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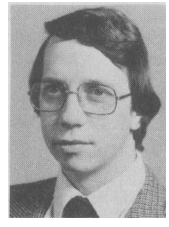
AUTHORS — JULY 1983

FISSION REACTORS

THE ABUNDANCE OF FISSION GASES IN THE OFF GAS OF A BOILING WATER REACTOR

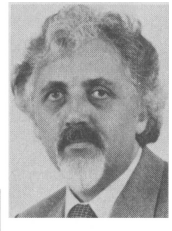
H. W. Kalfsbeek



H. W. Kalfsbeek (PhD, physics, University of Utrecht, 1979) is a staff member of KEMA, the joint research center of the Dutch utilities. He has been involved in experimental and computational research projects for more than eight years (nuclear physics, plasma physics, and risk and reliability analyses). He is currently concerned with reactor safety, both with probabilistic and experimental studies in the field of systems reliability, fission product releases, and transport mechanisms, (core, containment, and atmosphere).

THE MODULAR HIGH-TEMPERATURE REACTOR

Herbert Reutler
Günter H. Lohnert

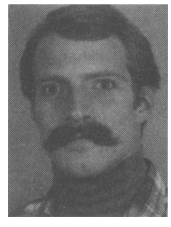


Herbert Reutler (top) [chemical and nuclear engineering, University of Karlsruhe, Federal Republic of Germany (FRG), 1964; Dr.-Ing., mechanical engineering, University of Aachen, 1974] has been actively involved from 1964 to 1972 (Germany's project leader from 1972-1974) in the design and construction of the German-French high-flux reactor in Grenoble, France. From 1972 to 1974, he was delegated by Hoecht AG to EURODIF in Paris. Since 1974 he has been employed by GHT/INTERATOM in the FRG as head of the Department for Conceptional Design of high-temperature reactors (HTRs). **Günter H. Lohnert** (PhD, nuclear sciences, University of Florida, 1971) has been employed since 1974 by GHT/INTERATOM Company in the FRG in the fields of core design, core analysis, and the conceptional design of HTRs. Since 1978 he has been visiting associate professor at the University of Florida, Department of Nuclear Sciences and Engineering.

NUCLEAR SAFETY

AN ANALYTICAL STUDY OF A SMALL-BREAK LOSS-OF-COOLANT ACCIDENT WITH UPPER HEAD INJECTION

Mark T. Leonard

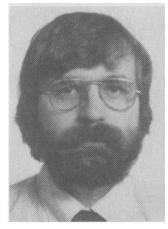


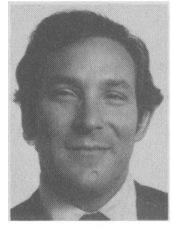
Mark T. Leonard (BS, nuclear engineering, Purdue University, 1980) is currently attending Massachusetts Institute of Technology in the Department of Nuclear Engineering. He is on a leave of absence from EG&G Idaho, Inc., where he was an engineer in the Water Reactor Research Test Facilities Division

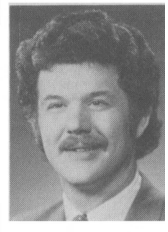
at the Idaho National Engineering Laboratory. His technical interests include reactor thermal-hydraulic safety analysis and applications of two-phase flow phenomena.

