



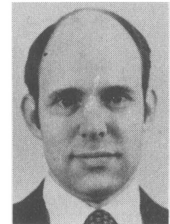
AUTHORS — APRIL 1981

REALISTIC ESTIMATES OF THE CONSEQUENCES OF NUCLEAR ACCIDENTS

REALISTIC ESTIMATES OF THE CONSEQUENCES OF NUCLEAR ACCIDENTS

*M. Levenson
F. Rahn*

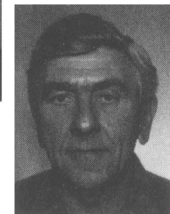
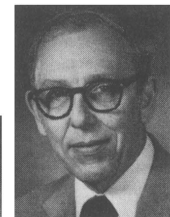
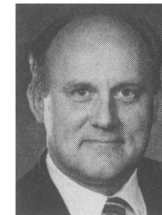
Milton Levenson (top) is working for the Bechtel Power Group of the Bechtel Company in San Francisco, California, a position he assumed on January 1, 1981. Until that time, he was director of the Nuclear Power Division, Electric Power Research Institute (EPRI), Palo Alto, California. Prior to joining EPRI, Levenson was Associate Laboratory Director for Energy and Environment at Argonne National Laboratory (ANL) in Argonne, Illinois. At ANL he at various times held the positions of project manager of the Argonne Advanced Research Reactor, project director of the Experimental Breeder Reactor, and deputy director of the Chemical Engineering Division. Prior to joining ANL, Levenson worked at what is now Oak Ridge National Laboratory from 1944 to 1948. **Frank J. Rahn** (BA, Queens College, 1965; MS, 1965, and DEngSci, 1970, nuclear engineering, Columbia University) is technical assistant to the director of the EPRI Nuclear Power Division, Palo Alto, California. He also served as project manager responsible for several technical areas in the Safety and Analysis Department of EPRI prior to his current assignment. Before joining EPRI in 1974, Rahn served successively as senior scientist at Mathematical Applications Group Inc. and senior engineer at Burns and Roe, Inc. He spent several post-graduate years at Columbia University as research associate. Prior to Columbia, he worked at Knolls Atomic Power Laboratory.



THE CHEMICAL BEHAVIOR OF FISSION PRODUCT IODINE IN LIGHT WATER REACTOR ACCIDENTS

*D. O. Campbell
A. P. Malinauskas
W. R. Stratton*

David O. Campbell (top) (PhD, physical chemistry, Illinois Institute of Technology, 1953) is manager of fuel reprocessing hot cell studies for the Chemical Technology Division at Oak Ridge National Laboratory (ORNL). His research interests include ion exchange, solvent extraction, separations chemistry, nuclear fuel reprocessing, fission product chemistry, and actinide separations. **Anthony P. Malinauskas** (center) (PhD, physical chemistry, Massachusetts Institute of Technology, 1962) is head of the Chemical Development Section at ORNL. His research interests include gas kinetic theory, separations science, nuclear fuel recycle chemistry, and nuclear fuel and fission product chemistry. **W. R. Stratton** (bottom) (PhD, physics, University of Minnesota, 1952) is a staff member at Los Alamos National Laboratory (LANL). He joined LANL in the same year and has worked in the theoretical design of

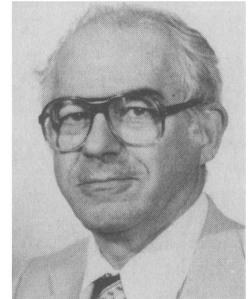


nuclear weapons, criticality safety, and reactor safety. He was a member of the Advisory Committee on Reactor Safeguards for nine years. His technical interests remain in the area of reactor safety, both for light water reactors and liquid-metal fast breeder reactors.

FISSION PRODUCT AND AEROSOL BEHAVIOR FOLLOWING DEGRADED CORE ACCIDENTS

H. A. Morewitz

Harry A. Morewitz (BA, physics, College of William and Mary, 1943; MA, physics, Columbia University, 1949; PhD, physics, New York University, 1953) is a senior staff engineer at the Atomics International Division, Energy Systems Group, Rockwell International. He is currently a consultant to both the Nuclear Safety Analysis Center and the Nuclear Energy Division of the Electric Power Research Institute in Palo Alto, California. He has been involved in reactor physics and safety research and development for 27 years. His recent research publications have been in the areas of aerosol transport, sodium fires, and the behavior of molten UO_2 .

