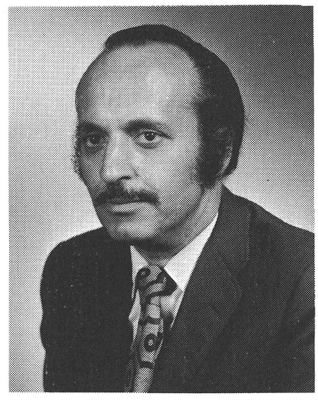
nuclear technology
CONTINUING NUCLEAR APPLICATIONS & TECHNOLOGY

AUTHORS — DECEMBER 1971

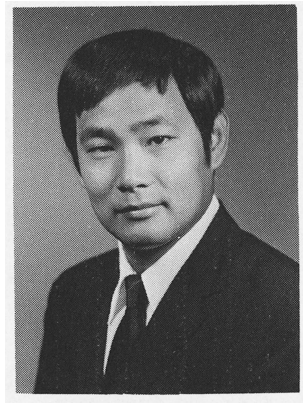
REACTORS



MINIMUM CRITICAL MASS OF URANIUM-235 REFLECTED BY NATURAL URANIUM IN WATER

A. W. Gray

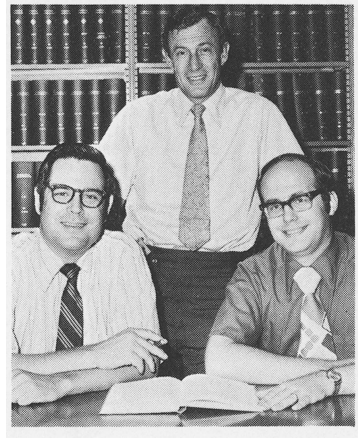
A. W. Gray (MS, Polytechnical Institute of Brooklyn) is a senior scientist in the Criticality Control Standards Group at the Westinghouse Bettis Atomic Power Laboratory. He is presently involved in control standards as they apply to ^{233}U systems.



ANALYSIS OF MECHANICAL WORK ENERGY FOR LMFBR MAXIMUM ACCIDENTS

Andrew Padilla, Jr.

Andrew Padilla, Jr.(PhD, The University of Michigan, 1966) was involved for over four years in core design and safety analysis for the Fast Flux Test Facility in Richland, Washington, where he was employed by WADCO Corporation and Battelle-Northwest. He is presently an associate chemical engineer at Argonne National Laboratory where he is involved in LMFBR safety analysis.



STATIC AND PULSED REACTIVITY MEASUREMENTS ON LARGE URANIUM-235 FUEL FORMS IN WATER

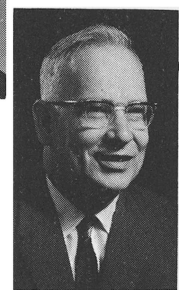
R. L. Currie
P. B. Parks
J. L. Jarriel

R. L. Currie (right) (BA, physics, Wesleyan University; PhD, nuclear science, Cornell), employed at Savannah River, is currently interested in static reactivity and subcritical neutron monitoring techniques. P. B. Parks (left) (BS, PhD, physics, Duke University) is currently working in pulsed source determinations and other aspects of reactor kinetics. J. L. Jarriel (center) (BS, MS, physics, University of Georgia) is currently the SP-SE Reactor supervisor for SRL's Experimental Physics Division.

REACTOR SITING

THE UTILITY OF ICE CUBES AS AN ABSORBENT FOR GASEOUS FISSION PRODUCTS

B. A. Soldano
W. T. Ward



B. A. Soldano (left) (PhD, chemistry, University of Wisconsin, 1949) has recently become a research professor of chemistry and physics at Furman University. He was responsible at Oak Ridge National Laboratory for both fundamental and applied R&D research in the fields of ion exchange, aqueous solution chemistry, solvent extraction, and nuclear safety, the last, as a member of the USAEC Spray and Absorption Technology Task Force. W. T. Ward (BS, chemical engineering, Virginia Polytechnic Institute and State University) is presently employed as a chemical engineer at Oak Ridge National Laboratory. He has more than 25 years experience in research and development on chemical problems related to nuclear reactors. He was a member of the USAEC Spray and Absorption Technology Task Force.

