AUTHORS AND PAPERS

The highly condensed summaries of papers and technical notes (below) are intended to assist the busy reader in determining the order in which to read the technical material. Biographical comments are for human interest.

FILTER FOR FAST FLUX TESTING

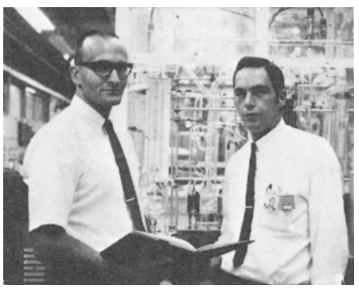
A boron filter, inserted into a large thermal test reactor, can provide a fast-neutron test facility 3.5 cm in diameter with flux levels one-half that of the EBR-II. The neutron spectra and fission rates are adjusted by varying the filter thickness and substituting europium for boron.

R. E. Wood (left) (PhD, University of Utah, 1955) was Manager of Engineering at General Electric's Idaho Test Station where F. L. Sims (center) (MS, University of Idaho, 1962) is a Reactor and Analysis Engineer, and J. F. Kunze (PhD, Carnegie-Mellon University, 1959) is Manager of Operations and Analysis. C. S. Robertson, Jr. (inset) (MS, MIT, 1957), a Project Engineer at G. E.'s Cincinnati headquarters, coordinated the filter test requirements with the fuel-element development and testing groups.

SOL-GEL PREPARATION OF DENSE PuO_2

Dense homogeneous microspheres of plutonia, plutonia-urania, and plutonia-thoria in desired ratios have been produced on a pilot plant scale via the sol-gel process.

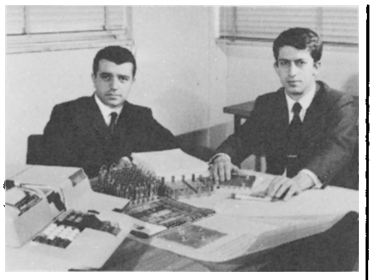
M. H. Lloyd (left) (MS, Creighton University, 1954) is a group leader in ORNL's Chemical Technology Division where he coordinates the research and development of heavy element separations. R. G. Haire (PhD, Michigan State University, 1965) is the principal investigator for plutonia sol-gel studies at ORNL.



PIQUA FUEL PERFORMANCE

Examination of six Piqua Core I fuel assemblies indicated that, although some tube deformation had occurred, the dimensional stability of the fuel was excellent and the design average burnup of 3000 MWd/metric ton of uranium was possible.

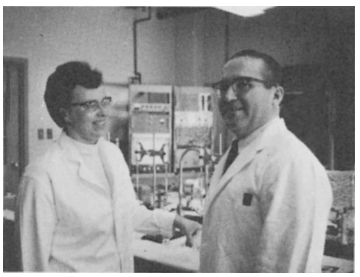
K. J. Miller (left), a senior research engineer at Atomics International Hot Laboratory, is responsible for hot-cell examination and analysis of fuels, structural materials, and reactor components. W. R. McCurnin, Supervisor of the Hot Lab Engineering Unit, has been associated with irradiated fuel and material examinations since 1960.



PLUTONIUM FUEL HOT SPOT FACTORS

Calculations show that segregation of PuO_2 in vibrational compacted, mixed oxide fuel rods can lead to hot spots 100% above nominal values, while agglomeration of PuO_2 in pelleted fuel gives only 10 to 15% over nominal values.

G. Testa (right) is Chief of the Irradiation and Evaluation Group of the Ceramics Technology Laboratory, Casaccia Nuclear Research Center. His experience in fuel design was obtained at AGIP Nucleare and at Hanford Laboratories. P. Grillo, responsible for the Fuel Design Section of this group, was involved in thermo-hydraulic and mechanical design at Fiat and at Westinghouse.



