



NUCLEAR DIVISION NEWS

A Newspaper for Employees of the Nuclear Division, Union Carbide Corporation

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16 4510



UCC-ND spearheads survey for new uranium sources

A water sampling reconnaissance program to aid in assessing United States uranium resources will be conducted in Texas and 11 other states by the Nuclear Division for the Energy Research and Development Administration.

The program started in Texas this month, and will be extended over the next two years to include Illinois, Indiana, Iowa, Kansas, Michigan, Minnesota, Nebraska, North Dakota, Oklahoma, South Dakota and Wisconsin.

The objective of the program is to complete, by 1980, a systematic survey of the nation's surface waters, groundwaters and stream sediments. One of the goals of the program is to assist private uranium exploration efforts by furnishing information which will identify potential new areas favorable for uranium exploration.

Others involved

The program is being conducted by four facilities under the overall management of the Grand Junction Office of the Energy Research and Development Administration. In addition to Union Carbide, the others are: The Lawrence Livermore Laboratory, which will survey the Pacific Coast and Basin and Range states; Los Alamos Scientific Laboratory, responsible for the Rocky Mountain states and Alaska; and the Savannah River Laboratory, responsible for the Eastern U.S., including the Appalachian, New England and Southeastern states. Union Carbide's effort is being conducted by personnel of the Oak Ridge Gaseous Diffusion Plant.

Uranium is a very mobile element geochemically and commonly is disseminated in varying degrees in rocks surrounding an occurrence. Groundwaters and streams redistribute the uranium which in places results in high concentrations in water and in fine stream sediments outward and downstream for some distance from the source. The systematic sampling

of the nation's streams is expected to provide evidence of uranium occurrences not currently known.

Only one phase

The survey will include collecting water and stream sediment samples at various spacings throughout the nation. The samples will be analyzed at the laboratories and the data plotted on maps. These maps will be placed on open file at various locations across the United States as they are completed. Each region will be divided into smaller study areas according to hydrologic, geologic and topographic characteristics.

The hydrogeochemical survey is only one phase of the contract work already under way in the National Uranium Resource Evaluation program. Contracts and agreements have been made by ERDA with universities, private companies and state agencies to conduct other investigations pertaining to the uranium assessment program. The types of work include airborne radiometric surveys, geological and geochemical investigations, and the development of geophysical technology.

World Press group visits February 1

Journalists from 12 countries will visit Oak Ridge February 1 and 2 for briefings and a tour of Nuclear Division facilities.

All of the visiting journalists are participants in the World Press Institute. The Institute, headquartered at Macalester College, St. Paul, Minn., is a private, nonprofit organization sponsored by American corporations and their foundations. Each year the Institute selects young journalists from throughout the world as World Press Institute Fellows. For nine months these journalists participate in a program that includes intensive study, internships and travel.

This year's participants are from Algeria, Argentina, Brazil, Chile, Denmark, West Germany, India, Japan, Pakistan, Poland, South Africa and Zambia.

The Fellows will be accompanied on their trip to Oak Ridge by Terrance L. Randolph, Program Director for the World Press Institute. Randolph explained that the goal of the Institute is to insure that international opinion about the United States is shaped by journalists writing from a comprehensive background of experience in America.

"Internships and extensive travel introduce the journalists to the complexities of American society," the director stated.

Tax advantages make PIA investments more attractive

The article, "Personal Investment Account enhances long-term savings," carried in the October 16, 1975, issue of *Nuclear Division News* gave rise to a number of questions from readers. These questions have been answered as they were received, but one question occurred so frequently that we feel the answer should be published. The question is, "Will it not be necessary to pay income tax on the Company contribution and the accumulated interest at retirement when PIA funds are used to purchase an annuity?" The answer is, "No, not at retirement." Employees are only subject to income tax on the taxable portions of their accounts when a distribution is made from the Plan.

The Trustees of the Savings Plan have made arrangements with Metropolitan Life Insurance Company to provide a variety of different annuity options which may be purchased at retirement with all or part of the cash value of the PIA funds. These options include the following:

1. *Life Annuity - Term Certain* - Monthly payments to retiree or his beneficiary for a term certain not exceeding twenty years.
2. *Joint and Survivor Life Annuity* - Monthly payments to retiree or his beneficiary for life.
3. *Installment Payments for a Specified Period* - Monthly payments to retiree for a specified period, not exceeding twenty years; with a single payment of the remaining value to the beneficiary if the retiree dies before the end of the period.
4. *Minimum Return Life Annuity* - Monthly payments to retiree for life with a final payment to the beneficiary of the excess of the total amount paid for the annuity over the sum of the annuity payments already made.

If the retiree elects any one of these annuity options, he pays income tax on the taxable portion of the annuity payments only as the payments are received.

Of course the retiree may still elect to take the PIA settlement in cash,

(Please turn to page 8)

1. *Life Annuity* - payments for the rest of retiree's life.

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Gas furnace heat losses identified in new study

A study by the Oak Ridge National Laboratory has found that 35 to 55 percent of the heating value of the fuel used in a typical residential gas furnace system is wasted. This overall efficiency of only 45 to 65 percent is considerably lower than the efficiency of the furnace itself, and represents losses attributable to the total heating system and method of operation, the Oak Ridge study found.

A report by Eugene C. Hise of ORNL and University of Tennessee graduate assistant Allen S. Holman recommends measures that can save money for consumers with gas heating systems while helping to conserve one of the nation's most important energy resources.

The study was conducted as part of the Laboratory's Residential Energy Conservation Program, which is sponsored by the Federal Energy Administration and the Energy Research and Development Administration (ERDA).



Eugene C. Hise

According to the report, the greatest controllable loss from a forced, hot-air heating system is from uninsulated or leaking ducts — a problem that can be remedied by examination and repair of ducts and insulation throughout the system. This source alone can account for the loss of as much as 40 percent of the heating value of the fuel.

The second greatest controllable loss (up to 10 percent) results from the cyclic operation of the furnace. The report suggests that this loss can be virtually eliminated by setting the fan switch to turn the fan off at 5 degrees F above the room thermostat setting

and to turn it on as closely above that setting as the switch construction permits.

The report also recommends turning off the pilot flame during nonheating seasons and performing the routine cleaning and adjustment suggested by the equipment manufacturer.

In addition to its advice for consumers, the report made several recommendations for the manufacture of new, high-efficiency gas furnaces which would use one-third less fuel than those of present design. These recommendations include: designing of all furnaces for sealed combustion and indoor installation, raising the American Standards Institute's full-load, steady-state efficiency standard from 75 to 80 percent; installing electric ignition (thereby eliminating the pilot flame system which represents 10 percent of the energy consumption of a gas furnace); setting the fan switch at the factory to turn off at 80 degrees F; and writing new codes for the installation of gas furnaces to assure that the furnace and ducting are sized and installed to achieve the attainable efficiency.

The recommendations were made following a series of experiments with gas furnaces in the laboratory and in the field. The laboratory tests were made with a typical indoor, atmospheric combustion furnace and an indoor, sealed combustion furnace. The field tests were made with an indoor, atmospheric combustion furnace; an indoor, sealed combustion furnace; and an outdoor furnace.

Measurements of the base efficiency were made of each furnace at steady-state and full-load conditions and over a range of other operating conditions to permit the quantifying of efficiency changes.

