

AUTHORS — DECEMBER 1978

EXTRACTION OF ENERGY FROM NUCLEAR FUELS WITHOUT REPROCESSING TO SEPARATE PLUTONIUM

A LOW-DECONTAMINATION APPROACH TO A PROLIFERATION-RESISTANT FUEL CYCLE

J. G. Asquith (top) (MS, nuclear physics, Syracuse University, 1953) has been manager of numerous nuclear development and engineering groups at Atomics International, including shielding, fuel materials, sodium technology, and sodium system engineering. He has served as project manager for the Zirconium Reactor Program and most recently as the program manager for the Fast Flux Test Facility Fuel Storage Facility and several advanced fuel reprocessing programs. **LeRoy F. Grantham** (PhD, physical chemistry, Kansas State University, 1959) has been a member of the research and engineering staff at Atomics International since 1959. His interests include fuel reprocessing, fuel cycle analysis, waste management, pollution control, desulfurization of waste gases, and utilization of molten salt and molten metal-salt technology. He is currently engaged in pyrochemical reprocessing development and waste volume reduction programs.

*J. G. Asquith
L. F. Grantham*



COPROCESSING—AN EVALUATION OF CHEMICAL REPROCESSING WITHOUT PLUTONIUM SEPARATION

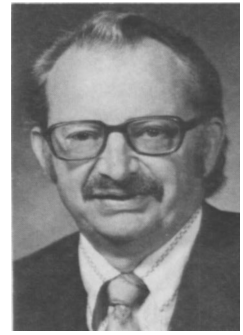
Meyer Pobereskin (top) (MS, physical chemistry, Columbia University, 1938) is a research leader at Battelle-Columbus Laboratories. Most of his 32 years of experience in atomic energy research has been in the area of fuel cycle technology. His current interests are in proliferation and waste management problems. **Kenneth D. Kok** (center) (BS, chemistry, Michigan Technological University, 1966; MS, business administration, Michigan Technological University, 1966; MS, nuclear engineering, Michigan Technological University, 1968) is a research engineer in the Nuclear and Flow Systems Section at Battelle-Columbus. His present interests are inertial confinement fusion systems, reliability and maintainability of nuclear systems, and the fission reactor fuel cycle. **William J. Madia** (bottom) (PhD, radiochemistry, Virginia Polytechnic Institute, 1975) has participated in and directed both analytical and experimental research in the general area of nuclear fuel cycle technology. Currently, he is manager of the Nuclear Materials Technology Section at Battelle-Columbus.

*Meyer Pobereskin
Kenneth D. Kok
William J. Madia*



SOME PLUTONIUM RECYCLE PROGRAM FUEL CYCLES HAVING REDUCED PROLIFERATION CHARACTERISTICS

Eugene A. Eschbach



Eugene A. Eschbach (BS, electrical engineering, Washington State University, 1942) has been involved in the development and analysis of advanced concepts since 1942, when he began working for RCA. He transferred to General Electric-Hanford in 1948 and was concerned with Hanford production reactor and fuel problems, folding this work into the plutonium recycle program, wherein he emphasized plutonium utilization. Most recently, he has been involved with innovation broadly, beginning with his transfer to Battelle-Northwest Laboratories in 1965. As an avocation, he is interested in futures and, more particularly, the shortcomings of model building to foresee the future.

REACTORS

AN INVESTIGATION OF ALTERED TRANSVERSE TRANSPORT OF AXIAL MOMENTUM IN COOLANT FLOWS DURING OSCILLATORY INSTABILITIES

R. P. Roy
P. K. Jain

R. P. Roy (top) (PhD, nuclear engineering, University of California at Berkeley, 1975) is assistant professor of nuclear engineering at the University of Illinois at Urbana-Champaign. His current research interests include experimental and theoretical studies of single-phase and two-phase flow and boiling heat transfer, studies of flow-induced vibration of reactor internals, and application of control theory to reactor systems modeling. **P. K. Jain** (BE, electrical engineering, Indian Institute of Science, Bangalore, 1975; MS, nuclear engineering, University of Cincinnati, 1977) is a graduate research assistant of nuclear engineering at the University of Illinois at Urbana-Champaign. He is presently pursuing his doctoral degree in the area of statistical behavior of two-phase flow systems.



