

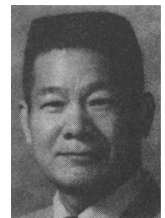
AUTHORS — FEBRUARY 1989

FISSION REACTORS

POWER OPTIMIZATION OF AN INDIRECT GAS-COOLED NUCLEAR REACTOR PLANT

Chih Wu

Chih Wu (PhD, mechanical engineering, University of Illinois, 1966) is a full professor in the Department of Mechanical Engineering at the U.S. Naval Academy. His research interests are in thermodynamics, fluid dynamics, heat transfer, energy, and education.



NUCLEAR SAFETY

SILVER-INDIUM-CADMIUM CONTROL ROD BEHAVIOR IN SEVERE REACTOR ACCIDENTS

David A. Petti

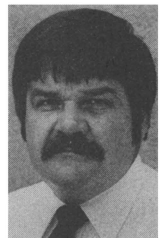
David A. Petti (SB/SM, 1983, and ScD, 1986, nuclear engineering, Massachusetts Institute of Technology) has been an engineering specialist for EG&G Idaho, Inc. at the Idaho National Engineering Laboratory since 1986. He is currently the principal investigator responsible for analyzing the Power Burst Facility severe fuel damage tests. His current interests are in the field of light water reactor severe accident and source term behavior.



CHARACTERIZATION OF SUSPENDED PARTICLES IN THREE MILE ISLAND UNIT 2 REACTOR COOLANT WATER

*Kazuhiko Akamine
K. J. Hofstetter
V. F. Baston*

Kazuhiko Akamine (top) (MS, chemical and environmental engineering, Tokyo Institute of Technology, Japan, 1980) works in chemical and material engineering at Hitachi, Ltd.'s Hitachi Works. In 1986, he was a radiochemist at Three Mile Island Unit 2 (TMI-2). **K. J. Hofstetter** (bottom) (AB, Augustana College, 1962; PhD, nuclear chemistry, Purdue University, 1967) is now a research staff scientist at the Savannah River Laboratory. He formerly directed liquid radwaste processing and radiochemical analyses at TMI-2 in recovery operations for GPU Nuclear Corporation. He was previously a radiochemistry supervisor for Allied General Nuclear Services, specializing in the development of nondestructive assay techniques and radiochemical analyses, and has also held a faculty position at the University of



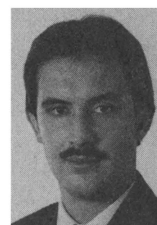
Kentucky. **V. F. Baston** (right) (BS, engineer—chemical option, 1960, and PhD, physical chemistry, 1965, University of Wyoming; postdoctoral, physical chemistry, University of Texas at Austin) is a registered professional engineer and head and corporate officer of Physical Sciences Incorporated, an engineering consulting firm with headquarters in Sun Valley, Idaho. Responsibilities include analytical model development and engineering evaluations involving process chemistry and engineering operations.



ANALYSIS OF THE SOURCE RANGE MONITOR DURING THE FIRST FOUR HOURS OF THE THREE MILE ISLAND UNIT 2 ACCIDENT

Horng-Yu Wu (top right) [BS, mechanical engineering, Cheng Chung Institute of Technology, Taiwan, 1973; MS, nuclear engineering, National Tsing Hua University, Taiwan, 1977; PhD, nuclear engineering, The Pennsylvania State University (PSU), 1986] is working at the Institute of Nuclear Energy Research in Taiwan. His current interests are fuel design, performance, and fabrication. **Ming-Yuan Hsiao** (top left) (BS, nuclear engineering, National Tsing Hua University, Taiwan, 1976; MS, nuclear engineering, 1980; PhD, nuclear engineering, University of Illinois at Urbana-Champaign, 1983) is an assistant professor of nuclear engineering at PSU. His research interests include fuel management, fission and fusion reactor studies, neutron transport, and plasma theory. **Anthony J. Baratta** (center right) (PhD, physics, Brown University, 1979) is an associate professor of nuclear engineering at PSU. His research interests include light water reactor (LWR) transient analysis and neutron transport. **Bernard R. Bandini** (bottom left) (MS, PSU, 1988) is a PhD candidate and graduate assistant in nuclear engineering at PSU. His interests are in the area of fission reactor shielding and core analysis. **E. L. (Bert) Tolman** (bottom right) (MS, nuclear engineering, University of Idaho, 1974) has directed the research in developing a core damage progression scenario based on the Three Mile Island Unit 2 (TMI-2) defueling data. This research is the focal point of the TMI-2 Accident Evaluation Program currently being completed for the U.S. Department of Energy. Prior to the TMI work, he was associated with LWR research at the Idaho National Engineering Laboratory. He has made contributions in defining both the Power Burst Facility and the Loss-of-Fluid Test Facility programs, and in interpreting the results of these programs toward resolving reactor safety issues. He is currently employed by Advanced Nuclear Fuels Corporation in Richland, Washington.