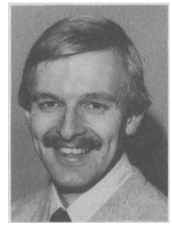
SIMPLE LAKE BREEZE FRONT POSITION TECHNIQUE FOR OFF-SITE DOSE ASSESSMENT

Thomas J. Burda
Carl A. Mazzola
Walter A. Lyons
Gary T. Van Helvoirt







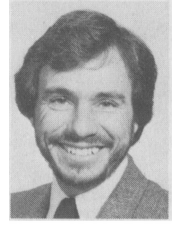


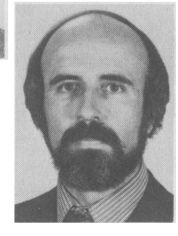
Thomas J. Burda (top right) (BS, meteorology, Lowell Technological Institute, 1974; MS, meteorology, University of Maryland, 1976) is employed as a principal meteorologist in the Environmental Engineering Division of Stone & Webster Engineering Corporation. His recent interests include the effects of micro- and mesoscale atmospheric phenomena on atmospheric dispersion. **Carl A. Mazzola** (top left) (BS, meteorology, City College of New York, 1968; MS, meteorology, Pennsylvania State University, 1970) has been with the Environmental Engineering Division of Stone & Webster Engineering Corporation since 1973. In 1978 he assumed the position of senior environmental scientist–meteorology. His current interests are in environmental impact assessment of all phases of the uranium fuel cycle with an emphasis on the meteorological aspects of emergency procedures. **Walter A. Lyons** (bottom right) (BS, meteorology, Saint Louis University, 1964; MS, 1965, and PhD, 1970, geophysical sciences, University of Chicago) served as administrator of the Air Pollution Analysis Laboratory, University of Wisconsin-Milwaukee from 1969 to 1975. Since then he has served as president of MESOMET, Inc. (and is now its principal senior scientist), and since 1981 has been president of R*SCAN Corporation. His principal interests include coastal mesometeorology, numerical modeling of atmospheric processes, and remote sensing of mesoscale atmospheric variables via technologies such as radar, satellite, acoustic sounder, and lightning tracking networks. **Gary T. Van Helvoirt** (bottom left) (BS, meteorology, University of Wisconsin, 1977; MS, environmental science, University of Virginia, 1980) is employed in the Environmental Engineering Section of the Wisconsin Public Service Corporation. He is involved with the development of a Class A dose projection model, air quality monitoring and modeling, and wind energy studies.

NUCLEAR FUELS

MODELING FRAGMENTATION AND SPALLATION OF OXIDE REACTOR FUEL DURING TRANSIENT HEATING INCLUDING THE EFFECTS OF BURNUP AND FISSION PRODUCT DISTRIBUTION

Ronald J. DiMelfi
John M. Kramer





Ronald J. DiMelfi (top) (PhD, materials science and engineering, Stanford University, 1975) is a staff metallurgist in the Reactor Analysis and Safety Division of Argonne National Laboratory (ANL). He has experience in the fields of high-temperature mechanical behavior and fracture of stressed materials. His current interests include modeling the transient behavior of reactor fuel and cladding material based on microstructural considerations, the effects of environment on material failure, and the fundamental aspects of material deformation. **John M. Kramer** (PhD, engineering mechanics, the University of Wisconsin, 1969) is the manager of the Fuel Behavior Section of the

Reactor Analysis and Safety Division at ANL. His general interests are in continuum mechanics and rheology. His current interests are in the interdisciplinary problems related to thermal-mechanical modeling of reactor fuel behavior under transient conditions.

HEAT TRANSFER FROM TRANSPORT CASK STORAGE FACILITIES FOR SPENT FUEL ELEMENTS

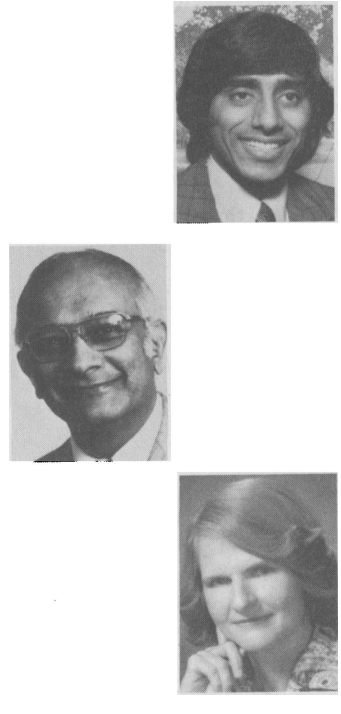
Wolfgang von Heesen
Heinz Malmström
Rüdiger Detzer
Werner Loew

Wolfgang von Heesen (top right) [Dipl.-Ing., mechanical engineering, 1973; Dipl.-Wirtsch.-Ing., economics, Aachen Technical University, Federal Republic of Germany (FRG), 1975] is employed at STEAG Kernenergie GmbH. His current interests are in the field of the nuclear fuel cycle, especially the interim storage of spent fuel elements and radioactive waste. **Heinz Malmström** (top left) (Dipl.-Ing., mechanical engineering, Hannover Technical University, FRG, 1963) has been with STEAG Kernenergie GmbH, Essen, FRG since 1970. He is manager of the DWK/STEAG Consortium Ahaus spent fuel interim storage facility. **Rüdiger Detzer** (bottom right) (Dr.-Ing., mechanical engineering, Stuttgart University, FRG, 1967; thesis in the field of HVaC, 1972) has served as a scientific staff member of Stuttgart University from 1967 to 1975. Since 1975 he has been head of the R&D center of Kessler + Luch GmbH, Giessen, FRG. **Werner Loew** (bottom left) (Dipl.-Ing., mechanical engineering, Aachen Technical University, FRG, 1979) has been employed at the R&D center of Kessler + Luch GmbH, Giessen, FRG since 1979 and has served as assistant head since 1982. His current interests are experimental and theoretical studies in air conditioning and ventilation.

