



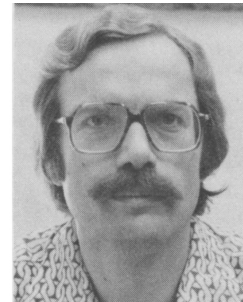
## AUTHORS — JANUARY 1980

### REACTORS

#### IRRADIATION BEHAVIOR OF EXPERIMENTAL MARK-II EXPERIMENTAL BREEDER REACTOR II DRIVER FUEL

**Gerard L. Hofman** (PhD, metallurgy, University of Florida, 1971) is currently working in a program at Argonne National Laboratory studying the behavior of metallic and ceramic fast reactor fuel under transient operation.

*G. L. Hofman*



#### EFFECT OF INTRASUBASSEMBLY INCOHERENCIES ON THE FAST TEST REACTOR UNPROTECTED TRANSIENT OVERPOWER ACCIDENT

**Shu-Chien Yung** (top) (PhD, mechanical engineering, University of Illinois, 1973) is a nuclear safety engineer at Hanford Engineering Development Laboratory (HEDL). He is currently involved with the analyses of unprotected transient overpower (TOP) accidents of liquid-metal fast breeder reactors. His special interests include multiphase fluid flow and heat transfer under the TOP accident conditions. **Norman P. Wilburn** (PhD, chemical engineering, California Institute of Technology, 1958) has worked at Hanford Plant Laboratories since 1958. He had been with HEDL since 1970 and since 1976 has been manager of the Reactor Dynamics Section, where he has been active in the development of computer codes for the analysis of hypothetical core disruptive accidents.

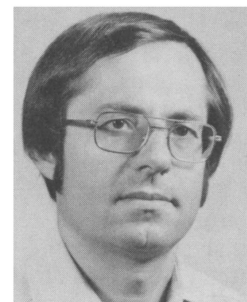
*Shu-Chien Yung  
Norman P. Wilburn*



#### ANALYSIS OF THE DIFFERENCES IN BREEDING RATIO AND FISSILE INVENTORY BETWEEN HETEROGENEOUS AND HOMOGENEOUS LIQUID-METAL FAST BREEDER REACTORS

**Constantine P. Tzanos** (Diploma, chemical engineering, National Technical University of Athens, Greece, 1968; ScD, nuclear engineering, Massachusetts Institute of Technology, 1971) is manager of Reactor Analysis and Methods Development at Science Applications, Inc., Chicago Office. His interests include reactor analysis and design, reactor safety, and methods development for reactor analysis and design.

*Constantine P. Tzanos*



**CRITICALITY EXPERIMENTS WITH SUBCRITICAL CLUSTERS OF LOW ENRICHED UO<sub>2</sub> RODS IN WATER WITH URANIUM OR LEAD REFLECTING WALLS**

*S. R. Bierman  
B. M. Durst  
E. D. Clayton*

**S. R. Bierman** (right) (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 currently a staff scientist at the Critical Mass Laboratory at Battelle-Pacific Northwest Laboratories (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. **B. M. Durst** (center) (BS, physics, University of Washington, 1971; MS, nuclear engineering, Louisiana State University, 1974) is a research scientist at PNL, where he has been actively involved in the generation of both basic experimental and computational criticality data. **E. Duane Clayton** (left) (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.



**DEVELOPMENT OF A DYNAMICS MODEL FOR THE RESEARCH REACTOR MARIA**

*Jerzy Kubowski*

**Jerzy Kubowski** (PhD, nuclear engineering, Institute of Nuclear Research, Świerk, Poland, 1976) is a research scientist in the Reactor Operational Department at Świerk, where he leads the In-Core Measurements and Analysis Group. His interests lie in the application of dynamics codes for safety analysis. At present, he is engaged in the measurements and calculations of gamma heating rates in reactor core materials.

