



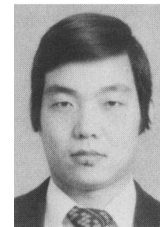
AUTHORS — DECEMBER 1989



RELEASE OF RADIOACTIVE MATERIALS IN SIMULATION TESTS OF A POSTULATED SOLVENT FIRE IN A NUCLEAR FUEL REPROCESSING PLANT

Gunji Nishio (top) (chemical engineering, Professional Technology School, Tokyo Institute of Technology, Japan, 1957) is a principal engineer at the Japan Atomic Energy Research Institute (JAERI). He is engaged in solvent fire and explosion tests to demonstrate safety evaluation methods for a postulated accident in a spent-fuel reprocessing plant. He was previously engaged in safety research in reactor containment spray tests for light water reactor (LWR) loss-of-coolant accidents and in aerosol behavior in the containment in fast breeder reactor accidents. **Kazuichiro Hashimoto** (BS, electrical engineering, Keio University, Japan, 1976) is a research engineer at JAERI. He is presently engaged in severe LWR fuel damage research. His current interest is the pool scrubbing effect for aerosols under severe LWR accident conditions. He was previously engaged in the solvent fire test program for reprocessing plants.

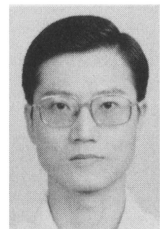
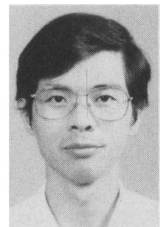
*Gunji Nishio
Kazuichiro Hashimoto*



ANALYSIS OF A MAIN STEAM ISOLATION VALVE CLOSURE ANTICIPATED TRANSIENT WITHOUT SCRAM IN A BOILING WATER REACTOR

T. J. Liaw (photo not available) [BS, 1986, and MS, 1988, nuclear engineering, National Tsing Hua University (NTHU), Taiwan] currently serves in the army and plans to begin work at Taipower Company of Taiwan in 1990. His research interests include reactor physics and thermal hydraulics. **Chin Pan** (top) (BS, nuclear engineering, NTHU, Taiwan, 1979; MS, 1983, and PhD, 1985, nuclear engineering, University of Illinois at Urbana-Champaign) is an associate professor of nuclear engineering at NTHU. His current research activities involve boiling heat transfer, concentration effect in steam generators, and reactor safety analysis. **Gen-Shun Chen** (center) (PhD, nuclear engineering, University of Cincinnati, 1985) is an associate professor of nuclear engineering at NTHU. His interests focus on reactor dynamics and neutron transport. **Jung-Kue Hsiue** (bottom) (MS, nuclear engineering, NTHU, 1972) is the division head of nuclear safety analysis at Taiwan Power Company. He is responsible for transport and accident analysis. His main interests are in plant design review, safety analysis, licensing, and probabilistic risk analysis.

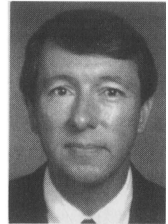
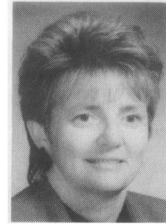
*T. J. Liaw
Chin Pan
Gen-Shun Chen
Jung-Kue Hsiue*



DEPRESSURIZATION TO MITIGATE DIRECT CONTAINMENT HEATING

Rosanna Chambers (top right) (MA, mathematics, University of Wisconsin, 1966) is currently a principal program specialist for EG&G Idaho (EG&G) in the Advanced Reactor Severe Accident Program at the Idaho National Engineering Laboratory (INEL). Her past experience includes severe reactor accident management, computer code assessment, and simulation of reactor transients and accidents. **Duane J. Hanson** (top left) (MS, mechanical engineering, Stanford University, 1968) is a senior engineering specialist for EG&G at INEL. His primary interests include severe accident management and resolution of reactor safety issues. **R. Jack Dallman** (bottom right) (MS, mechanical engineering, University of Nebraska, 1978) is manager of reactor safety analysis for EG&G at INEL. His technical interests focus on the phenomenological and risk-based safety evaluations of nuclear and nonnuclear facilities. **Fuat (Frank) Odar** (bottom left) (PhD, civil engineering, Northwestern University, 1962) is a senior reactor systems engineer in the Reactor and Plant Systems Branch, Office of Nuclear Regulatory Research of the U.S. Nuclear Regulatory Commission. He is the project manager of various projects on the management of severe accidents. His past experience includes research on thermal hydraulics of nuclear reactors.

