



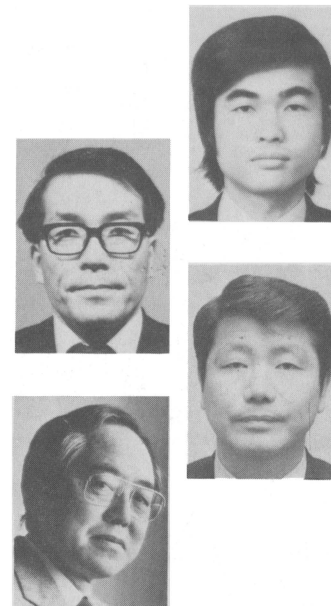
## AUTHORS – SEPTEMBER 1983

### FISSION REACTORS

#### DEPOSITION OF MODEL CRUD ON BOILING ZIRCALOY SURFACES AT HIGH TEMPERATURE

**Mitsuo Kawaguchi** (top right) (BS, nuclear engineering, 1977, and MS, nuclear engineering, 1979, University of Tokyo) is completing work on his doctorate in nuclear engineering at the University of Tokyo. He has been working on water chemistry, especially the behavior of crud in primary systems of boiling water reactors. **Kenkichi Ishigure** (top left) (BS, 1962, MS, 1964, and PhD, 1967, applied chemistry, University of Tokyo) is a professor in the Department of Nuclear Engineering, University of Tokyo. His current research interests include water chemistry of nuclear reactors, radioactive waste management, and radiation effects on materials. **Norihiko Fujita** (bottom right) (Dr. Eng., University of Tokyo, 1977) is currently in the Research and Development Division of the Industrial Research Institute. His current interest is corrosion problems, including stress corrosion cracking. **Keichi Oshima** (bottom left) (BS, 1944, and PhD, 1959, applied chemistry, University of Tokyo) is a professor emeritus of the University of Tokyo and president of Industrial Research Institute, Japan. His current interests are reactor chemistry, energy policy, nuclear policy, cryogenic engineering, and science and technology policy, including technological innovation and technology transfer.

*Mitsuo Kawaguchi  
Kenkichi Ishigure  
Norihiko Fujita  
Keichi Oshima*

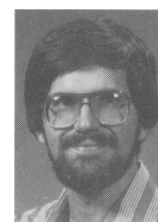


### NUCLEAR SAFETY

#### A TRANSIENT MODEL FOR THE ABLATION AND DECOMPOSITION OF CONCRETE

**Michael L. Corradini** (BS, mechanical engineering, Marquette University, 1975; MS and PhD, nuclear engineering, Massachusetts Institute of Technology, 1978) worked at Sandia National Laboratories for three years as principal investigator in the steam explosion research program and currently is assistant professor of nuclear engineering at the University of Wisconsin-Madison.

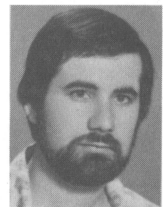
*Michael L. Corradini*



### HIGH CONVERTER PRESSURIZED WATER REACTOR WITH HEAVY WATER AS A COOLANT

*Yigal Ronen  
Dror Regev*

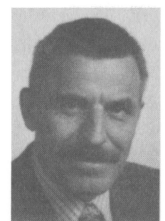
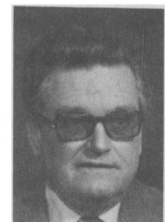
**Yigal Ronen** (top) (BS, mechanical engineering, and MS, nuclear engineering, 1967, Technion-Israel Institute of Technology; PhD, nuclear engineering, Cornell University, 1970) is associate professor of nuclear engineering at Ben-Gurion University. His research interests include advanced concepts of nuclear reactors and problems in uncertainty analysis. He is currently president of the Israel Nuclear Society. **Dror Regev** (BS, electrical engineering, and MS, nuclear engineering, Ben-Gurion University) is currently a doctoral student in the Department of Nuclear Engineering at Ben-Gurion University. His current research is on heavy water breeder reactors.