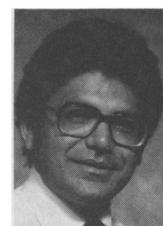


**REACTOR SITING**

**GRAVITATIONAL COLLISION EFFICIENCY OF POST HYPOTHETICAL CORE DISRUPTIVE ACCIDENT LIQUID-METAL FAST BREEDER REACTOR AEROSOLS: SPHERICAL PARTICLES**

*G. A. Pertmer  
S. K. Loyalka*

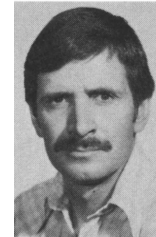
**Gary A. Pertmer** (top) (BS, aerospace engineering, Iowa State University, 1971; MS, 1973, and PhD, 1978, nuclear engineering, University of Missouri-Columbia) is an assistant professor in the Nuclear Engineering Program at the University of Maryland-College Park. His research interests include fluid mechanics and aerosol dynamics, heat transfer, and nuclear power reactor design and safety analysis. **Sudarshan K. Loyalka** (BE mech. hons., mechanical engineering, University of Rajasthan, India, 1964; MS, 1965, and PhD, 1967, nuclear engineering, Stanford University) is a professor in the Nuclear Engineering Program at the University of Missouri-Columbia. His research interests include kinetic theory of gases, neutron transport, aerosol behavior modeling, and reactor physics and safety analysis. During the years 1969-1971, he was a visiting scientist at the Max Planck Institut für Strömungsforschung, Göttingen, Federal Republic of Germany.



## THE ROLE OF FISSION GAS AND FUEL MELTING IN FUEL RESPONSE DURING SIMULATED HYPOTHETICAL LOSS-OF-FLOW TRANSIENTS

*G. Bandyopadhyay  
J. A. Buzzell*

**G. Bandyopadhyay** (top) (M. Tech., chemical engineering and chemical technology, University of Calcutta, India, 1968; MS, 1970, and PhD, 1973, materials science and engineering, University of California, Berkeley) is a staff ceramist in the Materials Science Division of Argonne National Laboratory (ANL). He is currently involved with the studies of materials problems in high-temperature battery systems, and the investigation of fuel and fission gas behavior in fast reactor fuels during simulated thermal transients. **John A. Buzzell** (undergraduate, electrical engineering) was a chief technician in the Materials Science Division at ANL at the time of this work. He is currently involved with the out-of-core testing of the Experimental Breeder Reactor II Operational Safety Testing Program in the Experimental Breeder Reactor Program at ANL-Idaho. He has 13 years of prior experience in hot cell and reactor operations.

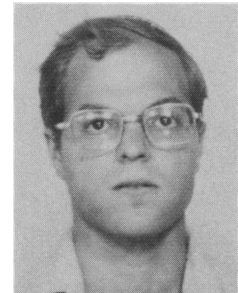


## CHEMICAL PROCESSING

### DESIGN AGAINST WEATHERING OF IODINE FILTERS

*Yakov Ben-Haim*

**Yakov Ben-Haim** (BS, mathematics, chemistry, Beloit College, 1973; MS, nuclear engineering, University of California, Berkeley, 1978; PhD, nuclear physics, University of California, Berkeley, 1978) is currently a postdoctoral fellow in nuclear engineering at the Technion-Israel Institute of Technology. His interests are air filter design, reactor control, and x-ray fluorescent compositional analysis.



## FUELS

### HELIUM FILL GAS ABSORPTION IN PRESSURIZED UO<sub>2</sub> FUEL RODS DURING IRRADIATION

*K. Vinjamuri  
D. E. Owen*

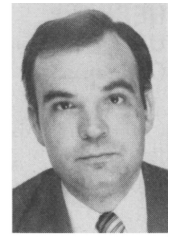
**Krishna Vinjamuri** (top) [BSc (honors), mathematical physics, 1959, and MSc, nuclear physics, 1963, Andhra University; MS, nuclear engineering, University of Wisconsin, 1968; PhD, nuclear engineering, Iowa State University, 1971] is a senior engineering specialist at EG&G Idaho, Inc. His primary research interests are in thermal fuels behavior during normal and accident conditions, in-reactor creep and densification, and fission gas release and swelling. **Dennis E. Owen** (BS, chemistry, California State University at Hayward, 1969) is supervisor of the Fuels Evaluation Section in the Light Water Reactor (LWR) Fuel Research Division of EG&G Idaho, Inc. He has nine years of nuclear fuels research and development experience, which began at General Electric's Vallecitos Nuclear Center, where he worked on commercial fuel improvements. He has been at EG&G since 1976. His current technical interests are the fuel behavior aspects of LWR safety testing and the postirradiation examination of transient tested fuels.