Results of measurements then were used to make modifications to the furnaces for additional testing of efficiency improvements. Resulting data were incorporated with hourly weather data into a computer of a model residence. Seasonal fuel utilization efficiencies were then calculated under a variety of operating conditions.

ORNL releases Human Resources Plan

A task force headed by Dan Robbins of Employee Relations has completed a Long-Range Plan for Human Resources for the Oak Ridge National Laboratory. The plan, covering the period from 1976-1981, is the result of a study assessing the needs, existing programs and deficiencies of the Laboratory in areas related to human resources.

The report is intended as a source of information, and states ORNL's general policies and commitments regarding human resources. It includes three main subject areas — staffing, developing, and conserving.

"Staffing" refers to programs designed to enable the movement of individuals into and out of positions or jobs.

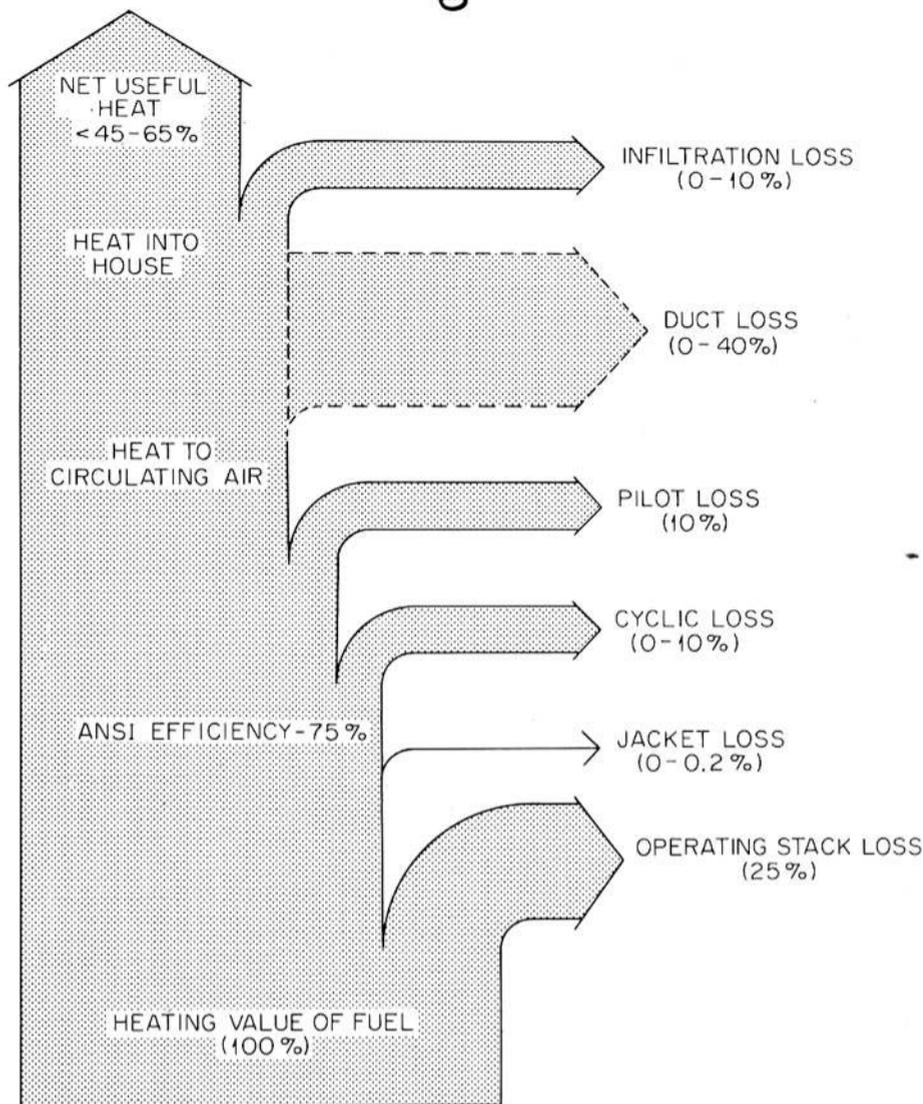
"Developing" human resources involves programs designed to develop skills needed in the employee's present work assignments and to prepare the employee for promotional opportunities.

"Conserving" of human resources is a broad category consisting of programs designed to protect and motivate employees.

According to Herman Postma, Laboratory Director, the objective regarding human resources recognizes the relationship which must exist between the welfare of the individual and the welfare of the organization in order that the potential of either be fully realized.

The Long Range Plan is intended to be a useful and accessible document for ORNL employees.

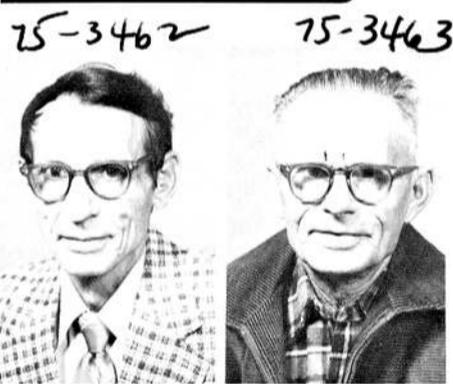
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Energy Flow for Gas Furnace System.

MEASURE TO REDUCE FUEL CONSUMPTION — Potential causes of heat losses in the atmospheric combustion type of gas furnace have been identified and quantified in a study conducted at Oak Ridge National Laboratory for the Energy Research and Development Administration and the Federal Energy Administration. The study is one of several carried out as part of the Residential Energy Conservation Program, the aim of which is to identify measures which can be taken by consumers and appliance manufacturers to reduce fuel and energy consumption in the home.

Retirements



J. J. Hotz

S. O. McClure

Three long-time employees retired from the Oak Ridge Gaseous Diffusion Plant last month.

John J. Hotz, Operations Division, joined Union Carbide in 1945. He now lives at 329 N. Aurora Street, Collinsville, Ill.

Samuel O. McClure lives in Oliver Springs. He joined Union Carbide in 1954 and retired from the Fabrication and Maintenance Division.

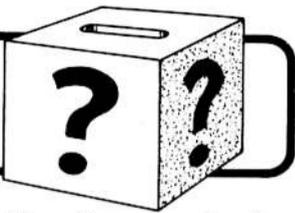
Rufus W. Keck completed 30 years' company service shortly before his retirement from the General Accounting Division. He lives at 5905 North Broadway, Knoxville.

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PATENT GRANTED

To Mark T. Curtis, Daniel H. Stitt, Steven C. Blue and William C. Orthwein, all of the Paducah Gaseous Diffusion Plant, for "Key-and-Keyway Coupling for Transmitting Torque."

QUESTION BOX



QUESTION: I recently received a \$2 statement from a physician for filling out a Major Medical form for me. Is this a legitimate charge ... and is it, itself, subject to reimbursement under our Major Medical Insurance?

ANSWER: We understand that there is a very limited number of physicians who make such charges. Whether or not such a charge is justified would depend on all the circumstances. We would suggest you ask any physician making such a charge why he does so. In any event, a charge for filling out forms is not eligible for payment as a medical expense under either the Hospitalization or the Major or Special Medical plans at Oak Ridge or Paducah.

QUESTION: Questions about the poor janitorial services at ORGDP have been posed in the past with the explanation that the janitorial staff is undermanned, etc. However, I can see no reason for the fact that our offices in K-1007 have not even been swept since the strike was settled. Our building was kept in much better order during the strike with quite literally less than half the manpower capabilities of the janitorial staff.