RADIOACTIVE WASTE MANAGEMENT

EVALUATION OF $SrMoO_4$ IN REPOSITORY SIMULATING TESTS

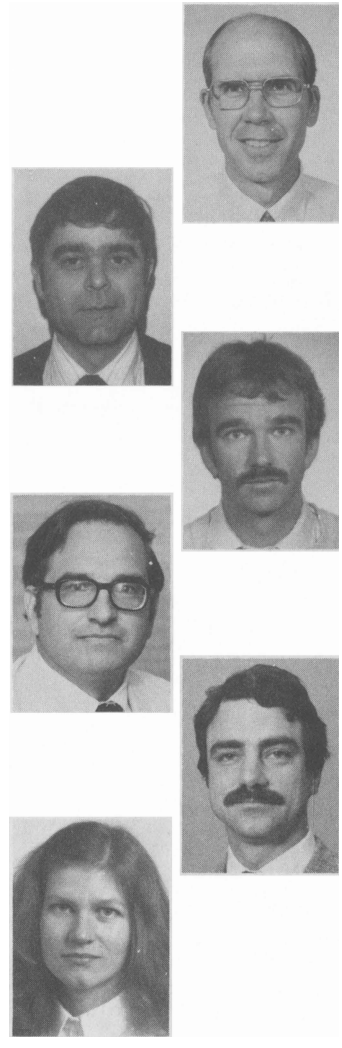
Sridhar Komarneni
Rustum Roy
Della M. Roy



Sridhar Komarneni (top) (PhD, soil chemistry and mineralogy, University of Wisconsin-Madison, 1973) is a senior research associate at the Materials Research Laboratory, The Pennsylvania State University, University Park. His primary research interests are materials preparation and characterization, crystal chemistry of the use of clays, zeolites, and gels in nuclear waste disposal, and the chemistry of alteration and interactions of nuclear waste solids with wall rock under repository conditions. **Rustum Roy** (center) (PhD, ceramics, The Pennsylvania State University, 1948) is professor of geochemistry and of solid state at Penn State. He has also been the director of the Penn State Materials Research Laboratory, University Park, since 1962. His main research interests are materials preparation and characterization, crystal chemistry, synthesis, stability, phase equilibria and crystal growth in nonmetallic systems, ultrahigh pressure reactions in solids, and the chemistry and physics of noncrystalline solids. **Della M. Roy** (bottom) (PhD, mineralogy, The Pennsylvania State University, 1952) is professor of materials science at Penn State. Her main research interests are preparation and characterization of cement and ceramic materials, high-temperature chemistry of cement, hydrothermal calcium silicate reactions, special cements, cements in nuclear waste isolation, and experimental geochemistry of calcium silicates.

IRRADIATION BEHAVIOR OF PRESSURIZED WATER REACTOR CONTROL MATERIALS

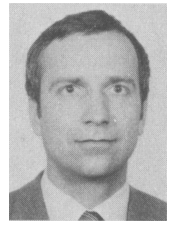
Richard V. Demars
Charles G. Dideon
Thomas A. Thornton
James S. Tulenko
Wayne A. Pavinich
Elma Beth S. Pardue



