



## AUTHORS — AUGUST 1985

FISSION REACTORS

### INVESTIGATIONS ON THE IMPROVEMENT OF THE IODINE FILTRATION CONCEPT OF BOILING WATER REACTORS

*H. Deuber*

**H. Deuber** (PhD, physical chemistry, University of Bonn, 1972) has worked at the Karlsruhe Nuclear Center, Federal Republic of Germany, since 1973. His primary research interest is in the field of nuclear filter technology. In recent years he has been particularly involved with the retention of various gaseous radioiodine species with activated carbons.



### INVESTIGATIONS ON THE TESTING OF IODINE FILTERS BY DIFFERENT METHODS

*H. Deuber  
K. Gerlach*

**H. Deuber** (top) (PhD, physical chemistry, University of Bonn, 1972) has worked at the Karlsruhe Nuclear Center (KfK), Federal Republic of Germany, since 1973. His primary research interest is in the field of nuclear filter technology. In recent years he has been particularly involved with the retention of various gaseous radioiodine species with activated carbons. **K. Gerlach** has worked at KfK since 1960. Since 1972 he has led the group that performs the tests of iodine filters in all German and in some foreign nuclear power plants.



### THE FILTERED VENTING SYSTEM UNDER CONSTRUCTION AT BARSEBÄCK

*Åke H. Persson*

**Åke H. Persson** (mechanical engineer, Malmö Institute of Technology, 1964; BSc, business economics and administration, University of Lund, 1978) is a project manager at Southern Sweden Power Supply. His interests are mainly in the field of research and development for nuclear power technology.



## INVESTIGATIONS ON THE AGING OF ACTIVATED CARBONS IN THE EXHAUST AIR OF A PRESSURIZED WATER REACTOR

**H. Deuber** (top) (PhD, physical chemistry, University of Bonn, 1972) has worked at the Karlsruhe Nuclear Center (KfK), Federal Republic of Germany, since 1973. His primary research interest is in the field of nuclear filter technology. In recent years he has been particularly involved with the retention of various gaseous radioiodine species with activated carbons. **K. Gerlach** (center) has worked at KfK since 1960. Since 1972 he has led the group that performs the tests of iodine filters in all German and in some foreign nuclear power plants. **R. Kaempffer** (bottom) (B.Eng., chemistry, Professional School of Darmstadt, 1970) has worked at KfK since 1973. His primary research interest is in the field of analytical chemistry.

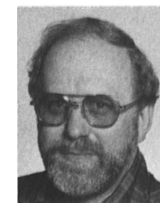
*H. Deuber  
K. Gerlach  
R. Kaempffer*



## INSTALLATION OF AUTOMATIC CONTROL AT EXPERIMENTAL BREEDER REACTOR II

**Howard A. Larson** (top right) (PhD, nuclear engineering, University of Washington, 1970) is a staff member of the Argonne National Laboratory (ANL) Experimental Breeder Reactor II (EBR-II) Division, working in the application of reactor analysis. His current interest is the application of system simulation codes to liquid-metal fast breeder reactor facilities. **William F. Booty** (top left) (BS, geological engineering, Texas A&M University, 1957) is a staff member of the ANL EBR-II Division responsible for data acquisition. His current interests include analysis of computer systems and computer control. **Donald R. Chick** (center right) (PhD, electrical engineering, University of Texas at Austin, 1970) is an engineering specialist at EG&G Idaho, Inc., currently responsible for circuit design and electrical analysis. His current interest is the design and analysis of control systems. **Lynn J. Christensen** (center left) (MS, electrical engineering, University of Utah, 1965) is manager of EBR-II instrumentation and control systems. His current interest is the upgrading of reactor control and instrumentation systems. **Robert J. Forrester** (bottom right) (ME, nuclear engineering, University of Idaho, 1976) is a staff member of the EBR-II Division of ANL currently working on the integral fast reactor concept. His interests include signal analysis techniques and nuclear safety. **J. W. Sielinsky** (bottom left) (BS, electrical engineering, Montana State College, 1963) is a senior engineering specialist at EG&G Idaho, Inc., working in design and analysis of reactor instrumentation and control systems. His current interests include kinetics measurement techniques for test reactors and simulation design.