*Rosanna Chambers
Duane J. Hanson
R. Jack Dallman
Fuat Odar*

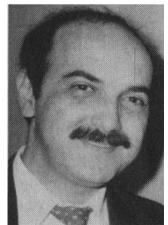
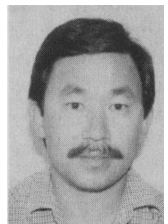


FUEL CYCLES

HEURISTIC OPTIMIZATION OF PRESSURIZED WATER REACTOR FUEL CYCLE DESIGN UNDER GENERAL CONSTRAINTS

Hoju Moon (top) [MS, nuclear engineering, The Pennsylvania State University (PSU), 1988] is currently pursuing his PhD degree. His research interest is in fuel management and nodal coarse-mesh reactor analysis. **Samuel H. Levine** (center) (PhD, nuclear physics, University of Pittsburgh, 1954) is a professor of nuclear engineering at PSU. His current technical interests are in fuel management, neutron radiography, optimization techniques, beta dosimetry, reactor design, fast reactor physics, research reactor experiments, and neutron spectrum measurements and calculations. **Moussa Mahgerefteh** (bottom) (MS, physics, 1977; PhD, nuclear engineering, Virginia Polytechnic and State University, 1984) is a senior nuclear engineer at GPU Nuclear Corporation, where his principal activities are in fuel management and plant life extension studies for Three Mile Island Unit 1.

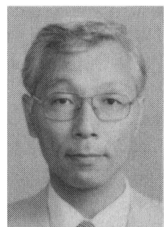
*Hoju Moon
Samuel H. Levine
Moussa Mahgerefteh*



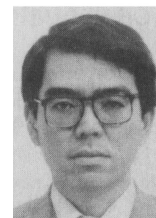
DESIGN STUDY FOR AN ADVANCED LIQUID-METAL FAST BREEDER REACTOR CORE WITH HIGH BURNUP

Tatsutoshi Inagaki (right) (BS, chemical engineering, 1967, and MS, nuclear engineering, 1969, Tokyo Institute of Technology, Japan) has been the manager of the fast breeder reactor (FBR) development department at the Japan Atomic Power Company (JAPC) since 1985. He previously managed FBR plant design and research and development (R&D) at the Tokyo Electric Power Company and the Federation of Electric Power Companies. For

*Tatsutoshi Inagaki
Hiroyuki Kuga
Masao Suzuki
Tsugio Yokoyama
Mitsuaki Yamaoka
Kunikazu Kaneto
Masahisa Ohashi
Kunitoshi Kurihara*



20 years, his technical interests have been in the areas of reactor physics and plant design for liquid-metal fast breeder reactors. **Hiroyuki Kuga** (no photo available) was an engineer at the JAPC until his death in 1988. **Masao Suzuki** (top right) (BS, physics, Tokyo Institute of Technology, Japan, 1969) is the manager of the Core and Safety Engineering Section of the advanced reactor engineering department at Toshiba Corporation. He has worked in the area of FBR core design since 1969. His current interests include core design of a demonstration FBR, planning of FBR core development, and advanced core concepts. **Tsugio Yokoyama** (top left) (BS, 1971, and MS, 1973, nuclear engineering, Tohoku University, Japan) is an engineer in the advanced reactor engineering department at Toshiba Corporation. He has worked in the area of FBR core design since 1973. His current interests include core design for a demonstration FBR and advanced core concepts. **Mitsuaki Yamaoka** (center right) (BS, 1978, and MS, 1981, nuclear engineering, Osaka University, Japan) is a researcher at the Nippon Atomic Industry Group Company Nuclear Research Laboratory. He has worked in the areas of FBR physics and core design since 1981. His current interests include development of core calculational methods and advanced core concepts. **Kunikazu Kaneto** (center left) (BS, nuclear engineering, Kyoto University, Japan, 1971) is a senior engineer in the advanced reactor and nuclear fuel cycle department at the Hitachi, Ltd., Hitachi Works. He has been engaged in core design and R&D for FBRs and heavy water reactors (HWRs). His current interests are in the areas of core system development for demonstration FBRs and HWRs. **Masahisa Ohashi** (bottom right) (BS, nuclear engineering, Hokkaido University, Japan, 1974) is an engineer in the advanced reactor and nuclear fuel cycle department at the Hitachi, Ltd., Hitachi Works. He has been engaged in FBR core design and R&D. His current interests are in the areas of core design for a demonstration FBR and advanced core concepts. **Kunitoshi Kurihara** (bottom left) (PhD, nuclear engineering, Osaka University, Japan, 1984) is a senior researcher at the Hitachi, Ltd., Energy Research Laboratory. He has been engaged in research on reactor noise analysis, reactor physics, and core design for FBRs, HWRs, and boiling water reactors. His current interests are in the area of advanced core designs for improved fuel economy and safety.



