

AUTHORS — JULY 1978

REACTORS

SOME IN-REACTOR LOOP EXPERIMENTS ON CORROSION PRODUCT TRANSPORT AND WATER CHEMISTRY

P. V. Balakrishnan (top) (MA, chemistry, University of Madras, India, 1961; PhD, chemistry, McMaster University, Canada, 1971) has been with Atomic Energy of Canada Limited (AECL) Chalk River Nuclear Laboratories since 1971. He has been involved with water chemistry and activity transport in power reactor primary coolant circuits. His current interest is water chemistry in nuclear steam generators. **G. M. Allison** (BA, chemistry, University of Toronto, 1942) joined the Chalk River Nuclear Laboratories of AECL in 1948. Since 1954, he has been involved with problems relating to the chemistry of coolants in loops and power reactors, including fission product releases from solid fuel, radiation decomposition of ammonia in boiling systems, and corrosion product activity transport. Before retirement from AECL at the end of 1977, he had responsibilities in the fields of waste management and decontamination.

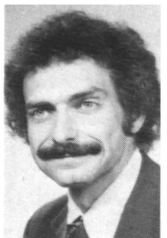
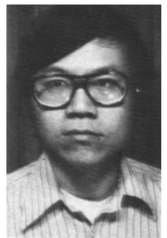
*P. V. Balakrishnan
G. M. Allison*



A MECHANISTIC STUDY OF FUEL FREEZING, CHANNEL PLUGGING, AND CONTINUED COOLABILITY DURING FAST REACTOR OVERPOWER EXCURSIONS

Kin W. Wong (top) [PhD, nuclear engineering, University of California at Los Angeles (UCLA), 1977] is an engineer with the consulting firm of Nuclear Services Corporation (NSC), located at Campbell, California. At NSC, he is involved in reactor physics and reactor thermal-hydraulic studies. **Vijay K. Dhir** (center) (PhD, mechanical engineering, University of Kentucky, Lexington, 1972) has been assistant professor of engineering and applied science at UCLA since 1974. His research interests include thermal-hydraulics of nuclear reactors and reactor safety problems. **William E. Kastenber** (bottom) (PhD, nuclear engineering, University of California at Berkeley, 1966) is professor of engineering and applied science at UCLA. His research interests include liquid-metal fast breeder reactor safety, fusion technology, and risk assessment.

*Kin Wah Wong
Vijay K. Dhir
W. E. Kastenber*



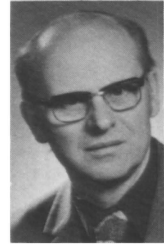
DEVELOPMENT WORK FOR A BORAX INTERNAL CORE-CATCHER FOR A GAS-COOLED FAST REACTOR

Mario Dalle Donne (right) (PhD, engineering science, Bologna University, Italy, 1956) worked from 1956 to 1959 at Agip Nucleare, Italy and from 1959 to 1963 at the Dragon Project, England; since 1963, he has worked at Kernforschungszentrum Karlsruhe (KfK) in the Federal Republic of Germany in the field of gas-cooled reactors. He is now head of the Gas Heat Transfer Group and coordinator of the Karlsruhe Nuclear Center activities for the gas-cooled fast reactor (GCFR). His main technical interests are thermal calculations, assessment,

*M. Dalle Donne
S. Dorner
G. Schumacher*



fuel element design and safety of the GCFR, and gas heat transfer with different artificial roughnesses and at very high temperatures. **Stefan Dorner** (top) (Dipl. Ing., metallurgical engineering, 1951; Dr. rer. nat., 1953, Stuttgart Technical University) was with Max-Planck-Institut für Metallforschung from 1949 to 1952, working on measurements of density and viscosity of liquid metals. From 1952 to 1961, he worked in various metallurgical industries. Since 1961, he has been involved in various material problems of fast breeder reactors at KfK. His current interests are concentrated on core melt-down problems. **G. Schumacher** (bottom) (Dr. Ing., nuclear engineering, University of Karlsruhe, 1970) has been working since 1961 at the Institut für Neutronenphysik und Reaktor-technik of KfK in the field of thermodynamics of nuclear materials. His main interests are transport processes in fuel pins.



HYDRAULIC FORCE CALCULATION WITH HYDRO-STRUCTURAL INTERACTIONS

K. Takeuchi

Kenji Takeuchi (PhD, nuclear engineering, The University of Michigan, 1976) is a fellow engineer of Westinghouse NES. His current responsibility is to develop methods to calculate the pressurized water reactor hydraulic loads during the loss-of-coolant accident subcooled blowdown period. His interests include thermodynamic nonequilibrium effects and pressure wave propagation in multi-dimensional media. He also made a number of contributions as a theoretical physicist at Argonne National Laboratory and Manchester University in England.

