



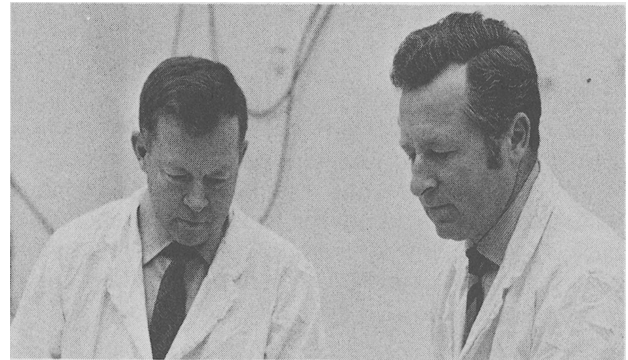
AUTHORS – AUGUST 1981

FISSION REACTORS

CRITICALITY EXPERIMENTS WITH SUBCRITICAL CLUSTERS OF 2.35 AND 4.31 wt% ²³⁵U-ENRICHED UO₂ RODS IN WATER WITH STEEL REFLECTING WALLS

*S. R. Bierman
E. D. Clayton*

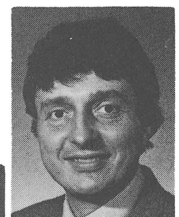
S. R. Bierman (left) (BS, chemical engineering, Texas Technological University, 1956; MS, nuclear engineering, University of Washington, 1963) has been involved in both the chemical processing industry and criticality research and analysis. He is now a staff scientist at the Critical Mass Laboratory at Pacific Northwest Laboratory (PNL), where he has been active in both the generation of basic experimental criticality data and the utilization of these data in performing criticality analyses of production plant systems. **E. Duane Clayton** (right) (PhD, physics, University of Oregon, 1952) is currently associate manager of criticality analysis at PNL, and is a research associate professor in the University of Washington's Department of Nuclear Engineering. He is a pioneer in criticality studies with plutonium, and since its inception in 1961, has been director of the Plutonium Critical Mass Laboratory of PNL. His current technical interests include most aspects of criticality measurements and studies.



EFFECT OF INOPERABLE IN-CORE DETECTORS ON CORE MONITORING SYSTEM ACCURACY

*R. K. Endter
R. G. Foster*

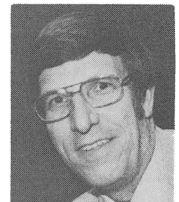
R. K. Endter (top) (MS, mathematics, University of Delaware, 1974) is an engineer in the Nuclear Instrumentation and Controls Engineering Department at Combustion Engineering (C-E). He has worked in core monitoring systems development since 1973. His current interests include core simulation and error analysis using core simulator models. **R. G. Foster** (PhD, North Carolina State University, 1969) is a supervisor of the Control and Monitoring Systems Group in the Nuclear Instrumentation and Controls Engineering Department at C-E. His interests include microcomputers, simulation, and the effective use of large-scale computers.



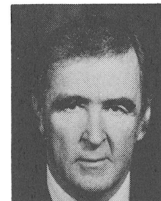
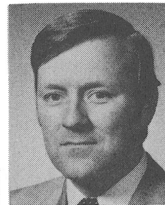
THREE MILE ISLAND ACCIDENT TECHNICAL SUPPORT

*R. L. Long
T. M. Crimmins
W. W. Lowe*

Robert L. Long (right) (BS, electrical engineering, Bucknell University, 1958; MS, 1959, and PhD, 1962, nuclear engineering, Purdue University) is director of training and education for the General Public Utilities (GPU) Nuclear Generation Group. This includes responsibilities for Training Departments at Corporate Headquarters, Three Mile Island (TMI) and Oyster



Creek, and the GPU System Laboratory. **Thomas M. Crimmins, Jr.** (top) (BS, physics, College of the Holy Cross, 1965; MS, engineering management, New Jersey Institute of Technology, 1974) is manager of nuclear plant engineering for Pennsylvania Power and Light Company, and served as part of the Emergency Response and Recovery Organization after the TMI-2 accident. **William W. Lowe** (bottom) (BS, chemical engineering, Purdue University, 1947) has been with Pickard, Lowe & Garrick, Inc. since 1956. In March and April of 1979, he was TMI accident control on-site night leader for technical support. He has also been employed as chief nuclear engineer at Bath Iron Works (1954-1956), as chief of the Nuclear Engineering Section of the U.S. Atomic Energy Commission in Hanford, Washington (1948-1954), and as a staff member of the Los Alamos National Laboratory (1944-1948). He is a registered nuclear engineer in the District of Columbia.

