



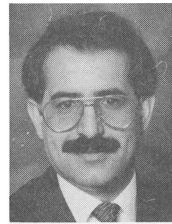
AUTHORS — AUGUST 1988

FISSION REACTORS

REAL-TIME DATA LOGGING AND COLOR GRAPHICS DISPLAY SYSTEMS FOR A BOILING WATER REACTOR SIMULATOR

Alireza Behbahani (top) (BS, electrical engineering, Utah State University, 1975; MS, 1977, and PhD, 1983, nuclear engineering, The Ohio State University) is presently with the Department of Chemical and Nuclear Engineering at the University of Cincinnati (UC). His primary areas of interest are nuclear instrumentation, reactor simulation and control, radiation sensors, experimental reactor physics and data/knowledge/signal acquisition. **Jeffery Reagan** is a computer programmer and a student in the Data Processing Program at the Raymond Walters College, UC. His diverse background includes employment as an electronic technician working on military air-defense radar and with commercial automated electronic banking equipment. His present interests include real-time data acquisition, local area networks, graphic display techniques, and text processing.

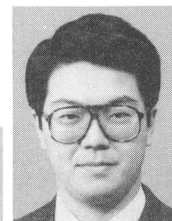
*Alireza Behbahani
Jeffery Reagan*



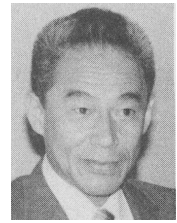
A METHOD OF STATE TRANSITION ANALYSIS UNDER SYSTEM INTERACTIONS: AN ANALYSIS OF A SHUTDOWN HEAT REMOVAL SYSTEM

Kotaro Nakada (top right) (BS, nuclear engineering, University of Tohoku, Japan, 1982; MS, nuclear engineering, University of Tokyo, Japan, 1984) is a research engineer at the nuclear research laboratory of Nippon Atomic Industry Group Company, Ltd. (NAIG), where he has worked on probabilistic safety assessment. His current interests include structural reliability analysis in liquid-metal fast breeder reactors (LMFBRs). **Kazumi Miyagi** (top left) (MS, nuclear engineering, University of Tohoku, Japan, 1977) is a researcher at the NAIG nuclear research laboratory, where he has worked in the areas of severe accident analysis and probabilistic safety assessment. He is presently working on the source term evaluation in LMFBRs. **Norihiko Handa** (bottom right) (MS, nuclear engineering, University

*Kotaro Nakada
Kazumi Miyagi
Norihiko Handa
Sadao Hattori*



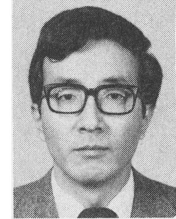
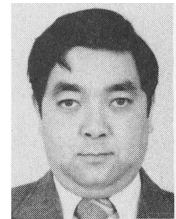
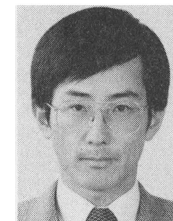
of Tokyo, Japan, 1976) is a senior engineer in the Department of Advanced Reactor Engineering, Toshiba Corporation. He has worked in the areas of probabilistic safety and seismic and structural analysis. He is presently working on the overall plant design of an LMFBR. **Sadao Hattori** (right) (MS, nuclear engineering, Tokyo Institute of Technology, Japan, 1959; graduate, Reactor Hazard Evaluation Course, Oak Ridge National Laboratory, 1960) has had experience in design, safety, and licensing of light water reactors for the Chubu Electric Power Company, and in design, licensing, and construction of the Fugen nuclear power plant for the Power Reactor and Nuclear Fuel Corporation. He is currently director of the LMFBR research project at the Central Research Institute of Electric Power Industry of Japan.