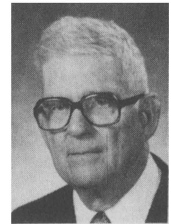


IMPACT OF SECONDARY EFFECTS ON THE REDUCTION OF FISSION PRODUCT SOURCE TERMS IN CLASS IX REACTOR ACCIDENTS

G. W. Parker

G. E. Creek

G. W. Parker (top) (MS, chemistry, University of Tennessee), beginning with the Manhattan Project at the University of Chicago, has worked at Oak Ridge National Laboratory (ORNL) on problems associated with isolating the synthetic elements from fission, reactor safety and fission product release, and contributed to WASH-1400, Appendix VII on fission product source terms. He is presently occupied with core melt aerosol source term experiments. **G. E. Creek** (MS, chemistry, University of Illinois) worked with the Manhattan Project at the University of Chicago. He was involved at ORNL in problems dealing with isolating the synthetic elements from fission, reactor safety, and fission product release. He retired from ORNL in 1973, but returned as a consultant in 1974 and is working on core melt aerosol source term experiments.



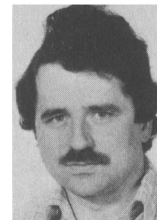
THE ROLE OF AEROSOL BEHAVIOR IN LIGHT WATER REACTOR CORE MELT ACCIDENTS

H. Bunz

W. Schikarski

W. Schöck

Helmut Bunz (top) (Diplom, physics and clinical radiology, University of Saarbrücken, 1975) is a scientist in the Laboratory for Aerosol Physics and Filter Technology at Karlsruhe Nuclear Research Center, Federal Republic of Germany, where he has been developing codes calculating the behavior of aerosols in containments of nuclear power plants after hypothetical accidents for five years. He is now working mainly in the field of light water reactor (LWR) safety research. He formerly worked in the field of liquid-metal fast breeder reactor safety. **Wolfgang O. Schikarski** (bottom) (Dr. rer. nat., University of Karlsruhe, 1957) is director of the Laboratory for Aerosol Physics and Filter Technology at the Karlsruhe Nuclear Research Center and is also professor in the Department of Energy Engineering at the University of Stuttgart. He works in the areas of nuclear safety and environmental safety of conventional and nuclear power plants. His current interests are the radiological



source term, nuclear aerosol behavior, and all types of environmental effects of energy installations including air pollution, waste heat, and climatology. **Werner Schöck** (right) (Dr. rer. nat., University of Giessen) obtained his degrees in the field of atomic spectroscopy. He has been working in aerosol research since 1971 and in reactor safety applications since 1974. He is presently leader of the LWR Safety Research Group at the Laboratory for Aerosol Physics and Filter Technology.



RADIOLOGICAL CONSEQUENCES OF BORAX/SPERT/SNAPTRAN EXPERIMENTS

R. R. Smith (PhD, physical chemistry, Columbia University, 1953) is the assistant director of the Experimental Breeder Reactor II Project located at the Idaho National Engineering Laboratory. He has spent approximately 25 years working for Argonne National Laboratory in many phases of liquid-metal fast breeder reactor technology. His principal interests are reactor kinetics, neutron cross sections, radiochemistry, and fast reactor safety.

