

# AUTHORS — OCTOBER 1989

## FISSION REACTORS

### A NEW APPROACH TO SIMPLIFIED LIQUID-METAL FAST BREEDER REACTOR PLANT DESIGN

**Morihiko Sato** (top) (BS, mechanical engineering, Keio University, Japan, 1964) has had experience in project management, design of large fast breeder reactors (FBRs), and construction of the experimental FBR at Toshiba Corporation. He is presently in charge of the company's overall design management and research and development. **Norihiko Handa** (MS, nuclear engineering, Tokyo University, Japan, 1976) is a senior engineer in the Department of Advanced Reactor Engineering at Toshiba Corporation. He has worked in the areas of safety, licensing, and design. He is presently working on the plant design of a large FBR.

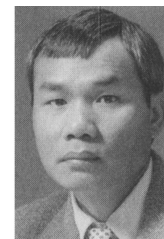
*Morihiko Sato  
Norihiko Handa*



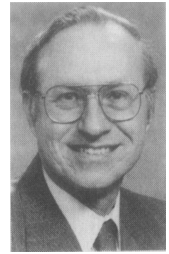
### PROBABILISTIC RISK ASSESSMENT BASED GUIDANCE FOR PIPING IN-SERVICE INSPECTION

**Truong V. Vo** (top) (MS, nuclear engineering, University of Missouri-Rolla, 1984) is a senior research staff member of the Technology and Analysis Center at Pacific Northwest Laboratory (PNL), operated by Battelle Memorial Institute. His current research activities involve development of risk analysis methods and risk applications to nuclear and nonnuclear plant systems. **Bryan F. Gore** (center) (PhD, physics, University of Michigan, 1967) is a senior research staff member of the Reactor Technology Center at PNL. His current research activities involve risk analysis and power plant safety analysis for the U.S. Nuclear Regulatory Commission. **Elizabeth J. Eschbach** (bottom) (MS, mechanical engineering, Washington State University, 1982) is a research staff member of the Applied Physics Center at PNL. She has been involved in facets of engineering research since 1977. Her recent areas of research include engineering-scale experimentation related to ice condenser containment, aerosol retention and heat transfer, and risk analysis and safety

*Truong V. Vo  
Bryan F. Gore  
Elizabeth J. Eschbach  
Fredric A. Simonen*



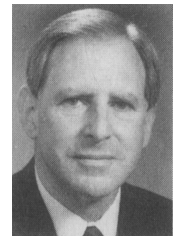
assessment. **Fredric A. Simonen** (right) (PhD, engineering mechanics, Stanford University, 1966) is a staff engineer in the Theoretical and Applied Mechanics Group at PNL. His current research activities are in the area of structural reliability with particular focus on probabilistic methods.



## NUCLEAR SAFETY

### PASSIVE SAFETY TESTING AT THE FAST FLUX TEST FACILITY

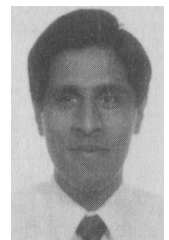
*D. M. Lucoff*



**D. M. Lucoff** (PhD, nuclear engineering, University of Wisconsin-Madison, 1971; MBA, University of Washington, 1983) was manager of the inherent safety and core design programs at the Westinghouse Hanford Company (WHC) during the 1986-1987 testing program at the Fast Flux Test Facility (FFTF). He has been at WHC and the FFTF since 1979 and is currently assigned to FFTF operations. Before transferring to WHC, he was a principal engineer in the nuclear engineering department of the Nuclear Fuels Division at Westinghouse Electric Corporation, where he was involved in the design and evaluation of pressurized water reactor reload cores.

### MELT PROPAGATION IN DRY CORE DEBRIS BEDS

*Sudip S. Dosanjh*

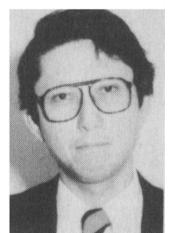


**Sudip S. Dosanjh** (PhD, mechanical engineering, University of California, Berkeley, 1986) is a division supervisor at Sandia National Laboratories. His current research interest is computational physics with an emphasis on reactor safety applications.