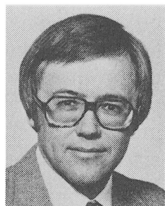


NUCLEAR FUELS

AN ANALYTICAL MODEL FOR TRANSIENT GAS FLOW IN NUCLEAR FUEL RODS

*D. S. Rowe
R. N. Oehlberg*

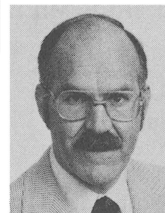
D. S. Rowe (top) (PhD, mechanical engineering, Oregon State University, 1973) has been involved with the thermal and hydraulic analysis of nuclear systems since 1963. His current activities as an engineering consultant are primarily concerned with the development of computational methods for use in engineering analysis with special emphasis on two-phase and heat transfer. **Richard N. Oehlberg** (BS, physics, Loyola University; MS, physics, Southern Illinois University; PhD, physics, University of Notre Dame, 1972; MPA, research and development administration, University of Southern California at Los Angeles, 1976) has been a project manager in the Safety and Analysis Department at the Electric Power Research Institute (EPRI) in Palo Alto, California, since 1976. Before joining EPRI, he was a program manager in the Fuel Behavior Research Branch in the Office of Water Reactor Safety Research of the U.S. Nuclear Regulatory Commission (formerly part of the U.S. Atomic Energy Commission), from 1974 to 1976, specializing in light water reactor (LWR) fuel-rod behavior, accident analysis, fuel-pin computer code development and experimental verification. Currently, his interests include transient LWR fuel behavior, structural response, fluid-structure interaction, and Three Mile Island Unit 2 related activities.



CALCULATION OF NEUTRON SOURCE STRENGTH IN FAST FLUX TEST FACILITY FUEL AS A FUNCTION OF IRRADIATION

*Paride A. Ombrellaro
David L. Johnson*

Paride A. Ombrellaro (top) (MA, physics, Boston University, 1950) is a senior engineer with the Core Physics Group at Westinghouse Electric Corporation, Hanford Engineering Development Laboratory. For a number of years, he has been involved with reactor physics and reactor operations activities associated with both water and fast reactors. His interests are in the development of reactor physics methods. Presently, his main work is in the development of a subcritical reactivity monitoring system for the Fast Flux Test Facility (FFTF) for use during all subcritical operations and core refueling. **David L. Johnson** (BS, physics, University of Denver, 1960; PhD, nuclear



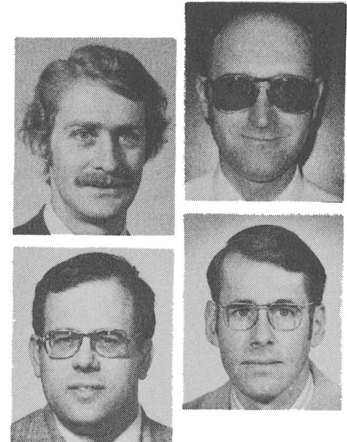
physics, University of Washington, 1974) is a senior scientist at Westinghouse Hanford Company, where he has contributed to development of subcritical reactivity monitoring and planning of neutronic characterization measurements for the FFTF. His interests are in the evaluation, measurement, and application of nuclear data for fission and fusion reactors. His main work in recent years has been to provide nuclear data for the Fusion Materials Irradiation Test Facility.

MATERIALS

CORROSION OF STRUCTURAL ALLOYS IN LIQUID RUBIDIUM

T. R. Pinchback (top right) (PhD, metallurgical engineering, Michigan Technological University) is formerly of EG&G Idaho, Inc., and is now vice-president of sales for Wilson-Garner Company, Troy, Michigan. **J. R. Winkel** (top left) (MS, metallurgical engineering, Colorado School of Mines) is a corrosion engineer with Rockwell International at the Rocky Flats Plant, Golden, Colorado. **D. K. Matlock** (bottom right) (PhD, materials science and engineering, Stanford University) is professor of metallurgical engineering at the Colorado School of Mines. **D. L. Olson** (bottom left) (PhD, materials science and engineering, Cornell University) is professor of metallurgical engineering at the Colorado School of Mines.