### THE LIFETIME AND FAILURE STRAIN PREDICTION OF ZIRCALOY-4 CLADDING LOADED UNDER LOCA-SIMILAR TEMPERATURE RAMP CONDITIONS

*Michael Boček  
Claus Petersen  
Lothar Schmidt*

**Michael Boček** (top) (MS, physics, 1953, and PhD, solid-state physics, 1957, Charles University, Prague) was a visiting professor at the Bergakademie Freiberg, Saxonia, German Democratic Republic from 1963 to 1966, and an assistant professor in the Department of Solid State Physics, Charles University, Prague, from 1966 to 1968. Since 1968 he has been a scientific member and head of the Department of Mechanical Properties at the Institut für Material- und Festkörperforschung II, Kernforschungszentrum Karlsruhe, Federal Republic of Germany (FRG) and a professor in the faculty of mechanical engineering, University of Karlsruhe, since 1975. His research areas include crystal growth, work hardening of metals, radiation damage, dislocation theory, and high-temperature plasticity. His current research interest is plastic behavior and lifetime prediction for materials subjected to nonstationary loading conditions. **Claus Petersen** (center) (Dipl.-Ing., material science, Technische Universität, Clausthal, FRG, 1972) is a scientific member and group leader in the Department of Mechanical Properties at the Institut für Material- und Festkörperforschung II of Kernforschungszentrum Karlsruhe. Since 1973 he has been engaged in research on the mechanical behavior of Zircaloy-4 at high temperatures. Current research interests include high temperature, inelastic behavior of cladding, and structural materials for advanced reactors. **Lothar Schmidt** (bottom) (Dipl.-Ing., mechanical engineering, Fachhochschule, Siegen, FRG, 1961) is a member of the Institut für Material- und Festkörperforschung III of Kernforschungszentrum Karlsruhe. He is employed as project engineer and has been engaged in the conception, design, construction, and operation of test facilities and irradiation devices for material development and safety experiments.



**PLUTONIUM SPECIATION IN SELECTED BASALT, GRANITE, SHALE, AND TUFF GROUNDWATERS**

**Jess M. Cleveland** (top) (BS, chemistry, Georgia Institute of Technology, 1951; MS, chemistry, 1955, and PhD, inorganic chemistry, 1959, University of Colorado) is chief of the Transuranium Research Project of the U.S. Geological Survey. His current interests include actinide element coordination chemistry and the groundwater chemistry of the transuranium elements. **Terry F. Rees** (center) (BS, chemistry, Metropolitan State College, 1974; MS, chemistry, 1981, and PhD, applied chemistry, 1982, Colorado School of Mines) is a research chemist in the Transuranium Research Project of the U.S. Geological Survey. His current research interest is in the geochemical behavior of transuranium elements under conditions expected in and near possible nuclear waste repositories. **Kenneth L. Nash** (bottom) (BA, chemistry, Lewis University, 1972; MS, chemistry, 1975, and PhD, inorganic chemistry, 1978, Florida State University) is a research chemist in the Transuranium Research Project of the U.S. Geological Survey. His primary research interest is in the solution chemistry of the actinide elements and its application to nuclear waste disposal.

*Jess M. Cleveland  
Terry F. Rees  
Kenneth L. Nash*

**EFFECTS OF TEMPERATURE ON THE LEACHING BEHAVIOR OF SINTERED MODIFIED SYNROC-B WASTE FORM**

**A. G. Solomah** (photograph not available) (PhD, nuclear engineering, North Carolina State University, 1980) is a research scientist at the Institut für Chemische Technologie, Kernforschungsanlage, Jülich, Federal Republic of Germany. His current research includes high-temperature mass spectrometry of high-level radioactive waste forms, radioanalytical chemistry applications in volatilization study, and crystalline waste form development. His research interests include materials performance under irradiation and nuclear fuel cycle analysis.