## HEAT TRANSFER IN PRESSURIZED WATER REACTOR COMPONENTS MOST OFTEN SUBJECT TO THERMAL SHOCK

**Faustino Parras** (top right) (graduate, Escuela Technica Superior de Ingenieros de Minas Del Instituto Politecnico de Madrid, 1965; postgraduate engineer, Higher Institute of Materials and Mechanical Construction, Paris, 1970) has done research in mathematical models for hydraulic transmission. In 1974, he became head of the Structural Analysis Department of Framatome, responsible for analyzing the capacity of reactor coolant system components in pressurized water reactors (PWRs) to withstand thermal, mechanical, seismic, and accident loads. At present, he is the new products manager in the Technical Department at Framatome. **Marcel Bosser** (top left) (engineering degree, CNAM, Paris, 1970) works for Framatome at Chalon-sur-Saône, France, in the Scientific Design Department, mainly dealing with the mechanical strength of pressure vessels in PWR power plants, with special responsibility for pressurizer design. **Daniel Milan** (bottom right) (graduate, Honors list, Ecole Nationale Supérieure des Mines, Nancy, 1960; engineering doctorate, University of Grenoble, 1971) is a lecturer at the Ecole Nationale Supérieure des Mines of Saint-Etienne in vibration mechanics and hydroelasticity. He is, at present, assistant head of the Thermohydraulics and Hydroelasticity Laboratories of NEYRPIC. **Gerard Berthollon** (bottom left) (graduate, Honors list, Ecole Nationale Supérieure des Mines, Saint-Etienne, 1970; postgraduate research degree, fluid mechanics, University of Grenoble, 1971) is a research engineer at the Thermohydraulics and Hydroelasticity Laboratories of NEYRPIC, with special interest in fluid mechanics and hydroelasticity.

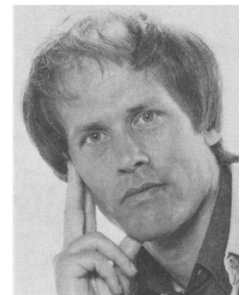
*F. Parras  
M. Bosser  
D. Milan  
G. Berthollon*



## DESIGN OF HIGH-PERFORMANCE FUEL PIN SIMULATORS FOR THERMODYNAMIC EXPERIMENTS WITH NUCLEAR FUEL ELEMENTS

**Valentin Casal** (Dipl. Ing., mechanical engineer, Technische Hochschule Darmstadt, 1962) is with the Karlsruhe Nuclear Research Center. He has been involved in research on thermodynamic behavior of nuclear fuel elements for various types of coolants. Presently, he is working on experiments describing the behavior of fuel elements after a loss-of-coolant accident in a liquid-metal fast breeder reactor.

*Valentin Casal*

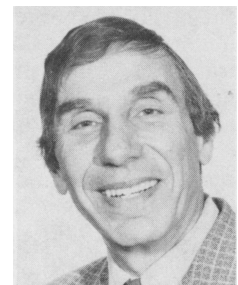


## RADIOACTIVE WASTE

### OCEAN DUMPING OF HIGH-LEVEL WASTE—AN ACCEPTABLE SOLUTION WE CAN "GUARANTEE"

**Bernard L. Cohen** (BS, Case Institute of Technology, 1944; MS, University of Pittsburgh, 1947; DSc, Carnegie Institute of Technology, 1950) is a professor of physics at the University of Pittsburgh. During the 1978-1979 academic year, he was a visiting scientist at Argonne National Laboratory. His current research is in radioactive waste management, radon problems, health effects of radiation, and risk-benefit considerations.