THE FAST BREEDER REACTOR FUEL CYCLE IN EUROPE — PRESENT STATUS AND PROSPECTS

Jean Mégy (top) (Ecole Nationale Supérieure des Mines de Paris, France) is director of the Centre d'Études Nucléaires de Cadarache, Commissariat à l'Énergie Atomique (CEA). He was director of the Reprocessing and Waste Management Division at CEA from 1980 to 1987. He played a key role in the development of the fast breeder program in France as the head of the Phénix project and director of the Superphénix project. His interests involve nuclear reactor design and fuel cycle. **Robert Harold Allardice** (photo not available) (applied chemistry, Glasgow University, United Kingdom) has had a 40-year career in the nuclear industry, working for the United Kingdom Atomic Energy Authority and for British Nuclear Fuels plc. **Klaus Ebert** (bottom) (Dr., physical chemistry, University of Vienna, Austria, 1954; Prof., applied physical chemistry, University of Heidelberg, Federal Republic of Germany, 1969) is director of the Institut für Heiße Chemie at Kernforschungszentrum Karlsruhe. His research interests include the kinetics of complex chemical systems and applications in chemical engineering. **Jean-Marie**

*Jean Mégy
Robert Harold Allardice
Klaus Ebert
Jean-Marie Morelle
Paolo Venditti*



Morelle (right) (Ingénieur Civil Electricien et Mécanicien, Université Catholique de Louvain, Belgium; MS, nuclear engineering, Massachusetts Institute of Technology) is director of the fast breeder and fuels programs at Belgonucléaire. He worked on the Kalkar project from 1968 to 1972 and has also been responsible for the design and fabrication of fuel for the Internationale Natrium Baugesellschaft reactor. A photograph and a biography for **Paolo Venditti** were not available at publication time.



CHEMICAL PROCESSING

DISSOLUTION OF PuO₂ IN HYDROCHLORIC ACID MEDIUM – EFFECT OF REDUCING AGENTS

Mrs. Shakila Abdul Majeed (top) (MSc, chemistry, Bombay University, India, 1982) joined the Bhabha Atomic Research Center (BARC), Bombay, in 1981. She has worked in the Radiochemistry Program of the Indira Gandhi Center (IGC) for Atomic Research since 1983 and is presently working in the Materials Science Division, IGC. **Thandangorai Ganapathi Srinivasan** (center) (BSc, chemistry, Madras University, India, 1972) joined BARC in 1973. He was a member of the Fuel Reprocessing Division at BARC until 1982 when he was transferred to IGC. **Kanwal Nain Sabharwal** (bottom) (MSc, chemistry, Delhi University, India, 1979) joined BARC in 1981. He has been with IGC since 1982.

