

Basketball—A summer league is now organizing. The 10-game, six-to-eight-week season starts July 5 with each team playing one or two games per week. Team rosters and $100 team fee should be turned in to Tom Lenz, recreation manager, by July 1. He's at the Coronado Club, 366-7577.

**Death**

Frank Francis of Electronic Property Materials Division 1815 died June 18 after a short illness. He was 64. He had worked at the Labs since October 1949.

He is survived by his widow and a daughter.
One of the grim statistics of our time is that rape is the fastest-growing crime in the United States—and one of the most frustrating to do anything about. According to the FBI, only 10 percent of the victims report the assault. That rape is the fastest-growing crime in the United States is interesting to those who work in the field and to those public officials who are interested in establishing a system that would quickly and efficiently search out, match, process, and analyze data on known and unknown rapists. This way the modus operandi of a rapist would be recognized and suspects tracked.

"APD had no money available for this project, so Sergeant Casey turned to the community for help," says Cecilia Chang of Personnel Systems Design Division 2626. "A non-profit project called 'ORDAIN Support Project' was then set up. I got involved because I was working for the City of Albuquerque while attending UNM. Since I had worked for Digital Equipment Corporation, I volunteered to approach my former boss, Tom Stockebrand, for help. He was most supportive and immediately arranged to have his company donate a terminal and printer to APD. At about the same time, UNM's Office of Personnel Services offered us free use of its PDP11-70 computer.

"Rapists, like most other criminals, tend to use the same methods over and over again, establishing a modus operandi. Imagine digging through stacks of files, looking for a rape suspect described as about 5 feet, 10 inches tall, weighing 175 pounds, carrying a knife, and picking up victims from parking lots. This is the kind of matching APD and the Rape Crisis Center have to do frequently, and it's what led to computerizing rape data." Cecilia designed a computer system known as Online Rape Data Analysis Information Network (ORDAIN) to automate the matching process. When certain essential features of a rape are keyed in, ORDAIN does all the searching and matching, and in seconds provides a list of similar previous cases. ORDAIN can be run on any computer that supports ANSI-Mumps and MEDUS/A, a general purpose data base management system developed by the Harvard School of Public Health.

"MEDUS/A is inexpensive, easy to install, and 'speaks' in English rather than some exotic computer language," says Cecilia. "The system can be adapted to any kind of crime with unpredictable patterns, as well as to engineering problems, say, to pinpoint weapon component failures. In fact, Los Alamos uses an ANSI-Mumps system to analyze nuclear health hazards. "Rape Crisis Center personnel interview victims, using the form we designed for computerized systems, and the police do the data entry and analysis. The Rape Crisis Center needs more volunteers to conduct interviews as well as to enter data so as to assure greater accuracy."

Cecilia points out that there's a lot of computer talent at Sandia, and that these people would be of immense value to other community projects that need to be computerized. She adds that Sandia was instrumental in initiating the computerization of rape data: "Two years ago, some funds were left over from ECP. With this money, the Rape Crisis Center purchased its first minicomputer."

Cecilia designed the sex crime computerized data base system in six months on her own time, working evenings and weekends. It also became the basis for her Master's project at UNM in computer science. Recently, she presented a paper at the Law Enforcement Data Processing Management Symposium at Williamsburg, Va. In June, Cecilia will present another paper entitled "Using MEDUS/A to Help Police Capture Rapist Suspects" at the Mumps Users Group meeting in Denver.

"Sandia has been very supportive," she says. "Letting me attend conferences and publishing my papers. And I'll be happy to provide information to employees who think the database system I designed might be useful in their own work."

Q. Some time ago I asked whether SNL employees could use the photo copying equipment [Xerox, Kodak, etc.] for personal use if they could put money in some sort of "coin box" located near the machine. Several arguments were presented to dispose of such an idea. The idea still appeals to me for a number of reasons. I again propose that SNL institute the above practice on a trial basis. To counter some of the earlier arguments: The monies accumulated in the collection boxes could be picked up by the service personnel while repairing or maintaining each piece of equipment. Revenue could be applied directly to reducing the cost of the service contract or particular repair order. This begs the question of use of government property for personal use but, in my opinion, should be interpreted as a "benefit."

A. Because of your previous request as well as the interest of some others, we did look into the possibility of using our copiers for personal use remaining the proceeds for such copying to the government. Our legal department and DOE/ALO have stated that this cannot be done. The only option open to us was to look for a concessionnaire who would offer this service. As you know, a copier was installed in the Credit Union for this purpose but was withdrawn by the concessionaire because it proved to be unprofitable. What it boils down to is that personal copying should only be done off the premises and outside working hours.

