# AUTHORS — JUNE 1989

FISSION REACTORS

THE CENTRALIZED RELIABILITY DATA ORGANIZATION (CREDO) ASSESSMENT OF CRITICAL COMPONENT UNAVAILABILITY IN LIQUID-METAL REACTORS

Karen H. Koger
M. Jonathan Haire
Brett L. Humphrys
Jay F. Manneschmidt
Keiichi Setoguchi
Ryodai Nakai

Karen H. Koger (top right) (BS, mechanical engineering, Virginia Polytechnic Institute and State University, 1989) worked as a co-op student at the Y-12 Plant and the Oak Ridge National Laboratory (ORNL). She was a staff member of the Reliability and Human Factors Group, doing research on the reliability of liquid-metal reactor (LMR) components and systems. Her career interests are design engineering, computer-aided design/computer-aided manufacturing, robotics, and automation. **M. Jonathan Haire** (top left) (PhD, nuclear engineering, North Carolina State University, 1970) is a senior research and development staff member at ORNL. He was an assistant professor at the Georgia Institute of Technology before joining ORNL. He participated in one of the first probabilistic risk analyses of high-temperature gas-cooled reactors while employed at General Atomic Company. His research interests are in system reliability, plant maintainability, and safety analyses. **Brett L. Humphrys** (center right) (BS, mechanical engineering, University of Tennesssee, 1989) worked as a co-op student at ORNL. He was a staff member of the Reliability and Human Factors Group, performing reliability analyses on LMR components and systems. His career interests are design and project engineering. **Jay F. Manneschmidt** (bottom left) (MS, mathematics, University of Tennessee, 1980) worked as a systems analyst at ORNL. He has been involved in developing software for reliability, availability, and maintainability analyses. **Keiichi Setoguchi** (bottom right) (BS, electrical engineering, Keio University, Japan, 1980) is an engineer in the Experimental Reactor Division at Oarai Engineering Center of Power Reactor and Nuclear Development Corporation (PNC). His research activities involve the development of artificial intelligence systems and a reliability data base for LMRs. He has been assigned at ORNL since April 1988. **Ryodai Nakai** (photo not available) (MS, nuclear engineering, University of Tokyo, Japan, 1980) is an assistant senior engineer of the Reactor Research Development Project at PNC. His research activities involve the development of systems analyses methods, reliability data analyses, and probabilistic risk assessments on liquidmetal fast breeder reactors.
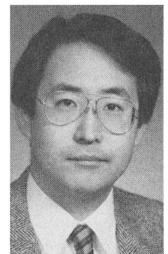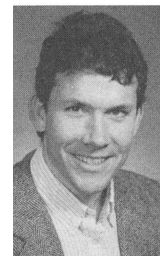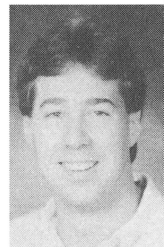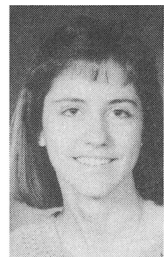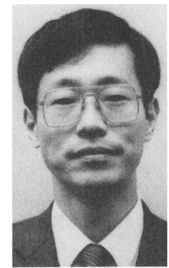
THE DEVELOPMENT OF THE FAST-RUNNING SIMULATION PRESSURIZED WATER REACTOR PLANT ANALYZER CODE (NUPAC-1)

Kazunori Sasaki
Naotaka Terashita
Takamichi Ogino

Kazunori Sasaki (top) (BS, mechanical engineering, Waseda University, Japan, 1975) is a nuclear engineer at the Central Research Laboratory, Mitsubishi Electric Corporation, where he has worked on plant dynamic code development. His current interests are parallel processing, CAI systems, operator support systems, and optimal maintenance scheduling. **Naotaka Terashita** (center) (BS, 1978, and MS, 1980, aeronautical engineering, Nagoya University, Japan) is a researcher at the Central Research Laboratory, where he has worked on computer applied systems for nuclear power plants. His current interests are knowledge acquisition, diagnosis, and cognitive science. **Takamichi Ogino** (bottom) (PhD, systems engineering, Waseda University, Japan, 1984) is a project manager of the advanced reactor and fuel cycle engineering group at Mitsubishi Electric Corporation. He worked for 18 years at Mitsubishi's Central Research Laboratory on nuclear power plant dynamics and diagnosis, artificial intelligence application to operator support systems, and cognitive engineering.

