



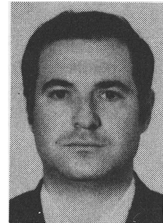
AUTHORS — SEPTEMBER 1986

FISSION REACTORS

AN APPROACH OF STATISTICAL THERMODYNAMICS TO EFFECTS OF COHERENT BLOCKAGES OF REACTOR CORE COOLANT CHANNELS

Dov Ingman (top) (PhD, Laboratory of Applied Nuclear Physics, Institute of Solid Fuel Materials, Moscow, USSR, 1975) currently works at Technion—Israel Institute of Technology, Haifa, in the areas of physical reliability models, nondestructive testing, and neutron physics. **Leib Reznik** (MSc, 1978, and DSc, 1985, nuclear engineering, Technion, Haifa, Israel) is a safety analysis engineer at the Israel Electric Corporation, Haifa. Areas of interest include reliability and safety analyses of components and complex systems.

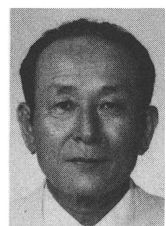
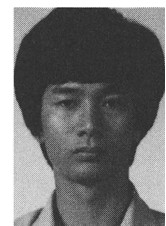
*Dov Ingman
Leib Reznik*



A NONEQUILIBRIUM THREE-REGION MODEL FOR TRANSIENT ANALYSIS OF PRESSURIZED WATER REACTOR PRESSURIZER

Seung Min Baek (top) (BS, nuclear engineering, Hanyang University; MS, Korea Advanced Institute of Science and Technology, 1985) works as a researcher in the Instrumentation and Control (I&C) Division of Korea Advanced Energy Research Institute (KAERI). Current research interests include instrument fault detection and diagnostic systems for nuclear power plant operation. **Hee Cheon No** (center) (BS, nuclear engineering, Seoul National University, Korea, 1976; PhD, nuclear engineering, Massachusetts Institute of Technology, 1983) is an assistant professor of the Department of Nuclear Engineering at Korea Advanced Institute of Science and Technology. His current research areas include thermal-hydraulic analysis of light water reactors, mechanical analysis of fuel elements, and application of modern control theory to nuclear power plants. **In Yong Park** (bottom) (BS, electrical engineering, Seoul National University, Korea, 1955; MS, power engineering, The Royal College of Science and Technology, 1959; PhD, control engineering, Seoul National University, Korea, 1965) has been a general manager of the I&C Division of the Nuclear Safety Center of KAERI since 1959. His current research field is I&C related to nuclear power plants.

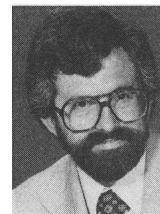
*Seung Min Baek
Hee Cheon No
In Yong Park*



THE AVAILABILITY OF NEUTRON CHANNELS AND POWER RANGE MONITORING SYSTEMS WITH *IN SITU* DETECTION OF CHANNEL DEGRADATION

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, between 1980 and 1983. His current research interests are probabilistic analysis of dynamic systems, optimal maintenance scheduling, and in-core fuel management. **Don W. Miller** (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.

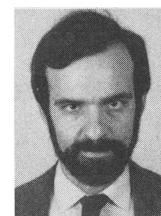
Tunc Aldemir
Don W. Miller



RELIABILITY AND RISK ALLOCATION IN NUCLEAR POWER PLANTS: A DECISION-THEORETIC APPROACH

I. A. Papazoglou (top) (Diploma, electrical and mechanical engineering, National Technical University of Athens, Greece, 1972; MS, 1974, and ScD, 1977, nuclear engineering, Massachusetts Institute of Technology) is a member of the Nuclear Technology Division of the Nuclear Research Center "Demokritos," Aghia Paraskevi, Greece. Before joining Demokritos in September 1985, he was with Brookhaven National Laboratory (BNL) where he was leader of the risk evaluation group. His interests include risk assessment, decision analysis, and reliability theory. **N. Z. Cho** (center) (BS, nuclear engineering, Seoul National University, Korea, 1971; MS, 1976, and PhD, 1980, nuclear engineering, University of California, Berkeley) is a nuclear engineer in the Department of Nuclear Energy at BNL. His current interests are in methods development and applications in nuclear power plant probabilistic safety studies and nuclear reactor analysis. **R. A. Bari** (bottom) (AB, physics, Rutgers University, 1965; PhD, physics, Brandeis University, 1969) is currently associate chairman of the Department of Nuclear Energy at BNL. Since 1974, he has been involved in various aspects of light water and advanced reactor safety on programs sponsored by the U.S. Nuclear Regulatory Commission at BNL. His current interests are in probabilistic risk assessment and severe accident analysis.

I. A. Papazoglou
N. Z. Cho
R. A. Bari

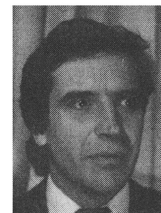


NUCLEAR FUELS

ACCELERATED HIGH-TEMPERATURE TESTS WITH SPENT PWR AND BWR FUEL RODS UNDER DRY STORAGE CONDITIONS

Gerd Porsch (left) [Dipl. Phys., 1973, and Dr. rer. nat., 1978, University of Kassel, Federal Republic of Germany (FRG)] worked in the research and development (R&D) department at NUKEM GmbH, where his interests focused mainly on interim dry storage. His current activities are in the field of solid state physics. **Joachim Fleisch** (right) (Dr.-Ing., inorganic and nuclear chemistry, Technische Hochschule Darmstadt, FRG, 1976) has

Gerd Porsch
Joachim Fleisch
Bernd Heits



coordinated the R&D activities in fuel storage, reprocessing, and waste handling at the Deutsche Gesellschaft für Wiederaufarbeitung von Kernbrennstoffen mbH (DWK) reprocessing plant at Wackersdorf since 1978, where he is responsible for development programs. **Bernd Heits** (right) (Dr. rer. nat., nuclear physics, University of Cologne, FRG, 1976) works in the development department at the DWK, Hannover. His current activities include fuel rod behavior during long-time dry storage.