We admire your integrity and hope that other Sandians share your concern about the incorrect use of government property, but unfortunately we feel that we have exhausted all avenues on this question.

K. A. Smith — 3100

Q. Last year, Technical Institute Equivalency [TIE] graduates were sent a questionnaire seeking information concerning the possible accreditation of the TIE Program. An accompanying memo indicated that Out-of-Hours courses taken at Sandia would be transferable to any college. A TIE graduate would have junior-level status at a university. I have not heard about any possible

Events Calendar

June 26—Chamber Orchestra of Albuquerque, 8:15 p.m., Albuquerque Little Theatre, 247-0262.
July 2-4—Indian Pueblo Cultural Center, Native American Arts and Crafts Fair, Pueblo dances daily, craft demonstrations.
July 3—American Legion Fireworks show, University Stadium, 8 p.m., 243-1901.

July 3, 9—Santa Fe Opera, "Die Fledermaus" (in English); July 7—"The Marriage of Figaro" (in English); 9 p.m., Albuquerque box office at the Broadway, 2nd floor, Mon.-Sat., 10 to 1 & 2 to 5.
July 5-29—(Sun. through Thurs.) Children's Story Hour—Indian Legends, Spanish Cuentos, and Tall Tales with storyteller Joe Hayes, 7-8 p.m., Wheelwright Museum grounds, Santa Fe. Free, bring blanket to sit upon, parking on Canyon Loma.
July 5—"Busy Body," comedy, Barn Dinner Theater, 281-3538.
developments concerning this except that
the accreditation team gave Sandia very
high marks. I am presently considering
taking evening courses towards a bachelor’s
degree, and acceptance by a university of
my Sandia courses would spare me many
years of effort and avoid considerable
duplication of courses if credit were
granted for Sandia’s courses. What is the
present status of the accreditation effort?
What is the attitude of Sandia manage-
tment towards accreditation?

A. The memo to which you refer
mentions the possibility of accreditation of
the TIE Program. It has since been
determined that accrediting Sandia’s TIE
Program would be very difficult. It would
require that Sandia petition the State
Board of Educational Finance to become a
degree-granting institution. It is not an
objective of Sandia to compete with local
educational institutions. The second major
group against accreditation is that in-
structors would have to be “approved” and
the general format of out-of-hours TIE
classes would have to be altered to meet the
more rigid standards of the accreditation
board. This might defeat one of the
objectives of the Out-of-Hours Program,
which is flexibility. Sandia would also have
to receive accreditation in the non-
traditional industrial category. This occurs
very infrequently.

A more promising route is to merge our
TIE Program with that of UNM. Their
new, expanded two-year Electronics Tech-
nology Program is scheduled to begin in
the fall of 1982.

Once it is operating in full, we hope to have interested TIE partici-
pants and graduates attend that program. They would have to take the extra English,
social science and humanities credits
needed to complete an accredited two-year
degree. It might be possible to obtain
advanced standing for the coursework
completed at Sandia and eventually obtain
their degrees from UNM.

Any action regarding the above options
will require approval from the University Programs Educations Committee and ap-
propriate committees at UNM. If you have
additional questions, please contact the
Education and Training Division 3521.

J. R. Garcia—3500

There’s a new look these days over at
TECPUBS—and that includes the name.
It stands for TECHnical PUBLICATIONS
Center which encompasses the following
divisions: Tech Writing 3151, Composition
3152, and Tech Art 3155.
The talented folks at TECPUBS can now
produce a professional, typeset SAND
report—a far cry from the familiar type-
written, double-spaced publications of
years past.

“In our new two-column typeset format,
we can get two to two-and-a-half pages of
typical typewriter/printer output on one of
our pages,” says Jan Willis, head of 3152.
“We can control the number of characters
per line to fit more text on a page. This is a
considerable savings in the cost of pub-
lishing SAND reports and, in addition, you
get a professional-looking, easy-reading,
amazingly pleasing report.”

The heart of TECPUBS is the Sandia
Text Editing and Processing System
(STEPS). It consists of Atex text processing
equipment, an Autologic phototypesetter,
and other equipment to produce high-
quality, camera-ready copy.

“We have about 60 fonts—a font being a
particular style and size of typeface,” says
Jan. “Our phototypesetter also has dia-
critical marks for any language—accents,
umlauts, cedillas. An example of our
versatility is that we’ve done some reports
in Spanish—we don’t have all fonts but we
can get them if they’re needed.”