ANSWER: As soon as this question was called in, on December 18, 1975, it was brought to ORGDP management's attention, and an inspection was immediately made of the area in question. A small sliver of wood from a picture frame, a rubberband, and some chalk dust were found in a blackboard tray. A janitor was dispatched to promptly take care of these items.

The following day, an inspection was made at K-1007 building which covered the entire building, including restrooms, halls, offices. This inspection resulted in finding the entire building exceeds the plant standards for cleanliness, with several comments in writing complimenting the janitorial department for vast improvements in this building. We quote from the Quarterly K-1007 Safety and Health Inspection Committee Report: "... in many areas of the K-1007 Building, the house-keeping has improved."

Questions concerning janitorial service or requests for same should properly be called into extension 3-3138 at ORGDP.

QUESTION: In the Equity Investment Fund, what happens to the stock dividends paid by the various companies and the interest paid on the various bonds?

ANSWER: Dividends from stock and interest on bonds in the Equity Investment Fund are simply a part of the cash inflow to the Fund and are available for investment by the Fund Manager in the same manner as your regular monthly payroll deductions. At the end of each month the market value of all holdings in the Fund, including purchases made by dividends and interest, is computed and a unit value determined. These unit values are published in the

Nuclear Division News in the first issue each month.

QUESTION: In view of the emphasis the Company places upon the United Way campaign and the stated goal of raising as much money as possible, why doesn't the Company dispense with the mass employee United Way meetings and, instead, add that fraction of the Company payroll to the Corporate contribution? Estimating that the total time each employee is away from his/her job for the United Way meetings to be one hour, how much money does this represent in terms of the four-plant payroll?

ANSWER: Employee United Way meetings have proved to be essential to the fund-raising effort, giving each employee a chance to observe firsthand the importance and meaning of United Way. We have not tried to calculate the cost of the time lost from work due to these meetings, but we feel it is minimal when measured against the return in community-employee and Company-employee relationships. It is the kind of thing that is done in other parts of Union Carbide and in industry in general.

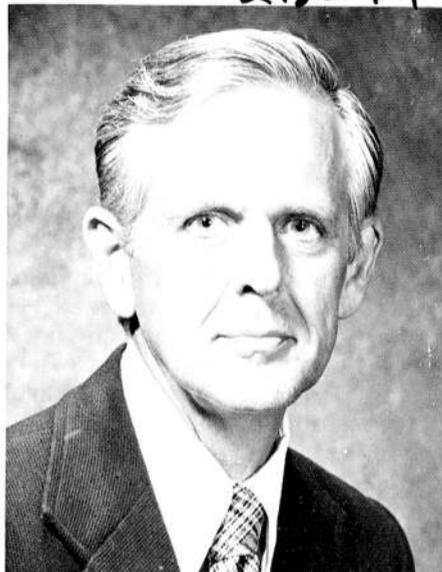
Perhaps the number of meetings and the time involved can be reduced in time as more and more employees elect to sign up as continuing "fair-share" givers.

QUESTION: Does Union Carbide's Nuclear Division come under the Federal Privacy Act of 1974?

ANSWER: The Privacy Act of 1974 applies to records maintained by the Federal Government and is not applicable to records of private employers such as the Nuclear Division of Union Carbide Corporation.

John Michel coordinates geothermal research activities

The appointment of John W. Michel as coordinator for geothermal energy research at Oak Ridge National Laboratory has been announced by Murray W. Rosenthal, Associate Director for Advanced Energy Systems. 2782-74



John W. Michel

Michel will be responsible for promoting and integrating the Laboratory's interests and capabilities in areas relating to geothermal energy. Included will be research on scaling and brine chemistry being carried out in the Chemistry Division; on corrosion in the Metals and Ceramics Division; and on low-temperature cycles in the Reactor and Energy Divisions.

Michel, who has been technical assistant to Rosenthal since August 1974, will also serve as manager of the Low-Temperature Heat Utilization Program in the Energy Division. This program includes the low-temperature power cycle, waste heat utilization, and ocean thermal gradient activities of the Division.

ORNL has been assigned responsibility for the heat exchanger development task which represents a

significant part of ERDA's ocean thermal energy conversion program, and Michel will direct these efforts.

Michel joined the Manhattan Project with the DuPont Company in 1944, after receiving a degree in chemical engineering from the University of Kansas. He subsequently worked on the project at the University of Chicago, then joined the staff of the Oak Ridge Gaseous Diffusion Plant in 1945. His responsibilities at ORGDP included experimental work related to the plant expansion program and advanced diffusion plant design studies.

After transferring to ORNL in 1959, Michel was involved in the analysis and development of gas-cooled reactors, the boiling potassium-cooled reactor, and safety aspects of large light-water power reactors. He also was a leader in studies of agro-industrial complexes and the use of process heat from reactors.

In 1964-65, Michel was on an 18-month assignment to the Australian Atomic Energy Commission, leading a portion of their design effort on BeO (beryllium oxide) pebble bed reactors. He served as chairman of the national panel that prepared a report on hydrogen and other synthetic fuels for the Federal Council on Science and Technology in 1972.

Just prior to joining Rosenthal's staff in 1974, Michel was on assignment to Uranium Enrichment Associates, and participated in their evaluation of a private enrichment venture.

IEEE elects Martin to Fellow rank



John A. Martin, deputy director of the Heavy Ion Accelerator Project, Oak Ridge National Laboratory, has been elected a Fellow of the Institute of Electrical and Electronics Engineers (IEEE).

In announcing his election, the Institute's board of directors cited Martin for his contributions to heavy ion cyclotron developments.

A native of Oregon, Martin attended Eastern Oregon College for two years and received the B.S. degree in electrical engineering from The University of Tennessee, where he has also done graduate study. He joined the Union Carbide staff in 1948, working first at Y-12's Electromagnetic Separation Plant. He has been associated with ORNL's Physics Division since 1951.

He was made associate director of the Cyclotron Laboratory in 1971 and retained that position until his assignment to the Heavy Ion Accelerator Project in 1974.

Martin is a member of the American Physical Society and the Southeastern Section, American Physical Society. In 1973 he was elected the first president of the IEEE's Nuclear and Plasma Sciences Society, which he was instrumental in forming.

He and his wife, Laurie, live at 9623 Tunbridge Lane, Concord.

ORGDP, ORNL tell promotions



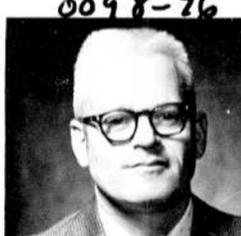
J. R. Yarborough

Jerry R. Yarborough has been named a maintenance foreman at the Oak Ridge Gaseous Diffusion Plant.

A native of Oliver Springs, Yarborough worked as a machinist in the Y-12 Plant for three years, transferring to ORGDP in 1972. He has attended Roane State College and Carson-Newman, and is a veteran of the U.S. Air Force.

He and his wife, Lois, live at Route 2, Oliver Springs, with their two children.

Two employees in the Plant and Equipment Division, Oak Ridge National Laboratory, have received promotions. Bobby E. Freeman has been promoted to supervisory trainee, and Hermon L. Lloyd has been named shops supervisor.



