A dry run conducted last week at the Project Gasbuggy site 50 air miles from Farmington indicates that all the Sandia instrumentation and earth motion measurement instruments are ready for a nuclear experiment scheduled for Nov. 21.

Cables of Sandia instrumentation have been lowered and "grounded" into their deep underground positions, and the surface instruments have been installed. The remote trailer and all recording instrumentation have been checked out. A 20-kiloton nuclear device will be detonated in a "light" sandstone gas reservoir at a depth of 4340 feet. Sandia instrumentation will measure the free-field earth motion and surface movement produced by the detonation.

Project Gasbuggy is an experiment to stimulate natural gas production. The nuclear explosion will create a chamber deep below the surface. The roof of the chamber is expected to split, forming a "chimney" of broken rock above the chamber. Gas will flow into this large area through the fractures which will extend in all directions.

The gas industry has long used various techniques to fracture the sandstone reservoirs such as conventional explosives and hydraulic pressure. The U.S. Bureau of Mines, one of the sponsoring agencies for Project Gasbuggy, has found that a nuclear fracturing technique could add 317 trillion cubic feet of natural gas to the nation's proved reserve, more than doubling the present supply. Nuclear fracturing could find wide application in many "light" sandstone reservoirs in the U.S.

Project Gasbuggy, which will determine the feasibility of using a nuclear device for this purpose, is a joint effort of the Atomic Energy Commission, the Bureau of Mines and the Bureau of Reclamation.

Final total of $279,957 pledged by Sandians to the current Employees' Contribution Plan is the highest contribution record since the beginning of the Plan in 1957. It marks an increase of seven percent over last year's total.

Two things are significant in this achievement. Bill Stevens (3230), chairman of the ECP committee, says. "First, it is a significant amount of money representing a source of pride for all Sandians who contributed. Second, the campaign was the simplest ever conducted at the Laboratory. This represents a new maturity for the plan."

In the past, the ECP campaign has been marked by a heavy distribution of literature and posters and by personal solicitation of employees by other employees working for the drive.

This year's campaign was conducted "low-key" with minimum literature and no personal solicitation. Letters from the committee carried the ECP message and made the appeal for contributions.

"You might say," Bill says, "that the objectives of ECP have almost been met. The idea in the beginning was to reduce the effort and the administrative overhead of conducting the campaign. If enough employees made a fair share contribution (one hour's pay per month) through payroll deduction, there would be no need for a campaign other than an announcement. We are getting there."

Aided by the current ECP reveal that 2789 employees are now making a fair share contribution through payroll deduction.

Another 183 employees made a cash contribution to ECP. In all, 6114 employees or 86 percent contributed.

"This is a clear notice of employee acceptance," Bill says. "Sandians are listening. We have not made a fair share contribution through payroll deduction. Another 183 employees made a cash contribution to ECP. In all, 6114 employees or 86 percent contributed.

They've given the employee committee the opportunity to join ECP when they sign into the Laboratory. The contributions of new employees, who join make up for the 183 employees who terminate employment or retire at Sandia. The level of participation in ECP has almost stabilized in the past few years, Bill says.

"As the campaign started," Bill says, "the committee was anxious. Suppose the employees did not respond? Suppose we lost ground? Frankly, we worried about it. Fortunately, the results were all that even the most optimistic of us hoped for. The contributions continued, adding to the campaign, and we will strive to achieve the goal everyone making a fair share contribution by payroll deduction. We are very pleased with the results this year. For the committee and everyone working on the campaign, the money to help those who need it, our

W. G. Funk Elected Chairman Of Human Resources Council
The Albuquerque Human Resources Council has elected W. G. Funk, manager of Employment Department 3250, to serve as chairman for a two-year term. Jutson Ford, acting director of the council's board of directors at the same meeting.

The council is a voluntary, non-profit organization of employees in the Albuquerque area. These employees support non-discriminatory practices in hiring, training, promotion, and compensation of their employees.
Modern Meaning of Design Concept Is Topic For Eighth Annual ASME Symposium Here

"The Concept of Design" is the thought-provoking title of the 8th Annual Technical Symposium co-sponsored by the New Mexico Section, American Society of Mechanical Engineers, and the University of New Mexico College of Engineering. Sessions will be held Nov. 17 and 18 at the UNM Student Union Building.

As Program Chairman John A. Anderson (1514) explains, "The objectives of this symposium are to set forth the modern meaning of the design discipline, to present new and unusual concepts, and to define the scope of the engineer's work. The design discipline and the design process are not static, and yet in many instances these first appointees were being defined 50 years ago."

"The academic tie-in is important for many doctorate-level employees at Sandia," Mr. Shelton explains, "because it gives them the satisfaction of teaching and administrative responsibilities. They can continue to contribute to a research or design project in their specialty."