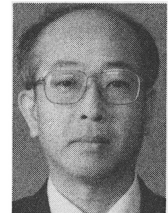


**RADIOACTIVE WASTE
MANAGEMENT**

LEACHING OF SYNROC-C: RELATION TO MICROSTRUCTURES

Takashi Murakami (top) (BS, 1975; MS, 1977; and PhD, 1980, crystallography and mineralogy, University of Tokyo) works in the area of high-level waste management for the Japan Atomic Energy Research Institute (JAERI). His interests include the study of microstructures and leaching mechanisms of glass and ceramic waste forms and also radiation effects on materials. **Tsunetaka Banba** (center) (BS, 1972, and MS, 1974, chemical engineering, Nagoya University) has been a research scientist for JAERI since 1974. His work has involved many aspects in the field of waste management. His main interest is in the mechanisms and modeling of waste form corrosion. **Haruto Nakamura** (bottom) (BS, 1957, and Dr. Sci., 1970, applied chemistry, Nagoya University) has worked at JAERI since 1970 and is currently general manager of the High-Level Waste Management Laboratory. His interests include the study of the properties of nuclear waste glass and the nuclide migration in geologic formations.

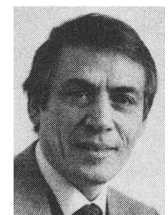
*Takashi Murakami
Tsunetaka Banba
Haruto Nakamura*



NEPTUNIUM MIGRATION IN SALT BRINE AQUIFERS

Giovanni Bidoglio (top) (PhD, physical chemistry, University of Milan, Italy, 1980) is a research chemist at the Joint Research Centre (JRC) of the Commission of the European Communities at Ispra, Italy, where he is conducting research on the impact of radionuclides on the environment. His research interests deal with release and transport of actinides through geological media and environmental chemistry of actinides. **Alfonso De Plano** (diploma, chemistry, ITIS-Verbania, Italy, 1974) is a research staff member at JRC, Radiochemistry Division. His principal activities in the field of nuclear waste management are related to the behavior of radionuclides under conditions expected in underground repositories.

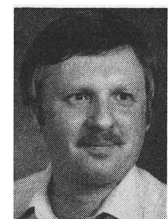
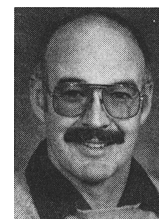
*Giovanni Bidoglio
Alfonso De Plano*



DIFFUSION OF TRITIATED WATER AND CHLORIDE IN BASALT-BENTONITE MIXTURES

John F. Relyea (left) (BS, 1970, and MS, 1972, physics, University of Arkansas; PhD, agronomy-soil chemistry, University of Arkansas, 1978) is a senior scientist for Rockwell Hanford Operations, Richland, Washington, in the Basalt Waste Isolation Project (BWIP). His research interests include radionuclide transport and behavior in the environment of a deep geologic nuclear waste repository. **David P. Trott** (right) (BA, physical geography/geology, Eastern Washington University, 1971; graduate

*John F. Relyea
David P. Trott
C. V. McIntyre
Craig G. Rieger*



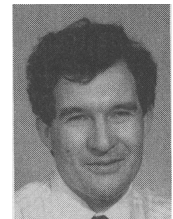
work, geosciences, University of Arizona, 1972-1974) is a scientist for Rockwell Hanford Operations. He is a member of the radioactive hydrothermal testing team for the BWIP Basalt Research Laboratory. His responsibility is investigation of radionuclide transport in porous media. His current interest is in the interfacing of laboratory equipment with microcomputers. **C. V. McIntyre** (top) (BS, metallurgical engineering, and MS, chemical engineering, University of Idaho, 1985) is an engineer with Westinghouse Idaho Nuclear Company and is currently involved in the development of reduction and solidification of nuclear fuel reprocessing waste. **Craig G. Rieger** (bottom) (BS, 1983, and MS, 1985, chemical engineering, Montana State University) is currently an engineer for Westinghouse Idaho Nuclear Company at Idaho National Engineering Laboratory. He has worked on the surveillance of water treatment equipment, such as ion exchangers, providing technical advice where needed.



A CHEMICAL DECONTAMINATION PROCESS FOR DECONTAMINATING AND DECOMMISSIONING NUCLEAR REACTORS

Alexander P. Murray

Alexander P. Murray (BS, 1978, and MS, 1985, chemical engineering, Carnegie-Mellon University) has worked on chemical and electrolytic decontamination developmental projects since 1978. He has also worked on chemistry and engineering analyses related to the nuclear and energy industries. His current activities are in decontamination, volume reduction, and radwaste processing.



MATERIALS

SAFETY MARGINS IN ZIRCALOY OXIDATION AND EMBRITTLEMENT CRITERIA FOR EMERGENCY CORE COOLING SYSTEM ACCEPTANCE

R. E. Williford

R. E. Williford (BS, mechanical engineering, and BS, mathematics, Oregon State University, 1972) has been involved with nuclear fuel rod thermal and mechanical analyses since joining Pacific Northwest Laboratory in 1975. His recent work includes investigations into stress corrosion cracking, chemically assisted crack nucleation, constitutive equations for discontinuous media, and microstructural damage evolution in viscoplasticity.