B. E. Freeman

Freeman was an electrician in Plant and Equipment prior to his promotion. A 20-year Union Carbide employee, he worked in the Laboratory's mail room before joining Plant and Equipment's apprentice program. Before joining ORNL he had worked with TVA.

A native of Kentucky, Freeman lives at Route 1, Briceville, with his wife, Barbara. They have two sons and two daughters.

Lloyd has been an employee since 1951. He also worked in the mail room at ORNL before becoming a machinist apprentice. Prior to his promotion he was a planner estimator with Plant and Equipment.

Lloyd lives with his family at Route 20, Knoxville, his hometown. He and his wife, Pat, have two sons.



H. L. Lloyd

Test of coal conversion process conducted in ORNL facility

Researchers at the Oak Ridge National Laboratory (ORNL) are investigating a process for the production of clean liquid and gaseous fuels from coal.

The coal conversion process under study is called "hydrocarbonization." It involves the chemical mixing of finely ground coal with hydrogen under conditions of elevated pressure and temperature. This process can produce synthetic crude oil, a substitute natural gas or a desulfurized char, which is a solid, coke-type fuel product.

Synthetic fuels differ from coal in the amount of hydrogen contained in their chemical structure. The hydrocarbonization process and other coal conversion methods now under study increase coal's hydrogen content through chemical reactions which produce new hydrocarbons — the compounds that are the basic constituents of all fossil fuels.

A major emphasis of the ORNL coal technology program is the development of coal conversion processes and engineering evaluation of systems to carry them out.

Using a new \$325,000 hydrocarbonization facility, ORNL engineers plan to process coal initially at a rate of 10 pounds per hour at temperatures up to 1,250 degrees F, and pressures up to 350 pounds per square inch (psig). After a year's operation, additional equipment may be added to the system to permit operating at higher pressures up to 1,200 psig.

Objectives of the experiment include determination of the best combination of operating temperature and pressure that will result in the production of increased yields of synthetic fuels with sustained,

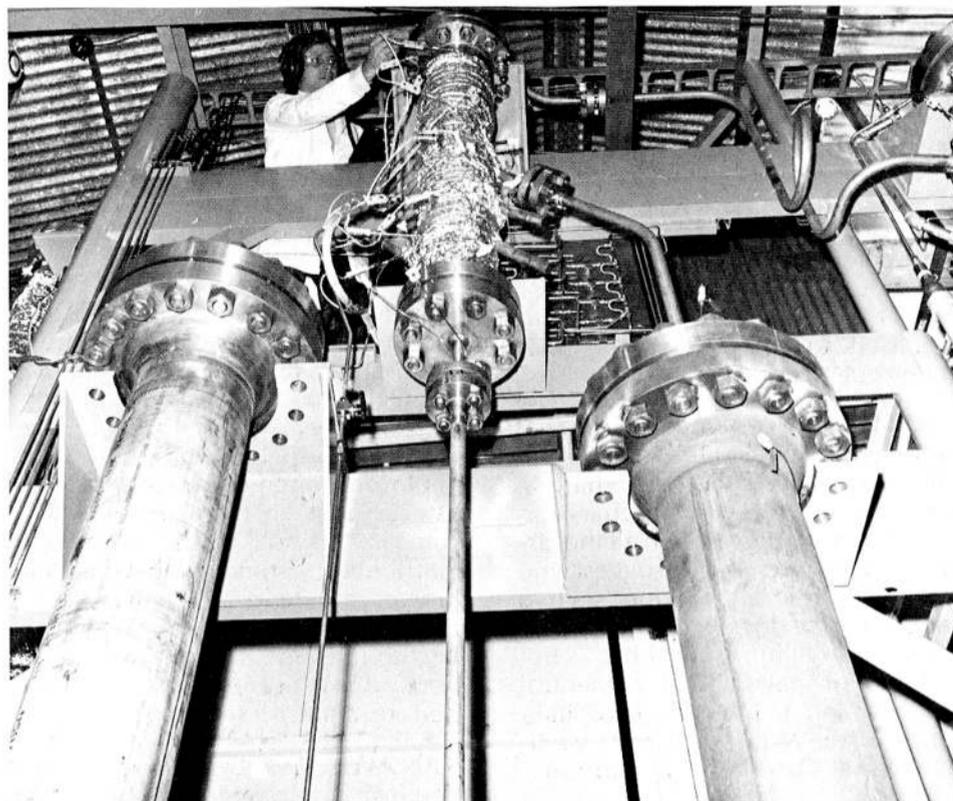
economical operation. The relative amounts of oil, gas or char produced will depend on the optimum conditions of operation eventually determined from evaluation of the process operation.

Data generated in the experiment will also be of value in identifying advantages and disadvantages unique to the process, including potential problem areas, and to serve as the basis for the design of future hydrocarbonization techniques and related process equipment and components.

Several laboratory-scale experiments elsewhere have shown very promising improvements in oil yield when coal is rapidly pyrolyzed — chemically changed by applying heat — in an entrained-bed reactor vessel. These results, however, are accompanied by three problems: (1) a very viscous (tar-like) oil is produced; (2) the char has very high sulfur content; and (3) a large number of eastern and western coals exhibit caking properties (become soft and sticky) when heated and may be difficult to handle.

The Laboratory experimental program initially will test the assumptions that: (1) the greater the hydrogen pressure, the lighter will be the oil produced; and (2) the caking and char sulfurization problems can be alleviated through operation of a new type of reactor vessel which allows rapid mixing of solids.

Jere P. Nichols is director of the Coal Technology Program. Staff members involved in the coal hydrocarbonization experiment are Henry D. Cochran, Grady L. Yoder, Jim B. Gibson, Phillip R. Westmoreland, Paul P. Haydon, Jack C. Rose and Ron L. Andrews, all of the Laboratory's Chemical Technology Division.



COAL CONVERSION FACILITY — Hydrocarbonization, one of the principal processes on which the U.S. will depend for future production of clean liquid and gaseous fuels from coal, is being tested in a new \$325,000 facility at Oak Ridge National Laboratory. The facility was designed, built, and is being operated by engineers in the Laboratory's Coal Technology Program. Henry Cochran uses an acoustic leak detector to check for emissions from the fluidized bed reactor, in which coal is chemically mixed with hydrogen under conditions of elevated pressure and temperature to produce controlled quantities of synthetic fuels.

Stock up for winter

First firewood cutting of year set for January 30-31 weekend

T...i...m...b...e...r!! The main tree harvest is over. The larger log sections have been removed. What remains are tree tops from most of the native species of pine and hardwood.

If your stockpile of firewood is getting low and you're looking for an inexpensive way of replenishing your supply, you will be interested in the upcoming firewood cutting on the Oak Ridge reservation.

Friday and Saturday, January 30 and 31, are the dates for the first firewood cutting of 1976. Interested persons should meet between 8 and 10 a.m., on either day, at the intersection of the Oak Ridge Turnpike and Highway 95 to purchase a permit and be directed to the area where the cutting will take place. Road access will be provided for private vehicles to remove wood from the reservation after it has been cut.

Price of the permit is \$5 for each individual or family for an entire day. Once the permit is purchased cutters are free to come and go, loading and unloading firewood. At previous firewood cuttings, families have averaged two and three pick-up truck loads in one day.

"If a family is energetic and hard working, two loads can be cut, split, and loaded in time for a late lunch," said Dennis Bradburn, director of the Forest Management program at Oak Ridge National Laboratory.

