



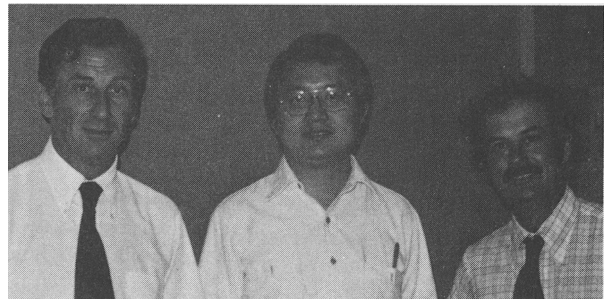
## AUTHORS — SEPTEMBER 1979

### REACTORS

#### NEUTRONIC PERFORMANCE OF FUSION REACTOR BLANKETS WITH DIFFERENT COOLANTS AND STRUCTURAL ARRANGEMENTS

**J. Chao** (center) [PhD, nuclear engineering, Massachusetts Institute of Technology (MIT), 1978] is a senior scientist at Science Applications, Inc. in Oak Brook, Illinois. His interests are design and safety analyses of nuclear cooling systems. **B. B. Mikić** (left) (ScD, mechanical engineering, MIT, 1966) is a professor of mechanical engineering at MIT. His interests are conduction, boiling, and condensation heat transfer. **N. E. Todreas** (right) (PhD, nuclear engineering, MIT, 1966) is a professor of nuclear engineering at MIT. His interests are mainly in nuclear engineering and safety analysis.

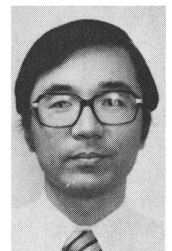
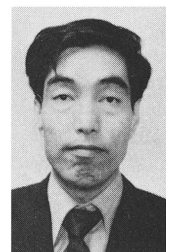
*J. Chao  
B. B. Mikić  
N. E. Todreas*



#### PERFORMANCE TEST OF THE UPPER HEAD INJECTION SYSTEM AT THE ROSA-II TEST FACILITY

**K. Tasaka** (top left) (Doctor of Engineering, nuclear engineering, University of Tokyo, 1976) has worked for ten years in the Division of Reactor Engineering and four years in the Division of Reactor Safety at the Japan Atomic Energy Research Institute (JAERI). He developed a new model to evaluate decay heat of nuclear fuel. His current interests include analysis of core thermal behavior during a loss-of-coolant accident (LOCA) and anticipated transient without scram (ATWS). **H. Adachi** (top right) (MS, nuclear technology, University of Tohoku, 1961) has worked for 18 years at JAERI. He is the project leader of the Rig of Safety Assessment (ROSA) Program, and his research has been in the area of fluid dynamics and heat transfer in reactor technology. His current interests include development of a two-phase flow model and analysis of coolant behavior during a LOCA. **M. Sobajima** (bottom left) (BS, applied physics, Tokyo Institute of Technology, 1969) has worked in the Division of Reactor Safety for ten years at JAERI. His work has been in the analysis of coolant behavior during a LOCA by using a computer code. His recent interests include large-scale reflooding experiments. **K. Soda** (bottom right) (PhD, energy engineering, University of Illinois at Chicago, 1972) has been in the Division of Reactor Safety at JAERI since 1973. His work has been in the area of fluid mechanics and heat transfer in the reactor core. His current interests include experiment and analysis of core thermal behavior during

*K. Tasaka  
H. Adachi  
M. Sobajima  
K. Soda  
M. Suzuki  
M. Okazaki  
M. Shiba*



a boiling water reactor (BWR) LOCA. **M. Suzuki** (top) (MS, mechanical engineering, University of Tokyo, 1971) has been in the Division of Reactor Safety at JAERI since 1974. His work has been in the analysis of fluid behavior in a simulated LOCA experiment by the use of the ROSA test facility. His current interests include code analysis of the test results in ROSA. **M. Okazaki** (center) (BS, mechanical engineering, Keio University, 1961) joined JAERI in 1964 and has worked in the Division of Reactor Safety for six years. His research has been in the area of two-phase flow dynamics and critical flow. His current interests include analysis of pressure oscillation in the pressure suppression system of BWRs. **M. Shiba** (bottom) (MS, mechanical engineering, Waseda University, 1959) is chief of Reactor Safety Laboratory 1 at JAERI. He has worked for 20 years at JAERI in the field of reactor engineering and reactor safety. He is currently responsible for simulated LOCA experiments in BWRs and large-scale pressure suppression tests.



