



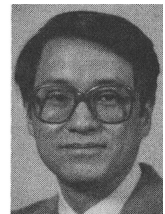
## AUTHORS — FEBRUARY 1987

### FUEL CYCLES

#### **DETERMINATION OF ISOTOPIC RATIOS FROM FUEL BURNUP**

*John C. Lee  
Sin Tao Hsue*

**John C. Lee** (top) (BS, Seoul National University, South Korea, 1963; PhD, nuclear engineering, University of California, Berkeley, 1969) is a professor of nuclear engineering at the University of Michigan. His research interests include nuclear reactor physics, core design analysis, and power plant simulation and control. **Sin Tao Hsue** (PhD, experimental nuclear physics, Indiana University, 1967; MS, nuclear engineering, University of Michigan, 1976) is a project leader in the Energy Division of the Los Alamos National Laboratory. His current interests are in nondestructive assays of special nuclear materials and safeguards.

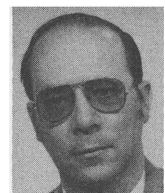
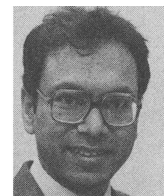


### NUCLEAR FUELS

#### **ELOCA-A: A CODE FOR RADIAL AND AXIAL BEHAVIOR OF CANDU FUEL ELEMENTS AT HIGH TEMPERATURES**

*Mukesh Tayal  
Ed Mischkot  
Harve E. Sills  
A. W. L. Segel*

**Mukesh Tayal** (top right) (B. Tech, Indian Institute of Technology, Kanpur, India, 1970; M.Sc., mechanical engineering, University of Saskatchewan, Canada, 1972) is an engineer at Atomic Energy of Canada Limited (AECL). His areas of interest include fuel performance during normal and accident conditions, fuel design, stress analyses, and heat transfer. **Ed Mischkot** (top left) (computer science technology degree, Sheridan College, Canada, 1980) is an engineering technologist at AECL. His experience includes development and use of computer programs in areas of reactor physics, nuclear fuel, and reactor control. **Harve E. Sills** (bottom right) (BSc, Queen's University, Canada, 1964) is head of fuel performance modeling at Chalk River Nuclear Laboratories. His interests include fuel performance during normal operation and upset conditions, application of expert system technology, and advanced fuels. **A. W. L. Segel** (bottom left)



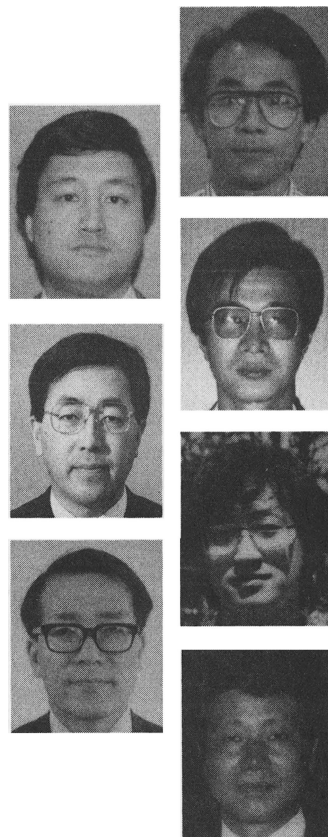
(BA Sc., engineering physics, and MA, physics, University of Toronto, Canada) is project manager at AECL. He was previously program supervisor for fuel performance at high temperatures.

RADIOACTIVE WASTE  
MANAGEMENT

**PROPERTIES OF BENTONITE CLAY AS BUFFER MATERIAL IN HIGH-LEVEL WASTE GEOLOGICAL DISPOSAL. PART I: CHEMICAL SPECIES CONTAINED IN BENTONITE**