CONCEPTUAL DESIGN AND THERMAL-HYDRAULIC CHARACTERISTICS OF NATURAL CIRCULATION BOILING WATER REACTORS

Yoshiyuki Kataoka (top right) (MS, mechanical engineering, Keio University, Japan, 1977) is a researcher at Energy Research Laboratory (ERL), Hitachi, Ltd. He is working with thermal hydraulics of boiling water reactors (BWRs). **Hiroaki Suzuki** (top left) (MS, energy science, Tokyo Institute of Technology, Japan, 1979) is a researcher at ERL, and works with safety analyses of BWRs. **Michio Murase** (center right) (MS, mechanical engineering, Kyoto University, Japan, 1971) is a senior researcher at ERL, and responsible for research and development (R&D) of next generation reactors. **Isao Sumida** (center left) (BS, physics, Tokyo University, Japan, 1963; PhD, engineering, Tokyo University, Japan, 1982) is a chief researcher at ERL, and responsible for R&D of nuclear power and alternative energy. **Tetsuo Horiuchi** (bottom right) (BS, physics, Ohsaka University, Japan, 1967) is a senior engineer at Hitachi Works, Hitachi, Ltd. He has been project manager for the development of advanced BWRs since 1985 and since 1987 has been a member of the Small and Medium-Sized Reactor Committee organized by the Ministry of International Trade and Industry. **Minoru Miki** (bottom left) (BS, mechanical engineering, Tokyo University, Japan, 1953) is a senior chief engineer at Hitachi Works, Hitachi, Ltd. He is responsible for research, development, and system improvement of BWRs.

*Yoshiyuki Kataoka
Hiroaki Suzuki
Michio Murase
Isao Sumida
Tetsuo Horiuchi
Minoru Miki*



NUCLEAR SAFETY

RADIOLYSIS OF CESIUM IODIDE SOLUTIONS IN CONDITIONS PREVAILING IN A PRESSURIZED WATER REACTOR SEVERE ACCIDENT

Michel Lucas (DSc, analytical chemistry, Université de Paris VI, France, 1968) is a senior chemist at Institut de Sûreté Nucléaire, Commissariat à l'Energie Atomique. He has worked on solution chemistry involved in fuel reprocessing and ruthenium reliability in the fluoride volatility process. His main interests are now in iodine chemistry in reactor severe accidents, gaseous ruthenium oxide and nitrous oxide reactions, and Raman spectroscopy fiber optic coupling to monitor chemical processes.

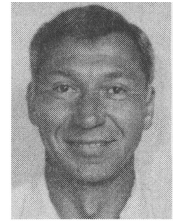
Michel Lucas



AN EXPERT SYSTEM APPROACH FOR SAFETY DIAGNOSIS

R. C. Erdmann (top) (PhD, California Institute of Technology, 1966) was on the engineering faculty at the University of California until 1973. He was a scientist and manager at Science Applications International Corporation until 1985. Since then he has been studying law at the University of Santa Clara, as well as consulting. **Bill K-H. Sun** (PhD, mechanical engineering, University of California, Berkeley, 1973) has been working in areas of nuclear technology development since 1972, including emergency core cooling heat transfer, core spray, reactor safety thermal hydraulics, thermal mixing, on-line monitoring and diagnostics, and expert systems. He worked at the General Electric Nuclear Energy Division between 1972 and 1977, starting as a senior engineer and becoming a technical leader. He joined Electric Power Research Institute, Nuclear Power Division, in 1977 as a project manager and is currently a program manager responsible for control and diagnostics.

*R. C. Erdmann
Bill K-H. Sun*

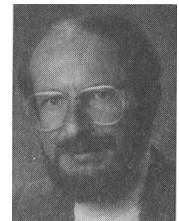


FUEL CYCLES

OREST—THE HAMMER-ORIGEN BURNUP PROGRAM SYSTEM: METHOD AND RESULTS

Ulrich Hesse (Dipl.-Phys., Technical University of Munich, Federal Republic of Germany, 1975) joined the Gesellschaft für Reaktorsicherheit in 1978. Starting with criticality calculations, he has been involved in burnup modeling and radiation shielding since 1980. He is engaged in the practical application of neutron physics and nuclear data in the field of fuel cycle problems. At present, his interests are directed toward developing an improved isotopic gamma-line library for shielding calculations and testing against experiments.