*Howard A. Larson  
William F. Booty  
Donald R. Chick  
Lynn J. Christensen  
Robert J. Forrester  
J. W. Sielinsky*



## CONTROL ROD WORTH AND RELATED NUCLEAR CHARACTERISTICS OF AN AXIALLY HETEROGENEOUS LIQUID-METAL FAST BREEDER REACTOR CORE

**Katsuyuki Kawashima** (top) (MS, physical engineering, Tokyo Institute of Technology, 1977) has been a research scientist at the Energy Research Laboratory (ERL), Hitachi Ltd., Japan, since 1977. His research interests include applied reactor physics and the optimization of fast breeder reactor (FBR) core systems. **Kotaro Inoue** (bottom) (BE, mechanical engineering, 1964; PhD, nuclear engineering, University of Tokyo, 1976) has engaged in reactor physics, reactor systems design, solar power development,

*Katsuyuki Kawashima  
Kotaro Inoue  
Kunikazu Kaneto  
Tatsutoshi Inagaki*



and fusion systems design. He is currently a manager of the Nuclear Power Systems Division at ERL. **Kunikazu Kaneto** (top) (BS, nuclear engineering, Kyoto University, 1971) has been engaged in the core design of the heavy water reactor and FBR at the advanced reactor department of Hitachi Works, Hitachi Ltd. He is currently involved in developing the FBR core for the demonstration plant. **Tatsutoshi Inagaki** (bottom) (BS, chemical engineering, 1967; MS, nuclear engineering, Tokyo Institute of Technology, 1969) has been employed by the Tokyo Electric Power Company since 1969. He is currently working on the design of large demonstration FBRs at the FBR project office.



NUCLEAR SAFETY

**RECIRCULATION PUMP DISCHARGE LINE BREAK TESTS AT ROSA-III FOR A BOILING WATER REACTOR**

**Mitsuhiro Suzuki** (top right) (MS, mechanical engineering, Kyoto University, 1971) has worked for the Rig of Safety Assessment (ROSA) program since 1974. His current interests include safety evaluation of a light water reactor (LWR). **Kanji Tasaka** (top left) (PhD, nuclear engineering, University of Tokyo, 1976) first worked in breeder reactor safety and fission product characteristics research for ten years and in LWR safety research for nine years at the Japan Atomic Energy Research Institute (JAERI). He is the project leader of the ROSA program, and his current interests include analysis of thermal-hydraulic behavior during a loss-of-coolant accident (LOCA) and an anticipated transient without scram in LWRs. **Yoshinari Anoda** (center right) (PhD, mechanical engineering, University of Tokyo, 1979) is a research engineer for the ROSA program. His current interests include two-phase flow during a LOCA. **Hiroshige Kumamaru** (center left) (PhD, nuclear engineering, University of Tokyo, 1980) is a research engineer for the ROSA program. His current interests include core heat transfer under LOCA conditions. **Hideo Nakamura** (bottom right) (MS, crystalline material engineering, Nagoya University, 1981) is a research engineer for the ROSA program. His current interests include two-phase flow and analysis of thermal-hydraulic behavior during a LOCA. **Masayoshi Shiba** (bottom left) (MS, mechanical engineering, Waseda University, 1959) is the general manager of Reactor Safety Laboratory 1 at JAERI. He has worked for 22 years at JAERI in the field of reactor engineering and safety and is currently responsible for simulated LOCA experiments.

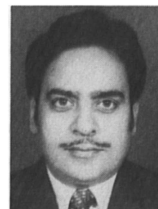
*Mitsuhiro Suzuki  
Kanji Tasaka  
Yoshinari Anoda  
Hiroshige Kumamaru  
Hideo Nakamura  
Masayoshi Shiba*



**REDUCING THE CONSEQUENCES OF REACTOR ACCIDENTS WITH A GREEN BELT**

**V. P. Gupta** (top) (MSc, physics, Agra University, 1960) specialized in operational health physics for research reactors and nuclear power plants. He is currently working on radiological aspects of reactor accidents, emergency preparedness plans in the public domain, and radiation protection in the nuclear industry. He is on the staff of the Technical Secretariat of the Safety Review Committee of the Department of Atomic Energy of India. **Ramesh K. Kapoor** (PhD, physics, University of Bombay, 1980) worked as a scientist with the Health Physics Division of

*V. K. Gupta  
Ramesh K. Kapoor*



Bhabha Atomic Research Centre from 1959. He specialized in atmospheric turbulence and diffusion. He is currently working with the Technical Secretariat of the Safety Review Committee of the Department of Atomic Energy and is involved with the environmental safety review of various units of the department.

