

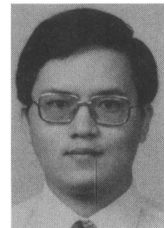
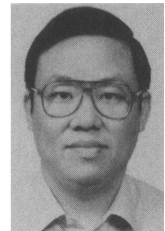
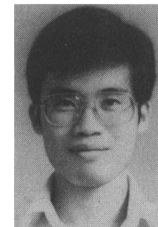
# AUTHORS — JANUARY 1989

## FISSION REACTORS

### POWER SIGNAL VALIDATION FOR TAIWAN RESEARCH REACTOR

**Chaung Lin** (top right) (PhD, nuclear engineering, University of California, Berkeley, 1983) is an associate professor in the nuclear engineering department at National Tsing-Hua University (NTHU), Taiwan. His research interests include optimal load-following operation, core design automation, and control and simulation of nuclear power plants. **Jen-Min Chen** (top left) (MS, nuclear engineering, NTHU, Taiwan, 1987) is an assistant research scientist at Chung-Sun Institute of Science and Technology in Taiwan. His current research interests are hydraulic control circuit design and simulation and identification of rocket launcher systems. **Shaw-Cuang Lee** (bottom right) (PhD, nuclear engineering, University of Michigan, 1984) is an associate research scientist in the nuclear engineering division of the Institute of Nuclear Energy Research (INER), Taiwan. His research interests include studies on two-phase flow instability and density wave oscillations, pressurized water reactor system modeling and simulation, optimal control and estimation, digital control, and related techniques. **Der-Jhy Shieh** (bottom left) (PhD, nuclear engineering, University of Tennessee, 1985) is presently head of the research reactor operation and maintenance center at INER. His areas of interest are nuclear reactor noise analysis, surveillance and diagnostics, and digital control.

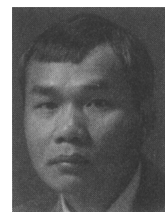
*Chaung Lin  
Jen-Min Chen  
Shaw-Cuang Lee  
Der-Jhy Shieh*



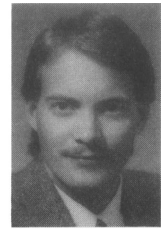
### PROBABILISTIC RISK ASSESSMENT BASED INSPECTION GUIDANCE FOR ARKANSAS NUCLEAR ONE UNIT 1

**Truong V. Vo** (right) (MS, nuclear engineering, University of Missouri-Rolla, 1984) is a senior research staff member of the Technology, Planning, and Analysis Center at Pacific Northwest Laboratory (PNL), operated by Battelle Memorial Institute. He worked at Argonne National Laboratory and Sargent & Lundy

*Truong V. Vo  
Michael S. Harris  
Bryan F. Gore*



Engineers before joining PNL. His research interests are in nuclear system reliability and risk analysis, nuclear probabilistic risk assessment (PRA) analysis, nuclear transient and accident analyses, and human factors. **Michael S. Harris** (top) (MS, nuclear engineering, University of Michigan, 1986) is a research engineer in the Technology Planning and Analysis Center at PNL. His principal research interests and activities are in the areas of PRA, systems safety and reliability analysis, and regulatory policy analysis. **Bryan F. Gore** (bottom) (PhD, physics, University of Michigan, 1967) is a senior research scientist in the nuclear systems and concept analysis department of PNL. He is PNL project manager for power plant inspections, and a U.S. Nuclear Regulatory Commission (NRC) certified reactor operator license examiner. He worked with the NRC senior resident inspector at Arkansas Nuclear One Unit 1 to perform the first PRA-based inspection there applying the information developed in this study. He performed the first application of generic PRA analysis to a U.S. power plant (Rancho Seco) and is also involved in the power plant safety analysis studies for the NRC.