Richard V. Demars (top right) (BS, 1962, and MS, 1968, mechanical engineering, University of Southern California) is a supervisory engineer in the Fuel Engineering Section of the Nuclear Power Generation Division of Babcock & Wilcox (B&W). His primary responsibility is for structural analysis of nuclear fuel. **Charles G. Dideon** (top left) (BS, mechanical engineering, University of Washington, 1961) is supervisor of the Fuel Material and Performance Group in B&W's Fuel Engineering Section. His interests include design of nuclear fuel components and postoperational evaluation of component/materials performance. **Thomas A. Thornton** (center right) (BS, 1968, and MS, 1969, chemical engineering, Manhattan College; PhD, nuclear engineering, University of Cincinnati, 1976) is a senior engineer in the Fuel Engineering Section of B&W's Nuclear Power Generation Division. Previously, he worked at B&W's Lynchburg Research Center in the general area of advanced nuclear fuel and fusion breeder materials processing and thermochemistry. Current interests include pressurized water reactor fuel and control materials thermochemistry, fabrication, and characterization techniques. **James S. Tulenko** (center left) (MS, nuclear engineering, Massachusetts Institute of Technology, 1963) was a manager in fuel engineering for B&W's Nuclear Power Generation Division. He has worked for B&W for 12 years in the fuel/control material performance area. Currently, he is manager of computer services for B&W in charge of the engineering/scientific computational area. **Wayne A. Pavinich** (bottom right) (BS, mechanical engineering, University of Colorado, 1974; MS, materials science, Cornell University, 1977) is currently involved in the reactor vessel surveillance program, development of fracture toughness techniques, and analysis of fracture toughness data. Previous duties at B&W included postirradiation examination and failure analysis of various reactor components, nuclear fuel assemblies, and reactor control components. **Elma Beth S. Pardue** (bottom left) (BS, materials engineering, North Carolina State University, 1977; MMS, materials science, University of Virginia, 1980) is an engineering consultant in Knoxville, Tennessee. She was previously an engineer in the Nuclear Materials Technology Section at B&W's Lynchburg Research Center. Her primary duties there included postirradiation examinations and failure analyses of nuclear components.

DOSE RESPONSE IN RADIATION-INDUCED HUMAN CARCINOGENESIS: ACCUMULATED DATA DO NOT YET SOLVE THE ENIGMA

Werner Burkart



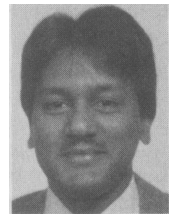
Werner Burkart (PhD, biochemistry, Swiss Institute of Technology, 1973) worked for several years at the University of Basel and, during the summer, at the Marine Biological Laboratory in Woods Hole, Cape Cod, on cell-cell interaction in tissue

formation. After a one-year stay at the Institute of Environmental Medicine, New York University, he started work at the Swiss Federal Institute for Reactor Research. His current research interests include susceptibility to radiation during cell differentiation and dose effect relationships at low levels of radiation.

HEAT TRANSFER AND FLUID FLOW

STATISTICAL CHARACTERISTICS OF INCIPIENT TWO-PHASE NOISE FOR REACTOR DIAGNOSIS

Monideep Kumar De

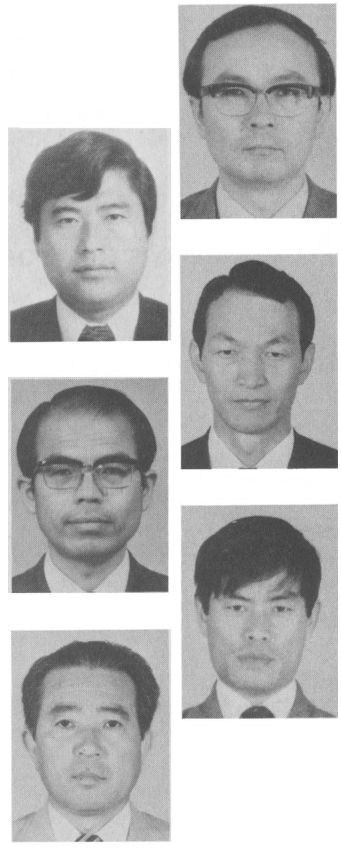


Monideep Kumar De (BSc, engineering physics, Queen's University, 1975; MS, 1976, and PhD, 1980, nuclear engineering, University of Michigan) is a senior engineer in the Nuclear Technology Division at Westinghouse Electric Corporation. His current interests are in the areas of fault analysis and diagnosis of safety systems in nuclear power plants.

TECHNIQUES

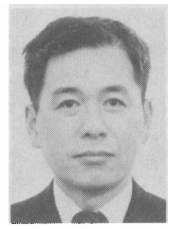
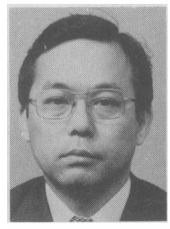
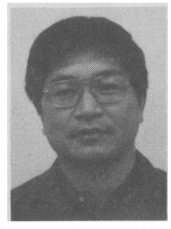
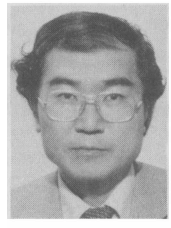
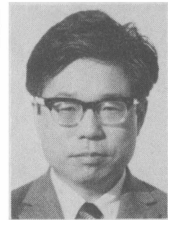
DEVELOPMENT AND OPERATIONAL EXPERIENCES OF AN AUTOMATED REMOTE INSPECTION SYSTEM FOR INTERIOR OF PRIMARY CONTAINMENT VESSEL OF A BWR

