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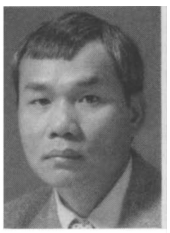
FISSION REACTORS

DEVELOPMENT OF GENERIC IN-SERVICE INSPECTION PRIORITIES FOR PRESSURE BOUNDARY SYSTEMS

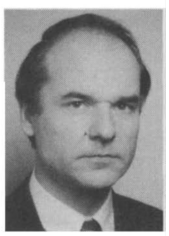
Truong V. Vo
Brian W. Smith
Frederic A. Simonen
Steven R. Doctor



Truong V. Vo (top) (MS, nuclear engineering, University of Missouri-Rolla, 1984) is a senior research staff member of the Reactor Technology Center at Pacific Northwest Laboratory (PNL), operated by Battelle Memorial Institute. His current research activities include development of risk analysis methods and risk applications to nuclear and nonnuclear plant systems. **Brian W. Smith** (photograph not available) (BS, electrical engineering, University of Washington, 1969) is a senior research engineer in the risk and safety analysis group at PNL. His current research activities include risk and safety analysis of nuclear fuel cycle facilities and nuclear materials safeguards and analysis. **Frederic A. Simonen** (center) (PhD, engineering mechanics, Stanford University, 1966) is a staff engineer in the theoretical mechanics group at PNL. His current research activities are in the area of structural reliability with particular focus on probabilistics methods. **Steven R. Doctor** (bottom) (BS, electrical engineering, Purdue University, 1966; MS, 1969, and PhD, 1973, electrical engineering, Iowa State University) is the technical group leader of the nondestructive evaluation group at Battelle, PNL. He currently manages two major programs sponsored by the U.S. Nuclear Regulatory Commission dealing with ultrasonic inspection technology.

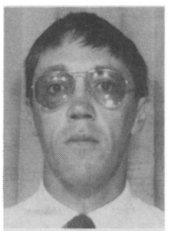
INSTRUMENTATION AND CONTROL REVAMPING

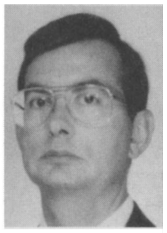
Jean-Lucien Mourlevat
Alain Parry
Jean-François Petetrot
Jean-François Aschenbrenner



Jean-Lucien Mourlevat (top) (graduate engineer, Ecole Nationale Supérieure de Chimie Industrielle, Lyon, France, 1971; Génie Atomique Saclay, 1973) had worked with Framatome since 1975 in the core physics and core control domain, including design and on-site tests. He managed the section in charge of core protection and control design for new reactor models. He passed away in May 1990. **Alain Parry** (bottom) (graduate engineer, Ecole Supérieure d'Electricité, Paris, France, 1970; Génie Atomique Saclay, 1971) has worked on control and protection systems, particularly in the adaptation of these systems to digital technologies. He now heads the instrumentation and control department of

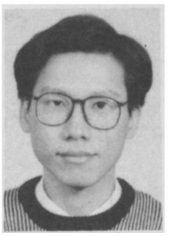
Framatome. **Jean-François Petetrot** (right) (graduate engineer, Ecole Supérieure d'Electricité, Paris, France, 1971; PhD, 1974) works with Framatome in the domain of automatic control of nuclear steam supply systems (NSSSs). He is currently senior expert engineer in the NSSS analysis department. **Jean-François Aschenbrenner** (left) (graduate engineer, Ecole Centrale de Lyon, France, 1976) has worked on successive series of digital protection systems. He is currently senior engineer with Electricité de France in the Department of Thermal and Nuclear Projects Design.





DEVELOPMENT AND VALIDATION OF A STEAM GENERATOR SIMULATION MODEL

Mankit Ray Yeung
Ping Lam Chan



Mankit Ray Yeung (top) (BS, engineering science, 1974; SM, 1975, and ScD, 1978, nuclear engineering, Massachusetts Institute of Technology) was formerly associated with Babcock & Wilcox, Westinghouse Electric, and Gould, Inc., Simulation Systems Division. He joined the Department of Mechanical Engineering at the University of Hong Kong in 1984. His current research interests include pressurized water reactor (PWR) plant simulation and off-site accident consequence analysis. **Ping Lam Chan** (BS, mechanical engineering, University of Hong Kong, China, 1985) is currently a graduate student in the Department of Mechanical Engineering at the University of Hong Kong. His research area is PWR simulation modeling.

