



AUTHORS — JANUARY 1975

REACTORS

A MECHANICAL EXPLANATION TO THE OVERPOWER FAILURES

Erik Rolstad (BSc, mechanical engineering, London, 1958) is in charge of the test-fuel data evaluation section of the Halden Reactor Project. He has been actively engaged in the HBWR fuel test program since 1962, with special interest in pellet-clad mechanical interaction problems.

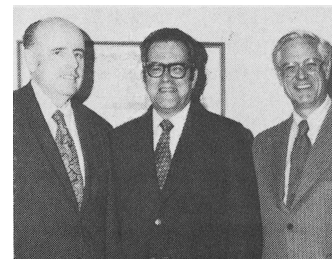
E. Rolstad



THERMAL SLEEVE FAILURE AND REPAIRS—INDIAN POINT #1 NUCLEAR UNIT (285 MW)

Arthur Flynn (left) (MS, chemical engineering, City College of New York, 1940; DSc, engineering, New York University, 1953) is chief nuclear engineer at Consolidated Edison Company of New York (Con Ed). William F. Nelson (not pictured) was a radiological engineer when he retired from Con Ed. William B. Warner (right) (ME, Stevens Institute of Technology, 1940) is presently technical consultant to the vice president at Con Ed. His experience includes mechanical maintenance with Westinghouse, and 28 years with Con Ed in mechanical maintenance of power generation equipment, electrical maintenance, and power generation operations. He is presently assistant vice president of power generation. Donald McCormick (center) (BS, chemistry, Fordham University) has been involved with the design and operation of the Indian Point Station for 11 years. His chief areas of interest have been in water chemistry and the radwaste systems associated with the facility. Currently he is the chief engineer in a newly organized QA group.

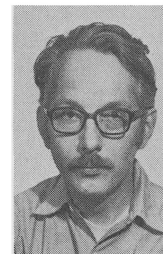
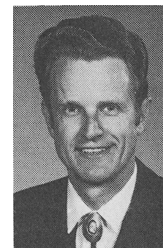
*Arthur Flynn
William Nelson
William Warner
Donald McCormick*



RADIOACTIVITY INDUCED IN A THETA-PINCH FUSION REACTOR

Donald J. Dudziak (left) (PhD, mathematics, 1963) is currently responsible for fusion reactor nucleonic analysis at Los Alamos Scientific Laboratory (LASL). His previous interests have been in several areas of reactor physics, including stochastic kinetics, cross-section data systems, shielding, and spallation neutron sources. Robert A. Krakowski (PhD, nuclear engineering, 1967) is associated with the CTR technology program at LASL. He has experience in nuclear materials as applied to fission power and thermionic reactors, and his general interests fall into the areas of solid-state physics, radiation damage, corrosion, and thermophysical properties of matter.

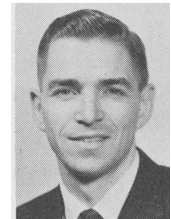
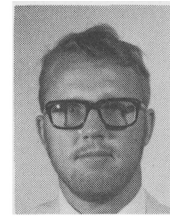
*Donald J. Dudziak
R. A. Krakowski*



AN EXPERIMENTAL STUDY OF TWO COUPLED REACTORS

Gary R. Thayer (top) (PhD, University of Illinois) has worked for Southern California Edison Company and is at present an assistant nuclear engineer at Argonne National Laboratory in Idaho Falls. He is currently engaged in research in experimental fast reactor physics. George H. Miley (center) (PhD, University of Michigan) worked at the Knolls Atomic Power Laboratory before joining the staff at the University of Illinois in 1961 where he is professor of nuclear and electrical engineering. In addition to reactor kinetics, he is actively involved in research on fusion, direct energy conversion, and nuclear-pumped lasers. Barclay G. Jones (bottom) (PhD, University of Illinois) has industrial experience with English Electric, Atomic Energy Research Establishment (Harwell), Canadian Nuclear Division, and Westinghouse Atomic Power. He is currently professor of nuclear and mechanical engineering at the University of Illinois. In addition to reactor kinetics, he is doing research on turbulent dispersion and on basic fluid turbulence.