**Masanori Takahashi** (top right) (BS, 1981, and MS, 1983, nuclear engineering, University of Tokyo, Japan). **Masayuki Muroi** (top left) (MS, material science, University of Electrocommunication, Japan, 1975) is a senior researcher at Industrial Research Institute, Japan. His interests are in stress corrosion cracking of stainless steel and nuclear waste disposal. He is presently working on the migration of transuranic elements in buffer material. **Atsuyuki Inoue** (second from top right) (PhD, mineralogy, University of Tokyo, Japan, 1980) is a research assistant at Chiba University. His interests and activities are in clay mineralogy and clay geochemistry. **Masahiro Aoki** (center left) (PhD, University of Tokyo, Japan, 1977) is a senior mineralogist at the Geological Survey of Japan. His interests are in mineralogy and geochemistry of zeolites and clays. He is working on the radioactive waste disposal problem from the viewpoint of water/rock interaction. **Makoto Takizawa** (third from top right) (BS, 1983, and MS, 1985, nuclear engineering, University of Tokyo, Japan). **Kenkichi Ishigure** (bottom left) (PhD, applied chemistry, University of Tokyo, Japan, 1967) is a professor in the Department of Nuclear Engineering, University of Tokyo. His major interests are in water chemistry of nuclear reactor systems, chemistry of fission products and actinides, and application of radiation chemistry. **Norihiko Fujita** (bottom right) (PhD, nuclear engineering, University of Tokyo, Japan, 1974) is general manager of Industrial Research Institute. He works in the area of corrosion of reactor materials and is interested either in reducing occupational exposure or in properly maintaining a reactor.

*Masanori Takahashi  
Masayuki Muroi  
Atsuyuki Inoue  
Masahiro Aoki  
Makoto Takizawa  
Kenkichi Ishigure  
Norihiko Fujita*

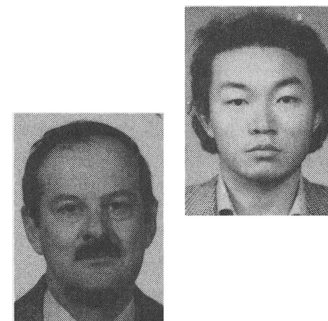


HEAT TRANSFER  
AND FLUID FLOW

**AN EXPERIMENTAL CORRELATION OF CROSS-FLOW PRESSURE DROP FOR TRIANGULAR ARRAY WIRE-WRAPPED ROD ASSEMBLIES**

**Kune Yull Suh** (top) [MS, Massachusetts Institute of Technology (MIT), 1985] is currently a PhD candidate in nuclear engineering at MIT. He worked from 1979 to 1981 as a reactor engineer at the Korea Atomic Energy Research Institute on thermal-hydraulic safety analysis of pressurized water reactors. **Neil E. Todreas** (ScD, MIT, 1966) is a professor and the head of the Department of Nuclear Engineering at MIT. His interests lie in thermal-hydraulic analysis for reactor design and safety.

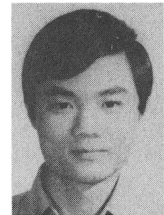
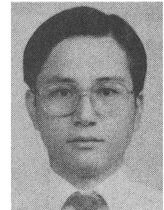
*Kune Yull Suh  
Neil E. Todreas*



### IN VIVO MEASUREMENT OF ORGAN MERCURY BY PROMPT GAMMA ACTIVATION ANALYSIS USING A MOBILE NUCLEAR REACTOR

**Pao-Shu Chang** (top right) [BE, nuclear engineering, 1977, and MS, health physics, 1979, National Tsing Hua University (NTHU), Taiwan; PhD, medical science, Kaohsiung Medical College (KMC), Taiwan, 1986] has worked on the technical staff at the Taiwan Radiation Monitoring Station and has lectured at KMC. He is an associate professor at KMC. His research interests include medical science, health physics, and nuclear applications. **Yau-Hui Ho** (top left) (MD, National Taiwan University, 1951) was a resident at the National Taiwan University Hospital and a lecturer at National Taiwan University. He is a professor and chairman of the Department of Radiology at KMC. His research interests include Wilson's disease, nasopharyngeal cancer, CT diagnosis and radiotherapy, primary secondary liver cancers, and skeletal metastases in malignancies. **Chien Chung** (center right) (PhD, nuclear chemistry, McGill University, Canada, 1980) is a professor at the Institute of Nuclear Science, NTHU. He has worked on fission reaction in Canada and on fission product properties at Brookhaven National Laboratory. He is currently working in the fields of nuclear medicine, nuclear chemistry, nuclear instrumentation, and nuclear engineering. **Liq-Ji Yuan** (bottom left) (MS, nuclear engineering, Texas A&M University, 1969) is an associate professor at NTHU. His primary research interests are in experimental reactor physics, nuclear applications, and health physics. **Pao-Shan Weng** (bottom right) (PhD, nuclear engineering, Texas A&M University, 1966) is a professor at NTHU. His primary research interests are in health physics and nuclear applications.