Sandians deeming part of their time to professional duties at the University of New Mexico as D. R. Bove, a retired Sandia laboratory engineer, or W. C. Buell, a retired Sandia laboratory engineer, who will speak on "Real World Applications - Part Design, Harmonic Analysis with Conversational Computation in Modern Meaning of Design Concept." Mr. Bove's subject is "Computer Graphics." He refers to computer graphics as one of the recent developments which will make the task of communicating with the computer much easier for man.

Mr. Bove's paper will describe and discuss computer-aided design and automated design systems which can reduce the time from problem statement to solution by 10-100 times. At Dartmouth, he recalls, "the effect of the time-shared computer...has been to produce an educational environment where the student has the opportunity to test and develop his own concepts, and, at the same time, man's role as operator or pilot of complex systems becomes even more important."

In most instances these first appointees were being defined 50 years ago. "The academic tie-in is important for many doctorate-level employees at Sandia," Mr. Shelton explains, "because it gives them the satisfaction of teaching and administrative responsibilities. They can continue to contribute to a research or design project in their specialty."

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Staff: Charles Lee Borden, Robert P. Gibb, William P. Dunlap, John R. Nelson

Public Information, Livermore, California 94550

Events Calendar

Laboratory - University Relations Strengthened With New Program

Joint Staff - Faculty Appointments, a new approach to an old idea, is being made by research laboratories and universities. The approach has already attracted five Sandians and one professor.

Howard R. Shelton, supervisor of University Relations Division 3114 which administers the new program, explains that a similar approach is used by the Lawrence Radiation Laboratory and the University of Tennessee for an exchange between the university and engineering department.

"In 1939," Mr. Shelton says, "it was designed to implement the desire of President Johnson and the Atomic Energy Commission to greatly benefit science and education. The program has been achieved between the government laboratories and universities throughout the country. It is felt that the resources in these laboratories can benefit the universities' research and education processes. The laboratories, in turn, can greatly benefit from closer association with the universities."

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MARSHALL D. MEYER TAKES CLASS G TROPHY
WITH TRIUMPH IN LAGUNA SECA RACE

Marshall D. Meyer (8141) won a third place trophy in the final regional (all of Northern California) race of the year held at the Laguna Sea track near Monterey, Calif., on Oct. 14.

M. D. Meyer, driver of a 1966 Triumph Spitfire, ran in Class G for production model vehicles. This event included 32 cars, 13 in his class. The 21-lap event covered about 40 miles around the hilly track; the average speed was in excess of 75 miles per hour.

The race-sponsored Sports Cars Racing Association of Monterey Peninsula announced the largest crowds in the track's history—a record weekend attendance of more than 65,000.

Marshall's third-place finish also earned him four points to make a total of 26 this season—and first in his class for regional points standing. Five previous races included one at Laguna Seca, two at Cusatoli, one at Crows Landing and one at Lake Tahoe.

Marshall says that the production category is divided into eight classes—A through H. "Class G means I was ranked next to lowest in potential speed," he explained.

"The word 'production' refers to commercial sports cars—you can buy from dealers," adds Marshall. "Only certain modifications can be made under standards set by the Sports Car Club of America. You could easily spend $1500 on the engine, but if you do the work yourself, this would probably run about $600."

Major modifications to the engine of Marshall's Spitfire included polishing and balancing the rods and crankshaft, installing a racing cam, porting the head, raising the compression, smoothing the interior of the carburetors and intake manifold, and installing an electric fuel pump and an oil cooler.

"In addition, I am also using heavier springs and shock absorbers, wider wheels and racing tires, close ratio transmission and a limited slip differential," he says.

Although this is only Marshall's second year of racing, he has not escaped without mishap. About two months ago at the Crow's Landing track, an axle of his car broke and a wheel came off, causing the car to flip over and slide for about 100 feet down the track. Luckily, he escaped with only a scraped helmet.

"It's quite possible I may quit racing in the near future because of the time and expense involved, but I'm sure I'll always be an avid racing enthusiast," says Marshall. "I enjoy watching races even more now because I have a greater appreciation for competitive driving and what is going on. To me it has to be one of the better sports around."

Free Film Series
At Chabot College
The 1967-68 Chabot College Film Series, sponsored by the Associated Students of Chabot College and the College's Community Services Office, is now underway.

Eight films remain in the series: "Ger- vais" (France), Dec. 6; "Moment of Truth" (Italy), Jan. 4; "Unico Pelo" (Italy), Feb. 7; "The Chinese Unrest" (United States), Mar. 12; "Oklahoma" (United States), Apr. 2; "Woman in the Dunes" (Japan), Apr. 17; "La Vazaet" (Italy), May 1; and "The Seventh Seal" (Sweden), May 22.

