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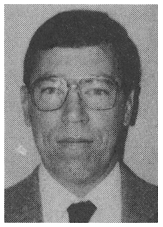
AUTHORS — APRIL 1989

FISSION REACTORS

POINT BEACH NUCLEAR PLANT SECONDARY IN-SERVICE INSPECTION PROJECT AND BADNESS FACTOR PROGRAM

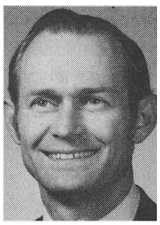
Ronald R. Winget

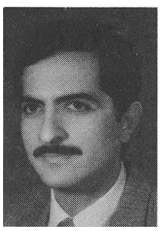


Ronald R. Winget (BS, nuclear engineering, University of Cincinnati, 1981) is an engineer in the engineering, quality, and regulatory services group at Point Beach Nuclear Plant, operated by Wisconsin Electric Power Company. He has been responsible for the balance-of-plant inspection program since industry concern arose following the December 1986 feed line rupture at the Surry power station. He is an ex-Navy nuclear propulsion operator and has duty technical advisor responsibilities at Point Beach. His interests include nuclear plant operation and systems engineering.

DESIGN AND DEVELOPMENT OF A PERSONAL-COMPUTER-BASED REACTIVITY METER FOR A RESEARCH REACTOR

Stephen E. Binney
Alla J. M. Bakir





Stephen E. Binney (top) (PhD, nuclear engineering, University of California, Berkeley, 1970) has been on the nuclear engineering faculty at Oregon State University since 1973. His primary research interests involve the application of nuclear instrumentation and nuclear techniques to a variety of scientific and engineering problems. **Alla J. M. Bakir** (MS, nuclear engineering, Oregon State University, 1988) is an instructor in the nuclear engineering department at Baghdad University in Iraq. His research interests are in nuclear electronics and instrumentation.

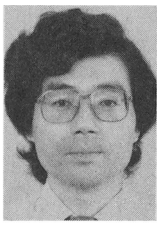
NUCLEAR SAFETY

HUMAN ERROR ANALYSIS RELATED TO STRUCTURAL RELIABILITY

Sadao Hattori
Hiroshi Sasakawa
Norihiko Handa

Sadao Hattori (right) (MS, nuclear engineering, Tokyo Institute of Technology, Japan, 1959; graduate, Reactor Hazard Evaluation Course, Oak Ridge National Laboratory, 1960) has had experience in the design, safety, and licensing of light water reactors (LWRs) for the Chubu Electric Power Company, and in the design, licensing, and construction of the Fugen nuclear power plant for the Power Reactor and Nuclear Fuel Corporation. He

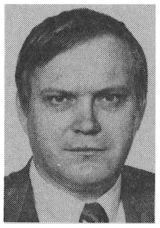
is currently director of the liquid-metal fast breeder reactor (LMFBR) research project at the Central Research Institute of Electric Power Industry of Japan. **Hiroshi Sasakawa** (top) (MS, nuclear engineering, Osaka University, Japan, 1979) is a researcher at the Nippon Atomic Industry Group Company, Ltd. Nuclear Research Laboratory. His research interests are in system reliability and risk assessment of LWRs. **Norihiko Handa** (bottom) (MS, nuclear engineering, Tokyo University, Japan, 1976) is a senior engineer in the Department of Advanced Reactor Engineering, Toshiba Corporation. He has worked in the areas of probabilistic safety and seismic and structural analysis. He is currently working on the overall plant design of an LMFBR.



ONE-DIMENSIONAL CONSIDERATIONS ON THE INITIAL PHASE OF THE CHERNOBYL ACCIDENT

Timo A. Vanttola
Markku K. Rajamäki

Timo A. Vanttola (top) (Lic. Tech., nuclear engineering, Helsinki University of Technology, Finland, 1981) is a research staff member at the Nuclear Engineering Laboratory in the Technical Research Centre of Finland. He has studied heat transfer with a special interest in critical heat flux. His current work is mainly in the field of accident simulation. **Markku K. Rajamäki** (D. Tech., nuclear engineering, Helsinki University of Technology, Finland, 1975) is a senior research scientist at the Nuclear Engineering Laboratory in the Technical Research Centre of Finland. He is responsible for the research and development of reactor physics and dynamics. Since his thesis work, his research interest has shifted from neutron transport theory to the modeling of nuclear reactor dynamics.