#### LATTICE CALCULATIONS AND THREE-DIMENSIONAL EFFECTS IN A LASER FUSION-FISSION REACTOR

**Magdi M. H. Ragheb** (top right) (PhD, nuclear engineering, University of Wisconsin, 1979) is a faculty member of the Department of Nuclear Engineering, the University of Alexandria, AR, of Egypt. He is on leave as a project associate with the Fusion Research Program at the University of Wisconsin, Madison. He has collaborated with the Department of Applied Science at Brookhaven National Laboratory, and the Division of Engineering Physics at Oak Ridge National Laboratory. His theoretical interests are in the areas of reactor theory, statistical simulation, variational, and weighted residual methods. His technical interests are in the neutronics and photonics of fusion and fusion-fission energy systems. **S. I. Abdel-Khalik** (top left) (PhD, mechanical engineering, University of Wisconsin, 1973) is an associate professor of nuclear engineering at the University of Wisconsin (UW)-Madison. He joined the UW faculty in 1976 after two years of postdoctoral work in chemical engineering and one year with the nuclear industry. His research interests are in the areas of fusion technology and fast reactor safety. **Mahmoud Z. Youssef** (bottom right) (MS, nuclear engineering, University of Wisconsin, 1977) is on leave from the Atomic Energy Authority, AR, of Egypt and is working toward his PhD degree in nuclear engineering from the UW-Madison. Currently, he holds a research assistantship with the Fusion Research Program at UW. He graduated from the University of Alexandria, AR, or Egypt, and spent one year at the Casaccia Nuclear Study Centre in Italy. His research interests are in the area of fusion-fission hybrid systems technology, nuclear data processing, sensitivity analysis, perturbation theory, and neutronics methods for fusion and fission reactors. **Charles W. Maynard** (bottom left) (BS, electrical engineering, University of Maryland; PhD, applied physics, Harvard University, 1961) has worked at Bettis Atomic Power Laboratory operated by Westinghouse Electric Company in the Reactor Theory and Methods section. He was appointed associate professor of nuclear engineering at the University of Wisconsin, Madison, in 1961 and became a professor in 1965. His research interests are centered on design and neutronics analysis of reactors.

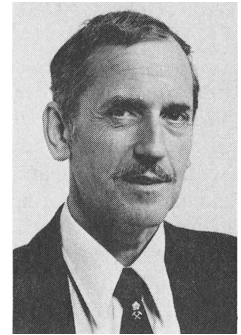
*Magdi M. H. Ragheb  
Said I. Abdel-Khalik  
Mahmoud Youssef  
Charles W. Maynard*



### HIGHLY COMPACTED SODIUM BENTONITE FOR ISOLATING ROCK-DEPOSITED RADIOACTIVE WASTE PRODUCTS

**Roland Pusch** (D. Eng., soil mechanics, Royal Institute of Technology, Stockholm, 1962; PhD, geology, Stockholm University, 1971) is a professor in soil mechanics at the University of Luleå, Sweden. He is currently involved in clay research, with special reference to the isolation of waste products from the biosphere. His special interests include rheological behavior, permeability, and diffusion processes in clay/water/electrolyte systems.

*Roland Pusch*

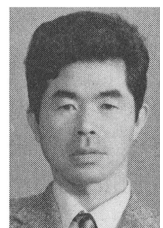
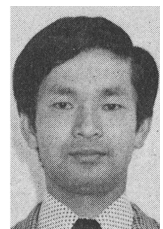


### MATERIALS

### MEASUREMENTS OF HYDROGEN CONCENTRATION IN LIQUID SODIUM BY USING AN INERT GAS CARRIER METHOD

**T. Funada** (top right) (MS, metallurgical engineering, Kyoto University, 1972) is a research engineer of the Sodium Technology Section of the Sodium Technology Division at the Power Reactor and Nuclear Fuel Development Corporation (PNC), Japan. His current interests are sodium coolant chemistry and materials behavior in sodium. **I. Nihei** (top left) (BS, metallurgical engineering, Ibaraki University, 1964) is an assistant senior engineer of the Sodium Technology Section at PNC. He has been engaged in the research of mass transfer and liquid-metal technology since 1964. **S. Yuhara** (bottom right) (BS, University of Electro-Communication, Tokyo, 1960) is a senior engineer of the Sodium Technology Section at PNC. He is primarily concerned with mechanical and metallurgical properties of reactor materials in sodium. **T. Nakasuji** (bottom left) (BS, metallurgical engineering, Nagoya Institute of Technology, 1953) has worked in the areas of sodium technology since 1975, and is currently manager of the Sodium Technology Section at PNC.