## CHEMICAL PROCESSING

### REDUCTION STRIPPING OF LOW-CONCENTRATION Np(VI) LOADED ON 30% TRI-*n*-BUTYL PHOSPHATE THROUGH LASER-INDUCED REACTIONS

*Youichi Enokida  
Atsuyuki Suzuki*

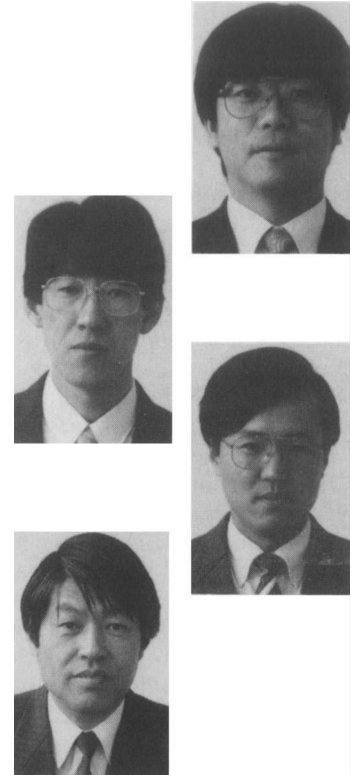


**Youichi Enokida** (top) (BS, 1981; MS, 1983; and Dr.Eng., 1989, nuclear engineering, University of Tokyo, Japan) is an associate professor in the Department of Nuclear Engineering at the University of Tokyo. His current interests lie in the analysis of chemical processes, especially the reprocessing of nuclear spent fuels. **Atsuyuki Suzuki** (BS, 1966; MS, 1968; and PhD, 1971, nuclear engineering, University of Tokyo, Japan) is a professor of nuclear chemical engineering at the University of Tokyo. His current field of interest is systems analysis of the nuclear fuel cycle, including advanced process design, safety management, and energy economics.

**RETARDATION FACTOR OF A RADIONUCLIDE FOR UNDISTURBED AND DISTURBED SANDY SOIL**

**Toshihiko Ohnuki** (top right) (M.Eng., applied physics, Hokkaido University, Japan, 1980) is a research scientist in the Department of Environmental Safety Research of the Japan Atomic Energy Research Institute (JAERI). His work has investigated the migration of radionuclides through soil. His present interest is in the field of adsorption of tracers on clay minerals and metal oxides. **Tadao Tanaka** (top left) (M.Eng., industrial chemistry, Ibaraki University, Japan, 1984) is a research scientist in the Department of Environmental Safety Research at JAERI. His interest lies in the field of radioactive waste management, and his recent work has investigated the adsorption behavior of radionuclides in soils. **Hiromichi Ogawa** (bottom right) (M.Eng., nuclear engineering, Nagoya University, Japan, 1982) is a research scientist in the Department of Environmental Safety Research at JAERI. His main interest is in the area of underground radionuclide migration, and his recent work has investigated the migration of radionuclides attached to finer particles. **Tadatoshi Yamamoto** (bottom left) (BS, chemistry, Shizuoka University, Japan, 1965; Dr.Eng., nuclear engineering, Tohoku University, Japan, 1983) is a senior engineer in the Department of Environmental Safety Research at JAERI. He has studied low-level radioactive waste land disposal management. His main interest lies in understanding the migration of radionuclides through soil.

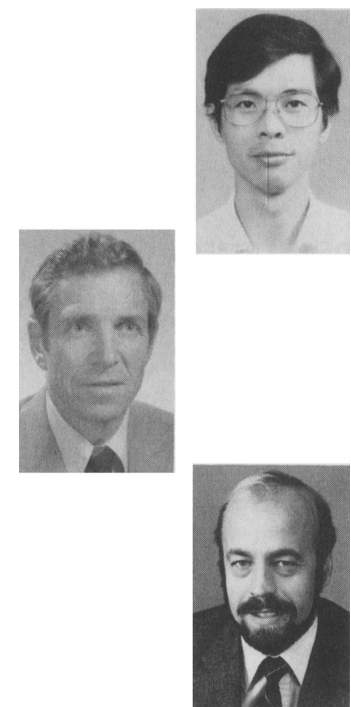
*Toshihiko Ohnuki  
Tadao Tanaka  
Hiromichi Ogawa  
Tadatoshi Yamamoto*



