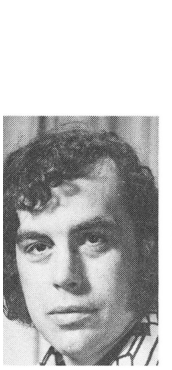
nuclear technology®

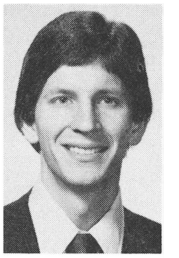
AUTHORS — MAY 1979

REACTORS

CYCLIC PURGING FOR LOW-TEMPERATURE SOLID FUSION REACTOR BLANKET OPERATION

Gary S. Was
Lawrence M. Lidsky

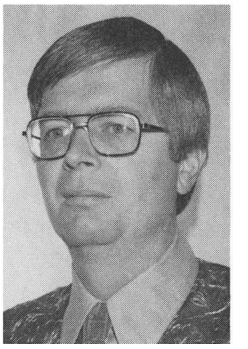




Gary S. Was (top) [SM, nuclear engineering, Massachusetts Institute of Technology (MIT), 1977] is a research assistant and graduate student in the Nuclear Engineering Department at MIT. His current interests are materials problems related to power generation systems. **Lawrence M. Lidsky** (PhD, nuclear engineering, MIT, 1962) is currently professor of nuclear engineering at MIT, and associate director and head of the Technology Development Division of the Plasma Fusion Center at MIT. His current interest is in alternative concepts for fusion reactor design, with particular emphasis on the Torsatron.

A SENSITIVITY STUDY ON THE DAMAGE POTENTIAL OF A LIQUID-METAL FAST BREEDER REACTOR CORE DISASSEMBLY

R. W. Ostensen

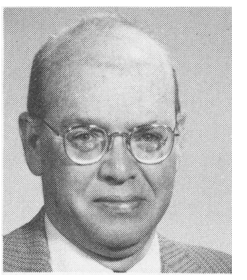


Raymond W. Ostensen (BS, physics, Brooklyn College, 1960; MS, physics, University of Dayton, 1967; PhD, nuclear engineering, University of Illinois, 1973) is a member of the technical staff of Sandia Laboratories. Formerly at Argonne National Laboratory, he has worked on theoretical studies of core disruptive accidents in liquid-metal fast breeder reactors for several years.

FUEL CYCLES

HIGH-ENRICHMENT STEADY-STATE CASCADE PERFORMANCE

George Emanuel

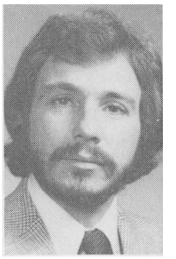


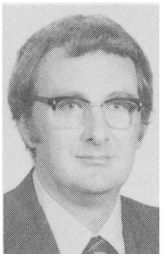
George Emanuel (PhD, aeronautical sciences, Stanford University, 1962) is a staff member in the Applied Photochemistry Division at Los Alamos Scientific Laboratory. His work has been in the areas of fluid mechanics, radiative transfer theory, chemical kinetics, and all aspects of pulsed and cw chemical lasers. His current interests focus on advanced laser isotope separation processes.

FUELS

THE EFFECTS OF GRAIN BOUNDARY FISSION GAS ON TRANSIENT FUEL BEHAVIOR

R. J. DiMelfi
L. W. Deitrich



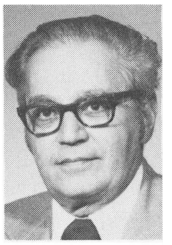


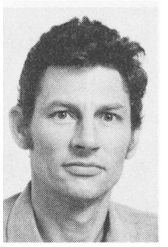
Ronald J. DiMelfi (top) (PhD, materials science and engineering, Stanford University, 1975) is a staff metallurgist in the Reactor Analysis and Safety Division at Argonne National Laboratory (ANL). He has experience in the fields of high-temperature mechanical behavior and fracture of stressed materials. His current interests include modeling the transient behavior of liquid-metal fast breeder reactor fuel and cladding material based on microstructural considerations. **L. Walter Deitrich** (BME, Cornell University, 1961; MS, Rensselaer Polytechnic Institute, 1963; PhD, Stanford University, 1969, mechanical engineering) is manager of the Fuel Behavior Section in the Reactor Analysis and Safety Division at ANL. His present responsibilities include modeling and phenomenological studies of the behavior of reactor fuel during hypothetical accidents.