NUCLEAR FUEL CYCLES

RELEASE OF IODINE AND NOBLE GAS FISSION PRODUCTS FROM DEFECTED FUEL ELEMENTS DURING REACTOR SHUTDOWN AND START-UP

Brent J. Lewis
Roderick D. MacDonald
Hugues W. Bonin

Brent J. Lewis (top) (PhD, nuclear engineering, University of Toronto, Canada, 1984) is currently an assistant professor of nuclear engineering at the Royal Military College. Prior to 1988, he was section head of fuel performance modeling at the Atomic Energy of Canada Limited (AECL) Chalk River Nuclear Laboratories (CRNL). His current activities include the modeling of fuel behavior and fission product release during normal and high-temperature accident conditions, and expert system applications to fuel failure monitoring in power reactors. **Roderick D. MacDonald** (center) (M. Eng., Technical University of Nova Scotia, Canada, 1960) is the test director of the blowdown test facility at the AECL CRNL. His past responsibilities have been in the area of irradiation testing of failed fuel, instrumented fuel experiments, and the development and testing of advanced fuel designs. His current interests are in the in-reactor testing of fuel during simulated loss-of-coolant and severe fuel damage accidents. **Hugues W. Bonin** (bottom) (PhD, nuclear engineering, Purdue University, 1983) is currently an associate professor of nuclear engineering at the Royal Military College. His present research interests are in optimal fuel management of thorium-fueled Canada deuterium uranium nuclear reactors and in defective fuel modeling.

BEHAVIOR OF MODERN METALLIC FUEL IN TREAT TRANSIENT OVERPOWER TESTS

Theodore H. Bauer
Arthur E. Wright
William R. Robinson
John W. Holland
Edgar A. Rhodes





Theodore H. Bauer (top right) (PhD, physics, Cornell University, 1970) has worked in the planning and analysis of complex in-reactor experiments since joining Argonne National Laboratory (ANL) in 1977. Principal interests include the application of such experiments to reactor safety issues. **Arthur E. Wright** (top left) (PhD, nuclear engineering, Massachusetts Institute of Technology, 1972) is a manager of the fuels experiments section of the Reactor Analysis and Safety Division of ANL. He has been involved in in-reactor safety experimentation and experiment analysis since joining ANL in 1972. **William R. Robinson** (center right) (BS, mathematics, Illinois Institute of Technology, 1962; graduate, International Institute of Nuclear Science and Engineering, ANL, 1963) has been involved in experimental reactor measurements for 34 years. He is currently an engineering specialist in the Fuels Experiments Section of the Reactor Analysis and Safety Division at ANL. **John W. Holland** (bottom left) (BS, mathematics and physics, Central Missouri State University, 1970; MS, 1972, and PhD, 1975, mechanical engineering, University of Missouri-Columbia) is currently a mechanical engineer in the Fuels Experiments Section of the Reactor Analysis and Safety Division at ANL. His present research interests are evaluation of fuel and cladding behavior in reactor safety experiments and development of treaty verification technologies for strategic and conventional arms control. **Edgar A. Rhodes** (bottom right) (PhD, physics, Florida State University, 1972) is in the Experimental Physics Section of the Reactor Analysis and Safety Division at ANL. He is responsible for radiation detection and transport computations, instrumentation, and data analysis for in-pile reactor safety and treaty verification experiments.