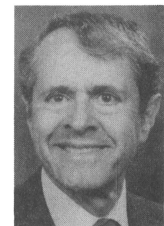


#### APPLICATIONS OF A PARALLEL PROCESSING MODULAR SIMULATION SYSTEM FOR DYNAMIC SIMULATION OF NUCLEAR POWER PLANTS

*Hsing Chien Yeh  
William E. Kastenberg  
Walter J. Karplus*



**Hsing Chien Yeh** (top) [MS, nuclear engineering, 1984, and PhD, engineering, 1987, University of California, Los Angeles (UCLA)] is a postdoctoral fellow in the Department of Mechanical, Aerospace, and Nuclear Engineering at UCLA. He is working on the exposure pathway and risk assessment for toxic waste. His interests include the application of array processors or multiprocessor computers in real time or fast simulation, special hardware and software development for high-speed scientific computation, application of fuzzy set theory in risk assessment methodology, nuclear reactor safety, and thermal-hydraulic analysis. **William E. Kastenberg** (center) (PhD, University of California, Berkeley, 1966) is a professor and former chair of the Department of Mechanical, Aerospace, and Nuclear Engineering at UCLA. His interests focus on reactor safety and risk assessment. **Walter J. Karplus** (bottom) (BS, electrical engineering, Cornell University, 1949; MS, electrical engineering, University of California, Berkeley, 1951; PhD, engineering, UCLA, 1955) is a professor and former chair of the UCLA Department of Computer Science. He is head of the Center for Experimental Computer Science and of the Simulation Laboratory.

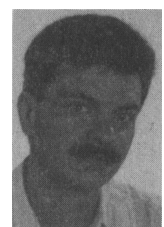


#### NUCLEAR SAFETY

#### THE REFLOODING PHASE AFTER A LOSS-OF-COOLANT ACCIDENT IN AN ADVANCED PRESSURIZED WATER REACTOR

*Marco Cigarini  
Mario Dalle Donne*

**Marco Cigarini** (right) [MS, nuclear engineering, Bologna University, Italy, 1982; PhD, Karlsruhe University, Federal Republic of Germany (FRG), 1987] has worked at Kernforschungszentrum Karlsruhe (KfK) since 1983. He is currently engaged in developing and verifying thermohydraulic computer programs applied



for safety analysis of light water reactors. **Mario Dalle Donne** (PhD, engineering science, Bologna University, Italy, 1956) worked from 1956 to 1959 at Agip Nucleare, Italy, and from 1959 to 1963 at the Dragon Project, England. Since 1963 he has worked in FRG at the KfK Institut für Neutronenphysik und Reaktortechnik. Since 1976 he has been a professor at Karlsruhe University. He has worked in the field of gas-cooled, water- and liquid-metal-cooled fission reactors and of blankets for fusion reactors. His main technical interests are thermohydraulics, safety, and reactor assessment.



### TESTING OF ELECTRIC MOTORS FOR MONITORING AGE-RELATED DEGRADATIONS

**Mano Subudhi** (top) [PhD, mechanical engineering, Polytechnic Institute of New York (PINY), 1974] is a scientist at Brookhaven National Laboratory (BNL). For the last 12 years, he has worked on nuclear safety research in the areas of structural analysis and nuclear plant aging of components and systems. **John H. Taylor** (photo not available) (MS, nuclear engineering, PINY) is a senior research engineer and group leader at BNL. His interests are aging, life extension, and risk assessment application. **Marvin Sheets** (bottom) (MS, electrical engineering, Stanford University) retired from General Electric Company after 37 years in motor design and testing for the nuclear industry. He is currently a consulting engineer with NUTECH Engineers.

*Mano Subudhi  
John H. Taylor  
Marvin Sheets*

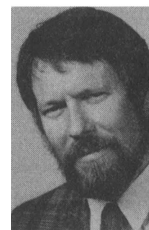


## NUCLEAR FUELS

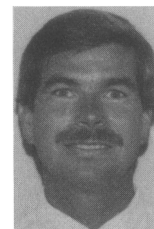
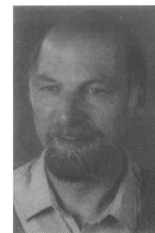
### THE PERFORMANCE OF HIGH-TEMPERATURE REACTOR FUEL PARTICLES AT EXTREME TEMPERATURES

**Heinz Nabielek** (top) (PhD, physics, University of Vienna, Austria) started his scientific career in nuclear physics and electronics at the Austrian research center Seibersdorf. In the 1970s, he experimented with coated particle fuel for high-temperature reactors (HTRs) as a staff member of the international Dragon Project in the United Kingdom. Currently at Kernforschungsanlage (KFA) Jülich, he is developing spherical fuel elements for pebble-bed reactors and is experimenting with the Arbeitsgemeinschaft Versuchsreaktor. He is also active in fuel performance modeling. **Werner Schenk** (center) [Dr. Ing., nuclear engineering, University of Aachen, Federal Republic of Germany (FRG), 1978] has been employed by KFA Jülich at the Division of Hot Cell Laboratories since 1964, where he was engaged in the development of hot laboratory facilities and postirradiation examinations of experimental fuel for HTRs. Currently, he is responsible for accident simulation testing with HTR fuel, postirradiation annealing examinations, particularly at very high temperatures. **Werner Heit** (bottom) (Dr. rer. nat., physical chemistry, University of Saarbrücken, FRG, 1972) joined Nukem in 1972. He is head of the production department for HTR fuel elements at Nukem. His current interests focus mainly on the development