“We also have the capability to transfer
files to STEPS from Wang and Lexitron
word processor disks and cassettes as well as
from most computer nine-track magnetic
tapes.”

“STEPS can set math equations of the
same quality as those found in textbooks
from leading publishers or the principal
scientific journals.”

“We’re very responsive to authors—
changes are no problem except after we get
to page makeup. Turnaround time has
improved tremendously with this auto-

mation—reports are available when you
need them. We feel that we can do better
than any other service available either
in-house or from outside firms. Our soft-
ware continues to improve—our compos-
itors keep up with the state of the art by
continuing training.”

Jan says that among other wonders,
TECPUBS will soon have a Shaffstall
Media Com 3300—a “black box” that
provides conversion from a variety of word
processors and computers into the Atex
over telephone lines. Also a computer
dictionary is being developed for the
system to automatically check the spelling
of 120,000 words.

Unfortunately, no machine is being
planned to write the report for you.

Jan adds that tech writing, art, and
editing services are also available. There is
a chargeback system for TECPUBS ser-
ices. Call Jan at 4-4950 for more info.
Oak Ridge Too

Highlights for World’s Fair Visitors

Need to travel to Oak Ridge on business? You may want to take off a couple of days and take in the World’s Fair in nearby Knoxville as well.

Need to travel to Knoxville to see the Fair? You may want to take in the new visitor attractions in nearby Oak Ridge as well. Here are some of the sights to see.

At the Fair, the United States Pavilion is this country’s energy showcase. The six-level glass and steel structural houses exhibit high technology and U.S. energy strategies for the next century. After the Fair, it will remain on site as an energy research center. The Clinch River Breeder Reactor Plant Project will occupy the center space in the American Electric Energy pavilion.

Just a 50-minute drive away is Oak Ridge where the DOE’s American Museum of Science and Energy provides visitors with an up-to-date, self-guided tour of over 200 exhibits in nine major exhibition halls:

* The self-guided motor tour of the “Energy Environment Loop” (ORNLFacilities and areas of interest in East Tennessee) features roadside overviews with panoramic views of the Gaseous Diffusion Plant, the historic Graphite Reactor, the Aquatic Ecology Laboratory, the University of Tennessee’s Arboretum, and two TVA power facilities—Bull Run Steam Plant (fossil) and the Melton Hill Dam (hydro).

* Two exhibits—“Oak Ridge Story” and “Oak Ridge Today”—present the history and the current responsibilities of the installation.

* The “Energy Science Lab” presents the basics of science through play, exploration, and discovery.

* “Energy: An American Experience” shows how machines have disrupted their own muscle with their own muscle and wind, water.

* The “Age of the Autohible” exhibit focuses on the evolution of America’s most loved plaything and most-hated necessity.

* “The Cloud Chamber” offers an enjoyable way to get the facts on alternatives to fossil fuels. Stroll the midway and play computer games.

* The exhibit hall on “Earth’s Energy Resources” highlights oil, natural gas, coal, hydropower, and geoenergetics.

* The complete tour of exhibition halls at the “Energy from Atoms” exhibit, which provides basic information on nuclear fusion. See the model of a nuclear reactor.

ALBERT EINSTEIN AND FRIEND...A young visitor to Oak Ridge’s American Museum of Science and Energy views a large photograph of the physicist.

walk through a model of the Tokamak fusion reactor, model the laser fusion game, and track subatomic particles through the cloud chamber.

In addition, the Museum has exhibits on loan from other facilities for the six months of the World’s Fair (May 1-Oct. 31).

JUNK•GOODIES•TRASH•ANTIQUES•KLUNKERS•CREAM PUFFS•HOUSES•HOVELS•LOST•FOUND•WANTED•& THINGS

REAL ESTATE

WINDROW, 1790 sq ft, 3 brd., 1 bath, den, fo, approx. 15% annual, 412 FITI, 65% farm negotiable. $39,950. 299-5514.

FREDERICKSBURG, 3 brd., 2 bath, den, approx. 15% annual. $39,950. 299-5514.

FIVE ACRES, mountain view, Arkan-


NE. brd., 2/bath, lg. master suite & den w/fo, 3-car garage, 278 sq. ft., some solar, assessable FHA 85%. French, 821-6144.

1 ACRE LOT in Pueblo West, Colo., 5 min. to Pueblo Reservoir, 1/2 mile down, 12% on balance. Hughes, 299-6774.

WANTED

WANTS KENTON,—arc chart recorder, single channel, long-term moni-
toring, emergency, 878-3972.