CHEMICAL ENRICHMENT OF MERCURY ISOTOPES

Diphenylmercury exposed to 2×10^{12} n/(cm^2 sec) (thermal) and $\sim 2 \times 10^7$ R/h gammas was enriched by factors >1000 for short irradiations. Although the yield of radiomercury increases with increased concentration and irradiation time, the enrichment decreases with irradiation time.

K. E. Collins (right) (PhD, University of Wisconsin) is Assistant Professor of Chemistry at SUNY in Buffalo where his research interests are radiation and hot atom chemistry. C. H. Collins (PhD, Iowa State College), for several years a Senior Scientist at Western N.Y. Nuclear Research Center, is now Assistant Professor of Chemistry at SUNY, Buffalo.

GAMMA-ELECTRIC CELL

Two multiplate gamma-electric cells, using either an epoxy or polystyrene dielectric material, have for the first time attained stable voltages <kV. A corresponding theory, covering collection of Compton electrons and leakage currents, is developed.

Henry T. Sampson (right), currently at Aerospace Corporation, received his PhD at the University of Illinois in 1967. Prior to graduate school he had several years' experience in the Propulsion Development Department of the U.S. Naval Ordnance Test Station. George H. Miley (PhD, 1959, University of Michigan) is Professor of Nuclear and Electrical Engineering at Illinois. His interests include radiation energy conversion and reactor physics.

SPACE NUCLEAR MATERIALS COMPATIBILITY

A review of progress on alkali metal-structure alloy compatibility shows that reliable Rankine-cycle space nuclear power systems can be constructed and operated to at least 2000°F using first-generation refractory alloys.

W. O. Harms (right) is Section Chief, Research and Development, in ORNL's Metals and Ceramics Division and Lecturer in Metallurgy at the University of Tennessee. He has been with both organizations since receiving his PhD in physical metallurgy at the University of Minnesota in 1953. Arnold P. Litman, Group Leader, Reactor Materials Engineering, has been at ORNL since 1958. He has MS degrees in metallurgical engineering from the University of Tennessee and industrial management from Georgia Institute of Technology.

IN-CORE DETECTOR FOR PULSED REACTORS

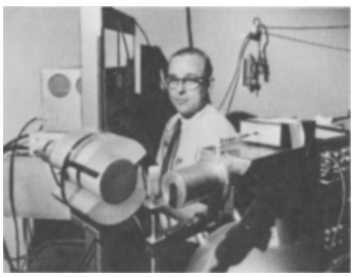
An in-core radiation detector, using an evacuated chamber, detected transient thermal fluxes $\leq 10^{18}$ n/(cm^2 sec) in >800 TRIGA pulses without deterioration in sensitivity.

William H. Todt, a project engineer at the Westinghouse Electronic Tube Division, has worked on the design of radiation detectors and their application to commercial power and test reactors for the past six years. His BA and MA degrees are from Williams College.

EXPERIMENTAL IRRADIATION SYSTEMS

Two rapid rabbits move $\frac{5}{8}$-in.-o.d. × 3-in. or $\frac{1}{4}$-in.-o.d. × 1-in. containers into and out of the Savannah River production reactors without interfering with the production cycle.

G. B. Cole (center) (BSME, South Dakota State, 1954) and G. F. Haase (left) (BSME, University of Maryland, 1961) are engineers in a design and development group in the Engineering Assistance Section at Savannah River Laboratory. W. R. Kennedy, Jr. (BSME, Georgia Institute of Technology, 1942) is the Group Leader.



GAMMA-RAY ASSAY OF ^{238}Pu

Contaminated trash in steel drums is assayed for ^{238}Pu by external measurement of the intensity of its 765-keV γ, using an external ^{238}Pu standard to correct for the attenuation of this photon by the trash and drum.

Walter W. Strohm (PhD, University of Kansas, 1966), a member of the Nuclear Physics Group at Mound Laboratory since 1963, is investigating the nuclear structure of light actinides using angular correlation and low-temperature nuclear orientation techniques.