**FABRICATION AND MECHANICAL PROPERTIES OF OXIDE DISPERSION STRENGTHENING FERRITIC ALLOY CANNING TUBES FOR FAST REACTOR FUEL PINS**

**J.-J. Huet** (top right) (civil engineer, metallurgy, Faculté Polytechnique de Mons, Belgium, 1954) has been a member of the Centre d'Étude de l'Énergie Nucléaire (CEN/SCK), Department of Metallurgy, since 1956, and has served as its head since 1964. He launched the ferritic steel for the fast reactor project in 1966 and has been head of the project since then. **L. Coheur** (top left) (civil chemical engineer, University of Liège, 1966) has been a member of the CEN/SCK, Department of Metallurgy, since 1976 and is presently head of the P/M Section. **A. De Bremaecker** (second from top right) (civil engineer, metallurgy, University of Louvain-la-Neuve, 1975) has been a member of the Department of Metallurgy, CEN/SCK, since 1976 and is in charge of the irradiation properties of the liquid-metal fast breeder reactor core's materials. **L. De Wilde** (center left) (civil engineer, metallurgy, University of Gent, 1960) has been a member of the Department of Metallurgy, CEN/SCK, since 1963 and is head of the Metals Fabrication Section. His interests include extrusion and cold drawing techniques. **J. Gedopt** (third from top right) (civil engineer, metallurgy, University of Gent, 1975) has been a member of the Department of Metallurgy, CEN/SCK, since 1976. He is involved with cold drawing, heat treatment, and nondestructive testing of canning materials. **W. Hendrix** (bottom left) (industrial engineer, TIHH, Hasselt, 1974) has been a member of the Department of Metallurgy, CEN/SCK, since 1974. He is involved with creep and fatigue testing for the oxide dispersion strengthening (ODS) steel and fusion program. **W. Vandermeulen** (bottom right) (civil engineer, 1964; PhD, metallurgy, University of Leuven, 1971) has been a member of the Department of Metallurgy, CEN/SCK, since 1971. He has worked on mechanical properties of the ferritic ODS alloys. Since 1982, he has been occupied with the study of fusion materials.

*J.-J. Huet  
L. Coheur  
A. De Bremaecker  
L. De Wilde  
J. Gedopt  
W. Hendrix  
W. Vandermeulen*



**EXPERIMENTAL INVESTIGATION OF COOLABILITY DEGRADATION BY FISSION GAS RELEASE INTO FLOWING SODIUM IN A FUEL PIN BUNDLE**

**Kazuo Haga** (top) (ME, nuclear engineering, Tokyo Institute of Technology, 1970) is an assistant senior engineer at the Power Reactor and Nuclear Fuel Development Corporation (PNC). He performed experimental work on liquid-metal fast breeder reactor safety using a sodium facility at O-arai Engineering Center, PNC, and presently is engaged in the planning of safety studies at the headquarters. **Yoshihiro Kikuchi** (MS, 1968, and PhD, 1978, nuclear engineering, Kyoto University) is an instructor in the Department of Nuclear Engineering, Kyoto University. He worked at PNC from 1969 to 1977. His current interests are thermal and hydraulic aspects of nuclear reactor safety.