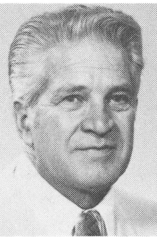
MATERIALS

FEASIBILITY STUDY TO PRODUCE FIRST WALL FUSION REACTOR SPECTRA AROUND A 14-MeV NEUTRON POINT SOURCE

Morris E. Battat
L. A. Ronald Dierckx
C. Robert Emigh



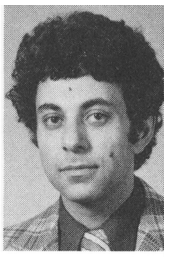




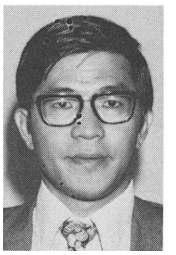
Morris E. Battat (top) (PhD, physics, Washington University, 1950) is presently a consultant, and was a staff member at the Los Alamos Scientific Laboratory (LASL) from 1950 to 1977. His recent interests include shielding studies of high-intensity deuterium-tritium neutron sources and developing shielding standards. He has also taught courses in the Nuclear Engineering Department at the University of New Mexico. **L. A. Ronald Dierckx** (center) (PhD, applied science, University of Lensen, Belgium, 1962) has worked at SCK/CEN in Mol, Belgium and since 1962 at Euratom CCR in Ispra, Italy. He has worked mostly in reactor physics research and reactor neutron dosimetry. For the past two years, he has been assigned to the Intense Neutron Source Project at LASL as an exchange scientist for the International Atomic Energy Agency. His interests lie in the field of high-energy neutron sources for fusion applied radiation damage research. **C. Robert Emigh** (bottom) (PhD, physics, University of Illinois, 1951) was the director of the Intense Neutron Source Project and is presently the associate division leader for energy technology at LASL. His work has been primarily in accelerator physics, both theoretical and experimental. His current interests include research and development in the areas of reactors, space power supplies, solar, cryogenics, and other energy technologies.

CORROSION BEHAVIOR OF SELECTED STRUCTURAL MATERIALS IN A SIMULATED STEAM-CYCLE HIGH-TEMPERATURE GAS-COOLED REACTOR HELIUM ENVIRONMENT

F. N. Mazandarany
G. Y. Lai



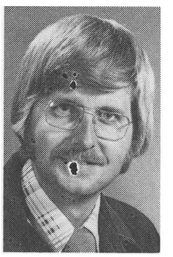
F. N. Mazandarany (top) (BS, 1968, MS, 1969, PhD, 1972, metallurgical engineering, University of Michigan) is manager of Advanced Energy Materials, Energy Systems Programs Department at the General Electric Company. He is responsible for materials research and development and materials engineering support for super conducting magnets for magnetic fusion and magnetohydrodynamics; solar thermal power systems; advanced battery systems for energy storage; and advanced fuel cells for base-load power. From 1972 to 1976, he was a senior section leader in the Materials Engineering Department at General Atomic Company (GA), responsible for determining the rate and mechanism(s) of corrosion by gaseous impurities in helium and effects of impure helium on creep-rupture properties of high-temperature gas-cooled reactor structural materials; development and characterization of unlubricated friction and wear coatings; and effects of aging at high temperatures on mechanical properties of high-temperature alloys. **G. Y. Lai** (PhD, materials engineering, North Carolina State University, 1972) is a staff engineer in the Department of Structural Materials at GA. He joined GA in 1974. Since then he has been a principal investigator working on tribology of wear-resistant coatings, aging effects of high-temperature alloys, and high-temperature corrosion of metals. From 1972 to 1974, he was a post-doctoral fellow in the Department of Materials Science and Engineering at the University of California, Berkeley, working on alloy design for high fracture toughness.