FUELS

MELTING HEAT RATING OF UO_2-25 wt% PuO_2 FUELS

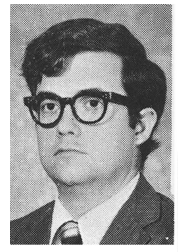
L. A. Lawrence
J. A. Christensen

L. A. Lawrence (left) and J. A. Christensen are members of the Materials Technology Department of the Hanford Engineering Development Laboratory operated by WADCO Corporation. Lawrence is a research scientist primarily involved with in-reactor experiments to study the effects of materials variables on the performance of mixed uranium-plutonium oxide fuels. Christensen is a senior research scientist presently on the Technical Analysis and Program Development Staff. His main interests lie in the area of irradiation behavior of ceramic fuels.

SHIELDING

SEMIEMPIRICAL FORMULAS FOR GAMMA-RAY DOSE RATES THROUGH TWO-LAYER SLAB SHIELDS

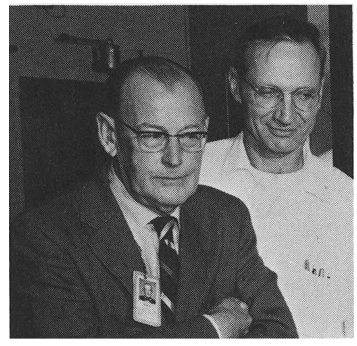
David A. Sharp
A. Carnesale



David A. Sharp (left) (PhD, North Carolina State University, 1970) has been a staff member in the Theoretical Physics Division of the Savannah River Laboratory since 1968. During this time he worked on reactor charge design and computer code development. He is currently involved in safety analysis studies for plutonium production charges. Albert Carnesale (PhD, North Carolina State University at Raleigh, 1965) was on the faculty of the Nuclear Engineering Department at North Carolina State University until 1969. He is presently with the U.S. Arms Control and Disarmament Agency, working on the Strategic Arms Limitations Talks (SALT).

ACTIVATION ANALYSIS OF SODIUM AND POTASSIUM IN SOLID PROPELLANTS

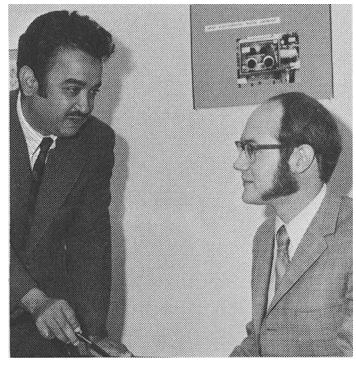
W. H. Barber
O. H. Dengel
R. H. Vogt
C. V. Strain



Charles V. Strain (top left) (PhD, University of Rochester, 1938), a consultant to the Nuclear Sciences Division, U.S. Naval Research Laboratory, is interested in nuclear safeguards and other nuclear applications. Richard H. Vogt (top right) (MS, University of Minnesota, 1952) is a member of the Acoustics Division, U.S. Naval Research Laboratory. He worked in radioactivity and nuclear applications at the nuclear reactor during the time it was in operation at NRL. Ottmar H. Dengel (bottom left) (PhD, Technical University, Munich, Germany, 1962) is head of the Electrodynamics Branch of the Science Department, Naval Ordnance Station, Indian Head, Maryland, and is closely associated with the activation analysis of propellants. William H. Barber (bottom right) (BS, Pennsylvania State University, 1962) is a member of the Science Department, Naval Ordnance Station, Indian Head, Maryland. He is in charge of the operation of the Station's 14-MeV fast neutron generator and the activation analysis programs.