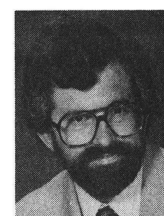
*Pao-Shu Chang  
Yau-Hui Ho  
Chien Chung  
Liq-Ji Yuan  
Pao-Shan Weng*



### SIMULATION OF THE TRANSIENT RESPONSE OF IONIZATION CHAMBERS TO BIAS VOLTAGE PERTURBATIONS

**Tunc Aldemir** (top) (BS, mathematical physics, Istanbul University, Turkey, 1971; MS, 1975, and PhD, 1978, nuclear engineering, University of Illinois) is an assistant professor of nuclear and mechanical engineering at Ohio State University. He worked on the probabilistic safety assessment of boiling water reactors at the Cekmece Nuclear Research Center, Istanbul, from 1980 to 1983. His current research interests are numerical methods, probabilistic analysis of dynamic systems, optimal maintenance scheduling, and in-core fuel management. **Steven A. Arndt** (center) (BS, engineering physics, 1981, and MS, nuclear engineering, 1981, Ohio State University) is presently associated with Battelle Memorial Institute. His primary areas of interest are nuclear instrumentation, measurement, control, and reactor noise analysis. **Don W. Miller** (bottom) (BS, physics, Miami University, 1964; PhD, nuclear engineering, Ohio State University, 1971) is a professor and chairman of the nuclear engineering department at Ohio State University. His primary areas of interest are nuclear instrumentation, measurement, control, and applications of artificial intelligence in engineering.

*Tunc Aldemir  
Steven A. Arndt  
Don W. Miller*

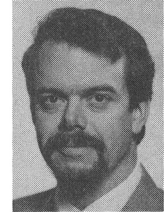


# PERFORMANCE OF BOROSILICATE GLASS HIGH-LEVEL WASTE FORMS IN DISPOSAL SYSTEMS

## THE FORMATION OF SURFACE LAYERS AND REACTION PRODUCTS IN THE LEACHING OF DEFENSE BOROSILICATE NUCLEAR WASTE GLASS

*Alan B. Harker  
John F. Flintoff*

**Alan B. Harker** (top) (BA, Oberlin College, 1968; PhD, physical chemistry, University of California, Berkeley, 1968) is manager of the Department of Applied Spectroscopy at the Rockwell International Science Center. His current work is in the characterization of the chemical and spectroscopic properties of ceramics and dielectric thin film materials and the development of energetic beam thin film deposition techniques. **John F. Flintoff** (LRIC, Royal Institute of Chemistry, London, England, 1969) is a senior research specialist at Rockwell International Science Center. Before joining Rockwell in 1979 he worked as a senior research chemist at the Davy McKee Research Facility, Stockton, England.



