

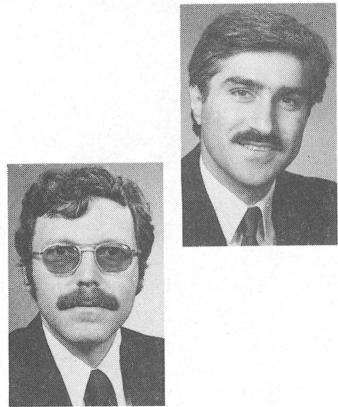
# AUTHORS — MAY 1989

**FISSION REACTORS**

## **GAMMA TRANSPORT THEORY ANALYSIS OF THE THREE MILE ISLAND UNIT 2 LOWER HEAD**

**Alireza Haghighat** (top) (PhD, nuclear engineering, University of Washington, 1986) has been on the faculty of The Pennsylvania State University since November 1986 and is currently a research associate in nuclear engineering. His current interests are in the areas of computational methods in reactor physics, neutronics and thermal-hydraulic modeling, and development and implementation of new transport theory algorithms for vector/parallel processors. **Anthony J. Baratta** (PhD, physics, Brown University, 1979) is an associate professor of nuclear engineering at The Pennsylvania State University. His research interests include light water reactor transient analysis and neutron transport.

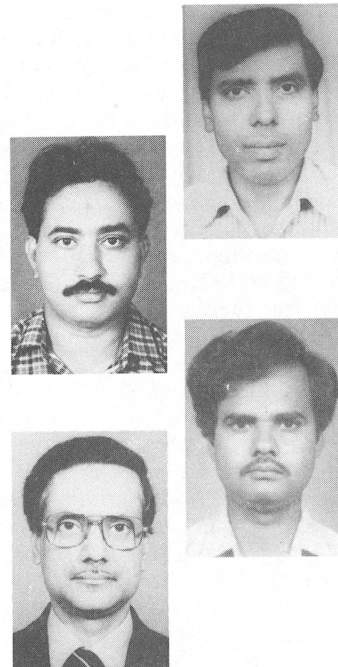
*Alireza Haghighat  
Anthony J. Baratta*



## **ELECTRON PROBE MICROANALYSIS AND SCANNING ELECTRON MICROSCOPY OF DEPOSITS ON THE INNER SURFACE OF BOILING WATER REACTOR CLADDING**

**D. N. Sah** (top right) (BSc Eng., metallurgy, Ranchi University, India, 1970) is head of the Basic Research and EPMA/SEM Services Group in the Radiometallurgy Division at the Bhabha Atomic Research Centre (BARC). He has worked on postirradiation examination and performance modeling of nuclear fuel elements since 1972. His current interests are irradiated material characterization and fuel element performance modeling. **C. S. Viswanadham** (top left) (MSc, physics, Indian Institute of Technology, Madras, India, 1980) has been a scientific officer in the Radiometallurgy Division at BARC since 1981. He has worked on fuel element performance modeling. His current interest is irradiated material characterization using microscopic techniques. **Sunil Kumar** (bottom right) (BSc Eng., metallurgy, Ranchi University, India, 1980) has been a scientific officer in the Radiometallurgy Division at BARC since 1981. He is associated with materials characterization using microscopic techniques. His current research interests include fractography and failure analysis. **P. R. Roy** (bottom left) (BE, metallurgical engineering, Calcutta University, India, 1958) is currently director of the Materials Group at BARC. His interests include nuclear fuels technology, plutonium metallurgy, and powder metallurgy.