CHARACTERIZATION OF A DIFFUSION TUBE HYDROGEN DETECTOR IN A DYNAMIC SODIUM SYSTEM

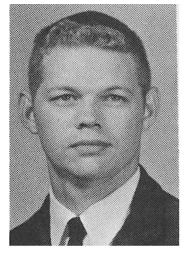
Prodyot Roy
Douglas N. Rodgers

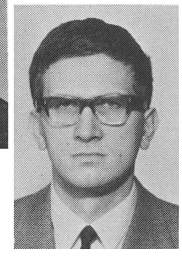


Prodyot Roy (left) (PhD, materials science, University of California, Berkeley) has been a member of the technical staff of the General Electric Company, Breeder Reactor Department since 1968. At GE his research interests are sodium coolant chemistry, mass transfer, and materials behavior in sodium. Douglas N. Rodgers (MS, chemical engineering, Lehigh University) has been a member of the GE technical staff since 1970. His work has been in the area of sodium coolant chemistry and related process equipment development.

THERMAL CONTACT RESISTANCE BY REFLECTION OF HEAT DIFFUSION WAVES

M. J. Robinson
M. Tomšič

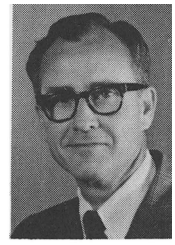


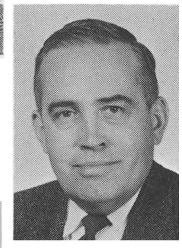


M. John Robinson (left) (PhD, nuclear engineering, University of Michigan, 1965) is an associate professor at Kansas State University. His current interest is in the area of heat and mass transfer in reactor systems. Miha Tomšič (MS, nuclear engineering, Kansas State University, 1969) is research assistant and acting head of the Reactor Engineering Section at the Institute Jožef Stefan, Ljubljana, Yugoslavia. His current interest is in the area of boiling heat transfer and in reactor safety.

COMPARISON OF STAINLESS STEEL AND ZIRCALOY-2 ENCAPSULATION MATERIALS FOR CALIFORNIUM-252

P. Philbin
F. Senftle
D. Duffey
P. Wiggins
A. G. Evans

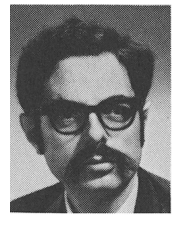


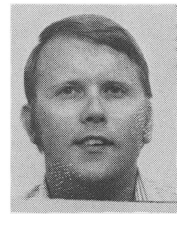


P. W. Philbin (top left) associated with the U.S. Geological Survey, is presently engaged in research using various nuclear techniques for mineral exploration. Frank E. Senftle (top right) (PhD, physics, University of Toronto, 1947) is in charge of the solid state physics research of the Isotope Geology Branch, United States Geological Survey. He was head of the Radiation Laboratory, Department of Mines and Technical Services, Ottawa, Ontario, Canada, until 1949 at which time he joined the staff of the Massachusetts Institute of Technology as a research associate. From 1951 until the present, Senftle has been with the United States Geological Survey. A. Gary Evans (bottom left) (MPh, University of Michigan, 1963) is a research chemist with E. I. du Pont de Nemours at the Savannah River Laboratory. His assignments at Savannah River Laboratory have included research in radiation protection, californium source fabrication, and reactor safety. Dick Duffey (center right) (PhD, University of Maryland) is professor of nuclear engineering at the University of Maryland. Following work with the U.S. Atomic Energy Commission as a nuclear engineer he started the nuclear engineering program at the University in 1954 and established the nuclear reactor project there in 1957, serving as nuclear reactor director through 1967. His technical interests are nuclear reactor design, construction, and operation, and neutron uses. Peter F. Wiggins (bottom right) (PhD, nuclear engineering, University of Maryland, 1970) joined the Naval Academy faculty in 1962 and is now an associate professor in the Naval Systems Engineering Department. He is currently interested in ocean sediment analysis by neutron capture gamma rays.

DEVELOPMENT OF A METHOD OF NEUTRON RADIOGRAPHY OF MIXED OXIDE FUELS USING RADIOGRAPHIC ANALOGS

Lutz W. Dahlke
Maurice Robkin





Maurice A. Robkin (left) (PhD, nuclear engineering, MIT, 1961) is associate professor in the Department of Nuclear Engineering, University of Washington, where his main interest research is in bionuclear engineering. L. W. Dahlke is a technical staff member of Sandia Laboratories where he is working on the nuclear applications to nondestructive testing.