



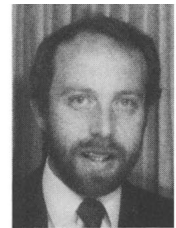
## AUTHORS — DECEMBER 1984

### FISSION REACTORS

#### THE LOGIC FLOWGRAPH: A NEW APPROACH TO PROCESS FAILURE MODELING AND DIAGNOSIS FOR DISTURBANCE ANALYSIS APPLICATIONS

*Sergio Guarro  
David Okrent*

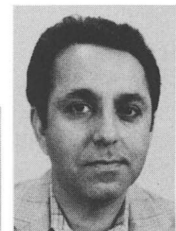
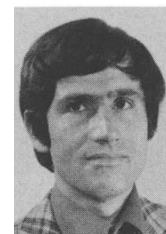
**Sergio Guarro** (top) [Diploma di Laurea, University of Bologna, Italy; PhD, nuclear science and engineering, University of California, Los Angeles (UCLA), 1983] is a Fellow of the Advisory Committee on Reactor Safeguards (ACRS), currently stationed at the School of Engineering and Applied Science, UCLA. Prior to this he worked in the Italian nuclear industry and participated in research projects at the University of Genoa. He has published several papers in the field of disturbance analysis and participates in ACRS activities in the areas of reliability and risk assessment. **David Okrent** (PhD, physics, Harvard University) is a professor in the School of Engineering and Applied Science, UCLA. He is currently serving as Chairman of the Department of Mechanics and Structures, which includes nuclear, aerospace, and mechanical engineering. He worked as a physicist at Argonne National Laboratory for 20 years prior to going to UCLA. He has been a member of the U.S. Nuclear Regulatory Commission's ACRS for 20 years; he served as ACRS chairman in 1966.



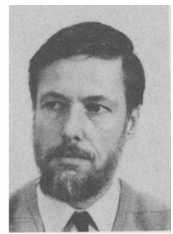
#### REACTIVITY AND REACTION RATE RATIO CHANGES WITH MODERATOR VOIDAGE IN A LIGHT WATER HIGH CONVERTER REACTOR LATTICE

*Rakesh Chawla  
Kurt Gmür  
Helmut Hager  
Rudolf Seiler*

**Rakesh Chawla** (top) (PhD, Imperial College, University of London, 1970) worked at the U.K. Atomic Energy Establishment, Winfrith, and the Indian Institute of Technology, Kanpur, before joining the Swiss Federal Institute for Reactor Research (EIR) in 1978. He is currently responsible for the Light Water High Converter Reactor (LWHCR) project, his own research activities having largely been on reactor physics aspects. **Kurt Gmür** (bottom) (Dipl. Phys., 1968, and Dr. phil., 1973, nuclear



physics, University of Zurich) has been working as an experimental physicist at the EIR since 1975. His interests focus on reaction rate measurements. Currently he is responsible for the operation of the PROTEUS zero-energy reactor. **Helmut Hager** (top) (Dr. phil., University of Vienna, 1964) has worked as a staff scientist in the Reactor Studies and Reactor Physics Divisions of the EIR. He is currently engaged in the analysis and interpretation of experiments in the PROTEUS-LWHCR program. **Rudolf Seiler** (bottom) (Dipl. Phys., 1976, and Dr. sc. nat., 1983, Swiss Federal Institute of Technology, Zurich) joined the EIR in 1981 after his dissertation in the field of Auger electron spectroscopy. He has been engaged in experimental reactor physics research with specific interests in reaction rate techniques.