Cut, clear and conserve

The firewood cuttings serve a variety of purposes. Primarily, they supply residents with an abundant source of firewood for personal use. The permit fee is a minimal charge to help defray the costs of personnel necessary to supervise the activity. The wood has to be cut, split and loaded by the individual.

The cuttings also aid the forest management program. Trees, like

most plants, need room to grow. Clearing away the tree tops makes room for new tree growth.

Another purpose is also served. During these times of energy shortages and environment awareness, with special emphasis being placed on conservation, the cuttings enable a tree to be utilized more fully. A tree can take anywhere from 50 to over 100 years to reach full maturity. Many of the trees on the Oak Ridge reservation are planted, nurtured and protected, with a watchful eye for disease, until they are fully grown. When the time is right trees are harvested much like any crop, and the land is prepared for another planting. Also like any other crop, the larger the portion of a tree put to use the smaller the amount of waste that is realized.

Safety first

No cutting can be fun and productive if safety isn't considered. Proper clothing should be worn and saws and other tools should be in safe working condition. No standing trees are to be cut unless specified by the agent. Children under 12 are not allowed in the area.

If you are industrious, need firewood, and would enjoy a day in the woods, attend the firewood cutting, January 30 and 31, from 8 a.m. to 4:30 p.m.

For more information, contact Dennis Bradburn at extension 3-1266.

Service Anniversaries

ORNL 30 YEARS

Frank S. Brinkley, Environmental Sciences; Alonzo Tabor, Plant and Equipment; Sherman D. Snyder, Metals and Ceramics; Glen H. Doughty, Plant and Equipment; Genevieve L. Downs, Health Physics; Roy L. Clark, Health Physics; Willis K. Prater, Chemical Technology; Francis K. McGowan, Physics; Fletcher L. Moore, Analytical Chemistry, and Paul W. Hill, Instrumentation and Controls.

25 YEARS

Vivian J. Zedler, Frank H. Ward, C. Elmo Wolfe, John C. Gower, Charles W. Boatman, Edgar J. Vittatoe, David A. McWhirter, William J. Bryan, Boyd S. Lynch, Thomas R. Steele, Thomas J. Sworski, Reuben G. Carver, William A. Shannon;

Robert J. Shannon, Thomas W. Hodge Jr., Charles E. Waddell Jr., William P. Smith, Dallard H. Loveday, Charles E. Hall, William E. Busby, Lewis F. Parsley Jr., Simpson J. Claiborne Jr., John W. Jarnagin, Charles B. Burns, Martin B. Hunter, Arnold E. McDaniels, Vernon J.

Houser, Raymond D. Johnston and Juanita B. Wright.

20 YEARS

Woodrow Carey, Robert L. Jolley, James R. Inman, Donald T. Henderson, Frances C. Fitzpatrick, Hisashi Kubota, Edwin C. Bradley, George C. Battle Jr., Georgia C. Bower, Leonard D. Liles, Barbara L. Bishop, Elmer H. Lee, Howard A. McLain and Larry G. Shrader.

ORNDP 30 YEARS

Perry Anthony, TIA barrier manufacturing; Francis E. Bowers, development maintenance; Charles A. Bradley, cascade maintenance department; William E. Elmore Jr., material services department; John T. Royston, operations planning department; James F. Mooney, shop services department; Forrest E. Johnson, dimensional inspection; Willis M. Isham, TIA barrier manufacturing; Ernest C. Evans, support services department; and Alvin C. King, power and utilities maintenance.

Project engineers coordinate various jobs at the Laboratory

Editor's Note: The following is the first in a series of articles on various service groups throughout the Nuclear Division.

"We're a service organization," says Robert M. (Bob) Hill, manager of Project Engineering at Oak Ridge National Laboratory. "Project engineers are available to assist anyone at the Laboratory who has a package of work to be done and money with which to do it."

The purpose of the Project Engineering organization is to provide engineering support to research people in planning new work and in implementing the design, procurement, construction, fabrication, and installation of equipment or facilities for research activities.

Jobs range in value

Project engineers at ORNL monitor and coordinate a variety of jobs which range in value from a few thousand to several million dollars. Many of these engineers have worked at other Nuclear Division installations, and have a variety of experience and educational backgrounds. Most of the 16 project engineers in Hill's organization are mechanical engineers, but also included are chemical engineers, a petroleum engineer, a civil engineer and an aeronautical engineer.

Project engineers perform work principally in response to two different types of authorizations: work order requests, and ERDA directives. Work order requests may be initiated by an individual research-

er, program or division. A directive is a contract between the Energy Research and Development Administration and the Nuclear Division to do specific work, for a specific amount of money, within a specific period of time. Directives are issued to cover all capital construction projects costing more than \$85,000, capital equipment projects of more than \$500,000, and experimental projects of more than \$500,000.

Project steps

When a project authorization is received the following steps usually are followed:

- The work order or directive is assigned to the project engineer who has the suitable experience and expertise to handle the project.
- A principal (usually design) engineer is assigned to the project by the appropriate engineering design organization.
- Both engineers meet with the requester (person in ORNL organization who will use the facility or equipment being planned) or his representative to develop criteria for the project.

These three people constitute the "project team."

- An engineering work plan for project design and construction is formulated and approved by the project team.
- Additional people or organizations are brought in, usually by the principal engineer, to perform the design work which converts the criteria to an engineering concept.
- Final design is completed.
- Materials are procured.
- Construction of facility or equipment is accomplished.

Team responsibilities

The project engineer is responsible for overall coordination of the project and accomplishing objectives of the work order or directive. One of the major constraints is keeping the project within the assigned budget. If the authorization is an ERDA directive, the project engineer must also maintain communications with ERDA, and provide documents, reports and other information to enable ERDA to monitor progress of the job.

The principal engineer on the project team is responsible for coordinating all design activities. The requester furnishes criteria for the project, monitors progress, reviews

any changes, and approves the completed project.

Successful project

When asked to give a good example of an engineering project, Hill chose the recently-completed Process Waste Treatment Facility. This project, based on a process developed and demonstrated by researchers in ORNL's Chemical Technology Division, involved construction of a facility for treating process waste originated at the Laboratory.

Conceptual design for the facility was done in 1972 by William Burch, Paul Jarvis and Robert Lampton. A request for a directive to construct the facility was submitted to ERDA and the authorization received in late 1973. Design of the \$1.3 million facility was approved by ERDA and site preparation was begun by Rust Engineering in early 1974.

Although the project team changed — members are currently Neal Dunwoody, project engineer; Richard Braatz, principal engineer; and Richard Robinson, (Waste Management Program), requester — the project was completed on schedule, according to specifications and within cost. Dunwoody credits the group responsible for the conceptual design for this accomplishment. "They used good foresight; therefore, we were able to keep the facility within budget, even though it was constructed during a period of high inflation," Dunwoody said.

Responsible for GPP

In addition to engineering projects previously mentioned, Project Engineering is responsible for planning and executing General Plant Projects (GPP) — those jobs which are directed toward making general capital improvements in the plant.

Each project engineer is assigned to one or more programs or divisions at ORNL. They are also assigned functionally to support Al Boch, director of ORNL's Capital Projects (including ERDA directives). Hill serves as Boch's deputy.