*Gary R. Thayer
George H. Miley
Barclay G. Jones*

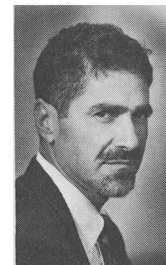
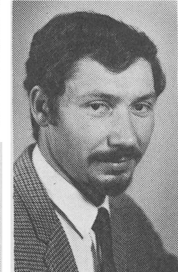
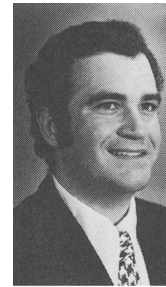


REACTOR SITING

ESTIMATE OF THE HAZARDS TO A NUCLEAR REACTOR FROM THE RANDOM IMPACT OF METEORITES

Kenneth Alvin Solomon (top) (MS, engineering, University of California, Los Angeles (UCLA), 1971; PhD, engineering, UCLA, 1974) has worked in both nuclear reactor reliability and general reliability studies, also in reactor kinetics. Robert C. Erdmann (center) (BS, mechanical engineering, Newark College of Engineering, 1960; MS, engineering, UCLA, 1962; PhD, California Institute of Technology) is currently on leave of absence as an associate professor of engineering at UCLA, and is manager of the Nuclear Engineering Reliability Group of Science Applications, Inc., Palo Alto, California. He has extensive experience in reactor reliability studies, general risk/benefit analysis, and reactor safety. David Okrent (bottom) (ME, Stevens Institute of Technology, 1943; PhD, physics, Harvard University, 1951) is professor of engineering and applied science at UCLA. He previously spent 20 years at Argonne National Laboratory working primarily on reactor physics and reactor safety.

*Kenneth A. Solomon
Robert C. Erdmann
David Okrent*

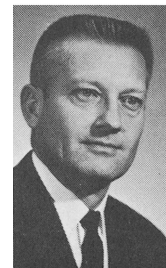


CHEMICAL PROCESSING

CRITICALITY DESIGN OF A LARGE-CAPACITY PLUTONIUM MELTING CRUCIBLE

C. L. Schuske (left) (MS, physics, University of Southern California) is director of the Nuclear Safety Group at Dow Chemical U.S.A.'s Rocky Flats Division. His areas of interest are critical mass physics and process plant nuclear criticality safety. Deanne Dickinson (PhD, mathematics, Massachusetts Institute of Technology) is a research specialist at Dow Chemical U.S.A.'s Rocky Flats Plant, working on computer calculations for nuclear safety.

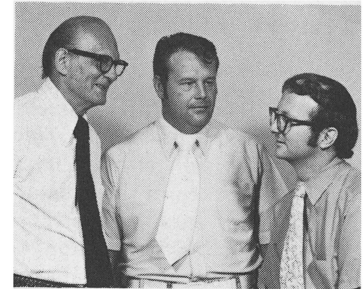
*C. L. Schuske
D. Dickinson*



SOME PRELIMINARY CONSIDERATIONS OF A MOLTEN-SALT EXTRACTION PROCESS TO REMOVE TRITIUM FROM LIQUID LITHIUM FUSION REACTOR BLANKETS

*Victor A. Maroni
Raymond D. Wolson
Gustav E. Staahl*

Victor A. Maroni (right) (PhD, chemistry, Princeton University, 1967) has been a member of the Chemical Engineering Division of the Argonne National Laboratory (ANL) since 1967. His past work has included studies of the structural and thermodynamic properties of molten salt systems pertinent to pyrochemical fuel reprocessing and to high-temperature battery systems with lithium anodes. He is currently leader of a group conducting research in areas of liquid-lithium chemistry and tritium-containment technology that are related to the development of controlled thermonuclear reactor systems. Raymond D. Wolson (center) (BS, chemistry, St. Joseph's College, Rensselaer, Indiana, 1963) joined the Chemical Engineering Division at ANL in 1963. He has participated in the pyrochemical fuel reprocessing and LMFBR sodium technology programs, and more recently has been involved in research on low-melting organic electrolytes for battery systems with alkali metal anodes. Gustav E. Staahl (left) (BS, physics, Northwestern University, 1940), a member of the ANL Chemical Engineering Division since 1966, has been engaged in research on the chemistry of irradiated LMFBR fuels. Prior to joining ANL he was a staff assistant at H. Kramer and Company, working on control instrumentation for metallurgical furnaces.



FUELS

FUEL STACK DIMENSIONAL VARIATIONS IN FAST REACTOR PINS UNDER IRRADIATION

IN-PILE MEASUREMENT OF FUEL-CLADDING CONDUCTANCE FOR PELLETTED AND VIPAC ZIRCALOY-2 SHEATHED FUEL PINS

The authors A. Calza-Bini (sitting first left), G. Cosoli (sitting second left), G. Filacchioni (sitting right), M. Lanchi (standing left), A. Nobili (standing center), E. Pesce (not pictured), U. V. Rocca (standing right), and P. L. Rotoloni (sitting third left), who form the Irradiation Group of the Laboratorio Tecnologie Ceramiche of the CNEN, have performed a research program since 1965 to improve the understanding of fuel pin behavior, particularly thermal and mechanical. Since 1967, an experimental program has been carried out using a hydraulic rabbit, several highly instrumented rigs in MTR, and small assemblies in BWR and LMFBR; a parallel work on modeling of pins in-pile thermal and mechanical behavior was carried out.