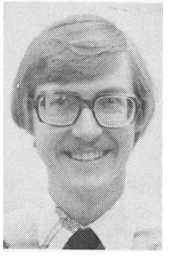
RADIOISOTOPES

RADIOISOTOPE-POWERED PHOTOVOLTAIC GENERATOR

John W. McKlveen
John Uselman



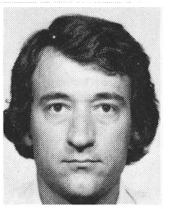
John W. McKlveen (top) (BS, U.S. Naval Academy, 1965; ME, nuclear engineering, 1971; PhD, nuclear engineering, University of Virginia, 1974) is the nuclear faculty member and radiation safety officer at Arizona State University. He is responsible for the radiation research laboratory, where research efforts include fast-neutron activation analysis, environmental radioactivity, and tracing the fate of uranium daughters in uranium mining and refining operations. He is a consultant in the areas of uranium mill licensing and operations, radioactive waste disposal, and energy education. **John Uselman** (BS, mechanical engineering, Arizona State University, 1975; MS, mechanical engineering, Arizona State University, 1977) is a development engineer in the Reactor Engineering Group at General Electric's Advanced Reactor Systems Department. While at Arizona State University, he conducted several experiments in direct energy conversion systems involving the use of nuclear fuels. His current interests are in the area of liquid-metal fast breeder reactor fuel design.

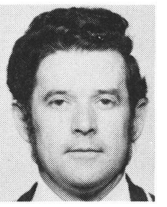


ACCELERATORS

DESIGN CALCULATIONS FOR A 14-MeV NEUTRON COLLIMATOR

R. A. Lillie
R. G. Alsmiller, Jr.
J. T. Mihalczo



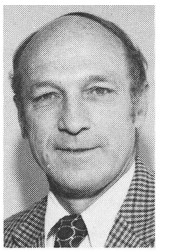


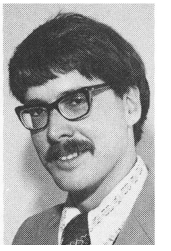
R. A. Lillie (top) (PhD, University of Tennessee, 1975) is a research staff member in the Engineering Physics Division at the Oak Ridge National Laboratory (ORNL). His work has been in the areas of fission reactor core physics and shielding analysis. His current interests focus on the application of radiation transport methods to fusion reactor neutronics problems. **R. G. Alsmiller, Jr.** (center) (PhD, University of Kansas, 1957) is leader of the Applied Physics and Fusion-Reactor Analysis Group of the Engineering Physics Division at ORNL. For several years, he has directed the theoretical research in this division in the areas of high-energy nuclear reactions, high-energy nuclear transport, and fusion reactor neutronics. **J. T. Mihalczo** (bottom) (PhD, University of Tennessee) is a member of the research staff at ORNL and the faculty of the University of Tennessee. For several years, he has been involved in a variety of static and kinetic fission reactor physics experiments and their analysis. His current interests include nuclear fusion experiments and their analysis.

REACTORS

ADDENDUM TO "IMPURITY RADIATION FROM MEDIUM DENSITY PLASMAS"

G. R. Hopkins
John M. Rawls



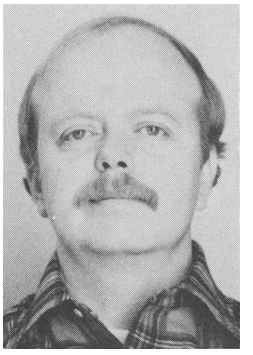


George R. Hopkins (top) (BS, physics, Allegheny College, 1948; MS, University of Rochester, 1951; PhD, physics, Iowa State University, 1954) is a senior staff engineer in the Fusion Division at General Atomic Company (GA). His current interests are in engineering and materials for fusion reactors, particularly in the application of ceramic materials of low atomic number to the development of low induced radioactivity fusion devices. **John M. Rawls** (BS, physics, Michigan State University, 1965; PhD, physics, Brandeis University, 1970) directs the Reactor Studies Group of the Fusion Division at GA. His present research activities center around plasma transport, impurity phenomena, and the systems integration aspects of tokamak reactor design.

MATERIALS

NICKEL-CHROMIUM ALLOY SUBMERGED ARC WELD SURFACING USING METAL POWDER FILLER ADDITIONS

G. H. Reynolds



G. H. Reynolds (BS, mechanical engineering, 1966, PhD, materials engineering, Rensselaer Polytechnic Institute, 1970) is president of Materials Sciences Northwest, Inc., Corvallis, Oregon. He has been a member of the research staffs of the International Nickel Company at Sterling Forest, New York and the General Atomic Company at San Diego, California. Most recently, he was director of research for Tapco International, Houston, Texas, where this work was performed. In 1978, he formed Materials Sciences Northwest, where he is engaged in research on high deposition rate automatic welding, cladding, and hardfacing techniques, including welding procedure and equipment development.