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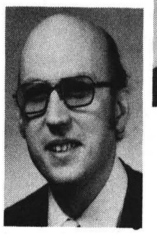
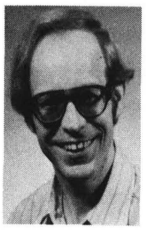
# AUTHORS — OCTOBER 1980

REACTORS

## THE EFFECT OF ACCIDENTAL STEAM ENTRY ON GAS-COOLED FAST REACTOR INTEGRAL NEUTRONICS PARAMETERS

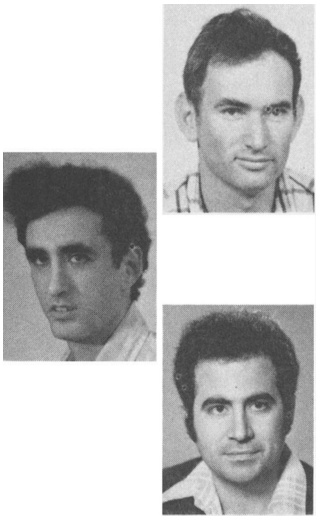
*S. K. Bhattacharyya*
*J. A. Morman*
*R. G. Bucher*
*D. M. Smith*
*W. R. Robinson*
*E. F. Bennett*


**Samit K. Bhattacharyya** (top right) (B Tech, mechanical engineering, Indian Institute of Technology, Kharagpur, 1968; MS, 1970, and PhD, 1973, nuclear engineering, University of Wisconsin) is presently leader of the Physics Design Group of the Safety Research Facilities (SAREF) Projects of the Applied Physics Division at Argonne National Laboratory (ANL). His current research interests are in the areas of fast critical experiments and analysis and physics design of fast and thermal reactors. **James A. Morman** (top left) (BS, physics, Illinois Benedictine College, 1967; MS, nuclear physics, Purdue University, 1969; PhD, nuclear physics, Iowa State University, 1974) is currently a reactor physicist in the Critical Experiments and Analysis Section of the Applied Physics Division at ANL. His present research interests include experimental reactor physics and experimental technique development. **Ronald G. Bucher** (center right) (BS, physics, Virginia Polytechnic Institute, 1968; MS, 1969, and PhD, 1975, physics, University of Illinois) is a staff physicist in the Critical Experiments and Analysis Section in the Applied Physics Division at ANL. His current research interests are in the area of experimental reactor physics. **Dale M. Smith** (center left) [BS, mathematics, Illinois Institute of Technology (IIT), 1969] is a scientific assistant in the Critical Experiments and Analysis Section of the Applied Physics Division of ANL. His present interests are in the area of experimental reactor physics. **William R. Robinson** (bottom right) (BS, mathematics, IIT, 1962; International Institute of Nuclear Science and Engineering, ANL, 1963) has been involved in reactor physics measurements for 25 years. He is presently a staff experimental physicist in the Critical Experiments and Analysis Section of the Applied Physics Division at ANL. **Edgar F. Bennett** (bottom left) (PhD, Princeton University, 1957) is a senior scientist and presently head of the Instrumentation Development Section in the Applied Physics Division at ANL. His current research interests are in the areas of development of reactor physics experimental methods and instrumentation.