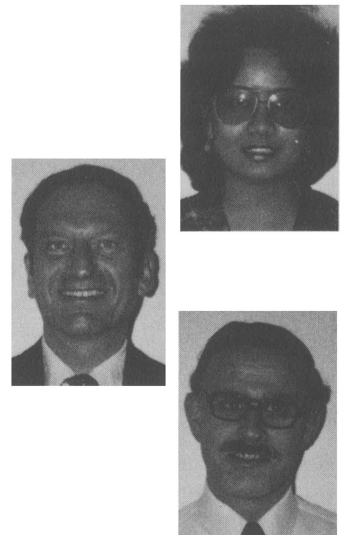
R. R. Smith



RADIATION RELEASES FROM THE SL-1 ACCIDENT

Z. T. Mendoza (top) (BS, chemical engineering, University of the Philippines, 1967) is a senior engineer at Science Applications, Inc. (SAI), Palo Alto, California. She has been involved in the area of nuclear safety analysis for the last six years and works primarily in the field of reactor accident consequences. **Charles A. Stevens** (center) (PhD, nuclear engineering, University of Michigan, 1962) is deputy manager of the Engineering and Physics Group of SAI, where he has worked since he helped found the company in 1969. He has experience in radiation transport, reactor physics, and nuclear weapons effects. Since 1974, his primary interests have been nuclear waste management and nuclear reactor safety, especially analyzing the consequences of accidents. **Robert L. Ritzman** (bottom) (PhD, physical chemistry, Rensselaer Polytechnic Institute, 1961) is manager of the Physics and Safety Department of SAI. He has been active in the area of consequence analysis as related to probabilistic risk assessment of nuclear facilities for the past ten years.

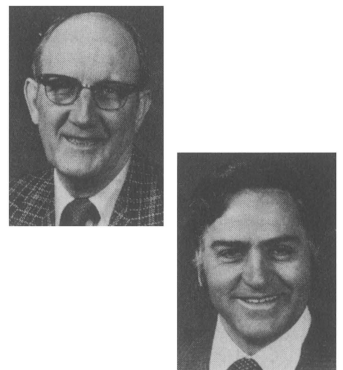
*Z. T. Mendoza
C. A. Stevens
R. L. Ritzman*



LARGE-SCALE FISSION PRODUCT CONTAINMENT TESTS

R. K. (Bob) Hilliard (top) (BS, University of Washington, 1949, and MS, University of Idaho, 1960, chemical engineering) has, for the past 25 years, been involved with safety research at Hanford Engineering Development Laboratory (HEDL) on production, light water reactors (LWRs), and liquid-metal fast breeder reactors (LMFBRs). He was technical leader for the fission product transport task of the Containment Systems Experiment and is presently performing research on sodium aerosols, their containment, and air cleaning. **Arlin Postma** (BS, 1958, and PhD, 1970, chemical engineering, Oregon State University) has, for the past 16 years, devoted his technical efforts to nuclear safety, and he is widely recognized for his

*R. K. Hilliard
A. K. Postma*



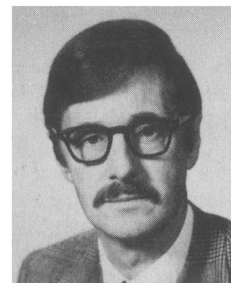
work on containment spray systems in LWRs. For the past six years he has worked as a private consultant to the nuclear industry. At HEDL, Arlin is currently involved in LMFBR aerosol behavior studies, air cleaning development, and hydrogen mixing studies.

REMOTE FABRICATION OF REACTOR FUELS

REMOTE FABRICATION OF $(Th,^{233}U)_2$ PELLETT-TYPE FUELS FOR CANDU REACTORS

M. A. Feraday

Melville A. Feraday [BSc, mechanical engineering, Queens University (Kingston), 1954; MSc, material science, University of Waterloo, 1970] is head of the Advanced Fuel Development Section, Fuel Materials Branch at Atomic Energy of Canada Limited's Chalk River Nuclear Laboratories, Chalk River, Ontario, Canada. His experience and interests include fabrication of mixed-oxide fuels for power reactors and metal fuels for research reactors along with the application of robotic technology to the recycle fuel industry.



FABRICATION OF PLUTONIUM-ENRICHED FUEL AT BELGONUCLEAIRE

Emile Vanden Bemd

Emile L. F. Vanden Bemden (BS, 1952, and PhD, 1956, chemistry, Brussel University) has been involved since 1957 in the development of plutonium-enriched fuel at Belgonucleaire and is responsible for fuel research and development and fuel production activities. He recently became coordinator of the three technical divisions of Belgonucleaire—Engineering, Fuel Design and Engineering, and Fuel Production.