*Heinz Nabielek  
Werner Schenk  
Werner Heit  
Alfred-Wilhelm Mehner  
Daniel T. Goodin*



of procedures and components for the HTR fuel element fabrication. **Alfred-Wilhelm Mehner** (top) (Dr. rer. nat., physics, Max-Planck-Institute for Chemistry, Mainz, FRG, 1971) is working for the Nukem research and development programs in HTR fuel cycles. During a 12-year assignment at KFA Jülich, he was responsible for the qualification of coated fuel particles and spherical fuel elements by irradiation testing. Currently, he is involved in fuel element development for advanced HTRs and the pertinent quality assurance programs. **Daniel T. Goodin** (bottom) (MS, radiochemistry, University of Kentucky, 1980) is a staff scientist at General Atomics. His work activities have been in the area of high-temperature gas-cooled reactor (HTGR) safety. His current interests are materials performance modeling, fission product release, and tritium behavior, especially under very high temperature conditions. In 1985, he was a visiting scientist at KFA Jülich, where he was involved with analysis of HTGR fuel performance testing data. In 1987, he was assigned to Oak Ridge National Laboratory where he participated in the drafting of a technology development plan for the HTGR.

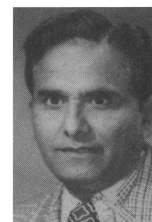


## RADIOACTIVE WASTE MANAGEMENT

### COLLOID FORMATION STUDY OF U, Th, Ra, Pb, Po, Sr, Rb, AND Cs IN BRINY (HIGH IONIC STRENGTH) GROUNDWATERS: ANALOG STUDY FOR WASTE DISPOSAL

**Tapas C. Maiti** (top) (PhD, soil and water chemistry, Calcutta, India; MS, hydrogeochemistry, University of San Francisco, 1983) is a postdoctoral fellow at Battelle Pacific Northwest Laboratory (PNL). His expertise is in the area of physical and analytical chemistry of radionuclides and trace elements in the environment. **Monty R. Smith** (center) (PhD, nuclear chemistry, Oregon State University) is a senior research scientist at PNL. His experience is in natural radionuclides, development of analytical procedures, and inductively coupled plasma-mass spectrometry. **Jagdish C. Laul** (bottom) (PhD, radiogeochemistry, Purdue University, 1971) is a staff scientist at PNL. His expertise is in geocosmochemistry, neutron activation analysis, natural radionuclides, and nuclear waste areas.

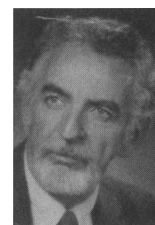
*Tapas C. Maiti  
Monty R. Smith  
Jagdish C. Laul*



### INCONSISTENCIES IN THERMODYNAMIC ANALYSES OF LONG-TERM ISOLATION OF HIGH-LEVEL WASTE

**Donald G. Schweitzer** (PhD, chemistry, Syracuse University, 1955) is the head of the U.S. Department of Energy (DOE) Radioactive Waste Division at Brookhaven National Laboratory. From 1974 to 1980, he was the head of the U.S. Nuclear Regulatory Commission High-Level Waste Division. He is the associate chairman of the Department of Nuclear Energy and has published works on the equilibrium aspects of hysteretic properties in phase transitions, superconductivity, elastic membranes, and on thermodynamic stability and instability in metals. He is responsible for the program evaluating the DOE waste package efforts.