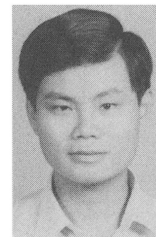
*D. N. Sah  
C. S. Viswanadham  
Sunil Kumar  
P. R. Roy*



## REDUCING SCRAM FREQUENCY BY RELAXING REACTOR TRIP SETPOINTS AT MAANSHAN NUCLEAR POWER STATION

**Ge-Ping Yu** (top) [BS, 1974, and MS, 1978, nuclear engineering, National Tsing-Hua University (NTU), Taiwan; ScD, nuclear engineering, Massachusetts Institute of Technology, 1981] is a professor in the Department of Nuclear Engineering at NTU. He has researched the fields of nuclear materials engineering and reactor safety analysis. His current research is on the code assessment of RELAP5-MOD2, erosion-corrosion of carbon steel, and safety analysis of advanced light water reactors. **Bau-Shei Pei** (center) (BS, nuclear engineering, NTU, Taiwan, 1975; MS, 1980, and PhD, 1981, nuclear engineering, University of Cincinnati) is a professor in the Department of Nuclear Engineering at NTU. His research interests are in two-phase flow and heat transfer, reactor safety analysis, and severe core damage study. **Ying-Pang Ma** (bottom) (BS, mechanical engineering, Chung-Cheng Institute of Technology, Taiwan, 1977) is a doctoral student in the Department of Nuclear Engineering at NTU. His research interests include two-phase flow and reactor safety analysis.

*Ge-Ping Yu  
Bau-Shei Pei  
Ying-Pang Ma*



## FUEL CYCLES

### OXIDATION BEHAVIOR OF NONIRRADIATED $UO_2$

**Todd K. Campbell** (top right) (BS, chemical engineering, University of Washington, 1983; MS, chemical engineering, University of Colorado, 1985) is a research engineer for the Reactor Systems and Fuel Performance Section at Battelle's Pacific Northwest Laboratory (PNL). He has worked for 3 years on test initiation, data collection, and analysis of spent-fuel oxidation testing. His other research activities involve the metallographic and chemical characterization of spent fuels. **Edgar Robert Gilbert** (top left) (BS, 1961; MS, 1962; and PhD, 1970, engineering science, Washington State University) is a staff scientist in the Department of Reactor Systems, Fuels, and Materials at PNL, where he also serves as group leader in the Fuels and Materials Performance Group. He has 25 years' experience in planning and conducting research of development activities on materials degradation, radiation effects, and analysis of nuclear fuel behavior in storage environments. **George D. White** (bottom right) (BS, ceramic technology, University of Alabama, 1949; MS, ceramic engineering, North Carolina State University, 1951) is a retired PNL staff scientist. He worked at PNL for 10 years in nuclear fuels and materials synthesis and continues to contribute as a consultant. **Gregory F. Piepel** (photo not available) (MS, mathematics, Central Washington University, 1978; PhD, statistics, University of Florida, 1985) is a senior research statistician in the Department of Computational Sciences at PNL. He develops and applies statistical experimental design data analysis methods to problems in the physical and engineering sciences. **Bernard J. Wrona** (bottom left) (BS, 1972, and MS, 1974, metallurgical engineering, Illinois Institute of Technology) was recently supervisor of the Ceramics and Metal Powder Processing Group at PNL. He is currently an engineer for Ford Aerospace Corporation. His research activities have included property studies of nuclear fuels and fabrication development of advanced ceramic materials.

*Todd K. Campbell  
Edgar Robert Gilbert  
George D. White  
Gregory F. Piepel  
Bernard J. Wrona*



**CUSEP—A NEW MATHEMATICAL MODEL OF PULSED COLUMN CONTACTORS USING THE PUREX PROCESS**

**John F. Geldard** (top) (BSc, chemistry, 1958; MSc, chemistry, 1959; and PhD, organic chemistry, 1964, University of Sydney, Australia) is professor of chemistry at Clemson University. Before joining the Clemson University faculty, he was visiting lecturer at the University of Illinois. His research interests include transition metal chemistry, molecular dynamical studies of rearrangements of small inorganic molecules by nondissociative pathways, and the mathematical modeling of nuclear reprocessing.

**Adolph L. Beyerlein** (BS, chemistry, Fort Hayes Kansas State College, 1960; PhD, physical chemistry, University of Kansas, 1966) is professor of chemistry at Clemson University. Before joining the Clemson University faculty in 1967, he was a Welch Foundation postdoctoral fellow at Rice University for 1 year. His areas of interest lie in theoretical chemistry, transport phenomena, thermal diffusion, and nuclear reprocessing.

