



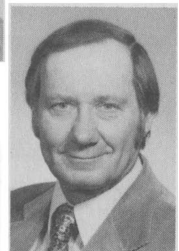
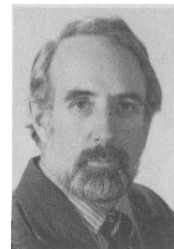
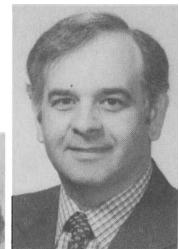
AUTHORS — MARCH 1981

FISSION REACTORS

LOSS-OF-FLOW TRANSIENT REACTOR TEST FACILITY TESTS L6 AND L7 WITH IRRADIATED LIQUID-METAL FAST BREEDER REACTOR TYPE FUEL

Richard Simms (top right) (BChE, chemical engineering, Cooper Union, 1959; PhD, nuclear engineering, Massachusetts Institute of Technology, 1964) is currently a nuclear engineer in the Reactor Analysis and Safety (RAS) Division at Argonne National Laboratory (ANL). His current research interests are in the planning, conduct, and analysis of in-pile experiments in the liquid-metal fast breeder reactor safety program. **Gerald E. Marsh** (top left) (BS, 1962, and MS, 1965, physics, University of Chicago) is a nuclear engineer in the RAS Division at ANL. He specializes in analysis of neutron hodoscope data from Transient Reactor Test Facility (TREAT) experiments. **Alan B. Rothman** (bottom right) (BS, chemistry, University of Pittsburgh, 1949; MS, chemistry, 1952, and PhD, physical chemistry, 1954, Carnegie Institute of Technology) is currently TREAT Program Experiments Section manager in the RAS Division at ANL. His special interests include thermodynamics, reactor physics, and nuclear engineering. **George S. Stanford** (bottom left) (BSc, physics, Acadia University, 1949; MA, physics, Wesleyan University, 1951; PhD, nuclear physics, Yale University, 1956) is a physicist in the RAS Division at ANL. He specializes in analysis of neutron hodoscope data from TREAT experiments.

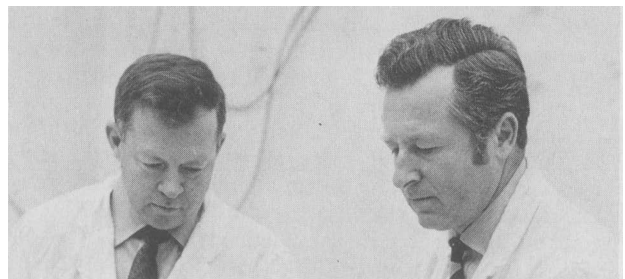
*Richard Simms
Gerald E. Marsh
Alan B. Rothman
George S. Stanford*



CRITICALITY EXPERIMENTS WITH SUBCRITICAL CLUSTERS OF LIGHT WATER REACTOR TYPE FUEL SEPARATED BY A FLUX TRAP

S. R. Bierman (left) (BS, chemical engineering, Texas Technological University, 1956; MS, nuclear engineering, University of Washington, 1963) has been involved in both the chemical processing industry and criticality research and analysis. He is now a staff scientist at the Critical Mass Laboratory at Pacific Northwest Laboratory (PNL), where he has been active in both the generation of basic experimental criticality data and the utilization of these data in performing criticality analyses of production plant systems. **E. Duane Clayton** (right) (PhD, physics, University of Oregon, 1952) is currently associate

*S. R. Bierman
E. D. Clayton*

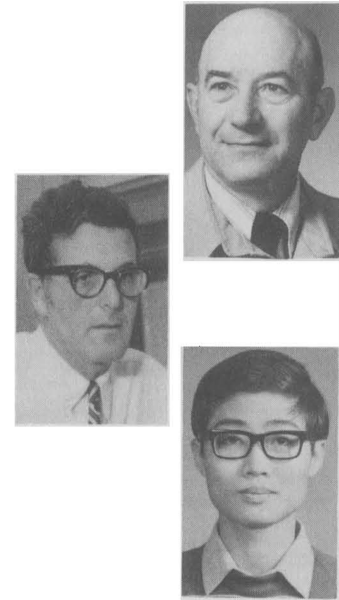


manager of criticality analysis at PNL, and is a research associate professor in the University of Washington's Department of Nuclear Engineering. He is a pioneer in criticality studies with plutonium, and since its inception in 1961, has been director of the Plutonium Critical Mass Laboratory of PNL. His current technical interests include most aspects of criticality measurements and studies.