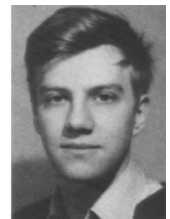


FUELS

LIQUID-METAL FAST BREEDER REACTOR FUEL ROD PERFORMANCE AND MODELING AT HIGH BURNUP

*P. Verbeek
H. Többe
N. Hoppe
B. Steinmetz*

Pierre Verbeek (top right) (ingénieur civil physicien, Université Catholique de Louvain, Belgium, 1973) was until 1977 with Belgonucleaire, where he worked on fast breeder core mechanical design studies, with a special interest in computerization of uranium-plutonium fuel rod behavior. He is now with Synatom, a subsidiary of the Belgian Utilities. **Hans Többe** (top left) (PhD, physics, University of Cologne, 1968) joined Interatom in 1970 and worked on fuel rod modeling and design. From 1972 to 1975, he developed the computer code IAMBUS. Since 1973, he has been a senior supervisor in the Core Element Design and Development Section within the Liquid-Metal Fast Breeder Reactor (LMFBR), Light Water Reactor, and High-Temperature Reactor Projects. **Norbert Hoppe** (bottom right) (civil engineer, Faculté Polytechnique de Mons, Belgium, 1965) joined Belgonucleaire in 1966 and started work on the thermo-hydraulics of the BR 3/Vulcain core within the Core Design Group. Since 1967, he has been in charge of the development of the computer code COMETHE. Since mid-1977, he has been on loan to the Electric Power Research Institute, in the Fuel Rod Mechanical Performance Modeling Project. **Bernhard Steinmetz** (bottom left) (PhD, physics, University of Cologne, 1973) has been with Interatom since 1974. He is in charge of the Fuel Rod Design and Development Group and is mainly involved in the development and refinement of special models and the corresponding material correlations related to fuel and cladding behavior during LMFBR operation.



MODEL FOR LIFE-LIMITING PROPERTIES OF FUSION REACTOR STRUCTURAL MATERIALS

Richard F. Mattas (top) (PhD, metallurgical engineering, University of Illinois, 1974) has studied the effects of radiation on metal properties since joining the Materials Science Division of Argonne National Laboratory (ANL) in 1974. He has been involved in fusion reactor design studies since 1975. **Dale L. Smith** (PhD, Iowa State University, 1966) is in the Materials Science Division at the ANL. He has been working in the Fusion Power Program, where he has been involved with materials selection and first wall design considerations for fusion power reactors. His work has included the analysis of surface-related phenomena that result from plasma-wall interactions and the effects of a fusion reactor environment on bulk properties of materials.

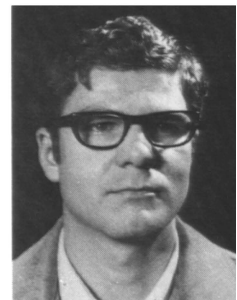
R. F. Mattas
D. L. Smith



EFFECT OF PRIOR IRRADIATION CREEP ON THE SUBSEQUENT BURST STRENGTH OF 20% COLD-WORKED TYPE 316 STAINLESS-STEEL CLADDING

Darrel R. Duncan (BS, physical metallurgy, Washington State University, 1967; MS, metallurgy, Iowa State University, 1969) is an advanced engineer at Westinghouse Hanford Company, his principal area of responsibility being mechanical properties of austenitic stainless steels.

D. R. Duncan



IRRADIATION TEMPERATURE DETERMINATION BY ELECTRICAL RESISTIVITY MEASUREMENTS

Frank Lee (right) (MS, materials science, University of Cincinnati, 1976) is presently working on his PhD in the Materials Science and Metallurgical Engineering Department at the University of Cincinnati. His MS research was on the defect recovery of neutron-irradiated molybdenum. He is now investigating the microstructure-strength relationships of irradiated and unirradiated molybdenum, with particular interest in deformation maps. **Joseph Matolich, Jr.** (standing) (MS, materials science, University of Cincinnati, 1976) formerly with the Battelle Memorial Institute in Columbus, Ohio, is presently on the staff of the University of Cincinnati's Materials Science and Metallurgical Engineering Department. He is interested in the general field of materials testing. His MS research was on the defect recovery of neutron-irradiated tungsten and W-25 Re. **John Moteff** (left) (PhD, materials science, University of Cincinnati, 1965) is professor and head of the Materials Science and Metallurgical Engineering Department at the University of Cincinnati. His interests include radiation effects to body-centered-cubic metals, elevated temperature mechanical properties of structural alloys, and strength-microstructure relationships of metals.

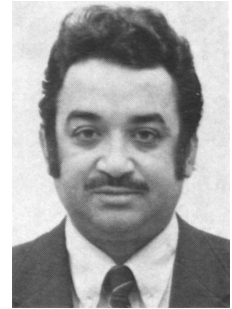
F. Lee
J. Matolich, Jr.
J. Moteff



HYDROGEN BURDEN FROM THE STEAM SIDE CORROSION IN SODIUM-HEATED STEAM GENERATORS

Prodyot Roy (right) (PhD, materials science, University of California at Berkeley, 1963) has been a member of the technical staff of the Fast Breeder Reactor Department at General Electric Company (GE) since 1968. At GE, his research interests are sodium coolant chemistry, mass transfer, and materials behavior in sodium. **Douglas N. Rodgers** (photo unavailable) (MS, chemical engineering, Lehigh University) has been a member of the GE technical staff since 1970. His work has been in the area of sodium coolant chemistry and related process equipment development.

*Prodyot Roy
Douglas N. Rodgers*



ELECTROCHEMICAL OXYGEN SENSOR FOR MEASUREMENT OF OXYGEN IN LIQUID SODIUM

Prodyot Roy (right) (PhD, materials science, University of California at Berkeley, 1963) has been a member of the technical staff of the Fast Breeder Reactor Department at General Electric Company (GE) since 1968. At GE, his research interests are sodium coolant chemistry, mass transfer, and materials behavior in sodium. **Bruce E. Bugbee** has been a senior sodium technologist in GE's Fast Breeder Reactor Department since 1970. Prior to joining GE he was associated with the U.S. Navy Nuclear Program for seven years.

*Prodyot Roy
Bruce E. Bugbee*