The films, open to the public without charge, will be shown in the new 250-seat Chabot College-Community Auditorium on the campus at 2655 Hesperian Blvd, Hayward, at 7:30 p.m.

Welcome . . .
Newcomers

Congratulations

Mr. and Mrs. Tom Pukuniga (8111), a daughter, Lisa Etsuko, Oct. 15.
Mr. and Mrs. Ray Pearson (8127), a daughter, Kristine Ann, Oct. 17.
Mr. and Mrs. Dina Sillman (8127), a daughter, Christine Jean, Oct. 20.

Sympathy
To Ferdinand Thome (8243) for the death of his father in Wichita, Kans. Oct. 6.
SNAP Safety Analysis Prompts Burial Tests and Soil Research

Present design criteria require intact reentry of some containers for Nuclear Auxiliary Power (SNAP) isotopic fuel capsules. Successful reentry of the fuel capsules through the earth's atmosphere and ensuing impact with the earth's surface is needed for a wide variety of data on soils and for corrosion rates of fuel containers.

Design Analysis Division 9312 is concerned, among other things, with the data on soils and for corrosion rates of soils encountered, including impact, soil conditions, and the chemical and thermal interaction between fuel capsules and soils. This information is necessary in the safety analysis of specific power supplies as well as for general SNAP safety studies.

Impact burial of the fuel container in soil after reentry is one of the unresolved problems of spacecraft isotopic fuel systems. The recent tests were conducted in Division 9312. Since the uninhabited condition of the capsule cannot be assured definitely, the conditions under which the metal container fails is a basic safety consideration. Uncontained fuel is much more hazardous than contained fuel.

An isotopic generator, which uses radioactive decay to generate heat that is converted to electricity, continues to produce limited power for at least 10 years. Because soil is a good insulator, the temperature rise until equilibrium is reached. This may result in the soil melting and sintering, which is another type of soils.

Failure of the isotopic fuel container can be the result of structural weakness caused by impact; internal pressure buildup; interaction of the fuel, soil and metal container; melting of the container; or a combination of these factors. Probable high temperatures of the isotopic capsule under burial conditions can be a major contributing factor in each of the failure modes.

Recent Tests
To determine the temperatures attained when a SNAP-27 fuel capsule is buried in representative soils, tests of a radioactively inert capsule were recently conducted in Sandia's Technical Area 17. SNAP-27 is a plutonium-238 fueled isotopic power unit which will deliver 50 watts to power the Apollo Lunar Surface Experiments Package that will be placed on the moon during the James Earl Apollo 11 mission.

The tests were designed to (1) determine the temperatures at which the metal fuel container melts or otherwise fails; (2) verify the validity of analytical techniques for predicting the maximum capsule temperatures from known soil thermal properties; and (3) observe any gross soil reactions, such as melting, flowing or other physical changes.

Burnout tests were conducted on three full-scale SNAP-27 capsules that were electrically heated to simulate operating conditions. Three types of soil, one for each capsule that enveloped the container, were used.

Each of the three soils was placed in a 125-cubic-foot excavation. During the 113 operations, soil samples were taken to determine such physical properties as density and moisture content. The capsules were placed 33 inches beneath the surface to simulate impact burial conditions. The platinum resistance heaters within the capsules were energized to 1500 watts, the normal SNAP-27 operating level. Surface and underground instruments recorded temperatures from the centerline of the capsule out about four feet.

The metal containers attained temperatures in excess of 2550°F, and were operated until the heaters failed about 48 hours, another 78 hours and the third 24 hours.

Soils Melted
In one experiment, the Bentonite surround contained the fuel capsule melted and sintered, forming a two-and-one-half-inch thick liquid mass. The cylindrical container melted around its circumference, and an escape hole formed in the top. One experiment, the Bentonite surround contained the fuel capsule melted and sintered. The capsule remained intact, but there was some oxidation of the metal capsule. In the third experiment, a football-shaped mass about eight inches in diameter melted or sintered, and some melt probably escaped. The units were then sent to General Electric Company, the SNAP-27 prime contractor, for post-mortem analysis. Data obtained from the tests are being used by General Electric and Sandia in the safety analysis of the SNAP-27. It will also contribute to the general pool of knowledge on burial of isotopic fuel capsules.

Research Contracts
In addition to the recent tests, Sandia has contracts with the National Bureau of Standards to conduct differential thermal analyses on nine different isotopic soils. Using this and other information, research personnel are determining the effective thermal conductivity of the soils from room temperature up to just below the soil melt point with maximum test temperatures of about 3180°F in laboratory tests. With data from burnout tests and the research projects, Division 9312 plans to acquire sufficient information on soils and their interaction with isotopic fuel capsules so that they can predict what will happen to the fuel capsules under a variety of burial conditions.