*Kazuo Haga  
Yoshihiro Kikuchi*



**THERMAL CONDUCTIVITY OF SIMULATED RADIOACTIVE WASTE GLASS**

**Seichi Sato** (top right) (BSc and Dr. Sc, chemistry, Hokkaido University, 1976) has been a research associate in the Department of Nuclear Engineering, Kyushu University, since 1978. He worked on high-temperature chemistry at the University of Chicago from 1976 to 1978. He is currently involved in radioactive waste management studies. **Hiroataka Furuya** (top left) (BSc, Tohoku University, 1960; Dr. Eng., Osaka University, 1969) is a professor in the Department of Nuclear Engineering, Kyushu University. He worked at Tohoku University from 1963 to 1969 and then in plutonium research at the Power Reactor and Nuclear Fuel Development Corporation from 1969 to 1977. His current interests are nuclear fuel performance, waste management, and tritium permeation in fusion reactor materials. **Yuji Nishino** (bottom right) (BS and MS, nuclear engineering, Kyushu University, 1980) has been employed at Nuclear Fuel Industries Ltd., Japan, since 1980. **Masayasu Sugisaki** (bottom left) (Dr. Sc, chemistry, Osaka University, 1968) was an assistant professor from 1970 to 1979 and has been an associate professor since 1979 in the Department of Nuclear Engineering, Kyushu University. His current interests are tritium technology of fission and fusion reactors and plasma/surface interactions.

*Seichi Sato  
Hiroataka Furuya  
Yuji Nishino  
Masayasu Sugisaki*



**THE LEACHING BEHAVIOR OF A GLASS WASTE FORM—  
PART II: THE LEACHING MECHANISMS**

**Tsunetaka Banba** (top) (BS, 1972, and MS, 1974, chemical engineering, Nagoya University) has been a research scientist for the Japan Atomic Energy Research Institute (JAERI) since 1974. His work has involved many aspects in the field of waste management. His main interest is in developing an understanding of glass interactions with aqueous solutions. **Takashi Murakami** (BS, 1975; MS, 1977; and PhD, 1980, crystallography and mineralogy, Tokyo University) works in the area of high-level waste management for JAERI. His main interest is in the microstructures and leaching mechanisms of glass and ceramic waste forms.

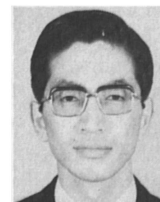
*Tsunetaka Banba  
Takashi Murakami*



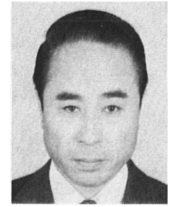
**ELECTROLYTIC DECONTAMINATION OF SURFACE-CONTAMINATED METAL BY ALTERNATING ELECTROLYSIS USING SQUARE-WAVE CURRENT IN A NEUTRAL SALT ELECTROLYTE**

**Tatsuo Izumida** (top) (BS, 1976; MS, 1978; and Dr. Eng., 1981, unit process engineering, Hokkaido University) is a researcher at the Energy Research Laboratory (ERL), Hitachi, Ltd. His interests and activities are in irradiation chemistry, electrochemistry, and radioactive waste treatment. **Koji Kato** (center) (BS, 1978, and MS, 1980, applied chemistry, Iwate University) is a researcher at Matsudo Laboratory of Hitachi Plant Engineering and Construction Company, Ltd. His interests and activities are in electrochemistry. Presently, he is working on the development of high-speed electroplating techniques for printed circuit boards. **Fumio Kawamura** (bottom) (BS, chemical engineering, Gunma

*Tatsuo Izumida  
Koji Kato  
Fumio Kawamura  
Hideo Yusa*



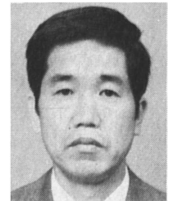
University, 1970; MS, 1972, and Dr. Eng., 1976, Tohoku University) is a researcher at ERL where he is involved in radioactive waste management and reactor water chemistry. **Hideo Yusa** (right) (BS, physics, Tohoku University, 1959; Dr. Eng., Osaka University, 1969) is a chief researcher at ERL. He is responsible for research and development in radioactive waste management systems.



#### A CONSOLIDATION PROCESS FOR SPENT BURNABLE POISON ROD ASSEMBLIES

**Yoshimasa Yamamoto** (top) (BS and MS, nuclear engineering, Osaka University, 1976) formerly specialized in research, development, and engineering in the management of radioactive waste that contains volatile nuclides. He is currently involved in planning for conditioning, transport, and storage of spent fuel as well as of radioactive waste. **Yukihiko Komatsu** (center) (BS, mechanical engineering, Kochi Technical Institute, 1952) has been involved in the engineering of equipment and plants for radioactive waste treatment, with a particular interest in robots for that purpose. **Minoru Harada** (bottom) (BS and MS, mechanical engineering, Tokyo University, 1969) has been involved in the engineering of equipment and plants for the nuclear industry.