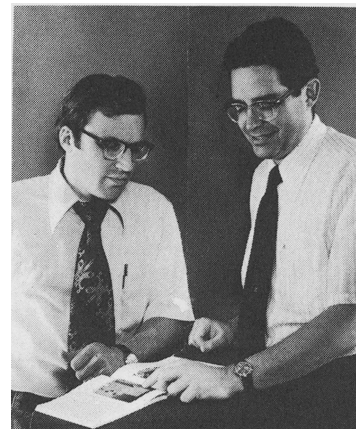
*A. Calza-Bini
G. Cosoli
G. Filacchioni
M. Lanchi
A. Nobili
E. Pesce
U. Rocca
P. L. Rotoloni*



EFFECT OF HIGH HELIUM CONTENT ON STAINLESS-STEEL SWELLING

F. W. Wiffen (right) (PhD, Northwestern University, 1967) and E. E. Bloom (PhD, University of Tennessee, 1970) are members of the Radiation Effects Group of the Metals and Ceramics Division of the Oak Ridge National Laboratory. Both have worked in the area of irradiation effects in metals for about 10 years, where the current emphasis is on the effect of reactor irradiation on the microstructures and mechanical properties of alloys of interest to the CTR and LMFBR projects.

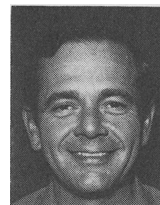
F. W. Wiffen
E. E. Bloom



TIME-DEPENDENT SOLUTION TO INTERSTITIAL DIFFUSION IN A TEMPERATURE GRADIENT

Clarence E. Lee (left) (PhD, University of Colorado, 1973) is a staff member in the Weapons Physics Group at Los Alamos Scientific Laboratory (LASL). He has done research in S_n transport theory, delayed-neutron detection, diffusion theory and elliptic operators, stochastic processes and probability of persistent fission chains, nuclear matter, phenomenological phase shift analysis on nucleon-nucleon scattering, exact analytical solutions to nucleon-nucleon scattering, hydrodynamics and mass transport processes, high temperature thermodynamics, nucleosynthesis, and charged-particle transport. Terry C. Wallace (PhD, Iowa State University, 1958) is the alternate group leader of the LASL High Temperature Chemistry Group. He was associated with the ROVER nuclear rocket program for 15 years doing research in the areas of high-temperature thermodynamics and mass transport processes. He has also worked on the development of the application of protective coatings to carbon-carbide composite fuel elements. Currently, he is working in the field of HTGR safety research.

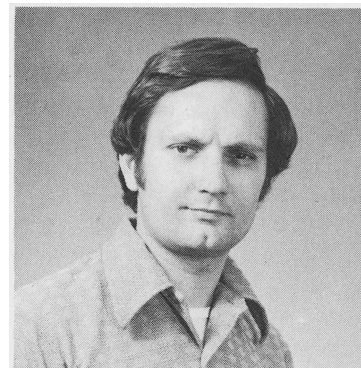
Clarence E. Lee
Terry C. Wallace



EVALUATION OF DETECTOR-EFFICIENCY AND SOURCE-WORTH CORRECTIONS FOR SUBCRITICAL REACTIVITY MEASUREMENTS IN A FAST CRITICAL ASSEMBLY

Richard E. Kaiser (PhD, nuclear engineering, Kansas State University, 1967) is currently working for the Idaho branch of the Applied Physics Division, Argonne National Laboratory, on fast reactor critical experiments. Prior to joining Argonne, he served as an instructor at Kansas State University and has worked in the area of SNAP reactor shielding at Atomics International. His current interests lie in the areas of fast reactor physics and safety.

R. E. Kaiser



SPECIFIC HEAT RATIO OF UF₆ MEASURED WITH A BALLISTIC PISTON COMPRESSOR

David E. Sterritt (top) (ME, nuclear engineering, University of Florida, 1972) is employed by the University of Florida where his main interests include numerical analysis and on-line data acquisition. George T. Lalos (center) (MS, physics, Catholic University of America, 1951) worked in the National Bureau of Standards' High Temperature Laboratory and since 1953 has been employed by the Naval Ordnance Laboratory as a group leader in the High Pressure Gases Group. Active in ballistic compressor research since 1960, he is currently a research associate in the Navy GDL and Chemical Laser Programs where his main interest is high-power lasers. Richard T. Schneider (bottom) (PhD, physics, University of Stuttgart, 1961) was employed by the Allison Division of General Motors Corporation as a section chief for plasma physics. Since 1965 he has been a professor of nuclear engineering at the University of Florida, where his main interests are nuclear pumped lasers and plasma diagnostics for uranium plasmas.

*David E. Sterritt
George T. Lalos
Richard T. Schneider*