## PARAMETRIC STUDY OF RADIOACTIVE RELEASE FROM A BREACHED CONTAINMENT

*A. Kenigsberg*
*D. Hasan*
*E. Elias*

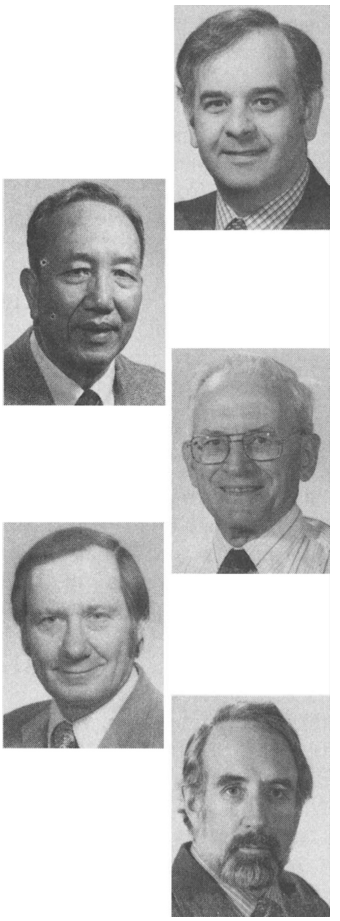


**A. Kenigsberg** (top) [BSc, chemical engineering, 1970, and MSc, nuclear engineering, 1976, Technion–Israel Institute of Technology (IIT), Haifa, Israel] is acting head of the Power Reactors Division, Israel Atomic Energy Commission, responsible for severe accident evaluation in power reactors and national site survey. His area of interest is in reactor thermal hydraulic analysis and containment accident analysis. **D. Hasan** (center) (MSc, nuclear engineering, Technion–IIT, 1977) is employed at The Israel Electric Corp. Ltd. in its Nuclear Engineering Department, working principally in the area of ther- employed at The Israel Electric Corp. Ltd. in its area of thermohydraulic aspects of nuclear reactor safety and operation. **E. Elias** (bottom) (PhD, nuclear engineering, Technion–IIT, 1975) is now senior lecturer of nuclear engineering at Technion. He has been involved in heat transfer research related to water reactor safety, both at Technion and as a consultant to various organizations.

# REACTOR SITING

## TREAT TEST E8 SIMULATING A LIQUID-METAL FAST BREEDER REACTOR $3/s OVERPOWER ACCIDENT WITH IRRADIATED FAST TEST REACTOR TYPE FUEL

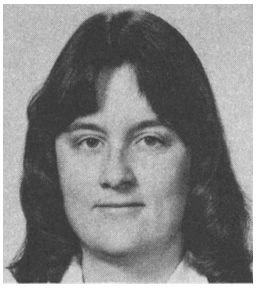
*Richard Simms*
*Robert K. Lo*
*William F. Murphy*
*Alan B. Rothman*
*George S. Stanford*



**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 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 (LMFBR) safety program. **Robert K. Lo** (top left) (BS, aeronautical engineering, National Central University, China, 1944; MS, mechanical engineering, Stanford University, 1951; PhD, Illinois Institute of Technology, 1957) has been with ANL as an experimental analyst since 1966. **William F. Murphy** (center right) is a metallurgist in the Material Science Division at ANL, where he has studied radiation effects and conducted hot-cell examinations since 1949. For the past ten years, he has performed post-test examinations of TREAT experiments in the LMFBR safety program. **Alan B. Rothman** (bottom left) (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 Reactor Analysis and Safety Division at ANL. His special interests include thermodynamics, reactor physics, and nuclear engineering. **George S. Stanford** (bottom right) (BSc, physics, Acadia University, 1949; MA, physics, Wesleyan University, 1951; PhD, nuclear physics, Yale University, 1956) is a physicist in the Reactor Analysis and Safety Division at ANL. He specializes in analysis of neutron-hodoscope data from TREAT experiments.

## AN EVALUATION OF THE PLUTONIUM DENATURING CONCEPT AS AN EFFECTIVE SAFEGUARDS METHOD

*Carolyn D. Heising-Goodman*

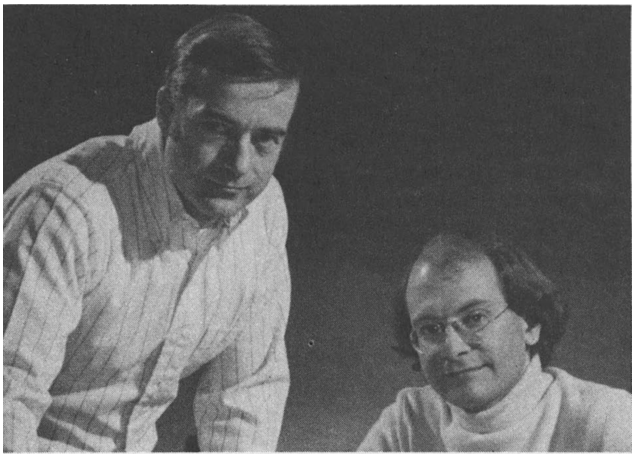


**Carolyn D. Heising-Goodman** (BS, applied physics, University of California at San Diego, 1974; MS, 1975, and PhD, 1978, nuclear engineering, Stanford University) is currently a postdoctoral research associate in the Department of Nuclear Engineering at the Massachusetts Institute of Technology, where she has been working under Electric Power Research Institute sponsorship on risk analysis and reliability studies in the areas of the nuclear fuel cycle (reprocessing, waste disposal, safeguards technology) and, more recently, in reactor safety. Her PhD thesis, related to reprocessing-breeder economics and risks, won her the Institute of Nuclear Materials Management first annual student paper award in 1978.