A METHOD OF PERFORMING SHUTDOWN REACTIVITY MEASUREMENTS IN SPENT NUCLEAR FUEL STORAGE POOLS

Samuel H. Levine (top) (PhD, nuclear physics, University of Pittsburgh, 1954) is professor of nuclear engineering and director of the Breazeale Nuclear Reactor at The Pennsylvania State University. His technical interests currently are in fuel management, neutron spectrum measurements, and research with radiation sources and TRIGA reactors. **Mortimer A. Schultz** (center) (BS, electrical engineering, Massachusetts Institute of Technology, 1939) is professor of nuclear engineering at The Pennsylvania State University. He has been involved in nuclear electronics and safety since the start of the submarine thermal reactor program in 1949. **Daren Chang** (bottom) (BS, nuclear engineering, Tsing-Hua University, 1972; MEng, nuclear engineering, Texas A&M University, 1978) is a doctoral degree candidate at The Pennsylvania State University. He has worked for the Taiwan Power Company on the construction of the Chin-San boiling water reactor power plant in Taiwan. His interests include nuclear instrumentation and measurements as well as reactor simulation.

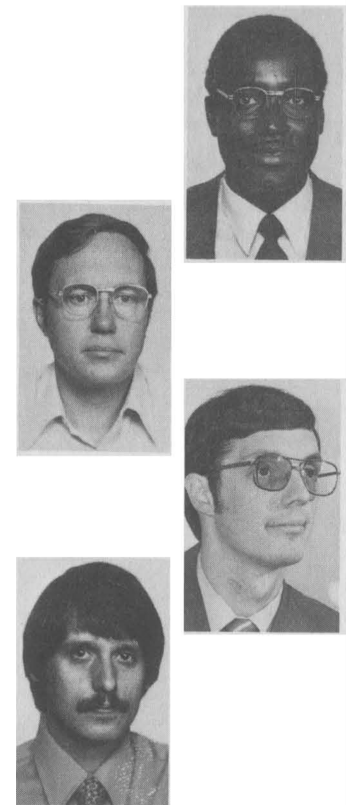
*Samuel H. Levine
Mortimer A. Schultz
Daren Chang*



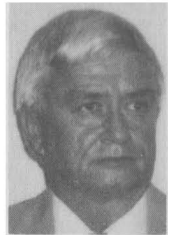
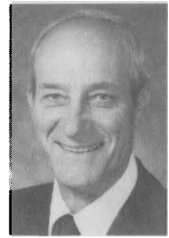
MEASUREMENT AND CALCULATION OF THE EFFECTIVENESS OF THE GAS-COOLED FAST BREEDER REACTOR GRID-PLATE SHIELD

C. O. Slater (top right) (PhD, nuclear engineering, University of Tennessee, 1973) is a research staff member in the Engineering Physics Division of Oak Ridge National Laboratory (ORNL). After spending two years at General Atomic Company working on high temperature gas-cooled reactor shielding analysis and computer code development, he came to ORNL in 1975 where he has since been involved in the analysis of the gas-cooled fast breeder reactor (GCFR) shielding design and of GCFR shielding experiments. His current interests remain in the area of reactor shielding analysis. **S. N. Cramer** (top left) (PhD, nuclear engineering, University of Tennessee, 1968), currently with the Engineering Physics Division of ORNL, has been involved in the development and application of Monte Carlo methods at ORNL since 1966. His areas of experience cover reactor physics, reactor shielding, weapons shielding, fusion systems, and waste processing. He has been involved in the design and analysis of many experiments at the ORELA and tower shielding facility (TSF). **D. T. Ingersoll** (bottom right) (PhD, nuclear engineering, University of Illinois, 1977) is a member of the research staff of the Reactor Physics and Shielding Group in the Engineering Physics Division of ORNL. His primary responsibilities are the design and analysis of integral shielding experiments for advanced reactor systems. **M. L. Williams** (bottom left) (PhD, nuclear engineering, University of Tennessee, 1979) is a member of the research staff of ORNL, where he

