



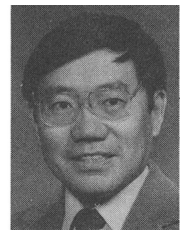
## AUTHORS — MARCH 1987

### FISSION REACTORS

#### FINITE ELEMENT ANALYSIS OF BOILING WATER REACTOR FUEL CHANNEL BULGE AND BOW

**David P. Chan** (top) (BS, mechanical engineering, University of Colorado, 1964; MSE, mechanical engineering, University of Michigan, 1965; PhD, EM, Case Institute of Technology, 1971) has worked for General Atomic on high-temperature gas-cooled reactor internals, and for Westinghouse Hanford on liquid-metal fast breeder reactor fuel. He currently works for Washington Public Power Supply System as principal engineer on boiling water reactor fuel and safety. **David L. Larkin** (BA, physics, Northwest Nazarene College, 1965; MS, nuclear engineering, University of Washington, 1977) has worked at Washington Public Power Supply System since 1973 and is currently manager of engineering analysis and nuclear fuel. His principal interests include fuel management, spent fuel disposal, and the behavior of core components in reactor environments.

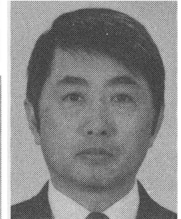
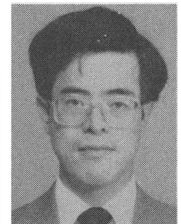
*David P. Chan  
David L. Larkin*



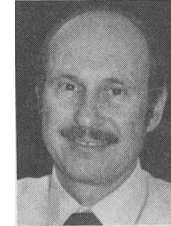
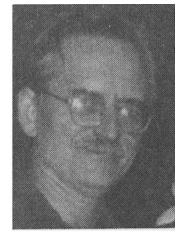
#### AN ANALYSIS OF INITIATING AND TRANSITION PHASES FOR AN UNPROTECTED LOSS-OF-FLOW ACCIDENT IN AN AXIALLY HETEROGENEOUS FAST BREEDER REACTOR CORE

**Kazuo Azekura** (top right) (MS, nuclear engineering, Osaka University, Japan, 1973) is a research staff member at the Energy Research Laboratory (ERL), Hitachi, Ltd., Japan. His research interests include the areas of reactor physics and hypothetical core disruptive accident (HCDA) analysis of fast breeder reactors. **Kikuo Umegaki** (top left) (BE, nuclear engineering, Hokkaido University, Japan, 1977) is a research staff member at the ERL. His research interests include reactor physics and fluid mechanics. **Kotaro Inoue** (bottom right) (BE, mechanical engineering, University of Tokyo, Japan, 1964; PhD, nuclear engineering, 1976) has been engaged in reactor physics, thermal hydraulics and safety analysis, systems design, solar energy development, and fusion systems research. He is currently a department manager at the ERL. **Sang K. Rhow** (bottom left) (PhD,

*Kazuo Azekura  
Kikuo Umegaki  
Kotaro Inoue  
Sang K. Rhow  
James E. McElroy  
Dennis M. Switick*



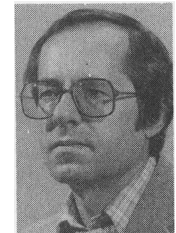
Columbia University, New York, 1973) is a principal engineer at General Electric Company (GE). His interests lie in systems analysis and design, thermal hydraulics, and safety. **James E. McElroy** (top) (PhD, Carnegie Institute of Technology, Pittsburgh, 1964) is a senior engineer at GE's Medical Systems Group. Currently he is working on the development of nuclear magnetic resonance instrumentation technology. **Dennis M. Switick** (bottom) (MS, aerospace engineering, State University of New York at Buffalo, 1960) is a principal engineer at GE's Nuclear Systems Technology Operation. His interests have been in the evaluation of HCDA consequences, including the formulation and interpretation of safety experiments. He was a major contributor to the successful licensing of the Clinch River Breeder Reactor in this technical area. He is currently performing systems analysis focused on improving the inherently safe response of liquid-metal reactors to accidents.