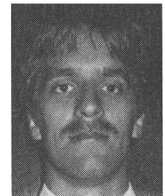
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## FOURTH INTERNATIONAL RETRAN MEETING

### A GUILLOTINE TUBE RUPTURE MODELING TECHNIQUE USING RETRAN-02

*Peter J. Jensen  
James F. Lang  
Jason Chao*

**Peter J. Jensen** (top) (BS, 1982, and MS, 1984, nuclear engineering, Oregon State University) has participated in the development of RETRAN and has performed a variety of thermal-hydraulic analyses using RETRAN. He is currently a program manager of RETRAN development applications at Energy Incorporated. **James F. Lang** (center) is manager of steam generator integrity and containment integrity issues in the Nuclear Safety Analysis Center at the Electric Power Research Institute (EPRI). He joined EPRI in 1979 as manager of the Steam Generator Thermal Hydraulic, Structural and Safety Program in the EPRI Steam Generator Project Office, moving to his current position in 1982. Previously he spent 9 years with the U.S. Navy's Nuclear Power Directorate. For 2 years he served as director of the Reactor Plant Valve Division. Prior to that he held various positions involving design and maintenance of steam generators and other primary components. He began his work in the nuclear field in 1968 as a physicist with the Phillips Petroleum Company and Idaho Nuclear Corporation. **Jason Chao** (bottom) [MA, physics, University of Texas-Austin, 1974; PhD, nuclear engineering, Massachusetts Institute of Technology (MIT), 1979] is presently a project manager at EPRI. He has participated in plant analyses related to pressurized thermal shock, steam generator tube rupture, anticipated transients without scram, and scram reduction issues at EPRI. His past experience includes design studies of reduced enrichment fuel for research reactors at Science Applications, Inc., for Argonne National Laboratory; a design study of tokamak fusion reactor

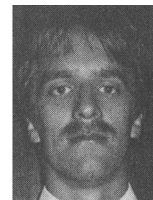


blanket at MIT; and experimental investigations on nuclear structure of krypton isotopes with a Van de Graaff Accelerator at the University of Texas-Austin. He is a registered professional engineer in mechanical engineering in the state of California.

### **A PARAMETRIC STUDY OF AN ANTICIPATED TRANSIENT WITHOUT SCRAM IN A WESTINGHOUSE FOUR-LOOP PLANT**

**Peter J. Jensen** (top) (BS, 1982, and MS, 1984, nuclear engineering, Oregon State University) has participated in the development of RETRAN and has performed a variety of thermal-hydraulic analyses using RETRAN. He is currently a program manager of RETRAN development applications at Energy Incorporated. **Kent D. Richert** (center) (BS, physics, University of Kansas, 1959; MA, mathematics, University of Kansas, 1962) has worked in the thermal-hydraulic analysis of nuclear reactors for 21 years. He has participated in the development of various safety analysis codes including RELAP4 and RETRAN, and has lectured in reactor safety analysis seminars in the United States, Europe, and Brazil. He is currently developing real-time software for nuclear plant process computer systems. **Jason Chao** (bottom) [MA, physics, University of Texas-Austin, 1974; PhD, nuclear engineering, Massachusetts Institute of Technology (MIT), 1979] is presently a project manager at the Electric Power Research Institute (EPRI). He has participated in plant analyses related to pressurized thermal shock, steam generator tube rupture, anticipated transients without scram, and scram reduction issues at EPRI. His past experience includes design studies of reduced enrichment fuel for research reactors at Science Applications, Inc., for Argonne National Laboratory; a design study of tokamak fusion reactor blanket at MIT; and experimental investigations on nuclear structure of krypton isotopes with a Van de Graaff accelerator at the University of Texas-Austin. He is a registered professional engineer in mechanical engineering in the state of California.

*Peter J. Jensen  
Kent D. Richert  
Jason Chao*



## FISSION REACTORS

### **MODERATOR FEEDBACK EFFECTS IN TWO-DIMENSIONAL NODAL METHODS FOR PRESSURIZED WATER REACTOR ANALYSIS**

**Thomas J. Downar** (BS, U.S. Military Academy, 1974; MS, 1975, and PhD, 1984, Massachusetts Institute of Technology) joined the faculty of the School of Nuclear Engineering at Purdue University in 1984. He has worked as a consultant in reactor physics and nuclear fuel management for Yankee Atomic Electric Company, Westinghouse Electric Company, and Commonwealth Edison. His current research is in light water reactor core reload optimization with special emphasis on approaches enhanced by utilizing supercomputing facilities at Purdue.

*Thomas J. Downar*