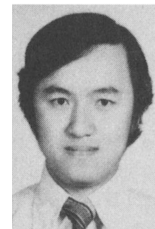
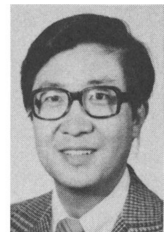


## NUCLEAR SAFETY

### CONSEQUENCE ANALYSIS OF A STEAM GENERATOR TUBE RUPTURE ACCIDENT

**James M. Wu** (top) (BS, chemical engineering, Tunghai University, 1965; PhD, engineering science, State University of New York at Buffalo, 1972) was a senior engineer with Bechtel Power Corporation from 1973 to 1979 and an associate professor in the nuclear engineering department at the Rensselaer Polytechnic Institute until the end of 1983. Recently, he joined Rocky Flats Plant as a research specialist working in the area of transuranic waste management. **Chun-Fa Chuang** (BS, 1972, and MS, 1976, nuclear engineering, Tsing-Hua University; PhD, nuclear engineering, Rensselaer Polytechnic Institute, 1983) joined the Engineering Division of Argonne National Laboratory recently. He is involved in nuclear aerosol formation and transport analysis. Before coming to the United States, he worked in the area of heavy water reactor operation at the Institute of Nuclear Energy Research in Taiwan from 1976 to 1979.

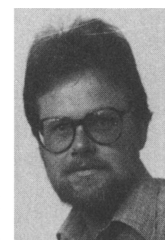
*James M. Wu  
Chun-Fa Chuang*



### THERMODYNAMICAL CALCULATIONS ON THE BEHAVIOR OF GASEOUS IODINE SPECIES FOLLOWING A HYPOTHETICAL SEVERE LIGHT WATER REACTOR ACCIDENT

**Rolf Hahn** (top) [Dr. rer. nat., Diplom-Chemiker, PhD, University of Karlsruhe, Federal Republic of Germany (FRG), 1982] is primarily interested in theoretical and experimental studies on iodine behavior following hypothetical nuclear reactor accidents. **Hans J. Ache** (PhD, University of Cologne, 1959) was an associate scientist from 1962 to 1965 at Brookhaven National Laboratory, professor of chemistry at Virginia Polytechnic Institute and State University, Blacksburg, Virginia, from 1965 to 1980, and has been chair professor at the University of Karlsruhe and director of the Institute of Radiochemistry at the Nuclear Research Center, Karlsruhe, FRG.

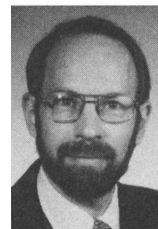
*Rolf Hahn  
Hans J. Ache*



## PONTRYAGIN'S OPTIMAL CONTROL PRINCIPLE APPLIED TO COMPUTER-ASSISTED ACCIDENT DIAGNOSTICS IN NUCLEAR POWER PLANTS

**Gerald R. Mazetis** (top) (BS, marine engineering, U.S. Naval Academy, Annapolis, 1963; MS, 1968, and PhD, 1984, nuclear and mechanical engineering, The Catholic University of America) is a nuclear engineer supervisor at the U.S. Nuclear Regulatory Commission in Washington, D.C. He has worked on the regulatory safety reviews of light water reactors, particularly in the reactor systems areas. His current activities are in the area of reactor control room emergency technical guidelines and procedures for pressurized and boiling water reactors. **David D. Ebert** (BS, applied mathematics and engineering physics, University of Wisconsin, 1963; MS, 1965, and PhD, 1972, nuclear engineering, Georgia Institute of Technology) is an independent consultant and adjunct professor at Catholic and Georgetown Universities. He has worked in the areas of neutron noise analysis and reactor dynamics and control.

*Gerald R. Mazetis*  
*David D. Ebert*



## RADIOACTIVE WASTE MANAGEMENT

## THE LEACHING BEHAVIOR OF A GLASS WASTE FORM—PART I: THE CHARACTERISTICS OF SURFACE LAYERS

**Takashi Murakami** (top) (BS, 1975; MS, 1977; and PhD, 1980, crystallography and mineralogy, Tokyo University) works in the area of high-level waste management for the Japan Atomic Energy Research Institute (JAERI). His main interest is in the microstructures and leaching mechanisms of glass and ceramic waste forms. **Tsunetaka Banba** (BS, 1972, and MS, 1974, chemical engineering, Nagoya University) has been a research scientist for JAERI since 1974. His work has involved many aspects of the field of waste management. His interest is in developing an understanding of glass interactions with aqueous solutions.