### LIQUID-METAL FAST BREEDER REACTOR INTERMEDIATE HEAT EXCHANGER TRANSIENT MODELING FOR FASTER THAN REAL-TIME ANALYSIS

*Constantine P. Tzanos*

**Constantine P. Tzanos** [Dipl., chemical engineering, National Technical University of Athens, Greece, 1968; ScD, nuclear engineering, Massachusetts Institute of Technology, 1971] is manager of the Operational Safety Section of the Reactor Analysis and Safety Division at Argonne National Laboratory. His current research activities involve development of methods for on-line data validation, system state verification, and fault identification as well as development of system models that run faster than real time for the implementation of these methods.



### DEVELOPMENT OF A POSTSCRAM ANALYZER FOR BOILING WATER REACTORS

*Bill K.-H. Sun  
Robert Colley  
David G. Cain  
John W. Hallam*

**Bill K.-H. Sun** (top) (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 then becoming a technical leader. He joined Electric Power Research Institute (EPRI), Nuclear Power Division, in 1977 as a project manager and is currently a program manager responsible for control and diagnostics. **Robert Colley** (center) (BS, New York University; MS, nuclear engineering, University of Wisconsin, 1976) joined EPRI in 1984. He has worked on the planning and development of computer software for simulation, diagnosis, and control of nuclear power plant processors. He is presently working in the areas of interactive graphic simulations, noise analysis, power plant activities modeling, computer communications, and automated reasoning applications. **David G. Cain** (bottom) (PhD, electrical engineering, University of Washington, 1971) has been working in computer systems applications to nuclear power plants since joining EPRI in 1974. His recent activities have been directed toward information processing systems for real-time analysis of plant process systems, computerized decision aids, and automated reasoning software tools development. He is currently a program



manager in the control and diagnostics subprogram of the Nuclear Power Division. **John W. Hallam** (right) (BS, physics, Imperial College, 1969; MS, nuclear physics, McMaster University, Ontario, Canada, 1961) has 26 years of experience in the nuclear industry. He has worked in the areas of research and development, nuclear methods, process computers, mini- and microcomputer applications, and core and fuel analysis. He is currently an independent consultant to the nuclear and computer industry.

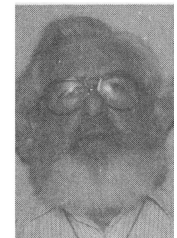
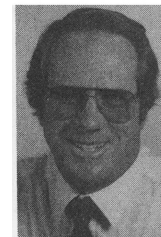
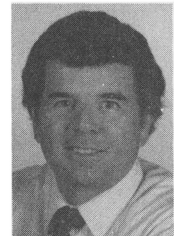
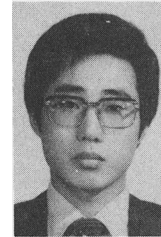
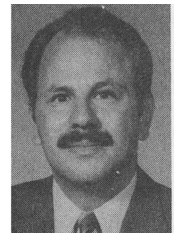