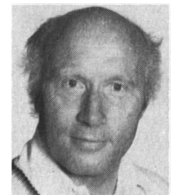
*Yoshimasa Yamamoto  
Yukihiko Komatsu  
Minoru Harada*



#### A LABORATORY STUDY ON RADIONUCLIDE MIGRATION IN SINGLE NATURAL GRANITIC FISSURES

**Trygve E. Eriksen** (ARCST, chemical engineering, Glasgow, 1961; PhD, nuclear chemistry, 1970, and docent, nuclear chemistry, 1975, The Royal Institute of Technology (RIT), Stockholm) is in charge of radiation chemistry research at the Department of Nuclear Chemistry, RIT. Current activities include fast reaction kinetics and transport of radionuclides in geomedial.

*Trygve E. Eriksen*

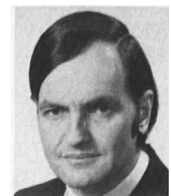


### MATERIALS

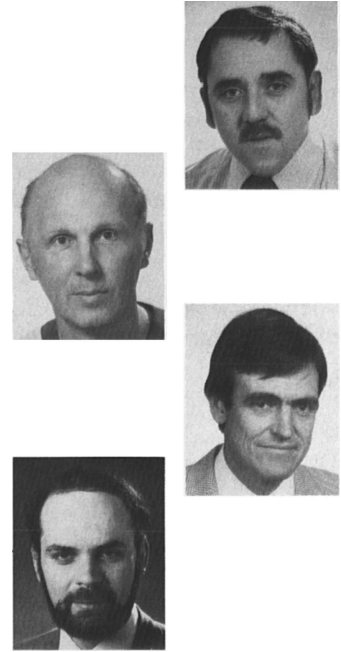
#### POSTIRRADIATION DIMENSIONAL STABILITY AND FISSION PRODUCT BEHAVIOR OF DELIBERATELY DEFECTED UO<sub>2</sub> FUEL AT 200 AND 400°C

**Ian J. Hastings** (top) (PhD, metallurgical science, University of Queensland, 1968) is head of the Fuel Properties and Behaviour Group in the Fuel Materials Branch at the Chalk River Nuclear Laboratories (CRNL) of Atomic Energy of Canada Limited. His current interests are in oxide fuel behavior under irradiation, particularly release of short-lived fission products under normal and accident conditions, and in fusion ceramics. **David R. McCracken** (center) (PhD, radiation chemistry, Cookridge Radiation Centre, Leeds, 1969) has been with the Fuel Engineering Branch of CRNL since 1981. His current interests lie in chemical aspects of fission product release and coolant radiolysis in water-cooled reactors. Previously he worked at the Berkeley Nuclear Laboratories of the U.K.'s Central Electricity Generating Board on similar topics. **Elio Mizzan** (bottom) (BA Sc, chemical engineering, University of Toronto, 1949) is a supervisor at

*Ian J. Hastings  
David R. McCracken  
Elio Mizzan  
Roger D. Barrand  
John R. Kelm  
Ken E. Nash  
J. Novak*



the Fuel Materials Branch Hot Cell Facility at CRNL. His interests have been in the areas of postirradiation examination of reactor fuels and materials, particularly postdefect handling of spent  $UO_2$  fuel. **Roger D. Barrand** (top right) (Dipl. Eng. Geol., Sault Community College, 1973) is a research technologist in the Fuel Engineering Branch at CRNL. His current research responsibility is  $UO_2$  oxidation. **John R. Kelm** (top left) is a research technician in the Fuel Materials Branch of CRNL. His research responsibility is the operation of a special project hot cell and current interest is  $UO_2$  oxidation and stress corrosion cracking. **Ken E. Nash** (bottom right) (BSc, mechanical engineering, University of Salford, 1973) is employed in the Nuclear Materials Management Department of Ontario Hydro. He worked for British Nuclear Fuels Limited for seven years on nuclear fuel design and irradiated fuel transportation. Currently, his main responsibility is the design and development of a cask for transportation of irradiated Canada deuterium uranium fuel. **J. Novak** (bottom left) (BA Sc, engineering science, University of Toronto, 1974) is employed in Central Nuclear Services, Nuclear Generation Division of Ontario Hydro. Since 1976 he has been engaged in nuclear fuel production and development. His current technical interests include behavior of irradiated fuel in air,  $UO_2$  powder characteristics, and fuel performance improvement.