*C. O. Slater
S. N. Cramer
D. T. Ingersoll
M. L. Williams
F. J. Muckenthaler
J. J. Manning
J. L. Hull*



has been employed since 1974. He has been involved in shielding analysis and design for the Fast Flux Test Facility, Clinch River Breeder Reactor, and GCFR. His current work is in developing perturbation methods for burnup calculations and in light water reactor physics analysis. **F. J. Muckenthaler** (top) (MS, physics, University of Kansas, 1949) has been head of the experimental group in radiation shielding of ORNL's TSF since 1963. He came to ORNL in 1951 after two years at Fairchild Engine and Airplane Corporation. **J. J. Manning** (center) (BS, science education, 1957; MS, water resources development, 1974, University of Tennessee) has been a staff member of the Engineering Physics Division at ORNL since 1955 and has been assigned to the TSF experimental group since 1960. **J. L. Hull** (bottom) (BS, physical science, University of Tennessee, 1950) came to ORNL in 1951 as a member of the Aircraft Nuclear Propulsion experimental staff. He later joined the TSF experimental staff and now serves that staff as a member of reactor operations.



NEUTRONIC SPACE-TIME EFFECTS WITH THERMAL-HYDRAULIC FEEDBACK IN LARGE HOMOGENEOUS AND HETEROGENEOUS LIQUID-METAL FAST BREEDER REACTORS

Shang Fon Su (top) (PhD, nuclear engineering, University of Washington, 1975) is an assistant nuclear engineer in the Systems Design Section of the Applied Physics Division at Argonne National Laboratory (ANL). His current interests include the design and analysis of heterogeneous liquid-metal fast breeder reactors (LMFBRs). **Yuri Orechwa** (center) (PhD, nuclear engineering, University of Illinois, 1976) is a nuclear engineer in the Systems Design Section of the Applied Physics Division at ANL. His current interests are the design and analysis of heterogeneous LMFBR cores. **Herbert Henryson II** (bottom) (PhD, nuclear engineering, University of California, Berkeley, 1968) is manager of the Methods and Computation Program of the Applied Physics Division at ANL. His current interests include physics considerations in reactor design and computational methods for fast breeder reactor analysis.

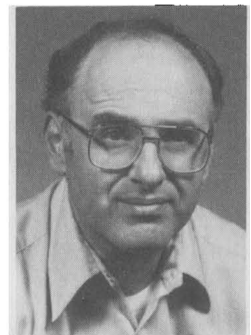
*S. F. Su
Y. Orechwa
H. Henryson II*



GEOMETRICAL VIEW FACTORS FOR RADIATIVE HEAT TRANSFER WITHIN BOILING WATER REACTOR FUEL BUNDLES

David A. Mandell (PhD, mechanics, State University of New York at Stony Brook, 1968) has been a staff member in the Safety Code Development Group at Los Alamos Scientific Laboratory (LASL) since 1978. Prior to joining LASL, he was an associate professor of mechanical engineering at Washington State University and a senior engineer in the General Electric Nuclear Energy Division. His current interests are two-phase flow and heat transfer modeling.