Current work at the ORNL site which is being coordinated by project engineers includes: the Heavy Ion Facility - John Murray; the Safeguards and Security Upgrading project - Walter Cox; engineering portions of the Coal Technology program - Joe Kurtz; and the Environmental Sciences Laboratory - Neal Dunwoody.

ORNL activities at Y-12

Project engineering activities in the Thermonuclear and Reactor Divisions are managed by Edward H. Bryant. Typical of the project engineering assignments for this group are: ORMAK Upgrade - Norman Durfee; and the Technology Test Assembly - Charlie Anderson.

Myer Bender, Manager of ORNL Engineering, views project engineering as "a results oriented engineering function whose main purpose is to be sure that suitable work objectives are defined and that appropriate resources are marshalled and used to accomplish ERDA purposes in accord with established rules, regulations, and policies."



Y-12 PLANT

RIDERS from Norwood, Merchants Road, Cherokee Ridge area, straight day, East, North or Central Portals. Jim Baker, plant phone 3-5935, home phone Knoxville 947-3396.

RIDERS from South Knoxville, East Chapman Highway areas, straight day, any portal. W. H. Sherrod, plant phone 3-7407, home phone 577-0295.

ORNL

Two or three CAR POOL MEMBERS to join pool now in its seventeenth year. From Hillside-Pennsylvania-West Outer area, Oak Ridge, to any portal. Will consider merging with another pool. Contact Tom Burnett, plant phone 3-6939, home phone 483-1975, or Dick Strehlow, plant phone 3-1175, home phone 482-3240.

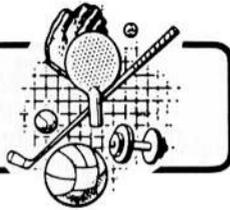
Two CAR POOL MEMBERS from Florida-New York Avenue area, Oak Ridge, to East Portal, 8-4:30 shift. Bill Henry, 483-0858, or R. L. Stone 483-4259.



CONSTRUCTED ON TIME, ACCORDING TO SPECS, WITHIN COST — Reviewing construction drawings in the recently completed Process Waste Treatment Facility's control room, are from left, Bob Hill, manager of Project Engineering at ORNL; Neal Dunwoody, project engineer for the facility; and Stephen Denny, Construction Engineering. Denny was responsible for coordinating all construction work on the facility.

The next issue will be dated February 5. The deadline is January 28.

RECREATIONOTES



ORNL FISHING RODEO

A total of 18 winners show in the ORNL fishing rodeo for the last half of 1975. Several categories went begging for winning entries. Prizes for ORNL top fish may be picked up in Room 113, Building 2518.

Winners were:

LARGEMOUTH BASS

1. R. I. VanHook
2. George Keller
3. R. H. Winget Jr.

SMALLMOUTH BASS

1. Newell A. Miller
2. W. F. Ohnesorge
3. D. E. Sproles

STRIPED BASS

1. Mrs. Roscoe H. Jones

BREAM, BLUEGILL

1. W. I. Tillery

ROUGH FISH

1. F. S. Adams

SAUGER

1. Charles L. Thompson III

TROUT

1. C. W. Bandy
2. G. A. West

WALLEYED PIKE

1. Arnold Beets
2. G. E. Testerman
3. A. D. Ryon

ORNGP BOWLING

The Starlites grab an early lead in the ORNGP Women's League. Olivia Osborne took honors early with games of 224, 234, 204 for a total handicap tally of 662.

The All Stars have a three and one-half point lead in the Tuesday League. W. J. Redmond rolled games of 222 scratch, 247 handicap; J. L. Hengstler rolled series of 569, 641.

The Amps are ahead of the Planners and Hi-Rollers in the Wednesday League. Lyle Hensley posted a single of 241, while Ray Smith rolled a 646 series.

ORNGP FISHING RODEO

The year's second half fishing rodeo closed with 27 winners announced in the 11-category competition.

Winners were:

LARGEMOUTH BASS

1. Mrs. J. T. Asbury
2. P. D. Brooks
3. Mrs. J. D. McClendon

SMALLMOUTH BASS

1. A. D. Reeder
2. H. E. Walters
3. C. M. Parker

STRIPED BASS

1. William M. Cox

BREAM, BLUEGILL

1. Alfred H. Sides
2. C. B. Gamble
3. Huey Sides

CRAPPIE

1. H. E. Walters
2. C. W. Castle
3. Neal H. Hurd

MUSKIE

1. J. D. McClendon

ROCK FISH & HYBRID

1. Bill Price
2. E. H. Randolph
3. V. O. Maggart Jr.

ROUGH FISH

1. C. W. Castle
2. J. H. Fletcher
3. Mrs. C. W. Castle

SAUGER

1. Robert F. Hyland
2. James McClullough

TROUT

1. R. E. Cassell
2. Lloyd L. Quarles Jr.

WALLEYED PIKE

1. R. D. Shaffer
2. Mrs. H. E. Walters
3. W. E. Brown

Prizes may be picked up at Room C-136, Building K-1001.

(62371)



MOTORCYCLE SAFETY — Lynda Marlar, Y-12 Assembly Division, models motorcycle safetywear featured at a division safety meeting recently. She admires the "wheels" of William N. Shipley, photography.



HARDLY THE SEASON — Paducah Plant employees staged a successful swim program last summer, and plans are being laid for another one. The instruction, which was aimed at all ages, was staged at Bob Noble Park Swimming Pool. An employee's youngster boldly plans a jump in the photograph above.

Y-12 FISHING RODEO

In Y-12's six-month fishing rodeo a total of 19 winners placed. A retiree, R. S. Phillippi, carried off top weight with an 18-pound plus drum.

Other winners were:

LARGEMOUTH BASS

1. Elbert Scott
2. G. S. Price Jr.

SMALL MOUTH BASS

1. J. W. Graves
2. T. D. Newman
3. A. L. Monday

BREAM, BLUEGILL

1. G. H. Caylor
2. Joe Jackson

CRAPPIE

1. J. B. Wade
2. A. L. Monday

ROUGH FISH

1. R. S. Phillippi
2. H. F. Benninghoff
3. Alvin Reynolds

SAUGER

1. Russell Hopper
2. R. A. Hamrick
3. Emmett Moore

TROUT

1. H. A. Price

WALLEYED PIKE

1. Harley Law
2. R. E. Belcher
3. Arnold Craft

Prizes may be picked up in building 9711-5.

ORNL BOWLING

The Alley Rads maintain a one-point lead over the Cellar Dwellers in the big C League. Joe Cable, Pin Heads, posted a 656 handicap series early in January, as the Knuckleheads' L. E. Tucker rolled a 639 scratch count.

The Mousechasers extended their lead to 12 points in the ORNL Ladies League recently, as Brena Stevens rolled a 226 game, 549 series ... in scratch counting. Elizabeth Phipps rolled a 642 handicap series.

The Carbide Family Mixed League opened second half guns early as the B's & C's, the Oops team (which capped honors in the first half) and the Odd Balls shared initial top standings with the Doozits, all winning three points from opponents. Paul Bennett and Mae Davis shared the spotlight with series of 573 and 539, scratch, respectively.

Calendar of EVENTS

TECHNICAL

January 26

Laboratory-Wide Seminar: "The Office of Technology Assessment (OTA) Analysis of the ERDA Plan and Program." Part I: "An Overview," Leon Zelby, Institute for Energy Analysis; Part II: "Implications on New Directions for ORNL," Floyd Culler, ORNL Deputy Director. Central Auditorium (TV viewing in East Auditorium), Building 4500N, 2:30 p.m.