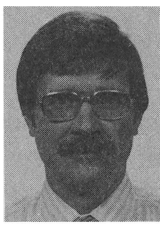
FUEL CYCLES

RESULTS AND ANALYSES OF DRY ROD CONSOLIDATION USING WESTINGHOUSE SPENT-FUEL ASSEMBLIES

Krishna Vinjamuri
Edgar M. Feldman
Carlan K. Mullen
Robert C. Hill

Krishna Vinjamuri (top) [BSc (Honours), mathematical physics, 1959, and MSc, nuclear physics, 1963, Andhra University, India; MSc, theory of structures, Madras University, India, 1961; MS, nuclear engineering, University of Wisconsin, 1968; PhD, nuclear engineering, Iowa State University, 1971] has been a senior scientist with EG&G Idaho, Inc., Idaho National Engineering Laboratory (INEL) for the past 11 years. His areas of expertise include fuel and fission product behavior during normal and accident conditions, in-reactor creep and densification, pre- and posttest characterization of light water reactor fuel elements, fuel consolidation, and fuel performance. **Edgar M. Feldman** (center) (BS, mechanical engineering, California University at Northridge, 1973) is a project engineer at EG&G Idaho, Inc. for the Buried Waste Program at the INEL. He has 15 years of experience in test engineering, specialized instrumentation development and application, experiment planning, and thermal-hydraulic analysis for pressurized water reactors. His current activities include project management and technical direction to provide data management and data validation for Resource Conservation and Recovery Act corrective actions being conducted at the Radioactive Waste Management Complex at the INEL. **Carlan K. Mullen** (bottom) (BS, computer graphics and mechanical design, Brigham Young University, 1971) is a senior project engineer in waste management operations at EG&G Idaho, Inc., INEL. He managed the dry rod consolidation project and

provided 10 years of operational experience in spent-fuel research, hot-cell operation, and wet and dry spent-fuel storage. His current work activities are in remediation of radioactive mixed hazardous waste sites at the INEL. **Robert C. Hill** (right) (MS, mechanical engineering, University of Pittsburgh, 1972) is a member of the Performance Oversight Organization responsible for internal safety appraisals of EG&G Idaho Programs at the INEL. He joined EG&G Idaho, Inc. in 1977 and has managed technical support activities for the U.S. Nuclear Regulatory Commission research programs. He managed the INEL spent-fuel cask testing and dry rod consolidation programs during 1987 and 1988.



PREDICTION OF MAXIMUM ALLOWABLE TEMPERATURES FOR DRY STORAGE OF ZIRCALOY-CLAD SPENT FUEL IN INERT ATMOSPHERE

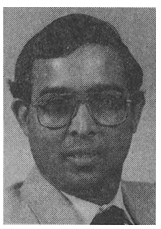
Bryan A. Chin
E. Robert Gilbert

Bryan A. Chin (top) (BA, materials engineering, Auburn University, 1973; MS and PhD, Stanford University, 1976) has been conducting research on the relationship between microstructure and properties of structural materials since 1973. His research had led to an improved understanding of the mechanisms of high-temperature deformation and development of automated systems for nuclear materials property characterization. He worked for 5 years at the Westinghouse Hanford Company Laboratories improving materials and fabrication processes for nuclear reactor components prior to joining Auburn University in 1981. **E. Robert Gilbert** (BS, 1961, and MS, 1962, physical metallurgy, Washington State University; PhD, engineering science, Washington State University, 1970) is a staff scientist in the reactor systems, fuels, and materials department at Pacific Northwest Laboratory where he also serves as leader of the Fuels and Materials Performance Group. He has 25 years of experience in planning and conducting research and development activities on materials degradation, radiation effects, and analysis of nuclear fuel behavior in storage environments.

CHEMICAL PROCESSING

A PROCESS FOR DECONTAMINATING STAINLESS STEELS TO RELEASE LIMITS

Aamir Husain



Aamir Husain (PhD, chemical engineering, McMaster University, Canada, 1981) is a chemical engineer at Ontario Hydro's Research Division in Toronto, Canada. His research interests are in nuclear reactor/component decontamination, low-level waste management, and nondestructive evaluation techniques.

NUCLEAR FUELS

MEASUREMENT OF THE OXIDATION OF SPENT FUEL BETWEEN 140 AND 225°C

Robert E. Woodley
Robert E. Einziger
H. Craig Buchanan

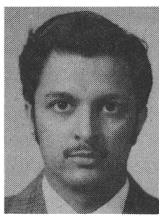
Robert E. Woodley (right) (PhD, chemistry, Oregon State University, 1965) retired in June 1987 from the Westinghouse Hanford Company (WHC), where, since 1970, he had performed research on the thermochemistry and oxidation-reduction kinetics of oxide fuels, fission product release from spent fuel, and

measurements of the viscosity of molten UO_2. He studied graphite chemistry at both the General Electric Company (GE) and Battelle's Pacific Northwest Laboratory (PNL) prior to joining WHC. **Robert E. Einziger** (top) (BS, Georgia Tech, 1967; PhD, Rensselaer Polytechnic Institute, 1973) is a senior research scientist and group leader of the Waste Barriers Performance (Tuff) group at PNL. His research interests include spent-fuel oxidation and the performance of fuel and cladding under dry storage, transportation, and repository conditions. He has conducted similar studies at WHC and studied metallic liquid-metal fast breeder reactor fuel performance at the Experimental Breeder Reactor II. **H. Craig Buchanan** (bottom) (Assoc. degree, arts and science) is a senior technician at PNL where he performs oxidation rate tests on spent fuel. Previously, he was employed at GE and WHC, where he acquired 24 years of experience in the nuclear field.