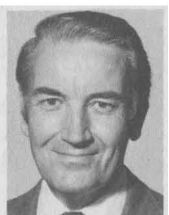
David A. Mandell



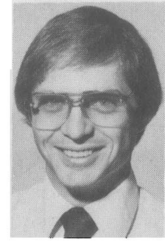
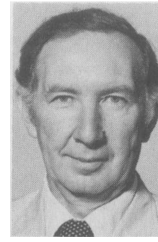
THE FABRICATION OF GRID SPACER ASSEMBLIES FOR LIQUID-METAL FAST BREEDER REACTORS

Eric D. Jones (right) (mechanical engineering, Reading Institute of Technology, 1958) is a senior engineer working in the Reactor Technology Group of the Westinghouse Advanced Reactors Division. He is responsible for the development of fabrication and welding techniques related to breeder reactor

*E. D. Jones
A. McBride
K. C. Thomas*



core hardware. **M. Alan McBride** (top) (BS, mechanical engineering, University of Kentucky, 1975) is employed by the Westinghouse Advanced Reactors Division as a mechanical engineer in the Materials Engineering Group. His interest is in the area of welding development for breeder reactor materials. **Kenneth C. Thomas** (bottom) (PhD, metallurgy, University of Wales, 1957) is manager of materials engineering and materials testing at the Westinghouse Electric Corporation Advanced Reactors Division. His responsibilities include the fabrication of irradiation test assemblies and the mechanical property evaluation of breeder reactor materials.

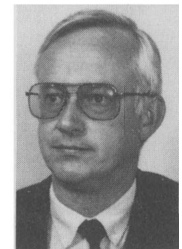
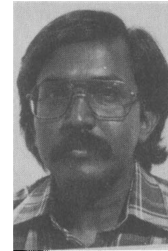


FUEL CYCLES

HEAT TRANSFER NEAR SPACER GRIDS IN GAS-COOLED ROD BUNDLES

M. Abul Hassan (top) (MSc, nuclear technology, University of Islamabad, Pakistan, 1972; Dr.-Ing., mechanical engineering, University of Karlsruhe, Federal Republic of Germany, 1980) has been engaged in nuclear technology research and development work since 1971. He was a member of the Atomic Energy Commission of Bangladesh and joined the Institute of Neutron Physics and Reactor Technology of the Karlsruhe Nuclear Research Center in 1976 with a Scholarship of DAAD (German Academic Exchange Program). His main research interest is thermal hydraulics of rod bundles. **Klaus Rehme** (Dr.-Ing., mechanical engineering, University of Karlsruhe, 1967; Priv.-Doz., thermodynamics and fluid dynamics, University of Karlsruhe) has been a member of the Institute of Neutron Physics and Reactor Technology of the Karlsruhe Nuclear Research Center since 1962. He is presently head of the Thermal-Hydraulics Division. His principal research interests include fluid flow and heat transfer in noncircular channels, especially in rod bundles of liquid-metal fast breeder reactor and gas-cooled fast reactor designs.

*M. A. Hassan
K. Rehme*

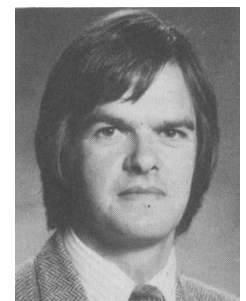


RADIOACTIVE WASTE MANAGEMENT

A COMPARISON OF BOROSILICATE GLASS AND SYNTHETIC MINERALS AS MEDIA FOR THE IMMOBILIZATION OF HIGH-LEVEL RADIOACTIVE WASTE

P. A. Tempest (BSc, physics, University of Birmingham, England, 1968; PhD, materials science, Imperial College, England, 1974) is a research officer for the Central Electricity Generating Board, England. He has worked on the problems associated with the devitrification of glass blocks containing radioactive waste. His present main interest is in the oxidation of stainless steels in reactor environments.

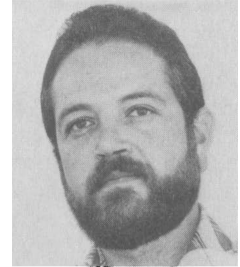
P. A. Tempest



AN EQUATION-OF-STATE OF XENON FOR NONEQUILIBRIUM BUBBLE KINETICS CALCULATIONS DURING FAST TRANSIENTS

Morris Schwarzblat

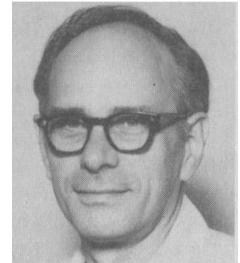
Morris Schwarzblat (BS, physics, Universidad Nacional Autónoma de México, 1968; MS, nuclear engineering, Instituto Politécnico Nacional, 1970; PhD, nuclear engineering, University of Arizona, 1974) is project manager at the Instituto de Investigaciones Eléctricas of Mexico. His main interests are in probabilistic safety analysis, fuel element modeling, and power plant simulation.