NUCLEAR SAFETY

PERFORMANCE OF HIGH-EFFICIENCY PARTICULATE AIR FILTERS UNDER SEVERE CONDITIONS

Makoto Osaki
Akira Kanagawa

Makoto Osaki (top) (BA, 1970, and MA, 1972, nuclear engineering, Nagoya University, Japan) is an engineer in the Machinery Division of Daido Steel Company, Limited. His current interest is the performance of iodine adsorbant under a variety of conditions. **Akira Kanagawa** (BA, chemical engineering, 1957; MA, 1959, and PhD, 1964, nuclear engineering, Tokyo Institute of Technology, Japan) is a professor of nuclear engineering at Nagoya University, Japan. His current research interests include fuel cycle safety assessment, isotope separation, and aerosol treatment.

USING THE RELAP5/MOD2 CODE UNDER LOW-PRESSURE/LOW-TEMPERATURE LOSS-OF-COOLANT-ACCIDENT CONDITIONS

Jan-Li Wang
Jay F. Kunze

Jan-Li Wang (top) (PhD, nuclear engineering, University of Missouri–Columbia, 1987) is a senior nuclear engineer of the Ebasco-CTCI Corporation in Taiwan. Previously, he worked at the University of Missouri Research Reactor. His research interests are in nuclear system thermal-hydraulic transient analysis and pipe rupture analysis. **Jay F. Kunze** (PhD, physics, Carnegie Mellon University, 1959) is professor and chair of nuclear engineering at the University of Missouri–Columbia. His prior experience includes 20 years of work in reactor physics, reactor design for space applications, and several years of engineering design and construction management of renewable energy systems. His current research interests are the power upgrade of the University of Missouri Research Reactor to 30 MW, and medical applications of neutrons from the reactor.
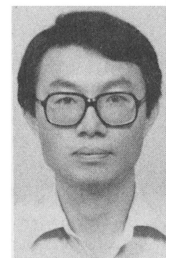
THE PERFORMANCE OF THE REMOTE ANALYTICAL LABORATORY DURING THE FIRST FLUORINEL DISSOLUTION PROCESS CAMPAIGN

L. C. Lewis
J. P. Henscheid

L. C. Lewis (top) (PhD, physical chemistry, Oregon State University, 1968) is manager of the Analytical Chemistry Section, which includes the Remote Analytical Laboratory for Westinghouse Idaho Nuclear Company, Inc., who operate the Idaho Chemical Processing Plant. His current research interests include remote processing technology and analytical chemistry applied to nuclear fuel processing. **J. P. Henscheid** (BS, chemistry, University of Idaho, Moscow, 1974) is the manager of the Production Support Analysis Subsection for Westinghouse Idaho Nuclear Company, Inc. at the Idaho National Engineering Laboratory. His current duties include managing the Remote Analytical Laboratory, which is involved in the analysis of spent nuclear fuel reprocessing streams. His interests are chemist analyses using remote technology.

A MODEL FOR THE TRANSIENT RELEASE OF FISSION PRODUCTS FROM UO$_2$ FUEL: GASOUT CODE DESCRIPTION

Mukesh Tayal
Lorne D. Macdonald
Erl Kohn
Walter P. Dovigo

Mukesh Tayal (top right) (MSc, mechanical engineering, University of Saskatchewan, Canada, 1972) is a fuel engineer at Atomic Energy of Canada Limited (AECL). His research interests include modeling and analysis of nuclear fuel under normal operating conditions and under conditions of high-temperature transients. **Lorne D. Macdonald** (top left) (MSc, theoretical condensed-matter physics, University of Toronto, Canada, 1985) is a research engineer in the fuel engineering branch of the Reactor Safety Research Division at the AECL Chalk River Nuclear Laboratories. He worked for 4 years on spin-density functional theory in metallic and atomic systems at the University of Toronto, 3 years of fission product and fuel channel modeling, and 1 year of reactor control and safety system modeling at AECL. Current research includes development of Canada deuterium uranium (CANDU) fuel and channel models with emphasis on transient fission product release and severe fuel damage. **Erl Kohn** (bottom right) (BEngSci, materials engineering, University of Western Ontario, Canada, 1968; PhD, metallurgy, University of New South Wales, Australia) is a practicing professional engineer with AECL. He is currently providing safety analysis and design support for advanced designs of the CANDU reactor. He has worked on the design and development of fuel and CANDU fuel channels and the safety analysis of the reactor, including assessment of severe core damage in CANDU plants. **Walter P. Dovigo** (bottom left) (BASc, mechanical engineering, University of Toronto, Canada, 1981) worked in the fuel engineering branch of AECL. His current area of interest is in the finite element and thermal stress analysis area.