*A. G. Solomah*

**ANALYSIS OF URANIUM ISOTOPE SEPARATION BY REDOX CHROMATOGRAPHY**

**Sachio Fujine** (right) (BS, 1970, and MS, 1972, chemical engineering, Kyoto University) is a research engineer at the Separation Engineering Laboratory in the Japan Atomic Energy Research Institute (JAERI). He has been engaged in research on

*Sachio Fujine  
Yuji Naruse  
Koreyuki Shiba*



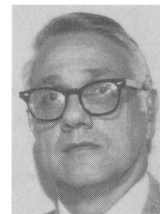
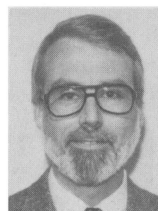
isotope separation by gaseous diffusion and by ion exchange method at JAERI since 1972. His current interests include lithium isotope separation by chemical exchange processes. **Yuji Naruse** (top) (BS, chemical engineering, Kyoto University, 1959) is chief of the Tritium Engineering Laboratory. He was engaged in research on fuel reprocessing and uranium enrichment. He is now involved in the design and construction of tritium facilities. **Koreyuki Shiba** (bottom) (BS, 1958, and PhD, 1966, chemistry, Tokyo University of Education) worked on fission product behavior in fuels. He is now chief of the Thorium Fuel and Separation Engineering Laboratory, interested in the application of thorium fuels to reactors and in research and development of isotope separation by chemical exchange and by laser irradiation.



### THE EFFECT OF VACUUM CORE BOUNDARY CONDITIONS ON SEPARATION IN THE GAS CENTRIFUGE

**Ed Von Halle** (top) (BS, Carnegie Institute of Technology, 1949; MS, Bucknell University, 1951; PhD, chemical engineering, University of Tennessee, 1959) has been a member of the staff of the Oak Ridge Gaseous Diffusion Plant (operated for the U.S. Department of Energy by the Union Carbide Corporation) since 1950. The primary objective of his work is the economical separation of isotopes, especially those of uranium. **Houston G. Wood III** (center) (BA, 1965, and MS, 1967, mathematics, Mississippi State University; PhD, applied mathematics, University of Virginia, 1978) was a member of the staff of the Oak Ridge Gaseous Diffusion Plant from 1967 to 1973 and from 1977 to 1981. He was employed by the Research Laboratories for the Engineering Sciences of the University of Virginia from 1973 to 1977 and since 1981, he has been associate professor of aerospace engineering at the University of Virginia. His current research interests include dynamics of rotating fluids and aerodynamics. **Ralph A. Lowry** (bottom) (BS, electrical engineering, 1949; PhD, physics, Iowa State University, 1955) is chaired professor of engineering and applied science at the University of Virginia. Since 1956, he has been engaged in research related to the gas centrifuge. His current interests include fluids in strong rotation and flow diagnostics.

*Ed Von Halle  
Houston G. Wood III  
Ralph A. Lowry*



## ANALYSES

### ORIGEN2: A VERSATILE COMPUTER CODE FOR CALCULATING THE NUCLIDE COMPOSITIONS AND CHARACTERISTICS OF NUCLEAR MATERIALS

**Allen G. Croff** (BS, chemical engineering, Michigan State University, 1971; Nuclear Engineer Degree, Massachusetts Institute of Technology, 1974; MBA, University of Tennessee, 1981) is a staff member at Oak Ridge National Laboratory. He is currently manager for engineering analysis and planning in the Chemical Technology Division. His past work and current interests include nuclear fuel cycle analysis, nuclear waste management, and technological planning.

*Allen G. Croff*



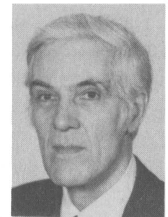
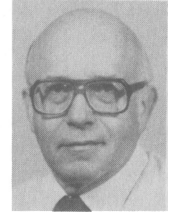
### U-Si AND U-Si-AI DISPERSION FUEL ALLOY DEVELOPMENT FOR RESEARCH AND TEST REACTORS