January 27

ORNL Bimonthly Colloquium: "The Search for Radiation-Resistant Metals," J. O. Stiegler, Metals and Ceramics Division, and "Outlook for the '76 and '77 Budgets," Herman Postma, ORNL Director, followed by questions from the floor. A badge is required for admission; refreshments will follow. American Museum of Atomic Energy auditorium, 7:30 p.m.

January 28

Cancer Research Seminar: "Terminal Deoxynucleotidyl Transferase Biology," Fred Bollum, University of Kentucky. Tower I Conference Room, Building 9207, Y-12, 12:15 p.m.

COMMUNITY

January 22, February 5

Dervish teaching stories: Thursdays, 7:30 - 8:30 p.m. Sears Civic Room, West Town Mall. Admission Free. A collection of Irdries Shah tales from the Middle East in the traditional dervish style.

Y-12 BOWLING

The Mini-Strikes keep a perfect record, to hold the C League lead. Ray Smith's 599 and Harold Zang's 598 scratch series keeps the spotlight. Bob Carmack's 255 scratch is a recent high single.

The Friskies keep an early lead in the Mixed League, with the Rollers and Alley Cats close behind. The Rollers' Patty Reece rolled a 201 scratch game last week!



QA and babies

by T. A. Lincoln, M.D.

(Editor's Note: Dr. Lincoln alternates his regular column with "The Medicine Chest," where he answers questions from employees concerning health in general. Questions are handled in strict confidence, as they are handled in our Question Box. Just address your question to "Medicine Chest," NUCLEAR DIVISION NEWS, Building 9704-2, Stop 20, Y-12, or call the news editor in your plant, and give him or her your question on the telephone.)

As many people in the Nuclear Division already know, quality assurance (QA) is receiving high priority. It is involved in all phases of a project from the initial planning and design through construction. The time has come to start applying some of these principles to making babies. What more important personal "construction project" can you imagine?

Giving some serious consideration to QA in having a baby makes more sense now than 25 or more years ago. The overwhelming majority of young couples today usually plan to have no more than one to three children. There used to be a widespread attitude that malformed or retarded babies were accidental and something over which we had no control. Having babies was a gamble and we were thankful for the healthy and did our best to care for the defective.

Birth defects no accident

We now know that environmental factors, such as the food we eat, the medicines we take, the life styles we lead and our exposure to pollutants, play an important role in causing birth defects. In a recent publication, the percentage of birth defects that can still be said to be of unknown cause is now only about 60-70 percent, and the percentage is rapidly falling as more research is conducted.

Another important reason for concern now is the exceedingly high cost of maintaining a severely defective offspring throughout its natural life. We used to be able to ship our defectives off to some state institution and forget about them. That option is rapidly disappearing except in extreme cases.

So a young couple agrees, "If we are going to have only two, we should do everything humanly possible to make them as perfect as we can. Now, how do we do it?" The suggestions below are full of generalizations and in some cases the information is incomplete, but it should serve as a basic guide.

Timing important

TIMING THE CONCEPTION: There is disturbing information that the sex-hormone birth control pill may be slightly teratogenic; i.e., it may tend to produce abnormalities in offspring. Studies suggest an increased frequency of congenital reduction deformities of limbs and malformations involving the great vessels in babies from women who have continued to take the pill during the early part of an unsuspected pregnancy.

Sex hormones are occasionally used to make a diagnosis of a pregnancy, since they will cause a menstrual period to start if the woman is not pregnant. They are also sometimes used in an attempt to prevent an abortion in women who are habitual aborters. Fortunately, there is evidence that women do not return to normal fertility for about four months after stopping the pill, so the main risk is the "accidental" pregnancy either due to failure to take the pill correctly or an actual pill failure.

Those really anxious to provide maximum safety should carefully time the conception. There is preliminary but still disturbing evidence that fertilizations of "aged" eggs by "old" sperm lead to a greater number of spontaneous abortions and possible birth defects.

After the egg leaves the ovary it remains in the uterus for several days awaiting fertilization by the sperm. Likewise, the sperm may remain several days in the uterus awaiting the arrival of the egg. Ideally the two should arrive in the uterus about the same time. By recording basal temperatures, women who have regular menstrual cycles can determine with considerable accuracy the time of ovulation.

A final consideration is that birth defects occur more frequently in women who are past 35 when they become pregnant.

Specific Advice: If you think you may be pregnant, stop the pill. Don't plan to try to get pregnant until three to six months after stopping the pill. Don't ask for a hormone shot to see if you are pregnant. Urine tests are simple, accurate and positive early in a pregnancy. Time the conception carefully.

SMOKING: There is now impressive evidence that smoking during a pregnancy has an adverse effect. The babies born are smaller, the survival rate is less and fetal growth retardation is associated with fetal malformations.

Specific Advice: Stop smoking before you get pregnant.

Excessive alcohol a danger

ALCOHOL: When expectant mothers are alcoholics, it is difficult to determine whether their increased frequency of having deformed children is related directly to the alcohol or to its other widespread effects. The liver may be diseased and nutrition impaired.

Specific Advice: Either don't drink at all or keep it to a minimum, especially during early pregnancy.

Angelly, Howard, Jones promoted in Paducah's fire, guard forces

Two new lieutenants and one captain have been elevated in Paducah's fire and guard department.

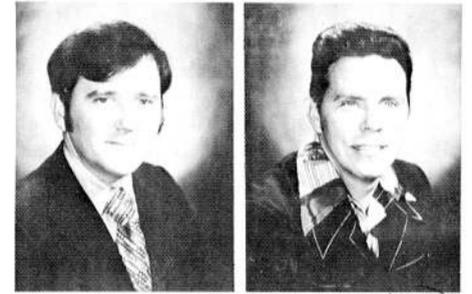
Stephen L. Angelly and Joe E. Howard are now lieutenants, and Carl E. Jones is a captain.

Angelly, a native of Paducah, joined Union Carbide last year, after working as an operations clerk with United Parcel Service. He attended Southern Illinois University, Paducah Community College and Murray State University.

He and his wife, the former Evelyn Short, live at Route 1, Brookport, Ill. They have one son.

Howard is also a native of Paducah. He has been with Union Carbide more than four years. Before joining Union Carbide he was with the Modine Manufacturing Company eight years. Mrs. Howard is the former Jo Anne Boldry, and they have three sons. The Howards live at Route 2, West Paducah.

Howard is a member of West McCracken's Fire and Rescue Squad, a certified first aider in the Red Cross, and is certified as an emergency medical technician.



S. L. Angelly

J. E. Howard



C. E. Jones

Jones, a native of Lynnville, Ky., has been with Union Carbide 24 years. Prior to joining the Paducah plant, he was with Merit Clothing Company.

Mrs. Jones is the former Ela Watson, and the couple lives at 210 Heritage Drive, Mayfield. They have one son.

SERVICE ANNIVERSARIES

GENERAL STAFF 30 YEARS

Margaret G. Elmore, General Industrial Relations Division; and L. Kate Penland, Y-12 management services.

25 YEARS

George R. Jasny (December 22), Harry J. Brown and Betty D. Martin.

20 YEARS

George D. Parker.