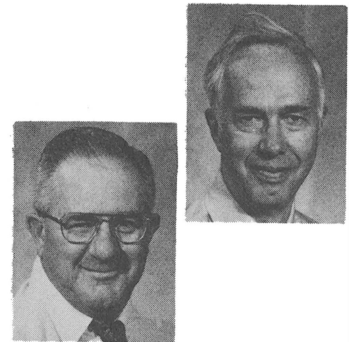
*T. R. Pinchback
J. R. Winkel
D. K. Matlock
D. L. Olson*



ELECTROLYTIC DECONTAMINATION OF STAINLESS STEEL USING A BASIC ELECTROLYTE

Everett L. Childs (top) (BS, chemical technology, Iowa State University, 1949) joined the Rocky Flats Plant, Rockwell International, in 1952. He has worked 23 years in electroplating research and development. He is presently working with decontamination development. **Jack L. Long** (BS, chemistry, 1953, and MS, metallurgy, 1959, University of Denver) has been at Rocky Flats since 1956. He has contributed to a variety of projects including the molten salt extraction of americium from plutonium, electrorefining of plutonium, decontamination of metals, the removal of plutonium from waste streams, and the electrolytic decontamination of bacteria in viruses in sewage and cooling tower water. He is named as an inventor on four U.S. patents and eight foreign patents. He is currently working in analytical chemistry at Rocky Flats and has developed a rapid x-ray procedure for the analysis of niobium in U-6% Nb alloys.

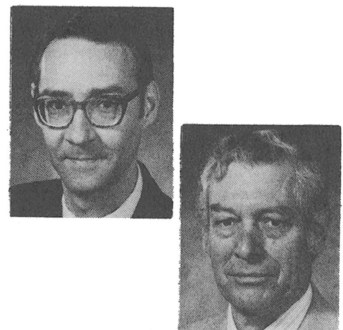
*E. L. Childs
J. L. Long*



CHEMICAL COMPATIBILITY OF URANIUM CARBIDES WITH Cr-Fe-Ni ALLOYS

Edward C. Beahm (top) (PhD, physical chemistry, Pennsylvania State University, Materials Research Laboratory, 1973) is a research staff member of the Chemical Technology Division of the Oak Ridge National Laboratory (ORNL). His current research interests are materials-related problems of nuclear reactor fuels with emphasis on thermodynamics. **Charles A. Culpepper** is a senior science technologist in the Solid State

*Edward C. Beahm
Charles A. Culpepper*

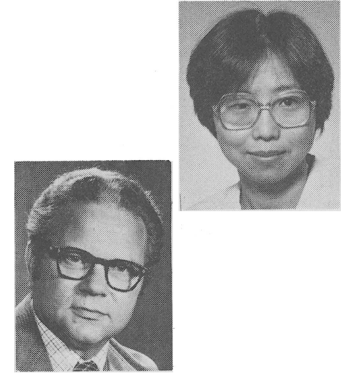


Division of ORNL. He has over 30 years of experience in the preparation and characterization of materials. His current activities involve the development of techniques for the preparation and fabrication of actinide alloys and inorganic compounds.

BEHAVIOR OF METALLIC INCLUSIONS IN URANIUM DIOXIDE

R. L. Yang (top) (PhD, nuclear engineering, University of California, Berkeley, 1980) was a research assistant at the Lawrence Berkeley Laboratory from 1973 to 1980. During that time, her research work was in the area of high temperature materials properties and nuclear fuel behavior. She currently works at General Electric Company, San Jose, California, in the area of fission gas behavior modeling. **D. R. Olander** (ScD, chemical engineering, Massachusetts Institute of Technology, 1958) is a professor of nuclear engineering at the University of California, Berkeley, and principal investigator in the Materials and Molecular Research Division of the Lawrence Berkeley Laboratory. His research and professional interests are in the fields of reactor fuel element materials and chemistry, chemical kinetics of gas-solid reactions, and uranium enrichment by the gas centrifuge.

Rosa L. Yang
D. R. Olander



NUCLEAR SAFETY

THE INTERACTION OF HIGH TEMPERATURE CORE DEBRIS WITH CONCRETE AND REFRACTORY MATERIAL

Edmund S. Sowa (top) is a chemical engineer at Argonne National Laboratory (ANL). He is presently doing research in post-accident heat removal in reactor safety. He has approximately 30 years of experience in nuclear reactor development, fast breeder development, sodium technology, and in-pile experiments. **John R. Pavlik** is a scientific assistant at ANL, currently in research on post-accident heat removal. He has 25 years of experience in uranium and plutonium chemistry and nuclear reactor safety.

E. Sowa
J. Pavlik