*Takashi Murakami*  
*Tsunetaka Banba*



## A PELLETIZING MODEL AND ITS APPLICATION TO RADIOACTIVE WASTE TREATMENT

**Koichi Chino** (top right) (BS, 1972, and MS, 1974, mechanical engineering, Tokyo Institute of Technology) is a researcher at the Energy Research Laboratory (ERL), Hitachi, Ltd. His primary areas of interest are transport phenomena and radioactive waste management. **Masami Matsuda** (top left) (BS, 1977, and MS, 1979, electronics, Osaka University) is a researcher at ERL. His interests and activities are in developing low-level radioactive waste treatment. **Fumio Kawamura** (bottom right) (BS, chemical engineering, Gunma University, 1970; MS, 1972, and Dr. Eng., 1976, Tohoku University) is a researcher at ERL where he is involved in radioactive waste management and reactor water chemistry. **Hideo Yusa** (bottom left) (BS, physics, Tohoku University, 1959; Dr. Eng., Osaka University, 1969) is a chief

*Koichi Chino*  
*Masami Matsuda*  
*Fumio Kawamura*  
*Hideo Yusa*  
*Susumu Horiuchi*  
*Makoto Kikuchi*



researcher at ERL. He is responsible for research and development (R&D) of radioactive waste management systems. **Susumu Horiuchi** (top) (BS, chemical engineering, Nippon University, 1966) is a senior engineer of Hitachi Works, Hitachi, Ltd. and is responsible for the development of radioactive waste systems. **Makoto Kikuchi** (bottom) (BS, chemistry, Tohoku University, 1968; PhD, chemistry, University of New York at Buffalo, 1973) is a senior engineer of Hitachi Works and is responsible for R&D of radioactive waste systems.

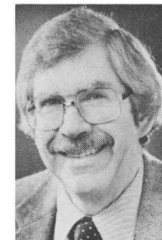
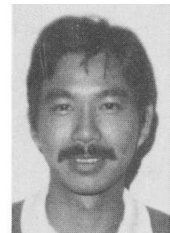


HEAT TRANSFER  
AND FLUID FLOW

**THE DEVELOPMENT OF A GAMMA-RAY SCATTERING DENSITOMETER FOR THE NONINTRUSIVE MEASUREMENT OF LOCAL VOID FRACTION**

**Katsuhiro Ohkawa** (top) [BS, physics, Sophia University, Tokyo, Japan, 1976; MS, 1978, and PhD, 1983, nuclear engineering, Rensselaer Polytechnic Institute (RPI)] currently is working in the Advanced Energy Systems Division at Westinghouse Electric Company in Madison, Pennsylvania. His current interests involve the development of the liquid-metal fast breeder reactor thermal-hydraulic analysis methodology. **Richard T. Lahey, Jr.** (BS, marine engineering, U.S. Merchant Marine Academy; MS, nuclear engineering, RPI; ME, engineering mechanics, Columbia University; PhD, mechanical engineering, Stanford University) has more than 23 years of experience in the field of nuclear engineering, including industrial experience at Knolls Atomic Power Laboratory and General Electric's Nuclear Energy Division. He is currently chairman of the Department of Nuclear Engineering at RPI. His interests are concerned with the application of two-phase flow and boiling heat transfer phenomena to nuclear reactor thermal-hydraulics and safety technology.