NUCLEAR SAFETY

**EXPERIMENTAL STUDIES OF THE AIR COOLABILITY OF TRIGA REACTORS FOLLOWING A LOSS-OF-COOLANT ACCIDENT**

**Mohamed S. El-Genk** (top right) is associate professor of chemical and nuclear engineering and director of the Institute for Space Nuclear Power Studies at the University of New Mexico (UNM). He has produced numerous technical articles and reports in the areas of heat transfer with change in phase, nuclear reactor safety, thermal hydraulics, nuclear fuel behavior, and modeling and analysis of space nuclear power systems. **Sung-Ho Kim** (top left) (BS, Hanyang University, Korea, 1981; MS, nuclear engineering, UNM, 1984) is a PhD candidate at the UNM. His interests and activities are in postaccident nuclear reactor safety, critical heat flux, and heat transfer in single- and two-phase flows. **Galal M. Zaki** (photo not available) is professor of nuclear engineering at King Abdul-Aziz University in Saudi Arabia. Before joining King Abdul-Aziz University, he was a research professor in the Department of Chemical and Nuclear Engineering at UNM. His research interests include nuclear reactor thermal hydraulics, utilization of solar energy, desalination of seawater, two-phase flow measurement, and general transport phenomena. **Jeffrey S. Philbin** (center right) (PhD, University of Illinois, 1970) is a nuclear engineer at Sandia National Laboratories (SNL). He has previously specialized in research reactor design, safety analysis, and neutron transport calculations supporting reactor safety experiments. His current interests are safeguards research and economic risk modeling. **James F. Schulze** (bottom left) (BS, electromechanical engineering, UNM, 1973) is an engineer at SNL. He is currently designing an external, fueling, experimental exposure cavity for SNL's Annular Core Research Reactor. **Fabian C. Foushée** (bottom right) (BA, physics, San Diego State University, 1951) has worked at GA Technologies, Inc., since 1960. He works in the TRIGA Reactor Division in the design of nuclear research reactors.

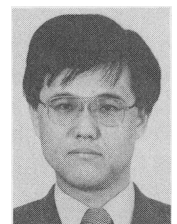
*Mohamed S. El-Genk  
Sung-Ho Kim  
Galal M. Zaki  
Jeffrey S. Philbin  
James F. Schulze  
Fabian C. Foushée*



**A PROBABILISTIC ANALYSIS METHOD TO EVALUATE THE EFFECT OF HUMAN FACTORS ON PLANT SAFETY**

**Hiroshi Ujita** (BS, nuclear engineering, Kyushu University, Japan, 1974) is a researcher at Energy Research Laboratory, Hitachi, Ltd. He is currently working on the reliability analysis method. His interests include the effects of human factors and cognitive engineering.

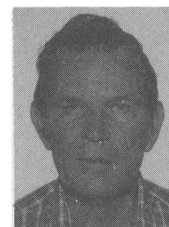
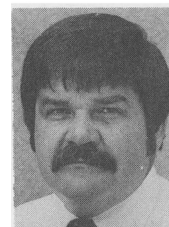
*Hiroshi Ujita*



## A COMPARISON OF MEASURED RADIONUCLIDE RELEASE RATES FROM THREE MILE ISLAND UNIT-2 CORE DEBRIS FOR DIFFERENT OXYGEN CHEMICAL POTENTIALS

**V. F. Baston** (top) (BS, engineering-chemical option, 1960, and PhD, physical chemistry, 1965, University of Wyoming; post-doctoral, physical chemistry, University of Texas at Austin) is head and corporate officer of Physical Sciences Incorporated, an engineering consulting firm with headquarters in Sun Valley, Idaho. Consulting responsibilities include analytical model development and engineering evaluations involving process chemistry and engineering operations. Professional experience includes being an analyst for engineering test programs, a director for an analytical laboratory and pilot plant, and a part-time instructor. **K. J. Hofstetter** (center) (AB, Augustana College, 1962; PhD, nuclear chemistry, Purdue University, 1967) is the supervisor of radiochemical engineering for GPU Nuclear Corporation at Three Mile Island (TMI). It is his responsibility to direct liquid radwaste processing and radiochemical analyses for Unit-2 recovery operations. He previously worked at Allied General Nuclear Services as a radiochemistry supervisor developing nondestructive assay techniques. **Robert F. Ryan** (bottom) (BS, marine engineering, New York State Maritime College, 1950; MS, mechanical engineering, New York University) is an advisory engineer for Babcock & Wilcox (B&W) assigned to GPU Nuclear Corporation at TMI. He provides engineering and technical advice and information to assist in the defueling of TMI-2. He has been in the nuclear engineering department of B&W serving in various technical and managerial positions for over 30 years.