Norihiko Ozaki
Fumio Tomizawa
Masaaki Fujii
Masayoshi Sasaki
Ken-Ichiro Sadakane
Chikara Sato
Katsuhiro Mizuno
Katsutoshi Shimizu
Teisuke Watarai
Takahiko Ito
Yuji Hashimoto



Norihiko Ozaki (top right) (BS, nuclear engineering, Kyoto University, 1962; Dr. Eng., nuclear engineering, Osaka University, 1972) was engaged in plasma diagnostics at Central Research Laboratory of Hitachi, Ltd., and uranium enrichment by gas centrifuge at Energy Research Laboratory (ERL). His recent interests include application of robotic technology to remote inspection and maintenance in the nuclear power station. **Fumio Tomizawa** (top left) (BS, electrical engineering, Waseda University, 1972) is a researcher at the ERL of Hitachi, Ltd. Since 1972, he has been engaged in development of the maintenance and inspection robot for the nuclear power plant. His main interest is control technique of robots. **Masaaki Fujii** (center right) (BS, electrical engineering, Ibaraki Technical College, 1961) is a senior researcher at the ERL of Hitachi, Ltd. His current interests are in the dose analysis of internal exposure and in radiation monitoring for nuclear power plants. **Masayoshi Sasaki** (center left) (BS, mechanical engineering, 1958, and BS, electrical engineering, 1960, Ibaraki University) is employed in the Hitachi Works of Hitachi, Ltd. His general field of interest throughout his career has been design and development of electromechanical equipment, especially for nuclear power stations. **Ken-ichiro Sadakane** (bottom right) (MS, electrical engineering, Kyushu Institute of Technology, 1972) is employed in ERL of Hitachi, Ltd. Since 1978, he has been engaged in the development of inspection robots for nuclear power plants. **Chikara Sato** (bottom left) (BS, mechanical engineering, Hitachi Technical College, 1953) was engaged in safety-related research on boiling water reactors. Since 1978,

he has been engaged in design and testings of the remote inspection system for nuclear power stations. **Katsuhiro Mizuno** (top right) (BS, electrical engineering, Tokyo University, 1959) is an assistant chief engineer at Omika Works of Hitachi, Ltd. His general field of interest throughout his career has been development of an instrumentation and automatic control system for a nuclear power plant. His current interest is in a robot system for automatic inspection to complement manual monitoring. **Katsutoshi Shimizu** (top left) (BS, nuclear engineering, Tohoku University, 1967) is employed in the Engineering Department of the Japan Atomic Power Company, which was established in 1957 to serve as the pioneer in the construction and operation of commercial nuclear power plants in Japan. **Teisuke Watarai** (center right) (MS, mechanical engineering, Keio University, 1972) joined Tokyo Electric Power Company, Inc. and was engaged in design and construction of a nuclear power station from 1972 to 1975. The next six years, he was with Atomic Power Development Laboratory, where he was responsible for promoting R&D activities. Since 1981, he has been engaged in design and construction of nuclear power stations. **Takahiko Ito** (bottom left) (BS, electrical engineering, Tokyo University, 1964) is a section head of the Nuclear Power Planning Division of Chubu Electric Power Company, Inc. and is in charge of planning and system design of electrical and instrumentation systems for nuclear power generating stations. He has been engaged in this field since 1964. **Yuji Hashimoto** (bottom right) (BS, electrical engineering, Hiroshima University, 1958) joined Chugoku Electric Power Company and was engaged in design and construction of thermal power stations from 1958 to 1972 and spent the next five years with the Health Physics Division. Since 1978, he has been engaged in system design of control and instrumentation of nuclear power stations.

RADIOACTIVE WASTE MANAGEMENT

THE MOVEMENT OF A REDOX FRONT DOWNSTREAM FROM A REPOSITORY FOR NUCLEAR WASTE

Ivars Neretnieks

Ivars Neretnieks (PhD, chemical engineering, Royal Institute of Technology, Stockholm, Sweden, 1967) has been a professor in chemical engineering at the University of Lund and at the Royal Institute of Technology, Stockholm. He has served as consultant to The Swedish Nuclear Fuel Supply Company since 1977 regarding radionuclide migration in near and far fields. His past and present studies include field studies on tracer movement in bedrock by flow and diffusion and modeling of radionuclide migration in fissured media. Other interests include applications of adsorption on activated carbon and other sorbents and ion exchange on zeolites.