INVESTIGATIONS OF ANTICIPATED TRANSIENTS WITHOUT REACTOR SCRAM AND OTHER SELECTED SAFETY DEVICES

W. Ullrich
W. Frisch

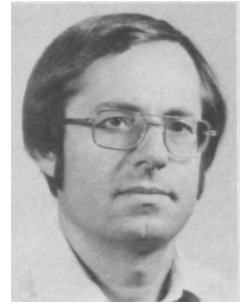
Walter Ullrich (top) (Dipl. Phys., Institute of Physics, Friedrich-Schiller-Universität Jena/Germany, 1959) has worked with Interatom GmbH in reactor physics and radiation shielding since 1966 at the Institute for Reactor Safety (IRS), Cologne, in core design, transient analysis, and reliability. Since 1977, he has been at Gesellschaft für Reaktorsicherheit (GRS) mbH, Cologne. He is the head of the "Processes K" Division. It consists of three departments: core design, emergency core cooling, and radiation shielding. His current interests focus on safety philosophy and transient analysis. **W. Frisch** (Dipl. Ing., electrical and control engineering, Technical University of Darmstadt, Germany, 1964; Dr. Ing., nuclear engineering, Technical University of Karlsruhe, Germany, 1968) is section manager of the Reactor Dynamics Section at GRS in Munich, Germany. He was previously employed by the Nuclear Research Center in Karlsruhe and by the Westinghouse Advanced Reactor Division in Madison, Pennsylvania. His work is in the field of transient analysis and code development for fast breeder and light water reactors.



ENRICHMENT ZONING AND CONTROL ROD PROGRAMMING FOR REACTIVITY AND POWER SHAPE CONTROL

Constantine P. Tzanos

Constantine P. Tzanos (Diploma, chemical engineering, National Technical University of Athens, Greece, 1968; ScD, nuclear engineering, Massachusetts Institute of Technology, 1971) is currently working at the Nuclear Research Center "Democritos," in Athens, Greece. His interests include reactor analysis and design, reactor safety, and reactor control.



FUEL CYCLES

BENCHMARK CRITICAL EXPERIMENTS ON HIGH-ENRICHED URANYL NITRATE SOLUTION SYSTEMS

*Robert E. Rothe
Inki Oh*

A CALCULATIONAL STUDY OF BENCHMARK CRITICAL EXPERIMENTS ON HIGH-ENRICHED URANYL NITRATE SOLUTION SYSTEMS

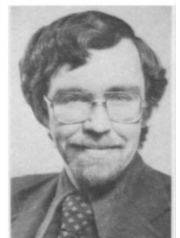
Robert E. Rothe (top) (BA, Knox College, 1956; MS, physics, California Institute of Technology, 1958; PhD, nuclear physics, University of Wisconsin, 1964) is a research specialist II and project leader at the Critical Mass Laboratory at Rockwell International's Rocky Flats Plant. His work in the Nuclear Safety Group has been the measurement of critical parameters for uranium and plutonium systems under a wide variety of conditions. He has 14 years of experience in this field. **Inki Oh** (PhD, nuclear physics, University of Colorado, 1970) is a research specialist I at Rocky Flats. He is a registered professional nuclear engineer. His research areas are both experimental and computational criticality studies.



URANIUM REQUIREMENTS FOR ADVANCED FUEL CYCLES IN EXPANDING NUCLEAR POWER SYSTEMS

*S. Banerjee
H. Tamm*

S. Banerjee (top) (PhD, chemical engineering, University of Waterloo, 1968) worked at Atomic Energy of Canada Limited (AECL), Pinawa, in the Chemical Technology Branch, as head of the Reactor Analysis Branch, and as acting director of the Applied Science Division. At present, he is a professor of engineering physics at McMaster University. His current interests are in thorium fuel cycle analysis and safety. **H. Tamm** (PhD, mechanical engineering, University of Saskatchewan, 1971) worked as assistant professor of engineering at the University of Guelph. At present, he is a member of the Fuel Development Branch at AECL, Pinawa. His current interests are in development of computer codes for nuclear power systems studies and demonstration irradiations of thorium fuels.



ANALYZING CONTAINMENT LEAKAGE FROM A SODIUM FIRE BY THE RESPONSE SURFACE METHOD*Lucy W. Person*

Lucy Wu Person (PhD, nuclear chemistry, University of California, Berkeley, 1961) is a research staff member in the Reactor Analysis and Safety Division at Argonne National Laboratory. Her current interests are systematic comparisons of analytical model with the nuclear safety related experiments and use of new mathematical techniques in studying fuel motion and detecting coolant boiling.