*V. F. Baston*  
*K. J. Hofstetter*  
*Robert F. Ryan*

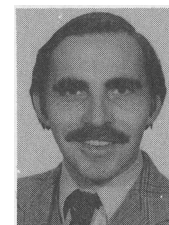


## FUEL CYCLES

### CANDU PRESSURIZED HEAVY WATER REACTOR THORIUM-<sup>233</sup>U OXIDE FUEL EVALUATION BASED ON OPTIMAL FUEL MANAGEMENT

**Hugues W. Bonin** (BA, Collège de Saint-Laurent, Quebec, Canada; BSc, physics, Université de Montréal, Canada; BScA and engineering degree, engineering physics, Ecole Polytechnique, Montréal, Canada; MEng, nuclear engineering, Ecole Polytechnique; PhD, nuclear engineering, Purdue University, 1983) is currently an assistant professor of nuclear engineering at Royal Military College of Canada. His present research interests are in optimal fuel management and optimal design of fuel bundles for thorium-fueled CANDU nuclear reactors and in neutron radiography with SLOWPOKE-2 research reactors.

*Hugues W. Bonin*

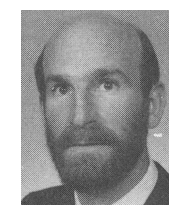


## CHEMICAL PROCESSING

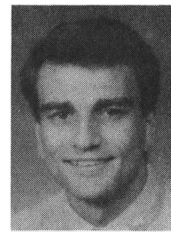
### GAMMA RADIATION EFFECTS ON TIME-DEPENDENT IODINE PARTITIONING

**Paul W. Marshall** (right) (BS, physics, James Madison University, 1980; MS, Medical College of Virginia-Virginia Commonwealth University, 1982; PhD, nuclear engineering, University of Virginia, 1985) is employed as a research physicist by Sochs/

*Paul W. Marshall*  
*Jeffrey B. Lutz*  
*James L. Kelly*



Freeman Associates, Inc., Landover, Maryland. **Jeffrey B. Lutz** (top) (BS, engineering physics, Grove City College, 1983) is working toward a PhD degree in engineering physics at the University of Virginia. **James L. Kelly** (bottom) (BS, chemical engineering, Tulane, 1954; MS, 1960, and PhD, 1962, chemical engineering, Louisiana State University) is a professor of nuclear engineering at the University of Virginia. His research interests deal with iodine chemistry and radiation-enhanced corrosion.

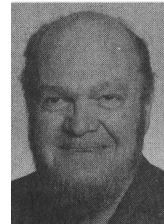
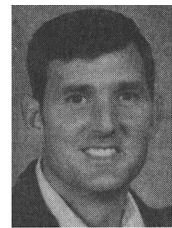


## MATERIALS

### RADIOGRAPHY EXPERIMENTS AT ARGONNE NATIONAL LABORATORY

**Wade J. Richards** (top) (BA, physics, California State University-Hayward; MS, physics, California State University-San Francisco) has over 15 years' working experience in the field of neutron radiography. His present position involves design and operation of an advanced state-of-the-art neutron radiography system for aircraft inspection with McClellan Air Force Base. **Howard A. Larson** (PhD, nuclear engineering, University of Washington, 1970) has worked in the application of reactor analysis at Argonne National Laboratory's Experimental Breeder Reactor-II and has recently joined the faculty at Idaho State University College of Engineering. His current interest is the application of liquid-metal fast breeder reactor system simulation codes.

*Wade J. Richards  
Howard A. Larson*



## FISSION REACTORS

### TOTAL CONTROL WORTH BY INSPECTION

**Charles R. Marotta** (BS, physics, St. John's University, 1950) attended New York University from 1950 to 1955 for graduate studies in physics and mathematics. He developed one of the first multigroup diffusion digital computer programs for use with the nuclear powered aircraft projects of the early 1950's. His work and interests have been in the area of reactor theory and design, neutron, and gamma transport and Monte Carlo theory and associated problems in mathematical physics. At present, he is a senior member of the Transportation Branch of the U.S. Nuclear Regulatory Commission.

*Charles R. Marotta*