U.K. DEVELOPMENT TOWARD REMOTE FABRICATION OF BREEDER REACTOR FUEL

*R. L. Nelson
N. Parkinson
W. C. L. Kent*

Roy L. Nelson (top) (BSc, 1956, and PhD, 1959, University of Edinburgh) spent periods in the physical chemistry departments at McGill and Brandeis Universities before joining the United Kingdom Atomic Energy Authority (UKAEA) at Harwell in 1961 to work on the effects of radiation on surfaces. Since 1971, he has been leader of the Special Processing Group and responsible for the development of gel processes for nuclear and nonnuclear applications. **Norman Parkinson** (center) (BSc, 1940, and MSc, 1941, University of Manchester) taught in the Metallurgy School at Manchester and held posts with British Aluminium, Tin Research Institute and Mallory Batteries before joining the UKAEA at Dounreay. His interests are in fuel fabrication, reprocessing, and liquid-metal coolants. He is currently manager of the Plutonium Fuels Technology Group at Windscale, which is responsible for fast reactor fuel studies covering physical chemistry, fuel, and fuel element fabrication development. **William C. L. Kent** (bottom) (member of the Institute of Mechanical Engineers, 1960), a chartered mechanical engineer, is presently chief engineer for fuel plant design in the Reprocessing Division of British Nuclear Fuels Limited, located at Risley. His main interest and experience over the past 20 years

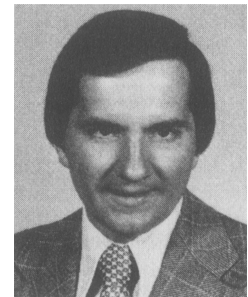


has been the design and construction of fast breeder and thermal fuel cycle plants concerned with the processing and handling of plutonium-bearing materials.

ANALYSIS OF FIRE BARRIERS WITHIN NUCLEAR POWER PLANTS

Dennis L. Berry

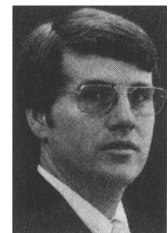
Dennis L. Berry (BS, chemical engineering, Pennsylvania State University, 1968; MS, chemical engineering, University of California, Berkeley, 1974) is a member of the technical staff at Sandia National Laboratories (SNL). He joined SNL in 1977 after spending four years at the Division of Naval Reactors in Washington, D.C., and three years at Burns and Roe Architect-Engineers in Oradell, New Jersey. His work at SNL has involved analysis of nuclear power plant fire protection systems, including ventilation, detection, and extinguishing systems. He is presently the principal investigator of an SNL program to develop alternate decay heat removal systems for light water reactors.



A REAL-TIME METHOD FOR ANALYZING NUCLEAR POWER PLANT TRANSIENTS

*T. G. Broughton
P. S. Walsh*

T. Gary Broughton (top) (BS, mathematics, Dartmouth College, 1966) is the control and safety analysis manager at GPU Nuclear, a group within General Public Utilities. He is responsible for dynamic analysis and review of dynamic performance of GPU nuclear power plants. After earning his degree, he served ten years in the U.S. Navy as an officer in the nuclear submarine force. He has coauthored several papers on computer simulations of nuclear power plant transients. **Patrick S. Walsh** (BS, chemical engineering, Illinois Institute of Technology, 1969; MS, nuclear engineering, Catholic University of America, 1978) is the plant analysis manager at GPU Nuclear. He is responsible for the analysis and improvement of the technical performance of GPU system nuclear generating stations. Prior to joining GPU, he held positions as nuclear fuels engineer and startup test engineer at the Baltimore Gas and Electric Company's Calvert Cliffs nuclear power plant and served five years in the Navy Nuclear Program.



ON EVALUATION OF THE STATISTICAL ERROR IN MEASURING THE REACTOR PERIOD AND REACTIVITY IN CASE OF A DRIFT-TYPE DISTURBANCE

Yurii Mikhailovich Karatsuba

Photograph and biography were not available at our publication deadline.

WASH-1400: A COMPARISON OF EXPERIENCE AND PREDICTION*G. S. Lellouche*

Gerald S. Lellouche (PhD, North Carolina State University, 1960) is responsible for research in the areas of statistics and consequence analysis for the Electric Power Research Institute (EPRI). Prior to joining EPRI, he worked for Brookhaven National Laboratory in the areas of reactor kinetics, reactor design, and thermal-hydraulics.