A MODEL FOR FISSION GAS RELEASE AND FUEL OXIDATION BEHAVIOR FOR DEFECTED UO_2 FUEL ELEMENTS

Brent J. Lewis
Fernando C. Iglesias
David S. Cox
Elena Gheorghiu




Brent J. Lewis (top right) (PhD, nuclear engineering, University of Toronto, Canada, 1984) is currently an assistant professor of nuclear engineering at the Royal Military College of Canada. Prior to 1988, he was section head of fuel performance modeling at the Atomic Energy of Canada Limited (AECL) Chalk River Nuclear Laboratories. His current activities include the modeling of fuel behavior and fission product release during normal and high-temperature accident conditions, and expert system applications to fuel failure monitoring in power reactors. **Fernando C. Iglesias** (top left) (PhD, nuclear physics, University of Tucuman, Argentina, 1976) is a nuclear design engineer specialist at Ontario Hydro, Department of Nuclear Safety. He was a section head at AECL until 1989 and also worked at the Argentine Atomic Energy Commission. His research interests are in fuel source term including the release behavior of fission products during normal operating and accident conditions with emphasis on the role of the environment on the release characteristics. **David S. Cox** (bottom right) (BESc, 1983, and MESc, 1985, materials science, University of Western Ontario, Canada) is a research engineer at the AECL Chalk River Nuclear Laboratories. His current activities include experimentation and modeling of UO_2 oxidation behavior, single-effect fission product release experimentation, and postirradiation examination of severe fuel damage including Three Mile Island Unit 2 core samples. **Elena Gheorghiu** (bottom left) (Diplomat Physicist, nuclear physics, Cluj University, Romania, 1972) is employed at the Institute of Nuclear Power Reactors, Pitesti, Romania. She has experience

in the field of nuclear fuel behavior including the modeling and evaluation of results from irradiation tests. In 1988, she was assigned to the AECL Chalk River Nuclear Laboratories for analysis of defected fuel experiments. Her current interests include modeling of defected fuel behavior, and the design of irradiation tests for investigation of fuel performance during defect conditions.

RADIOACTIVE WASTE MANAGEMENT

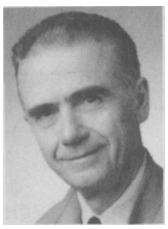
MODELING OF A DIFFUSION-SORPTION EXPERIMENT BY LINEAR AND NONLINEAR SORPTION ISOTHERMS

Paul A. Smith

Paul A. Smith (MA, natural sciences, University of Cambridge, United Kingdom, 1980; MSc, geophysics, University of Newcastle-upon-Tyne, United Kingdom, 1981; PhD, engineering, University of Manchester, United Kingdom, 1986) is a research scientist at the Paul Scherrer Institute, where he is involved in a program for the safety assessment of waste repositories. His current interest is the development and testing of models describing radionuclide transport in the geosphere.

CALCULATION OF CALIBRATION FACTORS AND LAYOUT CRITERIA FOR GAMMA SCANNING OF WASTE DRUMS FROM NUCLEAR PLANTS

Wilhelm in der Schmitten
Bernd Sohnius
Erwin Wehner

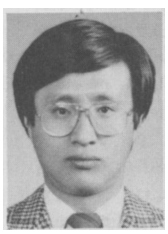


Wilhelm in der Schmitten (top) [PhD, metal physics, University of Gottingen, Federal Republic of Germany (FRG), 1959] is experienced in evaluating radiation protection concepts for fuel fabrication. He supplied mathematical analyses for the Nukem-A decommissioning project. **Bernd Sohnius** (center) (MS, chemistry, 1980, and PhD, nuclear chemistry, 1984, University of Mainz, FRG) is experienced in analytical techniques of radionuclides. He is head of the radiochemistry group of the Nukem-A decommissioning project and is responsible for the declaration of nuclear waste materials and for free release measurements. **Erwin Wehner** (bottom) (MS, chemistry, 1975, and PhD, inorganic chemistry, 1979, University of Frankfurt, FRG) is experienced in nuclear fuel development and production. He is general manager of the Nukem-A decommissioning project.

