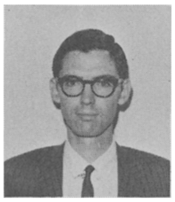
AUTHORS AND PAPERS

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.





HYDROGEN REACTIVITY CONTROL

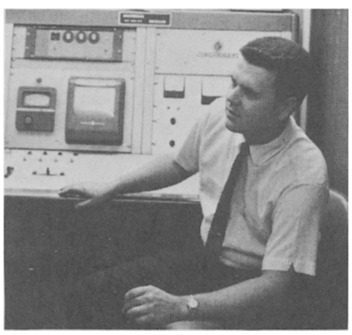
Dynamic reactor control, using the principle of mass transport of hydrogen between a UO_2-fueled ZrH_X core and a ZrH_X reservoir, has been shown to be effective, self-regulating, and responsive to varying load demands and reactor perturbations.

H. B. Rosenthal (upper left), who is presently coordinating evaluation and hardening activities for nuclear and weapons effects on missile systems at Martin Marietta's Orlando Division, was responsible for design, safety, and performance of the hydrogen reactivity experiment. E. A. Szymkowiak (right), who handled instrumentation and measurements for the H-Rho experiment, is currently directing radiation testing for the Nuclear Systems Division of Isotopes Inc. C. H. George, now a senior nuclear designer studying advance fuel cylces at Gulf General Atomic, performed design analysis and data evaluation for the H-Rho experiment.

DAMAGE FLUX IN FAST REACTORS

Reducing the power density of a reactor core is shown to have a far greater effect on the damage flux than removing moderator.

S. C. Cohen (left) and D. R. Mathews are staff members in Gulf General Atomic's Nuclear Analysis-Reactor Physics Department. Cohen (PhD, 1964, University of Michigan) is responsible for thermionic reactor physics, and Mathews (PhD, 1966, MIT) is engaged in design and analytical methods development.

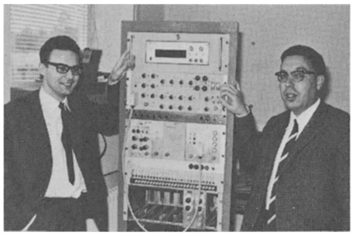


THERMOCOUPLE DECALIBRATION

The location of flux and temperature gradients along in-pile Chromel/Alumel thermocouple leads has a major influence on thermocouple decalibration ($\leq 50\ \mu V$), and is attributed to radiation produced, self-annealing scattering centers.

James H. Leonard (PhD, chemical engineering, University of Pittsburgh, 1960), is Associate Professor and Director of the Nuclear Engineering Program at the University of Cincinnati. Previously, he worked for Westinghouse on the design and control of the Shippingport reactor.

ON-LINE REACTIVITY METER



An on-line reactivity meter using reactor noise analysis based on a two-detector crosscorrelation technique gives subcriticality measurements during loading and shutdown.

W. Seifritz (left) (Dipl. Physics, University of Karlsruhe, 1964), a physicist at the Institut für Neutronenphysik und Reaktortechnik of the Kernforschungszentrum Karlsruhe, is interested in experimental reactor physics and reactor noise analysis. D. Stegemann (PhD, University of Karlsruhe, 1962) is group leader of experimental fast reactor physics.

GAMMA-RAY SCATTER GAUGE

A multivariable search method predicts optimum design parameters of a gamma-ray scatter gauge for measurement of the atmospheric density of Mars. This technique of searching mathematical models holds promise in other applications.

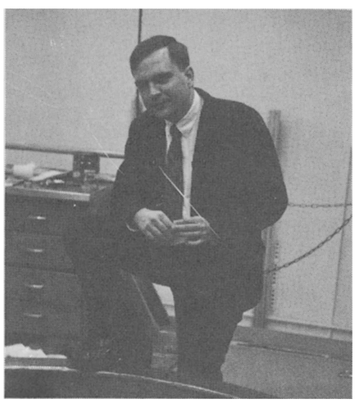
Robin P. Gardner (left) is Associate Professor of Nuclear Engineering at North Carolina State University. Donald R. Whitaker is a member of the environmental and engineering science division of the Research Triangle Institute. Both are active in the use of mathematical modeling techniques for the study and optimum design of radioisotope gauging techniques.

DIRECT READING GEIGER-MUELLER DETECTOR

A Geiger-Mueller detector with an improved response to photoelectrons and Compton electrons through use of a mesh cathode, an enlarged anode, and non-contaminating gas-filling techniques, can be read directly in flux and dose rates.

Victor Ozair is a member of the staff of the Bechtel Corporation (San Francisco) where he is responsible for radiation monitoring systems on a reactor test facility. Since receiving his master's degree from the University of Toronto (1966) he has gained experience in shielding for nuclear reactors (at AECL) and for accelerators (with Cambridge Research Laboratories). Douglas G. Andrews, with the University of Toronto since 1957, is Professor of Nuclear Engineering. After receiving his master's degree from the University of Cambridge (UK) he helped develop and design reactors and diffusion and chemical plants with the UKAEA.

DISTURBANCE LOCATION



Local perturbations in reactivity, worth ~50 millicents, were located accurately about four inches inside a TRIGA reactor core by two external gamma-ray collimator detectors and an analog computer programmed for cross-power spectral density analysis that eliminated information not common to both detectors.

Frank J. Baloh, a senior scientist at Westinghouse Advanced Reactor Division, spent three years at the NASA Lewis Research Center Reactor Division prior to receiving his PhD in nuclear engineering from Pennsylvania State. (For notes about Prof. Kenney see below.)

LOCAL POWER WITH GAMMA DETECTORS

Preliminary data indicate that power levels can be measured to a core depth of $\sim$10 cm using two collimated gamma-ray beams containing reactivity-induced noise information and detectors located outside the core.

E. S. Kenney (right), Associate Professor, and M. A. Schultz, Professor, are in the Nuclear Engineering Department of Pennsylvania State. Both are interested in reactor control problems and noise analysis. Schultz is author of Control of Nuclear Reactors and Power Plants *(McGraw-Hill, 1955) and a member of the* Nuclear Applications *Editorial Advisory Board.*

PYROLYTIC CARBON COATING

Low- and high-density pyrolytic coatings were deposited on ThO_2 particles in an engineering-scale system. The density, coating thickness, anisotropy factor, coating rate, and deposition efficiency were controlled, and the parameters that affect these properties were identified.

Shown right to left are R. B. Pratt, J. D. Sease, and W. H. Pechin, members of ORNL's Fuel Cycle Technology Group headed by A. L. Lotts (inset). Their work includes design, development, and operation of processes and equipment for fuel- and target-element fabrication.