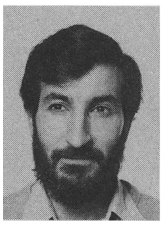
RADIOACTIVE WASTE MANAGEMENT

SYNROC-FA WASTE FORM FOR IMMOBILIZATION OF AMINE HIGH-LEVEL LIQUID WASTE: PROCESS DEVELOPMENT AND PRODUCT CHARACTERIZATION

T. Sampat Sridhar
Ahmad G. Solomah



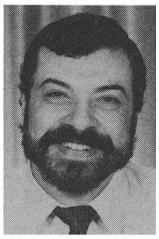
T. Sampat Sridhar (top) (PhD, chemical engineering, University of New Brunswick, Canada, 1969) has been with Atomic Energy of Canada Limited (AECL) since 1974. Prior to joining AECL, he was an assistant professor of chemical engineering at the University of Sherbrooke. He has also worked as scientific officer at the Bhabha Atomic Research Centre. At AECL's Whiteshell Nuclear Research Establishment, he directed research and development programs on both product recovery and radwaste treatment related to nuclear fuel recycle as head of the Process Development Section. He is currently head of the Industrial Materials Section, involved in the development of advanced industrial materials for nuclear and nonnuclear applications as part of the ongoing business development efforts on spinoff technologies at Whiteshell. **Ahmad G. Solomah** (PhD, nuclear engineering, North Carolina State University, 1980) is a research scientist in the Industrial Materials Section at the Whiteshell Nuclear Research Establishment, AECL. His research interests are in the area of materials for both nuclear and nonnuclear applications.



HEAT TRANSFER AND FLUID FLOW

A TRANSIENT MODEL FOR PREDICTING NONHOMOGENEOUS NONEQUILIBRIUM CRITICAL TWO-PHASE FLOWS

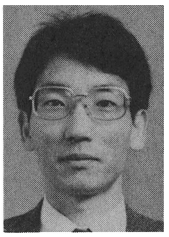
S. M. Sami
T. Duong

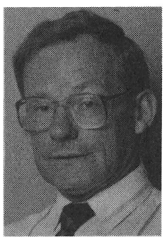


S. M. Sami (top) (BScA, MScA, and PhD, University of Montréal, Canada, 1981) has worked in the area of two-phase flow at various industries and institutions. He has specialized in the transient analysis of thermohydraulics, particularly thermohydraulic code developments for CANDU reactors. He is currently a professor of mechanical engineering at the University of Moncton and is involved in various projects with Atomic Energy of Canada Ltd., Rolls-Royce Canada, and the National Research Council. **T. Duong** (BScA, University of Montréal, Canada, 1985) is a graduate student at the University of Sherbrooke, Department of Mechanical Engineering.

FABRICATION OF CURIUM-DOPED SYNROC FOR AN ALPHA RADIATION STABILITY TEST

Hisayoshi Mitamura
Seiichiro Matsumoto
William J. Buykx
Shingo Tashiro





Hisayoshi Mitamura (top right) (BS, 1975, and MS, 1977, chemical engineering, Kyoto University, Japan) has been a member of the High-Level Waste Management Laboratory at the Japan Atomic Energy Research Institute (JAERI) since 1977. His current interest is in radiation effects on ceramic waste forms. **Seiichiro Matsumoto** (top left) (Taira Technical High School, Japan, 1960) has worked as a specialist for the operation of hot cells at JAERI. His current interest is centered on the SYNROC fabrication and long-term durability of nuclear waste forms. **William J. Buykx** (bottom right) (BS, 1972, and MS, 1979, ceramics, University of New South Wales, Australia) is leader of the Ceramics Fabrication Group at the Australian Nuclear Science and Technology Organisation. Apart from SYNROC fabrication, his current interest is in chemical processing of ceramic powders. **Shingo Tashiro** (bottom left) (BS, chemistry, Kyushu University, Japan, 1960) is the general manager of the Waste Safety Testing Facility Operation Division at JAERI. He is currently interested in the examination of the long-term durability of nuclear waste glass.