MATERIALS

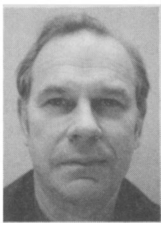
YIELD STRESS DETERMINATION BY THE MASSACHUSETTS INSTITUTE OF TECHNOLOGY MINIATURIZED DISK BEND TEST

Dong-Seong Sohn
Gordon E. Kohse
David M. Parks
Otto K. Harling



Dong-Seong Sohn (right) [BS, nuclear engineering, Seoul National University, Korea, 1974; MS, materials science, Korea Advanced Institute of Science, Korea, 1977; PhD, nuclear engineering, Massachusetts Institute of Technology (MIT), 1984] is a principal researcher and department manager for nuclear fuel engineering at the Korea Atomic Energy Research Institute. He has had experience in irradiated materials testing and nuclear fuel

thermal-mechanical design, fuel performance analysis, and licensing and manufacturing interface for the light water reactor (LWR) fuel localization project, which covers localization of both the design and manufacture of LWR fuel. **Gordon E. Kohse** (top) (BSc, chemical engineering, University of Calgary, Canada, 1978; PhD, nuclear engineering, MIT, 1983) is a research scientist at the MIT Nuclear Reactor Laboratory. His research includes in-reactor materials testing and miniature mechanical property test development for fusion and commercial reactor applications. **David M. Parks** (center) (BSc, engineering mechanics, University of Illinois, 1971; MSc, 1973, and PhD, 1975, engineering, Brown University) is associate professor in the Department of Mechanical Engineering at MIT, working in the areas of fracture mechanics, plasticity, and finite element analysis. His primary technical interests are in the application of numerical methods to the analysis of fracture and inelastic deformation of materials, both at the structural and microstructural levels. **Otto K. Harling** (bottom) (PhD, nuclear physics, Pennsylvania State University, 1962) is director of the MIT Nuclear Reactor Laboratory and professor of nuclear engineering. His research interests include nuclear materials, nuclear medicine, neutron scattering, and dose and corrosion reduction in LWRs.



RADIATION APPLICATIONS

PRACTICAL METHODS OF MEASURING DIMENSIONS FROM NEUTRON RADIOGRAPHS OF NUCLEAR REACTOR FUEL

Jozef C. Domanus

Jozef C. Domanus (MSc, electrical engineering, Technical University, Warsaw, Poland, 1945) has been associated with the Risø National Laboratory in Denmark since 1969, where he is engaged in neutron radiography of reactor fuel. He was chairman of the Euratom neutron radiography working group from 1979 to 1989 and leader of its test program from 1981 to 1988.

HEAT TRANSFER AND FLUID FLOW

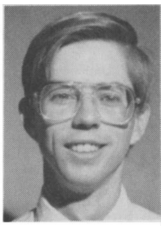
THE INVESTIGATION OF CONJUGATE HEAT TRANSFER PHENOMENA IN ADVANCED FAST REACTORS

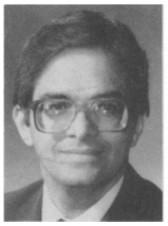
T. C. Hung
V. K. Dhir

T. C. Hung (top) [BS, 1980, and MS, 1982, nuclear engineering, National Tsing-Hua University, Taiwan; PhD, mechanical engineering, University of California–Los Angeles (UCLA), 1989] is a scientist at Argonne National Laboratory. His current interests are thermal hydraulics, heat transfer, reactor safety analysis, system modeling, and simulation of advanced reactors. **V. K. Dhir** (PhD, mechanical engineering, University of Kentucky, 1972) is a professor of engineering and applied science at UCLA. His research interests are in the areas of phase change heat transfer, heat transfer enhancement, and nuclear reactor thermal hydraulics and safety.

AN INTEGRATED SIGNAL VALIDATION SYSTEM FOR NUCLEAR POWER PLANTS

Keith E. Holbert
Belle R. Upadhyaya





Keith E. Holbert (top) (BS, MS, and PhD, nuclear engineering, University of Tennessee, 1989) is an assistant professor of electrical engineering at Arizona State University. He was formerly an engineer with Analysis and Measurement Services Corporation for 5 years. His experience includes sensor response time testing, noise analysis, calibration uncertainty, and signal validation. His current research interests include various areas in instrumentation and diagnostics for nuclear power plants. **Belle R. Upadhyaya** (PhD, systems science, University of California–San Diego, 1975) is a professor of nuclear engineering at the University of Tennessee–Knoxville. He is an adjunct research associate in the Instrumentation and Controls Division of Oak Ridge National Laboratory. His current research interests include digital signal processing, neural networks, preventive maintenance technology, and process instrumentation and controls.