**RADIATION BIOLOGY AND ENVIRONMENT**

**INITIAL RADIATIONS FROM TACTICAL NUCLEAR WEAPONS**

*William E. Loewe*

**William E. Loewe** [AB, University of Chicago, 1952; BS, physics, University of Illinois, Urbana, 1953; MS, 1959, and PhD, 1963, physics, Illinois Institute of Technology (IIT), Chicago] has contributed papers on physics problems occurring in nuclear reactors and in nuclear weapons and their effects while employed at the Savannah River Laboratory, IIT Research Institute, Westinghouse Electric Corporation, and Lawrence Livermore National Laboratory. Since 1980, when he and his collaborator publicly challenged and replaced the T65D estimates, he has worked on increasing the confidence in the new dose levels assigned to individual atomic-bomb survivors, which are a necessary ingredient of epidemiological studies on the biological effects of ionizing radiation.

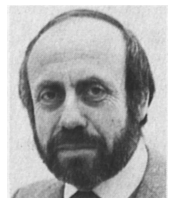


**FISSION REACTORS**

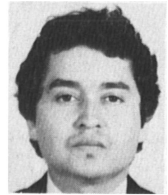
**THE EFFECT OF RE-SOLUTION MODELS ON FISSION GAS DISPOSITION IN IRRADIATED  $UO_2$  FUEL**

*A. R. Wazzan  
A. Villalobos  
D. Okrent*

**A. R. Wazzan** (right) (PhD, engineering science, University of California, Berkeley, 1963) is a professor in the Department of Chemical, Nuclear and Thermal Engineering at the University of California, Los Angeles (UCLA). His current fields of interest include light water reactor and fast breeder reactor fuel



element modeling, thermal hydraulics of pressurized water reactors, and laminar boundary layers. **A. Villalobos** (top) (BA, physics, California State University, San Diego, 1973; MS, physics, 1975, and PhD, nuclear engineering, 1981, UCLA) is a research scientist in the Department of Nuclear Energy at the Instituto de Investigaciones Eléctricas. His current interests are simulation of nuclear systems, reliability studies, and fission gas behavior. **D. Okrent** (bottom) (PhD, physics, Harvard University, 1951) is a professor in the Department of Chemical, Nuclear and Thermal Engineering at UCLA. His current fields of interest include nuclear fuel element behavior, reactor safety, and risk benefit.



## NUCLEAR SAFETY

### MEASUREMENT OF THE IODINE PARTITION COEFFICIENT

**Max Furrer** (top) (Dr. Sc. Techn., chemistry, Swiss Federal Institute of Technology ETH, Zürich, Switzerland, 1974) has headed the Nuclear Chemical Technology Group in the hot laboratory department of the Swiss Federal Institute for Reactor Research (EIR) since 1978. His current interests include the study of volatile fission product behavior in water/vapor systems. **Robin C. Cripps** (center) (HNC, chemistry, Kingston Polytechnic, London, 1969) is employed at EIR. He is currently working in the fields of iodine water chemistry, radioactive waste water decontamination methods, and postirradiation examination (fusion materials technology). **Reinhard Gubler** (bottom) (Dr. Sc. Techn., nuclear engineering, Swiss Federal Institute of Technology ETH, Zürich, Switzerland, 1977) has worked in the field of accident analysis for light water reactors since 1977. Before coming to the Swiss Federal Nuclear Safety Inspectorate in 1980, he spent three years with Motor-Columbus Consulting Engineers, Baden. His current interest is probabilistic risk assessment.

*Max Furrer  
Robin C. Cripps  
Reinhard Gubler*