## USING FUEL PERFORMANCE TO DETERMINE OPERATING LIMIT UNCERTAINTY ALLOWANCE

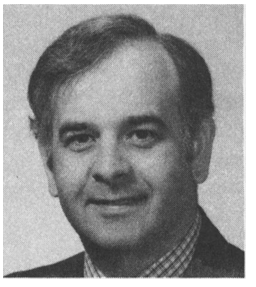
*John F. Carew*
*David J. Diamond*



**J. F. Carew** (left) (PhD, physics, New York University, 1968) is leader of the Core Performance Group at Brookhaven National Laboratory. He has worked in the areas of reactor physics, thermal reactor design, core monitoring systems and is presently involved in light water reactor (LWR) safety. **David J. Diamond** (PhD, nuclear engineering, Massachusetts Institute of Technology, 1968) is leader of the Reactor Safety Analysis Group. His interests are in reactor physics and thermal hydraulics and the application of these disciplines to LWR safety and core performance problems.

## AN EVALUATION OF FUEL MOTION IN RECENT TREAT EXPERIMENTS WITH LIQUID-METAL FAST BREEDER REACTOR FUEL

*Richard Simms*



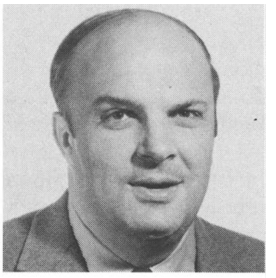
**Richard Simms** (BChE, chemical engineering, Cooper Union, 1959; PhD, nuclear engineering, Massachusetts Institute of Technology, 1964) is currently a nuclear engineer in the Reactor Analysis and Safety Division at Argonne National Laboratory. His current research interests are in the planning, conduct, and analysis of in-pile experiments in the liquid-metal fast breeder reactor safety program.

## MATERIALS

### TO THE CORROSION OF AUSTENITIC STEEL IN SODIUM LOOPS

### APPLICATION OF A SODIUM AUSTENITIC CORROSION MODEL TO A FUEL ROD

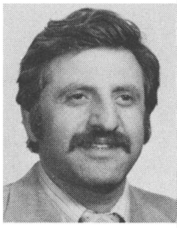
*M. Schad*



**Manfred K. Schad** (Dr. Ing., Technical University Karlsruhe, Federal Republic of Germany, 1977) is a senior engineer with the Advanced Reactor Systems Department (ARSD) of General Electric Company, Sunnyvale, California. He has been with ARSD since 1965 except for the five years from 1973 to 1978. Three of these years were spent at the Gesellschaft für Kernforschung (GfK) in Karlsruhe, where the work described in these papers was performed. Following this, he was the manager of the Chemical Department of Leybold Heraus in Hanau, Federal Republic of Germany for two years. During the time spent at ARSD and GfK, he worked on various sodium-cooled fast breeder reactor development projects. Presently he is working on the gas-cooled reactor.

### ONE-DIMENSIONAL PENETRATION OF MOLTEN $UO_2$ INTO SUBSTRATE LIMESTONE CONCRETE

*R. Farhadieh*
*W. H. Gunther*

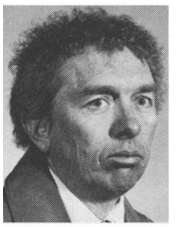


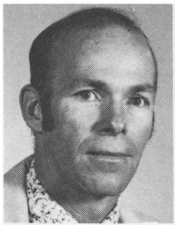
**R. Farhadieh** (top) (BS, mechanical engineering, University of Arizona, 1968; MS, mechanical engineering, Stanford University, 1970; PhD, mechanical engineering, Northwestern University, 1974) is currently a mechanical engineer at Argonne National Laboratory (ANL). His research interests include fluid mechanics, heat transfer, reactor analysis and safety, and alternate energy resources. **William H. Gunther** (BS, chemistry, DePaul University, 1954) is a scientific associate at ANL and has been in the nuclear energy field since 1956.

## INSTRUMENTS

### A THERMAL NEUTRON COINCIDENCE COUNTING SYSTEM

*B. H. Erkkila*
*R. S. Marshall*





**Bruce H. Erkkila** (top) (MS, physics, University of Nevada, 1962) has been employed at Los Alamos Scientific Laboratory (LASL) since 1963. He is presently a staff member in the Nuclear Safeguards Subsystems Development and Evaluation Group at LASL. His interests are nondestructive assay (NDA) of fissionable material and implementation of safeguards systems. **Robert S. Marshall** (BS, College of Wooster, 1962; MS, University of Colorado, 1964) is a research chemist at LASL. He is currently working on nuclear safeguards measurement techniques. He formerly worked at the Rocky Flats Nuclear Weapons Plant and the Kerr McGee Breeder Reactor Fuels Plant in both analytical chemistry and process development. When he joined LASL in 1975, he was responsible for specifying the NDA instrument package for the DYMAC nuclear materials accountability system. Later he became involved in designing, installing, testing, and evaluating the thermal neutron coincidence counters used in the LASL Plutonium Processing Facility. His current technical interests lie in the development of practical safeguards instruments that are acceptable to process personnel.