**DRYOUT HEAT FLUXES FOR SURFACES OVERLAYED WITH CHIMNEY-TYPE POROUS DEPOSITS**

**Chin Pan** (top) [BS, nuclear engineering, National Tsing-Hua University, Taiwan, 1979; MS, 1983, and PhD, 1985, nuclear engineering, University of Illinois at Urbana-Champaign (UI-UC)] is an associate professor in the Department of Nuclear Engineering at National Tsing-Hua University. His current research activities involve boiling heat transfer, concentration effects in steam generators, and reactor safety analysis. **Barclay G. Jones** (center) (BS, mechanical engineering, University of Saskatchewan, Canada, 1954; MS, 1960, and PhD, 1966, nuclear engineering, UI-UC) is head of the Department of Nuclear Engineering at UI-UC. His current research areas include thermal-hydraulic aspects of reactor safety; two-phase heat transfer fluid flow; experiment and modeling of turbulent flow phenomena; and human factors, operator training, and system simulation of nuclear power plants. **Albert J. Machiels** (bottom) (PhD, engineering, University of California, Berkeley, 1976) is a program manager at the Electric Power Research Institute (EPRI), Palo Alto, California. He taught nuclear engineering at UI-UC, and at the University of California, Berkeley, from 1976 to 1982. After joining EPRI in 1982, he served as program manager of the nuclear fuel industry research program until 1988. Later that year he was assigned to the Nuclear Management and Resources

*Chin Pan  
Barclay G. Jones  
Albert J. Machiels*

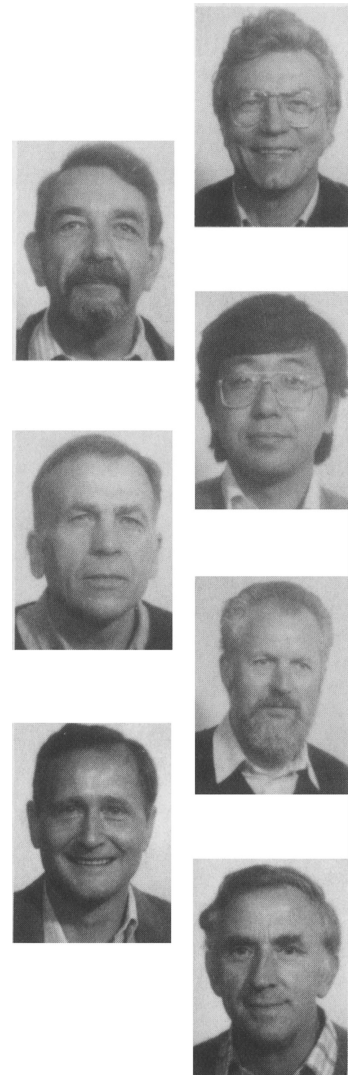


Council, Washington, D.C. His current responsibilities include the coordination of EPRI's research and development efforts in the area of severe-accident issues resolution.

### THERMOHYDRAULIC INVESTIGATIONS OF DECAY HEAT REMOVAL SYSTEMS BY NATURAL CONVECTION FOR LIQUID-METAL FAST BREEDER REACTORS