**HIGH-LEVEL LIQUID WASTE TREATMENT: PROCESS DE-
VELOPMENT STUDIES IN THE WIPE FACILITY — PART I**

T. Sampat Sridhar

T. Sampat Sridhar (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 Univer-
sity 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 re-
lated 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 busi-
ness development efforts on spinoff technologies at Whiteshell.

**DETERMINING THE PHYSICAL PROPERTIES OF STEAM GEN-
ERATOR TUBE SCALE USING MINIATURE SPECIMENS**

Michael P. Manahan

Michael P. Manahan (BA, physics, Michigan State University,
1975; BS, mathematics, Michigan State University, 1975; MS,
nuclear reactor physics, Columbia University, 1978; ScD, nuclear
materials engineering, Massachusetts Institute of Technology,
1982) is a senior research scientist in the mechanical engineer-
ing department of Battelle Columbus Division. He is also an
adjunct associate professor in nuclear materials engineering at
The Ohio State University. His research interests include miniatur-
ized specimen technology, radiation damage in materials, pres-
sure vessel technology, radiation transport analysis, crack and
strain gauge technology, radiation field measurement technology,
failure analysis, and strategic planning and research prioritiza-
tion.

**CORRELATION BETWEEN COMPOSITION EFFECTS ON
GLASS DURABILITY AND THE STRUCTURAL ROLE OF THE
CONSTITUENT OXIDES**

Xiangdong Feng
Ian L. Pegg
Aaron Barkatt
Pedro B. Macedo
Samuel J. Cucinell
Shantao Lai

Xiangdong Feng (right) [PhD, chemistry, The Catholic Univer-
sity of America (CUA), 1988] is a research scientist at The Vitre-
ous State Laboratory (VSL). He is interested in glass chemistry
with applications in chemical durability of glasses and the de-
velopment of electrorheological fluids and glass optical-fiber
sensors. **Ian L. Pegg** (left) (PhD, chemistry, The University of
Sheffield, United Kingdom, 1982) is a research professor with the
VSL at CUA. His interests include glass corrosion, composition
effects on glass viscosity, statistical process models for high-level
waste vitrification, and the statistical thermodynamics of phase

transition and surfaces. **Aaron Barkatt** (top right) (PhD, chemistry, The Hebrew University of Jerusalem, Israel, 1974) is an associate professor at the Department of Chemistry at CUA. His interests include the surface chemistry and durability of glasses, with applications in the development and characterization of high-level waste forms and in the development of selective glassy ion exchangers for decontamination of reactor streams. **Pedro B. Macedo** (top left) (PhD, physics, CUA, 1963) is a professor of physics and codirector of the VSL at CUA. His activities have been mainly in the molecular engineering of new glass materials for novel applications. **Samuel J. Cucinell** (bottom right) (BS, chemistry, MacMaster University, Canada) has been a research assistant at VSL since 1987. **Shantao Lai** (bottom left) (MS, chemistry, CUA, 1988) is a PhD candidate of physical chemistry at CUA. His interests include $X\alpha$ calculations, polyhedral MO theory, and angular momentum theory and applications.

A NEW NON-FOURIER TOMOGRAPHIC FILTER FOR IMAGE RECONSTRUCTION

R. K. S. Rathore
P. Munshi
P. Arora
S. D. Malik
A. K. Vaish
K. S. Singh
U. Singh

R. K. S. Rathore (top right) [PhD, Indian Institute of Technology (IIT), Delhi, India, 1973; DSc, Delft, Netherlands, 1974] is a professor of mathematics at IIT, Kanpur, India. His interests include various aspects of approximation theory, numerical analysis, and linear algebra. His current activities are in the areas of image processing and computerized tomography. **P. Munshi** (top left) (MS, Ohio State University, 1979) is a lecturer in the nuclear engineering program at IIT. His areas of interest are two-phase flow, reactor safety, and tomographic systems. **P. Arora** (second from top right) (MTech, IIT, 1987) is a graduate student at Clark University. His interests include nuclear magnetic resonance, health physics, and nuclear medicine. **S. D. Malik** (center left) is an undergraduate student at IIT. He is interested in computer graphics and image processing. **A. K. Vaish** (third from top right) is an undergraduate student at IIT. His interests include computer graphics and image processing. **K. S. Singh** (bottom left) (MSc, IIT, 1986) is a graduate student in the Department of Mathematics at IIT and is interested in the approximation aspects of tomography. **U. Singh** (bottom right) (MSc, IIT, 1986) is a graduate student in the Department of Mathematics at IIT and is interested in the approximation aspects of tomography.