**R. F. Domagala** (top) [BS, 1950, and MS, 1954, metallurgical engineering, Illinois Institute of Technology (IIT)] served as a member of the metals research staff of the ITT Research Institute (formerly the Armour Research Foundation) from 1950 to 1966. In 1966 he joined the faculty of the Materials Engineering Department of the Chicago Campus of the University of Illinois (UI-C) as an associate professor (1966 to 1972), then professor of metallurgy (1972 to 1978). He is currently an adjunct professor of metallurgy at UI-C. He joined the Materials Science and Technology Division of Argonne National Laboratory (ANL) as a staff metallurgist in 1978. His research work has included a variety of projects; most recently his efforts have been directed toward the development of special fuels for research and test nuclear reactors. **T. C. Wienczek** (center) (BS, 1977 and MS, 1979, metallurgical engineering, UI-C) joined the Materials Science and Technology Division of ANL in 1979 and is currently a staff engineering specialist in the Materials Processing and Development Group. His recent research projects have included fuel development for research and test nuclear reactors and substitution for critical and strategic materials. **H. R. Thresh** (bottom) (BSc, 1952, and PhD, 1957, metallurgy, University of Birmingham, United Kingdom) joined the Department of Energy, Mines, and Resources in Ottawa, Canada as a National Research Council Fellow in 1959. From 1960 to 1967, he was involved in an extensive program on the properties of liquid metals to relate process phenomena such as galvanizing to liquid-metal behavior. In 1967, he joined the Casting Laboratory of Kennecott Copper. Since 1972, he has been with ANL as a group leader for the Materials Processing and Development Group in the Materials Science and Technology Division, having responsibility for the design and fabrication of hardware concepts used in the evaluation of energy programs.

*R. F. Domagala*

*T. C. Wienczek*

*H. R. Thresh*

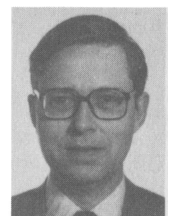


### ANALYTIC SOLUTION TO VERIFY CODE PREDICTIONS OF TWO-PHASE FLOW IN A BOILING WATER REACTOR CORE CHANNEL

**Kuo-Fu Chen** (top) (BS, physics, Tunghai University, 1970; MS, nuclear physics, University of Lowell, 1974; ME, 1976, and PhD, 1981, nuclear engineering, University of Virginia) is a senior engineer at Westinghouse Electric Corporation, Nuclear Fuel Division. He is currently involved in the development of critical power correlation for Westinghouse advanced QUAD + BWR fuel assembly. His other technical interests include the development of the thermal analysis basis for the boiling water reactors (BWRs), advanced product design, and thermal-hydraulic testing. **C. A. Olson** (BS, engineering science, 1960, MS, 1962, and PhD, 1967, aero and engineering sciences, Purdue University) is a senior engineer at Westinghouse Nuclear Fuel Division. His current interests are the thermal and hydraulic analyses of both BWR and pressurized water reactor cores.

*Kuo-Fu Chen*

*C. A. Olson*



## A MOBILE GAMMA SCANNING SYSTEM FOR DETECTING RADIATION ANOMALIES

**Tim E. Myrick** (top right) (BS, nuclear engineering, Kansas State University, 1976; ME, environmental engineering, University of Florida, 1977) is a research associate with the Oak Ridge National Laboratory (ORNL), previously involved in characterization and analysis of uranium mill tailings sites and off-site properties. His current interests are in the decontamination and decommissioning of ORNL surplus facilities. **Michael S. Blair** (top left) is an electrical engineer in the Instrumentation and Controls Division at ORNL. His research interests include design and development of computer-controlled instrumentation and associated software. **Richard W. Doane** (bottom right) is a senior instrument technologist at ORNL. He is responsible for the development and implementation of radiation detection instrumentation for application in radiological surveillance. **William A. Goldsmith** (bottom left) (BS, civil engineering, 1964, and MS, sanitary engineering, 1966, Mississippi State University; PhD, environmental engineering, University of Florida, 1968) is currently a staff member of Bechtel National, Inc., principally involved in decontamination and decommissioning projects. Previously, he was manager of the uranium mill tailings radiological survey program at ORNL.

*Tim E. Myrick  
Michael S. Blair  
Richard W. Doane  
William A. Goldsmith*