Ulrich Hesse



NUCLEAR FUELS

VARIATIONAL DETERMINATION OF TRANSIENT RADIAL-AZIMUTHAL TEMPERATURE DISTRIBUTIONS IN FUEL RODS FOR LOSS-OF-COOLANT-ACCIDENT ANALYSIS

Nicholas T. Saltos (top) [PhD, The Ohio State University (OSU), 1987] is currently a consulting engineer with EI International, Inc. His interests and activities lie in the areas of thermal sciences, probabilistic safety analysis, and numerical methods. **Tunc Aldemir** (center) (BS, mathematical physics, Istanbul University, Turkey, 1971; MS, 1975, and PhD, 1978, nuclear engineering, University of Illinois) is an assistant professor of nuclear and mechanical engineering at OSU. He has 10 years of finite difference techniques and variational methods as applied to reactor core modeling. His current interests are numerical methods, probabilistic analysis of dynamic systems, optimal maintenance scheduling, and in-core fuel management. **Richard N. Christensen** (bottom) (BS, physics, Brigham Young University, 1968; MS, mechanical engineering, and PhD, nuclear engineering, Stanford University) is currently an associate professor in the

*Nicholas T. Saltos
Tunc Aldemir
Richard N. Christensen*

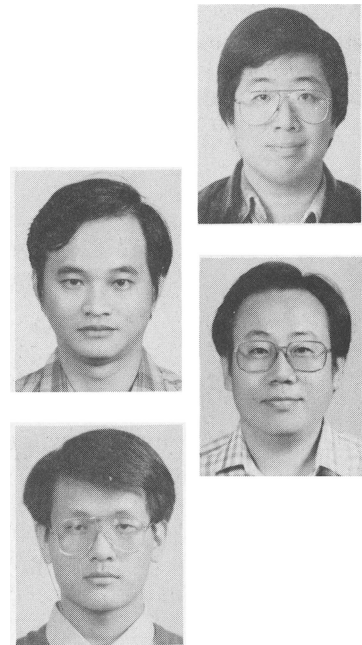


nuclear engineering program at OSU. His current research areas include enhanced heat transfer, two-phase flow and heat transfer, condensation in the presence of a noncondensable, heat transfer in nuclear waste repositories, and inherently safe reactors.

IDENTIFICATION OF TWO-PHASE FLOW REGIMES BY AN OPTIMUM MODELING METHOD

C. H. King (top right) [MS, nuclear engineering, National Tsing-Hua University (NT-HU), Taiwan, 1978] is now a PhD candidate in the Department of Nuclear Engineering of NT-HU. His research interests include two-phase flow, neutron noise analysis, system identification, and two-phase flow regime identification by neutron noise analysis. **M. S. Ouyang** (top left) (BS, 1971, and MS, 1977, nuclear engineering, NT-HU, Taiwan; PhD, mechanical engineering, University of Wisconsin, 1982) is joint professor of the Departments of Nuclear Engineering and Mechanical Engineering at NT-HU. His current interests are in reactor noise analysis, surveillance, system identification, and control. **B. S. Pei** (bottom right) (BS, nuclear engineering, NT-HU, Taiwan, 1975; MS, 1980, and PhD, 1981, nuclear engineering, University of Cincinnati) is an associate professor of the Department of Nuclear Engineering at NT-HU. His research interests include two-phase flow and heat transfer, reactor safety analysis, and severe core damage study. **Y. W. Wang** (bottom left) (BS, 1985, and MS, 1987, nuclear engineering, NT-HU, Taiwan) is a PhD student in the Department of Nuclear Engineering at NT-HU. His research interests include two-phase flow and heat transfer, time series, and system analysis.

*C. H. King
M. S. Ouyang
B. S. Pei
Y. W. Wang*



INVESTIGATION OF THE BUBBLY AIR/WATER FLOW USING THE CHORD-SEGMENT INVERSION ALGORITHM

R. K. S. Rathore (top right) [PhD, Indian Institute of Technology (IIT), Delhi, India, 1973; DSc, Delft, Netherlands, 1974] is a professor of mathematics at IIT, Kanpur. His broad interests lie in various aspects of approximation theory, numerical analysis, and linear algebra. His current activities are in the areas of image processing and computerized tomography. **P. Munshi** (top left) (MS, Ohio State University, 1979) is a lecturer in the nuclear engineering program at IIT, Kanpur. His areas of interest are two-phase flow, reactor safety, and tomographic systems. **R. K. Jarwal** (bottom right) (M. Tech., IIT, Kanpur, India, 1987) is a research assistant at the Regional College of Engineering in Indore, India. His areas of interest are instrumentation and programming. **I. D. Dhariyal** (bottom left) (PhD, Ohio State University, 1977) is an assistant professor of mathematics at IIT, Kanpur. His research interests are multiple decisions, ranking and selection, and tomography.

*R. K. S. Rathore
P. Munshi
R. K. Jarwal
I. D. Dhariyal*