DRUGS: A large number of drugs have been either proven to increase or suspected of increasing the rate of congenital malformations.

Specific Advice: Take no drugs of any kind during the first six months and, if possible, during the entire pregnancy, unless prescribed by a physician who knows you are pregnant and is familiar with the teratogenic potential of certain drugs.

OCCUPATION: The fetus is much more susceptible to the effects of radiation, certain chemicals and viruses.

Specific Advice: Advise your supervisor as soon as you suspect a pregnancy. Your work area may need to be checked for any agents which might have an adverse effect on the fetus even though they are of insufficient quantity to be of concern to you directly.

Obviously good nutrition as well as careful obstetrical care are extremely important. Nevertheless, the couple makes the crucial early decisions because the obstetrician usually doesn't get involved until after the second or third month of the pregnancy. It is, therefore, the parents who have the primary responsibility for QA for their anticipated baby.

Y-12 PLANT 30 YEARS

William A. Freels Jr., statistical services and SS control; Edwin F. Gammon, quality evaluation; Delmas "Bo" Glovier, electrical and electronics; Hugh C. Nichols, chemical services; William Garland, laboratory operations; Ernest Edwards, area 5 maintenance; and George E. Massengill, building services.

25 YEARS

William A. Sahr, John C. Bryan, Edward E. Gregory, Grady W. Smith, Robert L. Carson, Anne W. Wenzler, Hilton A. Tunnell, Ebenezer B. Oglesby, William W. Bradshaw, James H. Billingsley, Melburn L. Patterson, Carl A. Slaughter, Laroy S. Nabors, Robert L. Fain, Charles N. Brient, Orville M. Freels, Chester A. Franklin, Clifford W. Anderson, Mattie B. Humphrey, Basil E. Ward, Henry G. Chamblers, Andrew J. Smith and Floyd McClure.

20 YEARS

John D. Caylor and William E. Webb.

PADUCAH 30 YEARS

Lindsey E. Price, technology laboratory; and George T. Hull, plant superintendents.

ORGDP

25 YEARS

Emra F. Martin Jr., Mary E. Adams, James C. Bridges, Howard M. Hubbard, Russell A. Cooper, Edwin R. Henderson, Ben B. Smith and Jotty F. Winesette.

20 YEARS

Harold C. Jones and Hilton H. Abernathy.

Nuclear Division Deaths

James C. Long, a guard in the Plant Protection Department at Oak Ridge National Laboratory, died January 1 at his home on West Beaver Creek Drive, Powell.



Mr. Long A native of Marlow Community, Mr. Long had been employed as an ORNL guard for the past 28 years. He was a member of Grace Baptist Church.

He is survived by his wife, Imogene Hill Long; three sisters, Mrs. Ellis (Alice) Hackworth, Mrs. Florence Burgess and Mrs. T. W. (Bertha) Williams, and several nieces and nephews. Services were held January 3 at Holley-Gamble Funeral Home Chapel with the Rev. E. V. Cullum officiating. Burial was in Anderson Memorial Gardens.

Frank Morehouse, a 30-year veteran in the Fabrication and Maintenance Division at ORGDP, died January 5 in a Knoxville hospital.



Mr. Morehouse Survivors include his wife, Margaret Morehouse, 2546 McCalla Avenue, Knoxville; daughters, Florine and Clinton Davis; sisters, Louella Mayfield and Jerusha Taylor; and eight grandchildren. Services were held at the Tabernacle Baptist Church, with the Rev. J. P. Jones officiating. Burial followed in Crestview Gardens.

Mark Bowelle, a consultant in the Instrumentation and Controls Division, Oak Ridge National Laboratory, died January 10 at his home.



He was a native of South Dakota and came to Knoxville in 1938. After working with the Tennessee Valley Authority and Tennessee Eastman, he joined the Laboratory staff in 1946.

Mr. Bowelle He is survived by his wife, Wildred Ruth Bowelle, 361 East Drive, Oak Ridge; a son, John Bowelle; a sister-in-law, Mrs. Blanche Yohnor; two grandchildren, and several nieces and nephews.

Funeral services were held January 14 at Weatherford's Mortuary Chapel in Oak Ridge, with the Rev. Henry C. Ruth and the Rev. Robert Crothers officiating. Burial was in Oak Ridge Memorial Park.

Richard E. Reed, a research staff member in the Solid State Division at Oak Ridge National Laboratory, died January 4 in Oak Ridge Hospital where he had been a patient since August 15.



Mr. Reed Mr. Reed, a Laboratory employee for nearly 15 years, was a native of Canfield, Ohio. He was principal investigator for an experiment aboard the Appollo-Soyuz space mission last July. He is survived by his wife, Phillis S. Reed, 100 W. Newcomb Road, Oak Ridge; three daughters, Mrs. Tod (Debby) Phillips and Barbara and Nancy Reed; two sons, Richard Jr. and Michael; his parents, Mr. and Mrs. M. W. Reed; a brother, James Reed, and a sister, Mrs. Richard Smith.

A memorial service was held January 6 at First United Presbyterian Church in Oak Ridge; the Rev. Robert Crothers officiated. Martin's Funeral Home in Oak Ridge was in charge of arrangements.

BIMONTHLY COLLOQUIUM

The next ORNL Bimonthly Colloquium will be held in the auditorium of the new American Museum of Atomic Energy on Tuesday, January 27, at 7:30 p.m.

J. O. Stiegler, Metals and Ceramics Division, will discuss "The Search for Radiation Resistant Materials." Following the technical presentation, Laboratory Director Herman Postma will comment on "Outlook for the '76 and '77 Budgets," after which he will answer questions from the floor on this and other topics of general interest.

A badge will be required for admission. Refreshments will be served following the colloquium.



NOZZLE-TO-SPHERE TEST FACILITY — Y-12 craftsmen Bert E. Burdette and William A. Wilburn, and Malcolm Richardson, an engineer in ORNL's Reactor Division, examine and adjust the nozzle-to-sphere test facility for the Liquid Metal Fast Breeder Reactor program. This experimental facility will provide high temperatures and loadings to furnish realistic data for evaluating structural design methods for LMFBRs. The data will also enable designers to assess the predictive capability of the computer programs used in designing system components.

NUCLEAR DIVISION SAFETY SCOREBOARD

Time worked without a lost-time accident through January 15:

Paducah	101 Days	928,000 Man-Hours
ORGDP	120 Days	2,612,952 Man-Hours
Y-12 Plant	108 Days	2,952,000 Man-Hours
ORNL	65 Days	1,324,964 Man-Hours

Tax advantages

(Continued from page one)

bonds, and/or UCC stock at the time of retirement or to defer the same settlement as late as the month of December in the next year following retirement. The tax treatment for this type of settlement varies but in any event income taxes will have to be paid in the year the settlement is received. If a cash settlement is elected, all money in excess of the employee's contributions is taxable. If U. S. Savings Bonds are received, the amount taxable at that time is the difference between the current value of the bond and the employee's contributions. If UCC stock is received, the taxable amount at settlement is the excess, if any, of the lower of the stock's cost or present market value over the employee's contributions.

The detailed study of how the Personal Investment Account may be used for additional retirement income was made by Ronald D. Smith and Alan K. VanHull. They are in the Nuclear Division's Process Analysis and Planning Division.

More information about the PIA payout options may be obtained from the savings plan representative in your Benefit Plans Office.



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