**CHEMICAL PROCESSING****THE REMOVAL OF TRACE CONTAMINANTS FROM RE-CYCLE NITRIC ACID**

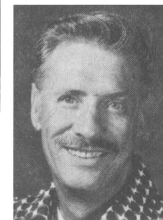
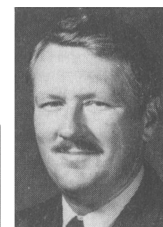
*Walter E. Clark
W. B. Howerton
J. C. Mailen*

Walter E. Clark (top) (BS, chemistry, Virginia Military Institute, 1937; MA, chemistry, George Washington University, 1939; PhD, inorganic chemistry, University of Wisconsin, 1949) was a research staff member of the Chemical Technology Division at Oak Ridge National Laboratory (ORNL) with interests in the reprocessing of nuclear fuels and waste management. He has recently retired. **William B. Howerton** (center) is a science technologist in the Chemical Technology Division at ORNL. He has worked on a wide variety of chemical problems connected with nuclear fuel reprocessing and nuclear waste disposal. His current interests continue to be in these areas. **James C. Mailen** (bottom) (BS, chemical engineering, Kansas State University, 1959; PhD, chemical engineering, University of Florida, 1964) has been involved in fuel cycle research in the Chemical Technology Division at ORNL since 1963. He is currently group leader for laboratory development with technical interests in fuel reprocessing, product conversion, and waste management.

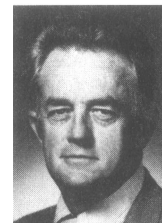
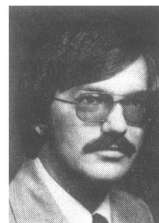
**NUCLEAR FUELS****DEVELOPMENT OF IN-CORE GAS RELEASE DEVICES FOR FAST FLUX TEST FACILITY FUEL FAILURE MONITORING SYSTEM TESTING**

*R. Kolowith
D. V. Archer
F. E. Holt
W. C. Miller
J. J. McCown*

R. Kolowith (top) (BS, mechanical engineering, Marquette University, 1963) has been doing nuclear technology design and development work at Hanford Engineering Development Laboratory (HEDL) since 1967. He is presently a senior engineer at Westinghouse Hanford Company with technical interest in design and development of experimental lithium systems. **D. V. Archer** (center) has been working at Westinghouse Hanford Company as an engineering technician since 1972. He has 18 years of experience operating reactors and test systems. **F. E. Holt** (bottom) (BS, chemistry, Seattle University, 1947) is a senior scientist with the Westinghouse Hanford Company. He has had a number of radioanalytical assignments,



both individual and supervisory, in the nuclear field and is one of the principal designers of the Fast Flux Test Facility (FFTF) Cover Gas Monitoring System. **W. C. Miller** (top) (MS, mechanical engineering, Stanford University, 1972) has been doing nuclear technology design and development work for Westinghouse Hanford Company since 1972. He was a group leader in the Liquid Metal Technology Department and is presently manager of target development on the Fusion Materials Irradiation Test Facility. **J. J. McCown** (bottom) (MS, chemistry, University of Tennessee, 1955) has been working in nuclear technology since 1952 in analytical chemistry and radiochemistry at Oak Ridge National Laboratory, Argonne National Laboratory, and Westinghouse Astronuclear Laboratory. He has been working in sodium technology at HEDL since 1968, and is presently the manager of the Sodium Systems Technology Group, which developed the Fuel Failure Monitoring System for the FFTF.



RADIOISOTOPES
AND ISOTOPES

A TWIN SELF-POWERED NEUTRON DETECTOR FOR STEAM VELOCITY DETERMINATION IN A BOILING WATER REACTOR

E. B. J. Kleiss
H. van Dam

Erik B. J. Kleiss (top) (graduate physical engineer, Delft University of Technology, The Netherlands, 1976) has been doing reactor physics research since 1975. At present, he is researcher at the Interuniversity Reactor Institute, working on light water reactor noise subjects. **Hugo van Dam** (graduate physical engineer, 1964, and DSc, 1971, Delft University of Technology, The Netherlands) has been involved in reactor physics research since 1961. Presently, he is professor of reactor physics at the Delft University of Technology and the Interuniversity Reactor Institute, with current technical interests in noise analysis and reactor safety.