*Horng-Yu Wu
Ming-Yuan Hsiao
Anthony J. Baratta
Bernard R. Bandini
E. L. Tolman*

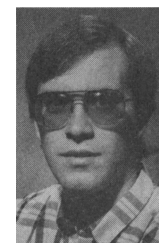


FUEL CYCLES

OXIDATION BEHAVIOR OF SPENT UO₂ FUEL

Todd K. Campbell (right) (BS, chemical engineering, University of Washington, 1983; MS, chemical engineering, University of Colorado, 1985) is a research engineer in the Reactor and Fuel Performance Section at Battelle Pacific Northwest Laboratory (PNL). He has worked for 3 years on test planning, data collection, and analysis of spent-fuel oxidation testing. His other research activities involve the metallographic and chemical

*Todd K. Campbell
Edgar Robert Gilbert
Cheryl Knox Thornhill
Bernard J. Wrona*



characterization of spent fuels. **Edgar Robert Gilbert** (top) (BS, 1961, and MS, 1962, physical metallurgy, and PhD, 1970, engineering science, Washington State University) is a staff scientist in the reactor systems, fuels, and materials department at PNL, 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. **Cheryl Knox Thornhill** (center) (BS, chemical engineering, University of New Mexico; MBA, University of Washington, 1986) is a senior development engineer at PNL. Her current activities are in hot-cell operations directed at handling, characterizing, and testing spent-fuel materials. **Bernard J. Wrona** (bottom) (BS, 1972, and MS, 1974, metallurgical engineering, Illinois Institute of Technology) is supervisor of the Ceramics and Metal Powder Processing Group at PNL. He previously worked at the Babcock & Wilcox Company and Argonne National Laboratory. His current research activities include property studies of nuclear fuels and fabrication development of advanced ceramic materials.

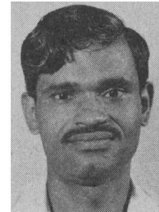
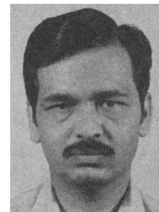
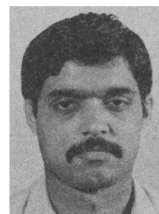