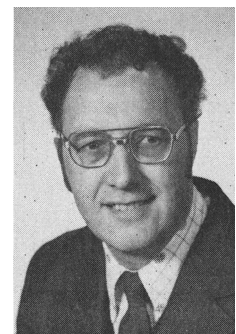
*Toshio Funada  
Isao Nihei  
Shunichi Yuhara  
Takashi Nakasuji*



### EXPERIMENTAL INVESTIGATION OF VARIOUS PELLET GEOMETRIES TO REDUCE STRAINS IN ZIRCONIUM ALLOY CLADDING

**Terence J. Carter** (Diploma, metallurgy, University of Leeds, 1962; MSc, metallurgy, University of Leeds, 1964; PhD, metallurgy, University of New South Wales, 1969) is with the Fuels and Materials Division of Atomic Energy of Canada Limited at Chalk River Nuclear Laboratories. His current interests include fuel postirradiation examination and performance evaluation and investigation of fuel defect mechanisms and remedies.

*T. J. Carter*



### NEUTRON GAUGE FOR MEASUREMENT OF HIGH VOID FRACTION IN WATER-STEAM MIXTURES

**Franco Vittorio Frazzoli** (top) (physicist, University of Rome, 1965) joined the Engineering Faculty of Rome in 1967, and, since 1974, has been a professor in the Nuclear Engineering Section. His research interest is devoted to subjects in nuclear radiation engineering dealing with the development of radiation gauges for industrial applications (process control, quality assessment, etc.). His current interests include nondestructive techniques for nuclear materials assay in fuel reprocessing and safeguards. **Alberto Magrini** (nuclear engineer, University of Rome, 1971) joined the Engineering Faculty of Rome as a research engineer in 1972. He is currently involved in nuclear radiation applications in industry and medicine, with special interest in the design of radiation gauges and in radiotracer techniques.

*Franco Vittorio Frazzoli*  
*Alberto Magrini*



### TRITIUM LEVELS IN URINE OF OCCUPATIONALLY EXPOSED PERSONS CAUSED BY DIFFERENT TYPES OF WORKING CONDITIONS

**K. Irlweck** (top) (PhD, University of Vienna, 1969) is a radiochemist currently working at the Institute for Radiation Protection, Research Center Seibersdorf, in Austria. He has interests in the field of incorporation surveillance and environmental studies. **H. Sorantin** (PhD, Technical University of Graz, 1953) is an assistant professor in analytical chemistry at the Technical University of Vienna. Since 1972, he has been head of the Institute for Radiation Protection, Austrian Atomic Energy Research Organization Ltd. His interest is in the field of determination of trace elements.

*K. Irlweck*  
*H. Sorantin*



### THERMAL ANALYSIS OF AMMONIUM DIURANATE

**C. N. Turcanu** (top) (MS, radiochemistry, University of Bucharest, 1964; PhD, nuclear chemistry, Central Physics Institute of Bucharest, 1977) is a senior scientist at the Institute for Nuclear Power Reactors in Romania. His work concerns uranium chemistry and other elements related to the nuclear fuel cycle. **R. Deju** (MS, chemical engineering, Polytechnic Institute of Bucharest, 1971) is a senior scientist at the Institute for Nuclear Power Reactors in Romania. His current technical interests include characterization and processing of  $UO_2$  powders and the theory of metallic and ceramic powder compacting.

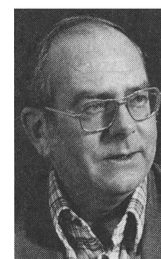
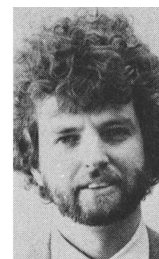
*C. N. Turcanu*  
*R. Deju*



### THERMAL-NEUTRON FLUX DEPRESSION IN CYLINDRICAL UO<sub>2</sub> FUEL RODS

**James E. Gibson** (top) (BS, nuclear engineering, University of Cincinnati, 1977) is associated with the Thermal-Hydraulic Design and Analysis Group at Combustion Engineering, Windsor, Connecticut. His current technical interests are in the areas of heat transfer and fluid flow. He is also presently completing his MS degree at Cincinnati. **J. N. Anno** (BS, 1955, MS, 1961, PhD, 1965, physics, Ohio State University) is a professor of nuclear engineering and director of the Laboratory of Basic and Applied Nuclear Research at the University of Cincinnati. He was employed by Battelle Memorial Institute, Columbus, Ohio from 1953 to 1970, where he spent a large portion of his time in nuclear-oriented research, including six years as operating supervisor of the Battelle Research Reactor. Since 1970, Dr. Anno has been in teaching and research at the University of Cincinnati, with special interests in fission and fusion reactors.

*James E. Gibson*  
*J. N. Anno*



### CONCENTRIC-SPHERE DESIGN FOR SPACING OF TAG-GAS ISOTOPIC RATIOS

**Kenny C. Gross** (BS, 1975, MS, 1976, and PhD, 1977, nuclear engineering, University of Cincinnati) is with the Experimental Breeder Reactor Division of Argonne National Laboratory. He is currently involved with the development of failed fuel identification techniques for fast and light water reactors, with special interests in gas tagging and delayed neutron monitoring techniques.

*Kenny C. Gross*