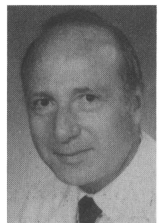
*Donald G. Schweitzer*



**A NEUTRONIC STUDY OF AN ACCELERATOR-BASED NEUTRON IRRADIATION FACILITY FOR BORON NEUTRON CAPTURE THERAPY**

*C.-K. Chris Wang  
Thomas E. Blue  
Reinhard Gahbauer*

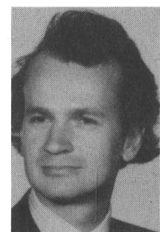
**C.-K. Chris Wang** (top) (BS, nuclear engineering, National Tsing-Hua University, Taiwan, 1976; MS, nuclear engineering, Tuskegee Institute, 1978) is currently a PhD candidate at the Ohio State University (OSU). He has worked 6 years in the nuclear industry, specifically in the area of computational and measuring techniques of radiation. His current research interests are in the area of medical use of radiation. **Thomas E. Blue** (center) (PhD, nuclear engineering, University of Michigan, 1978) is an assistant professor of nuclear and mechanical engineering at OSU. His present research interests include radiation interaction, transport, and measurement in biology and medicine and, especially, fast neutron radiation therapy and boron neutron capture therapy (BNCT), using solid-state nuclear track detectors and automatic image analysis. **Reinhard Gahbauer** (bottom) [Ludwig Maximilian University, Federal Republic of Germany (FRG), 1969; MD, Technische Hochschule, FRG, 1970] was clinical director of the CCF National Aeronautics and Space Administration neutron treatment program after postgraduate training in Augsburg and Vancouver. Since 1985, he has been director of the Division of Radiation Oncology at OSU. Brain tumors are an area of particular interest. He is actively participating in the OSU-Brookhaven National Laboratory BNCT research program.



**EXPERIENCE WITH THE ON-LINE CORE MASTER MONITORING AND PREDICTING SYSTEM AT KERNKRAFTWERK LEIBSTADT**

*Charles Jacquemart  
Mabruk Methnani  
Juan Jaliff  
Sigurd Børresen*

**Charles Jacquemart** (top right) (Dr. sc. nat., nuclear physics, Swiss Federal Institute of Technology, Zurich, 1981) is currently with the Fuel Department of Elektrizitäts-Gesellschaft Laufenburg and works for the nuclear power plant of Leibstadt, Switzerland. His interests include core simulation, core supervision, and in-core fuel management (ICFM). **Mabruk M. Methnani** (top left) (PhD, nuclear engineering, University of Michigan, 1983) is currently with the Reactor Division of ABB-Atom. His interests include core supervision systems, ICFM, and transient analysis. **Juan O. Jaliff** (bottom right) (MS, nuclear engineering, Inst. Balseiro, C.A. Bariloche, Argentina, 1981) is manager of the ICFM Systems Section within TeknikData, ABB-Atom. His thesis addressed lattice physics, and his current interests are computer applications for core supervision and design, improvement of plant capacity factors, and support for engineering tasks. **Sigurd Børresen** (bottom left) (Cand. Real degree, physics, University of Oslo, 1962) is manager of Scandpower's Division for Nuclear and Petroleum Computational Services. His responsibilities include methods and code development as well as marketing and consulting to nuclear utilities. His more than 20 years of experience in nuclear research and consulting includes the



development of methods for the Scandpower FMS code package, in particular, the three-dimensional nodal simulation program PRESTO.

### APPLICATION OF MAGNETIC RESONANCE IMAGING TO VISUALIZATION OF FLOW IN POROUS MEDIA

**Adolfas K. Gaigalas** (top right) (PhD, physics, Carnegie-Mellon University, 1967) is a physicist at the National Bureau of Standards (NBS), where he has worked since 1979. His research interest is the dynamic behavior of multiphase systems. **Ann Chidester Van Orden** (top left) (PhD, engineering materials, University of Maryland, 1988) is a metallurgist at NBS, where she has worked since 1979. Her current research involves archaeological analogues and biological corrosion of nuclear waste containers. **Baldwin Robertson** (center right) (PhD, physics, Stanford University, 1965) is a chemical engineer at NBS, where he has worked since 1966. His current interests include mass transport in porous media. **Thomas H. Mareci** (bottom left) (D. Phil., physical chemistry, Oxford University, England, 1982) is an associate professor in the Department of Radiology and an affiliate associate professor in the Department of Physics at the University of Florida. His research interests involve the development of methods and applications of nuclear magnetic resonance (NMR) imaging and spectroscopy. **Lori A. Lewis** (bottom right) (BS, physics, Eckerd College, 1985) is a graduate research assistant working toward her PhD at the University of Florida's Department of Physics. Her current research interests are localized NMR spectroscopy and the application of NMR imaging and spectroscopy to the study of arterial plaques.

*Adolfas K. Gaigalas  
Ann Chidester Van Orden  
Baldwin Robertson  
Thomas H. Mareci  
Lori A. Lewis*