INCREASES IN NEUTRON YIELD OF $^{239}\text{Pu-Be}(\alpha, n)$ SOURCES—II

M. E. Anderson

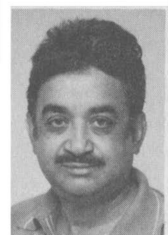
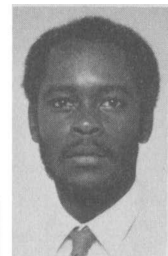
M. Edward Anderson (MS, physics, University of Michigan, 1955) has been active in the measurement of fast-neutron fluxes and energy spectra since joining Monsanto Research Corporation Mound Facility in 1958. His current interests also include neutron activation analysis and personnel dosimetry.



WATERSIDE CORROSION CORRELATIONS FOR $2\frac{1}{4}\text{Cr}-1\text{Mo}$ STEEL IN LIQUID-METAL FAST BREEDER REACTOR STEAM GENERATORS

*L. V. Hampton
G. J. Licina
P. Roy*

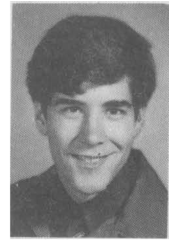
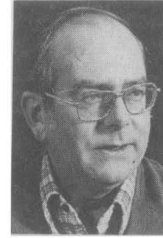
L. V. Hampton (top) (BS, biomedical engineering, 1972, and MS, materials science, 1975, Rensselaer Polytechnic Institute) has been involved in the compatibility of liquid-metal fast breeder reactor structural materials with water/steam and sodium at the Advanced Reactor Systems Department (ARSD) of the General Electric Company (GE). He is currently investigating carbon transport effects in sodium systems. **G. J. Licina** (center) (BS, metallurgical engineering, University of Illinois, 1972) is an engineer in the Plant Materials and Processes Development Group of the ARSD of GE. He has been involved in studies of the compatibility of structural materials with liquid sodium and with steam. He is presently engaged in the development of electrochemical cells for sodium purity monitoring. **P. Roy** (bottom) (PhD, University of California, Berkeley; research fellow at Max-Planck Institute) is a manager of the technical staff of the ARSD of GE. His interests are in sodium coolant chemistry, mass transfer, and materials behavior in sodium.



RADIATION-INDUCED OUTGASSING FROM SEVERAL METALS

A. R. Shepherd (top) (BS, physics, and BA, mathematics, 1977, and MS, nuclear science, 1979, University of Cincinnati) is currently engaged in completing his doctoral studies in fusion and plasma physics at the University of Cincinnati. **James N. Anno** (BS, 1955, MS, 1961, and PhD, 1965, physics, Ohio State University) has been active in radiation-related research since 1955, with emphasis on the effects of radiation on materials and components. Currently, he is a professor of nuclear engineering at the University of Cincinnati, having joined the faculty in 1970.

A. R. Shepherd
J. N. Anno



RADIATION-INDUCED GAS EVOLUTION FROM SEVERAL ORGANIC LIQUIDS

Woon H. Chung (top) (BS, physics, Seoul National University, Korea, 1958; MS, nuclear engineering, University of Cincinnati, 1979) has worked with the Saskatchewan Accelerator Laboratory at the University of Saskatchewan, Canada, and is currently an instructor in the Department of Physics at the Busan National University, Busan, Korea. His interests include nuclear physics reactions and the effects of radiation on various materials. **James N. Anno** (BS, 1955, MS, 1961, and PhD, 1965, physics, Ohio State University) has been active in radiation-related research since 1955, with emphasis on the effects of radiation on materials and components. Currently, he is a professor of nuclear engineering at the University of Cincinnati, having joined the faculty in 1970.

Woon H. Chung
J. N. Anno