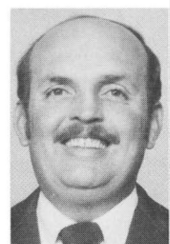
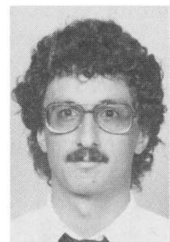
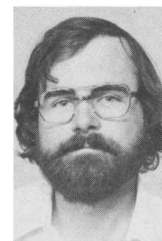
*Katsuhiro Ohkawa  
Richard T. Lahey, Jr.*



**CONVECTION-RADIATION HEAT TRANSFER TO STEAM IN ROD BUNDLE GEOMETRY**

**Ahmet Sozer** (top) (BS, chemical engineering, University of Ankara, 1979; MS, nuclear engineering, University of Tennessee, 1984) is an employee of the Engineering Technology Division at Oak Ridge National Laboratory (ORNL). He has been engaged in research on safety related thermal-hydraulic aspects of nuclear power plants. He is currently involved in the development of a hybrid computer code for for pressurized water reactors for studying safety implications of reactor control systems. **Thomas M. Anklam** (center) (BS, nuclear engineering, University of Wisconsin, Madison, 1978) has been employed by ORNL since 1978. Primary interests are heat transfer and fluid flow related to nuclear reactor safety and isotope separation processes. He is currently assigned to the Atomic Vapor Laser Isotope Separation Program. **H. L. Dodds, Jr.** (bottom) (PhD, nuclear engineering, University of Tennessee, 1970, PE) is an IBM Professor of Engineering and professor of nuclear engineering, University of Tennessee at Knoxville. He was formerly with the Savannah River Laboratory in Aiken, South Carolina. His

*Ahmet Sozer  
Thomas M. Anklam  
H. L. Dodds, Jr.*



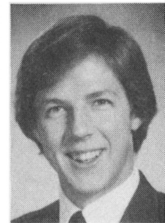
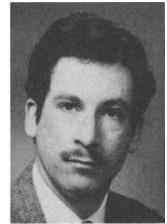
research interests are directed toward computational-methods development for applications in reactor physics and engineering. He is a consultant to several industrial organizations, including ORNL. He is currently chairman of the Mathematics and Computation Division of the American Nuclear Society.

## ANALYSES

### A COMPARISON OF THEORETICAL AND EXPERIMENTAL CALIBRATION OF A HIGHLY COLLIMATED MOBILE GAMMA-RAY SPECTROMETER

**Gary L. Catchen** (top) (PhD, nuclear chemistry, Columbia University, 1979) is currently an assistant professor of nuclear engineering at The Pennsylvania State University (PSU). Prior to joining the faculty at PSU, he was a research scientist for Conoco Inc. His current research interests are solid-state chemistry, radiation detection and measurement, isotope geochemistry, and heavy ion nuclear reactions. **Amos Notea** (center) (PhD, Hebrew University, Jerusalem) presently works in the area of radiation gauging techniques and interpretational models. **Brian C. Campbell** (bottom) (BS, chemical engineering, PSU, 1983) is currently a graduate student in the nuclear engineering department at PSU pursuing an MS degree. He is doing research in solid-state chemistry.

*Gary L. Catchen  
Amos Notea  
Brian C. Campbell*



## TECHNIQUES

### SOME CONSIDERATIONS IN THE USE OF AN A PRIORI MATHEMATICAL MODEL TO FIT A NUCLEAR UTILITY'S THERMOLUMINESCENCE DOSIMETRY DATA

**William H. Harding** (top) (AB, physics and mathematics, Gettysburg College, 1963; MA, experimental nuclear physics, 1968, and PhD, theoretical nuclear physics, 1971, University of Texas, Austin) was formerly director of mathematical and computer analysis with Radiation Management Corporation and on the faculty of Drexel University, where he taught radiological health, statistical analysis, and experimental design. He is currently on the faculty of Villanova University. His interests include technology management and assessment strategies. **Carl A. Silver** (BS, experimental psychology, 1951, Bowling Green University; MS, physiological psychology, 1952, and PhD, human engineering, 1955, Ohio State University) has been associated with Drexel University since 1967 and since 1969 has been professor of statistics there. His research interests include environmental safety, human factors engineering, and experimental design and statistics.

*William H. Harding  
Carl A. Silver*