*John F. Geldard  
Adolph L. Beyerlein*

**AN INFERENCE MODEL FOR PREDICTING A PINCHING EFFECT IN THE CO-DECONTAMINATION EXTRACTION PROCESS IN A PUREX FUEL REPROCESSING PLANT**

**Masaki Suwa** (top) (BS, 1983, and MS, 1985, nuclear engineering, University of Tokyo, Japan) is a student of nuclear engineering at the University of Tokyo. His current areas of interest include criticality safety control of chemical processes, man/machine interface theory, and human learning and understanding in the field of artificial intelligence. **Atsuyuki Suzuki** (BS, 1966; MS, 1968; and PhD, 1971, nuclear engineering, University of Tokyo, Japan) is a professor of nuclear engineering at the University of Tokyo. His current areas of interest include laser application for separation processes, stochastics of transport phenomena, and policy science of technological society.

*Masaki Suwa  
Atsuyuki Suzuki*

**THE BEHAVIOR OF IODINE IN A SIMULATED SPENT-FUEL SOLUTION**

**Tsutomu Sakurai** (top right) (PhD, Hokkaido University, Japan, 1974) joined the chemistry department at Japan Atomic Energy Research Institute (JAERI) in 1960 and participated in chemical research on the fluoride volatility process of spent fuels. Since 1983, he has been engaged in research on radioiodine treatment in spent-fuel solutions and in dissolver off-gas. **Akira Takahashi** (top left) has worked for JAERI on research concerning the behavior of radioiodine in the dissolution of spent fuels. **Niro Ishikawa** (bottom right) has been involved in research on radioiodine treatment in spent-fuel solutions at JAERI. **Yoshihide Komaki** (bottom left) (BS, chemistry, Shizuoka University, Japan, 1960) has been engaged in research on radioiodine treatment in spent-fuel solutions and in production of porous polymer films by a heavy-ion bombardment truck-etching technique at JAERI.

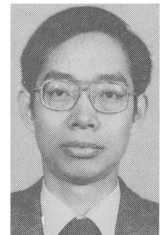
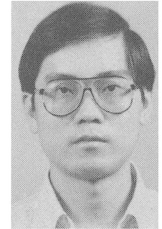
*Tsutomu Sakurai  
Akira Takahashi  
Niro Ishikawa  
Yoshihide Komaki*



**A THEORETICAL CRITICAL HEAT FLUX MODEL FOR ROD BUNDLES UNDER PRESSURIZED WATER REACTOR CONDITIONS**

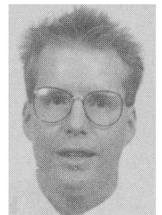
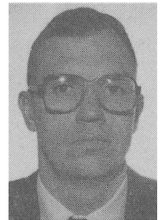
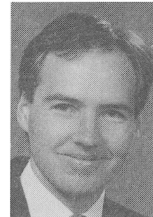
**Wen-Shan Lin** (top right) [BS, 1983, and MS, 1985, nuclear engineering, National Tsing-Hua University (NTHU), Taiwan] is a PhD student in the NTHU Department of Nuclear Engineering. His research interests include two-phase flow, boiling heat transfer, and reactor safety analysis. **Bau-Shei Pei** (top left) (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 damaging study. **Chien-Hsiung Lee** (bottom right) (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. **I. A. Mudawwar** (bottom left) (BS, mechanical engineering, American University of Beirut, Lebanon, 1978; MS, 1980, and PhD, 1984, mechanical engineering, Massachusetts Institute of Technology) is an assistant professor of mechanical engineering and the director of Purdue's boiling and two-phase flow laboratory. His research interests include electronic cooling, two-phase flow, and boiling heat transfer.