ANALYSES

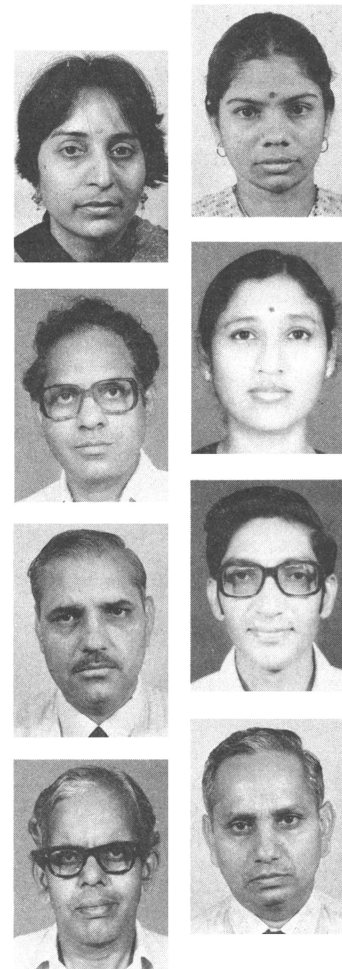
TRACE METAL CHARACTERIZATION OF THE U-AI MATRIX BY ATOMIC SPECTROSCOPY

A. A. Argekar (top right) (MSc, chemistry, University of Bombay, India, 1974) joined Bhabha Atomic Research Centre (BARC) in 1975 and works in analytical spectroscopy. **S. K. Thulasidas** (top left) (MSc, chemistry, University of Saurashtra, India, 1979; PhD, chemistry, University of Bhavnagar, India, 1983) joined BARC in 1982 and works in analytical spectroscopy. **M. J. Kulkarni** (second from top right) (MSc, chemistry, University of Bombay, India, 1974) joined BARC in 1975 and works in analytical spectroscopy. **M. K. Bhide** (second from top left) (MSc, chemistry, University of Bombay, India, 1982) joined BARC in 1976 and works in analytical spectroscopy. **R. Sampathkumar** (third from top right) (MSc, chemistry, University of Bombay, India, 1966) joined BARC in 1967 and has worked in analytical spectroscopy since 1979. **S. V. Godbole** (third from top left) (MSc, physics, University of Bombay, India, 1974) joined BARC in 1975 and works in analytical spectroscopy. **V. C. Adya** (bottom right) (MSc, chemistry, University of Bombay, India, 1982) joined BARC in 1982 and works in analytical spectroscopy. **B. A. Dhawale** (bottom left) (BSc, chemistry, University of Poona, India, 1975) joined BARC in 1976 and works in analytical spectroscopy. **B. Rajeshwari** (top right, next page) (BSc, chemistry, University of Bombay, India, 1983) joined BARC in 1985 and works in analytical spectroscopy. **Neelam Goyal** (top left, next page) (MSc, chemistry, University of Rajasthan, India, 1974) joined BARC in 1976 and works in analytical spectroscopy. **P. J. Purohit** (second from top right, next page) (BSc, chemistry, University of South Gujarat, India, 1974) joined BARC in 1975 and works in analytical spectroscopy. **A. G. Page** (second from top left, next page) (MSc, 1966, and PhD, 1983, physics, University of Bombay, India) joined BARC in 1967. His research interests are in analytical spectroscopy and solid state spectroscopy of actinides. **A. G. I. Dalvi** (third from top right, next page) (BSc (Hons), 1968, and PhD, 1983, chemistry,

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A. G. Page
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T. R. Bangia
M. D. Sastry
P. R. Natarajan*



University of Bombay, India] joined BARC in 1969. His interests are in analytical spectroscopy, electron and paramagnetic resonance (EPR), and thermally stimulated luminescence. **T. R. Bangia** (third from top left) (MSc, chemistry, University of Agra, India, 1963) joined BARC in 1967. His research interests are analytical spectroscopy and chemical separation procedures for trace metal assay. **M. D. Sastry** (bottom right) (MSc, physics, University of Roorke, India, 1964; PhD, physics, Indian Institute of Technology, India, 1968) joined BARC in 1973 and is head of the Spectroscopy Section, Radiochemistry Division. His interests are analytical spectroscopy and EPR. **P. R. Natarajan** (bottom left) (MSc, chemistry, Annamalai University, India, 1957; PhD, chemistry, Imperial College, United Kingdom, 1963) is head of the Radiochemistry Division at BARC. His research interests are radiochemistry, radiation chemistry, and chemical quality control.



TECHNIQUES

QUALITY ASSURANCE VERIFICATION OF HIGH-FLUX ISOTOPE REACTOR FUEL ELEMENTS BY THE ²⁵²Cf-SOURCE-DRIVEN NOISE ANALYSIS METHOD

J. T. Mihalcz (top) [PhD, nuclear engineering, University of Tennessee (UT)] is a staff member at Oak Ridge National Laboratory (ORNL). He has been involved in a variety of static and kinetic reactor physics experiments and their analysis, specializing in the area of critical and subcritical experiments. His current interests are in the development of subcritical measurement techniques. **W. T. King** (PhD, nuclear engineering, UT) was a staff member at ORNL specializing in noise analysis measurements and theory. He is currently with Computation Systems, Incorporated, specializing in the development of the predictive maintenance techniques for rotating machinery.

*J. T. Mihalcz
W. T. King*