FIREPLACE CAMPERS SHELL FOR SWB Ford pickup. Perkins, 885-6220.

DRAWING BOARD, 34x32, or similarly, 18,000-$200. Hughes, 299-6220.

RIDES from Abq to Flagstaff, daugh-
ter’s dog going home, will pay for gasoline & incidentals, before July 12. Submissions, 229-8606.

REDEEMERS, $500—hunting July 5-7 est. Amarillo, Oklahoma, St. Louis, Indianapolis, Columbus, Cleveland, Buffalo, Rochester, Syracuse, Ks. 239-7000.

WORK WANTED

HOUSE SITTING & animal care, college student, references. NE/NW area. Christine Lambricht, 346-6151. COLLEGE student needs yard & misc. work, painting experience. Steve Northrup, 884-6783.
**Coronado Club Activities**

**Rio Grande Mexican Food Buffet Tonight**

**TONIGHT** at Happy Hour the Country Showmen hold the bandstand from 8 until midnight while Chef Bill Potts spreads a Rio Grande-style Mexican food buffet from 5:30 until 9. Special prices are in effect all evening.

**TOMORROW** is the party of the year as the Club and patio are turned into a South Seas setting for the annual Luau. Spinning Wheel plays for dancing, a 10-member dance troupe called Polynesian Phantasies entertains, and a fantastic oriental buffet is spread. About 300 reservations had been made as LAB NEWS went to press.

**NEXT FRIDAY,** July 2, the long weekend starts with a Single Mingle during Happy Hour, and 12-Gauge booked to play early and stay late. The music starts at 5 and continues until midnight. The buffet is fried chicken and fish.

**THE FOURTH OF JULY** is always a big day in the Club’s pool and patio area. The celebration starts with the twin pools opening at 11 a.m. The snack bar will have a two-hot-dog special with chips and beans for $1.75 ($2 with chili), a beer truck will dispense 35-cent mugs of foamy, horse-shoes and other fun and games are planned in the patio area for kids of all ages, and the Municipal Band plans a concert from 1 to 5 p.m. It should be a great day for families. Members show membership cards for free admittance; adult guests pay $2, kids $1.

A **BAR PROMOTION** by the Miller’s beer people is set at the Club on Thursday, July 8. Glasses of their draft brew will sell for 25 cents until 8 p.m., and they’ll hold drawings for prizes every half hour starting at 5.

TRAVEL DIRECTOR Frank Biggs announces a couple of new trips—two trips on the Cumbres-Toltec scenic railway on Sept. 26 or Oct. 2. Cost is $42 for adults, $30 for children 11 and under. This includes charter bus with treats and refreshments and the train ride. Another new trip is Canyon de Chelly by charter bus Oct. 30-31 for $82. This includes treats and refreshments on the bus, lodging and all admissions. Deposit $25 now, balance due by Sept. 50.

In the meantime, there’s the Silverton-Durango train ride package July 10-11 for $88. Check with the Club office about available space. Or if you want to raft down the Chama River, a group goes July 10-11. You camp overnight and meals are furnished. Cost is $100.

The Gallup Indian Ceremonial on Aug. 14 is another one-day charter bus destination. Take in all the events for $32 adults, $27 for kids 11 and under.

Fly or bus to Las Vegas Sept. 12-15 and stay at the Maxim Hotel, tour Hoover Dam. Pay $130 for bus, $185 for plane.

The Mexican Pacific coast cruise aboard the MTS Daphne has space available. The cruise is set Oct. 23-30 and prices start at $789, which includes air fare to Los Angeles, transfers, port taxes and the works.

Go to Mazatlan Nov. 1-8 or Nov. 8-15 for $559. The package includes airfare, seven nights at the Playa Mazatlan, transfers, hotel taxes, and bell tips plus a special two-hour cocktail party.

See Frank in the lobby tonight between 5 and 7 to talk travel.

**Congratulations**

Paul Klimas (9725) and Carlota Romero (UNM/NMERI), married in Albuquerque June 12.

"Frustrated by defeat in earlier skirmishes with such barbaric invaders as I.e hot dog and I.e weekend, French protectors of the language have declared full-scale war on the incursions of I.e software and I.e hardware into French discourse on computer technology. Such illegal aliens need not be admitted, say the Gallic defenders of verbal purity, when native equivalents like I.e logiciel (for software), I.e matériel (for hardware), and I.e banque de données (for data bank) exist in the new list of French computer words created by 40 members of the Académie Française and published by the French Ministry of Industry." —New York Times