Further, D. B. UST (7123), assistant project engineer for Sandia's earth motion instrumentation, checks the four canisters prior to lowering them into the hole. When at proper depth, motors inside the canisters precisely position the internal seismic and accelerometer instruments directly in line with the nuclear device.
Coronado Club

Holiday Fashion Show Tomorrow; Club Renovation Starts Nov. 10

A fashion show—glittering and glamorous—will highlight tomorrow night's party at the Coronado Club. Numerous members of the Social Committee and employees will be on hand to select the models for the show. At 7, the fashion show begins at 7, the fashion show begins at 7, and dancing to Phil Graham's orchestra starts at 8. Admission for members is $3, guests $3.50.

Social Hours

tomak Tommy Kelly will make the happy music while the Coronado Club days are closed. The buffet costs $1.75 for adults, $1.00 for kids.

Next few Sunday's shows will be Thurs-
day night since the Club will be closed on
employees.

Football Bus

Buses from the Coronado Club to the slater will leave at 11 on Nov. 11 for the Lobo-Wyoming game. Pat Reich.

Football Bus

A holiday fashion show—glittering and glamorous—will highlight tomorrow night's show. Models for the show include Nina Ricci and Dior. The event includes a social hour, Cornish game hen dinner and dancing to Phil Graham's orchestra.

Sandia Y-Indians Guides Looking For Father-Son New Members

More than 200 Sandians and their sons are members of the Y-Indian Guides organization which is currently conducting a membership drive. Wayne Sorensen, chairman of the Board of Regents, will be the organizer with the title of National Director. The Guides are divided into 33 tribes of 14 father-son teams. The tribes meet once a month in members' homes for such activities as designing and making traditional Indian costumes and drums. Membership is open to boys between the ages of six and nine.

The Guides wear at all UNM home football games. They also rent the YMCA Camp Beaver facilities in the Jemez Mountains for a summer of camping and cleanup the camp prior to winter.

Every two months, all the tribes gather for a special event. The annual Pinegrove Derby, an exhibit of wooden model cars built to exact specifications, is scheduled this month. Each spring, a kite derby is held and the annual Pow-Wow. Throughout the year other activities are scheduled.

SCHOLARSHIP CHECK for study at the Uni-
versity of New Mexico is presented Ramesh Ganeriwal, student from India, by W. A. Sherman (2125), ASQC section chairman.

W. A. Sherman (2125), chairman of the Albuquerque section of the American Society for Quality Control, recently awarded the group's annual scholarship to Ramesh Ganeriwal, a mechanical engineering senior at the University of New Mexico. A similar scholarship was presented by ASQC to Daryl Paul Jones at New Mexico State University.

The scholarships are a way of promoting interest in quality control among university students. Mr. Ganeriwal, who is from In-
dia, plans to specialize in quality control.

The university nominates three can-
didates for the scholarship, and the ASQC section makes the final selection.

Employees taking evening classes no
longer need to worry about carrying "brown bags." The Exchange, located in Main and P Streets, is now open from 9-9 p.m.

Sandia Safety Signals

Eye Injuries

The National Society for the Preven-
tion of Blindness, Inc., reports that point-
ed objects, falls and burns cause nearly 80 percent of eye injuries among children. Teach youngsters safe play.

Quick Headlight Check

To be sure your car headlights are working, whenever you drive into your garage, turn on the low beams and also turn on the high beams. Then inspect the high beam to be sure that both are shining brightly. If not, replace either headlight housing or both.

Alcohol and Driving

In approximately half of the traffic accidents where fatalities occurred, the victims had evidence of alcohol in the blood. A one-
ounce shot is approximately equal to one 12-oz. can of your percent beer.

If you can tolerate alcohol from the blood stream, Coffee, cold showers, or登入 does not speed up the sobering process.

AALBORGUE'S Environmental Health Department has lauded Sandia's Environmental Health Department 310 and its management for cooperation and achievement in air pollution control. The award was made during National Cleaner Air Week.

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Some 40 Sandians will best their im-
mediate supervisors at the annual Bosses' Night meeting of the Albuquerque Chapter, National Association of Accountants, on Nov. 11. Speaker of the evening will be E. H. Caplan, head of the UNM Depart-
ment of Management, who will dis-
cuss "Accounting Education—Pitfall or Fox of Management." The meeting will be held at the Fez Club, 469 Copper, NW, starting with a social hour at 6 p.m.

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Y-INDIAN GUIDE WEEK was proclaimed recently by Governor David F. Cargo. He presents the proclamation to Wayne Sorensen (1542), Longhouse Chief. Top row, from left, are A. L. (2121), R. L. Posey (former Sandian) and Jim (2123). To the right of the Governor is John Zimmeran (1514). The group is conducting a membership drive.