*Mrs. Shakila Abdul Majeed
Thandangorai Ganapathi Srinivasan
Kanwal Nain Sabharwal*

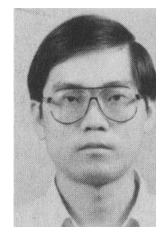


HEAT TRANSFER AND FLUID FLOW

AN IMPROVED THEORETICAL CRITICAL HEAT FLUX MODEL FOR LOW-QUALITY FLOW

Wen-Shan Lin (top) [BS, 1983, and MS, 1985, nuclear engineering, National Tsing-Hua University (NTHU), Taiwan] is a PhD candidate in the Department of Nuclear Engineering at NTHU. His research interests include two-phase flow, boiling heat transfer, and reactor safety analysis. **Chien-Hsiung Lee** (center) (BS, 1972, and MS, 1976, mechanical engineering, Chung-Cheng Institute of Technology, Taiwan; PhD, nuclear engineering, Purdue University, 1987) is the manager of the thermohydraulic laboratory at the Institute of Nuclear Energy Research. His main research interests include transient critical heat flux, boiling heat transfer, and reactor safety analysis. **Bau-Shei Pei** (bottom) (BS, nuclear engineering, NTHU, 1975; MS, 1980, and PhD, 1981, nuclear engineering, University of Cincinnati) is a professor in the Department of Nuclear Engineering at NTHU. His research interests are in two-phase flow and heat transfer, reactor safety analysis, and severe core damage study.

*Wen-Shan Lin
Chien-Hsiung Lee
Bau-Shei Pei*



MODERATOR CIRCULATION IN CANDU REACTORS: AN ALTERNATIVE APPROACH FOR THE TUBE MATRIX SIMULATION

Hassan E. S. Fath (top) (BSc, 1972, and MSc, 1975, Alexandria University, Egypt; MS, engineering, 1977, and PhD, 1981, McMaster University, Canada) is an assistant professor in the Department of Mechanical Engineering, Alexandria University. He was a visiting professor at the University of Technology, Iraq, and Beirut University, Lebanon, from 1985 to 1988, and worked at Atomic Energy of Canada Limited from 1980 to 1982. He was a member of the Egyptian Nuclear Safety Commission from 1983 to 1985. His research interests include thermal engineering applications. **Makarem A. Hussein** (BS and MSc, nuclear engineering, Alexandria University, Egypt; PhD, nuclear engineering and engineering physics, University of Wisconsin-Madison, 1989) has worked in the field of numerical simulation and modeling since 1982. He worked on the simulation of fluid flow, particularly moderator circulation in CANDU reactors, from 1982 to 1985. His current research interests include simulation of plasmas for fusion reactor systems and plasma processing experiments.

*Hassan E. S. Fath
Makarem A. Hussein*

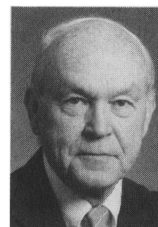


TECHNIQUES

A NULL-TYPE BORONIMETER FOR ON-LINE ANALYSIS

Carol A. Jaeger (top) [MS, mechanical engineering, Virginia Polytechnic Institute and State University (VPI&SU), 1988] is a PhD candidate in mechanical engineering at VPI&SU. Her research interests are in instrumentation, controls, and computer applications. **Eric R. Ellis** (center) is a laboratory instrument worker in the electrical engineering department at VPI&SU and is completing requirements for a degree in nuclear science at VPI&SU. He has extensive experience in reactor operations and nuclear instrumentation. **Thomas F. Parkinson** (bottom) (PhD, physics, University of Virginia, 1953) has been a professor of mechanical and nuclear engineering at VPI&SU since 1975. His research interests include nuclear instrumentation, neutron activation analysis, reactor physics, and reactor safety.

*Carol A. Jaeger
Eric R. Ellis
Thomas F. Parkinson*



CALIBRATING A VACUUM IONIZATION GAUGE FOR HYDROGEN USING A FRIT-TYPE PLUGGING METER

DeeEarl Vaden (BS, chemical engineering, Colorado School of Mines, 1979; MS, chemical engineering, University of Arizona, 1982) is a chemical engineer in the Reactor Neutronics and Chemistry Section at the Experimental Breeder Reactor II (EBR-II), operated by Argonne National Laboratory for the U.S. Department of Energy. He is responsible for the monitoring of impurity levels in the primary and secondary sodium gas systems at EBR-II as well as the operation and calibration of impurity monitoring equipment. He has 5 years' experience in operating and calibrating the hydrogen meter leak detectors at EBR-II.

DeeEarl Vaden