*Wen-Shan Lin  
Bau-Shei Pei  
Chien-Hsiung Lee  
I. A. Mudawwar*

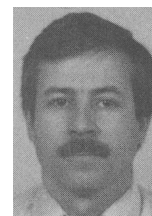
**APPLICATION OF REALISTIC THERMAL-HYDRAULIC METHODS FOR PRESSURIZED WATER REACTORS WITH UPPER PLENUM INJECTION**

**Thomas M. Parker** (top right) (MS, nuclear engineering, Iowa State University, 1971) is an engineer for Northern States Power Company. He has been involved in project management of U.S. Nuclear Regulatory Commission (NRC) Licensing Projects for pressurized water reactors (PWRs) and boiling water reactors. **Richard J. Kohrt** (top left) (MS, nuclear engineering, University of Wisconsin, Madison, 1980) is an engineer with Wisconsin Electric Power Company, which operates the Point Beach Nuclear Plant. He worked at Battelle-Pacific Northwest Laboratories before joining Wisconsin Electric in 1985. His current activities include loss-of-coolant-accident (LOCA) analysis and procurement of a training simulator. **Sue I. Dederer** (center right) (BS, mechanical engineering, Bucknell University, 1979) is an engineering consultant for the Department of Nuclear Safety of Westinghouse Electric Corporation, working in the area of LOCA analysis of PWRs using the WCOBRA/TRAC computer code. **Larry E. Hochreiter** (center left) (BS, mechanical engineering, University of Buffalo; MS and PhD, nuclear engineering, Purdue University) is a consulting engineer at Westinghouse and has been working in the area of thermal hydraulics, particularly light water reactor safety analysis. **Walter R. Schwarz** (bottom right) (BS, engineering science, Pennsylvania State University, 1978; MS, mechanical engineering, University of Pittsburgh, 1980) is a senior engineer at Westinghouse. His activities focus on developing new and improved thermal-hydraulic models for use in nuclear safety analyses of postulated LOCAs in PWRs. **Chon-Kwo Tsai** (bottom left) (BS, nuclear

*Thomas M. Parker  
Richard J. Kohrt  
Sue I. Dederer  
Larry E. Hochreiter  
Walter R. Schwarz  
Chon-Kwo Tsai  
Michael Y. Young*



engineering, National Tsing-Hua University of Taiwan, 1978; MS and PhD, nuclear engineering, Massachusetts Institute of Technology, 1985) is a senior engineer at Westinghouse and has been working on the LOCA margin improvement project (best-estimate approach). His current activities involve best-estimate uncertainty assessment and using best-estimate codes for nonnuclear applications. **Michael Y. Young** (right) (MS, mechanical engineering, Rensselaer Polytechnic Institute) is currently manager of the thermal-hydraulic applications group at Westinghouse.



TECHNIQUES

**COMPARISON OF GAMMA-RAY HEATING MEASUREMENTS USING THERMOLUMINESCENT DOSIMETERS WITH CALCULATIONS**

*Khalid A. Al-Hussan  
Tien-Ko Wang  
Mohamed A. Obeid*

**Khalid A. Al-Hussan** (top) (BSc, civil engineering, 1983, and MSc, nuclear engineering, 1987, King Saud University, Saudi Arabia) is a member of the research staff of the Institute of Atomic Energy Research, King Abdulaziz City for Science and Technology, Saudi Arabia. His interests are in nuclear and radiation safety. **Tien-Ko Wang** (center) (BS, nuclear engineering, 1975, and MS, nuclear science, 1977, National Tsing-Hua University, Taiwan; PhD, nuclear engineering, Purdue University, 1984) is the head of the Nuclear Reactor Division and an associate professor of the Department of Nuclear Engineering at the National Tsing-Hua University, Taiwan. His current research interests are in the areas of research reactor analysis, nuclear power plant severe accident analysis, and radiation safety. **Mohamed A. Obeid** (bottom) (BSc, electrical engineering, University of Alexandria, Egypt, 1959; MSc, 1965, and PhD, 1967, nuclear engineering, University of Virginia) worked as a senior engineer for the Babcock & Wilcox Company. Since 1968, he has been on the staff of the College of Engineering, King Saud University, Saudi Arabia. He was head of the General Sciences from 1977 to 1979, then head of the Department of Electrical Engineering from 1979 to 1983. He currently holds the position of professor. His broad interests lie in electrical power and nuclear engineering, including reactor control, safety, research and development, and energy planning.