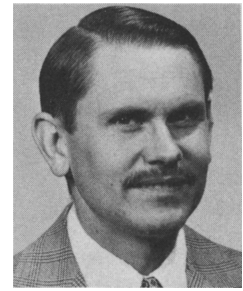
*Bernard Cohen*



## LABORATORY SIMULATION OF HIGH-LEVEL LIQUID WASTE EVAPORATION AND STORAGE

*Philip A. Anderson*

**Philip A. Anderson** (BS, chemistry, Colorado State College, 1964; graduate study, Arizona State University, Idaho State University, and University of Idaho) has been employed at Idaho National Engineering Laboratory since 1965. Currently, he is a senior chemist for Exxon Nuclear Idaho Company. His professional interests are analytical chemistry, nuclear fuel reprocessing, and radioactive waste management.



## MATERIALS

## EFFECTS OF TEMPERATURE CHANGES ON THE SWELLING BEHAVIOR OF 20% COLD-WORKED AISI TYPE 316 STAINLESS STEEL

*J. P. Foster*

*A. Boltax*

**John P. Foster** (right) (PhD, materials engineering, Drexel University, 1970) is a senior engineer at Westinghouse Electric Corporation in the Advanced Reactors Division. His interests include the design and performance evaluation of structural component and fuel pin mechanical behavior under neutron irradiation. **Alvin Boltax** (ScD, physical metallurgy, Massachusetts Institute of Technology, 1955) is manager of fuel materials technology in the Westinghouse Advanced Reactors Division. His special interests include fuel and structural materials irradiation behavior and reactor design of core components.



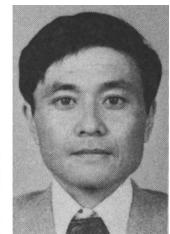
## SHIELDING

## ANALYSIS OF $^{60}\text{Co}$ GAMMA-RAY TRANSPORT THROUGH AIR BY DISCRETE-ORDINATES TRANSPORT CODES

*Nobuo Sasamoto*

*Kiyoshi Takeuchi*

**Nobuo Sasamoto** (top) (BS, electrical engineering, Kyoto University) is currently interested in evaluation of discrete-ordinates transport methods in shielding analysis through shielding benchmark calculations at the Japan Atomic Energy Research Institute. **Kiyoshi Takeuchi** (BS, physics, Tokyo University of Education; PhD, nuclear engineering, Kyoto University) is chief of the Shielding Effect Section of the Tokai Branch of the Ship Research Institute. His special interests include calculations of radiation shielding, radiation heating, and radiation damage on structural materials.

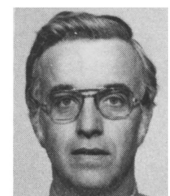


## RADIATION TRANSPORT IN EARTH FOR NEUTRON AND GAMMA-RAY POINT SOURCES ABOVE AN AIR-GROUND INTERFACE

*R. A. Lillie*

*R. T. Santoro*

**R. A. Lillie** (top) (PhD, University of Tennessee, 1975) is a research staff member in the Engineering Physics Division at the Oak Ridge National Laboratory (ORNL). His work has been in the areas of fission reactor core physics and shielding analysis. His current interests focus on the application of radiation transport methods to fusion reactor neutronics problems. **R. T. Santoro** (MS, University of Tennessee, 1967) is a research staff member in the Engineering Physics Division at ORNL. His interests focus on magnetic fusion energy reactor design, particularly on the analysis of neutronics problems related to shielding, neutral beam injectors, and integral experiments.



**DETERMINATION OF THE CONCENTRATION OF SOLUTES IN LIQUIDS BY MEANS OF THE  $(n,\alpha)$  AND  $(n,\gamma)$  REACTIONS**

*G. U. Greger  
K. Schügerl*

**Gerd Ulrich Greger** (top) (MS, chemistry, 1972, and DSc, technical chemistry, 1976, Technical University of Hannover) is at the Technical University of Darmstadt in the Institute for Nuclear Chemistry. He is engaged with different problems of nuclear waste deposit and investigates the behavior of tritium in Zircaloy. **Karl Schügerl** (MS, chemical engineering, Technical University of Budapest, 1949; DSc, technical chemistry, Technical University of Hannover, 1958) is professor of technical chemistry and director of the Institut für Technische Chemie at the University of Hannover. He is currently involved with the application of nuclide technique in chemical engineering.