**Helmut Hoffmann** (top right) [Dr.-Ing., University of Karlsruhe, Federal Republic of Germany (FRG), 1973] joined the Kernforschungszentrum Karlsruhe (KfK) in 1963. He worked on thermal hydraulics for fast breeder reactor fuel elements, cold neutron sources for high-flux reactors, and is currently interested in decay heat removal (DHR) by natural convection for liquid-metal-cooled reactors. **Dietrich Weinberg** (top left) (Dipl.-Ing., Technical University, Berlin, FRG, 1963) works at KfK in thermal-hydraulic analysis for liquid-metal-cooled fission reactors. His main interest is currently focused on natural convection DHR. **Yoshiaki Ieda** (second from top right) (Dipl.-Ing., University of Osaka, Japan, 1979) is a member of Power Reactor and Nuclear Fuel Development Corporation in Japan and has worked in the liquid-metal reactor field. He is currently a guest scientist at KfK, where he is involved in DHR investigations for liquid-metal fast breeder reactors (LMFBRs). **Klaus Marten** (center left) (Dipl.-Ing., Fachhochschule Wismar, German Democratic Republic, 1955) is a research staff member at KfK. He has been active in the fields of gas-liquid flows and single-phase investigations on rod bundles, and is currently working on steady-state and transient experiments for natural convection DHR for LMFBRs. **Herbert Tschöke** (third from top right) (Dipl.-Ing., Fachhochschule Bielefeld, FRG, 1966) is a research staff member at KfK. He has worked in the field of liquid-metal heat transfer in rod bundles and his current interests are focused on natural convection thermohydraulics. **Hans-Heinz Frey** (bottom left), currently a computer programmer, has been with KfK since 1970. He operates three-dimensional computer codes that calculate temperature and velocity fields in complex geometries currently used for the DHR experiments. **Kurt Dres** (bottom right) has been a research staff member at KfK since 1962. He has worked on rod bundle thermohydraulic safety experiments for pressurized water reactors and is currently involved in DHR experiments for LMFBRs.

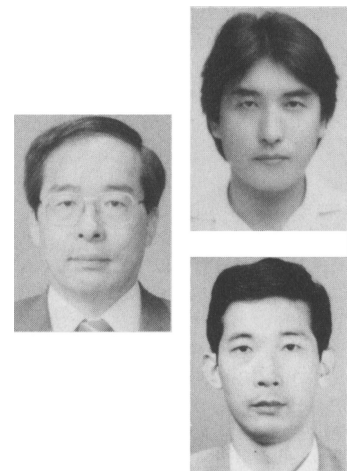
*Helmut Hoffmann  
Dietrich Weinberg  
Yoshiaki Ieda  
Klaus Marten  
Herbert Tschöke  
Hans-Heinz Frey  
Kurt Dres*



### DEVELOPMENT OF A THREE-DIMENSIONAL TRANSIENT CODE FOR REACTIVITY-INITIATED EVENTS IN BOILING WATER REACTORS—MODELS AND CODE VERIFICATIONS

**Hitoshi Uematsu** (top) (MS, nuclear engineering, University of Hokkaido, Japan, 1977) is a researcher at the Nippon Atomic Industry Group Nuclear Research Laboratory. He works on transient code development and analysis. **Sadayuki Izutsu** (center) (PhD, nuclear engineering, University of Tohoku, Japan, 1977) is an engineer in the nuclear power plant engineering department at Hitachi, Ltd., Hitachi Works. He is involved in nuclear design and transient method development for boiling water reactors (BWRs). **Toru Yamamoto** (bottom) (PhD, nuclear engineering, University of Tohoku, Japan, 1977) is a research associate in the Nuclear Energy Division of the Energy System Group of Toshiba Corporation. He is working on nuclear design of BWR fuel and the development of a reactor core

*Hitoshi Uematsu  
Sadayuki Izutsu  
Toru Yamamoto  
Ryutarō Yamashita  
Sakae Muto  
Akio Toba*



dynamic analysis code. **Ryutaro Yamashita** (top) (MS, nuclear engineering, University of Tokai, Japan, 1979) is an engineer in the information systems development department of Hitachi Engineering Co., Ltd. His current interests are in BWR core advanced calculational schemes. **Sakae Muto** (center) (BS, nuclear engineering, University of Tokyo, Japan, 1974; MS and M.Eng., nuclear engineering, University of California, Berkeley, 1981) is a manager in the Engineering Division at Tokyo Electric Power Company's Kashiwazaki Kariwa Nuclear Power Station. He is involved in core design and transient analyses of the power station. **Akio Toba** (bottom) (MS, nuclear engineering, University of Tokyo, Japan, 1981) is an assistant manager in the Engineering Division at Tokyo Electric Power Company's Fukushima Daini Nuclear Power Station. His current interest is in burnup extension of light water reactor fuel.

