

AUTHORS — OCTOBER 1990

DEVELOPMENT OF NUCLEAR GAS CLEANING AND FILTERING TECHNIQUES

HIGH-STRENGTH HIGH-EFFICIENCY PARTICULATE AIR FILTERS FOR NUCLEAR APPLICATIONS

Volker Rüdinger (top) [Dr. Ing., mechanical process engineering, Technical University of Karlsruhe, Federal Republic of Germany (FRG), 1972] was a group leader in the Laboratory for Aerosol Physics and Filter Technology II (LAF II) at Kernforschungszentrum Karlsruhe (KfK) from 1979 to 1989. He is currently project manager for the decommissioning of the Niederaichbach nuclear power station in Bavaria. His present interests deal with technologies applied in the decommissioning of nuclear installations. **Craig I. Ricketts** (center) (MS, mechanical engineering, New Mexico State University, 1981), most recently with the LAF II at KfK, is a doctoral candidate at the Technical University of Karlsruhe. His involvement in studies related to the performance of components in air cleaning systems under nuclear facility accident conditions began in 1976 at a test installation of Los Alamos National Laboratory. **Jürgen G. Wilhelm** (bottom) (MS, chemistry, University of Mainz, FRG, 1962) joined KfK in 1962. He has been managing director of the LAF II since 1974 and became a member of the German Reactor Safety Commission in 1976. He spent several years as a guest scientist at Oak Ridge National Laboratory. His primary research interest lies in the field of filter technology.

*Volker Rüdinger
Craig I. Ricketts
Jürgen G. Wilhelm*



APPLICATION OF CIRCULAR FILTER INSERTS

R. P. Pratt (top) (C. Eng., MIMechE) has worked at the U.K. Atomic Energy Authority (UKAEA) Harwell Laboratory since 1961 in engineering research and development. He was head of the Filter Development Section from 1978 to 1986 and is currently head of the Active Facilities Design and Decommissioning Section of the Engineering Division. A photograph and a biography for **B. L. Stewart** were not available at publication time. **D. Loughborough** (bottom) (BSc, mechanical engineering, University of Newcastle-Upon-Tyne, United Kingdom) spent 4 years with Davy McKee (International) Ltd. before joining Harwell Laboratory in 1985. He is currently project leader of the Filter Development Section in the Engineering Sciences Division.

*R. P. Pratt
B. L. Stewart
D. Loughborough*



FILTERED VENTING FOR GERMAN POWER REACTORS

H.-G. Dillmann (right) has studied engineering, nuclear technology, and chemistry at Technical University of Karlsruhe. Since 1971 he has been a member of the Laboratory of Aerosol Physics and Filter Technology at Kernforschungszentrum Karlsruhe. Photographs and biographies for **H. Pasler** and **J. G. Wilhelm** were not available at publication time.

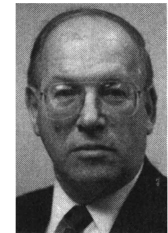
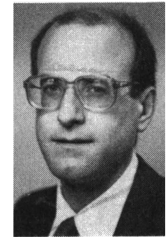
*H.-G. Dillmann
H. Pasler
J. G. Wilhelm*



ASPECTS OF THE INCREASE IN PRESSURE DROP OF HIGH-EFFICIENCY PARTICULATE AIR FILTERS UNDER FOG CONDITIONS

Craig I. Ricketts (top) (MS, mechanical engineering, New Mexico State University, 1981), most recently with the Laboratory for Aerosol Physics and Filter Technology II (LAF II) at Kernforschungszentrum Karlsruhe (KfK), is a doctoral candidate at the Technical University of Karlsruhe. His involvement in studies related to the performance of components in air cleaning systems under nuclear facility accident conditions began in 1976 at a test installation of Los Alamos National Laboratory. **Volker Rüdinger** (center) [Dr. Ing., mechanical process engineering, Technical University of Karlsruhe, Federal Republic of Germany (FRG), 1972] was a group leader in the LAF II at KfK from 1979 to 1989. He is currently project manager for the decommissioning of the Niedereichbach nuclear power station in Bavaria. His present interests deal with technologies applied in the decommissioning of nuclear installations. **Jürgen G. Wilhelm** (bottom) (MS, chemistry, University of Mainz, FRG, 1962) joined KfK in 1962. He has been managing director of the LAF II since 1974 and became a member of the German Reactor Safety Commission in 1976. He spent several years as a guest scientist at Oak Ridge National Laboratory. His primary research interest lies in the field of filter technology.

*Craig I. Ricketts
Volker Rüdinger
Jürgen G. Wilhelm*



OFF-GAS CLEANING IN AN FRG REPROCESSING PLANT

Jürgen Furrer (top) [BSc, chemical engineering, 1967, and doctorate, inorganic chemistry, Technical University of Karlsruhe, Federal Republic of Germany (FRG), 1970] worked at the Technical University of Karlsruhe between 1970 and 1972. He was a member of the scientific staff at Karlsruhe Nuclear Research Center working on the research and development (R&D) of iodine filters for reactor exhaust from 1972 to 1975. Since 1975 he has been a senior engineer in the Laboratory of Aerosol Physics and Filter Technology at Karlsruhe Nuclear Research Center working on R&D of off-gas treatment in reprocessing plants. **Walter Weinländer** (doctorate, radiochemistry, Technical University of Munich, FRG, 1971) was a member of the scientific staff at the Karlsruhe Nuclear Research Center, Institute for Hot Chemistry (reprocessing), from 1971 to 1977. From 1977 to 1984, he was a staff member, project engineer, and project leader at Deutsche Gesellschaft für Wiederaufarbeitung von Kernbrennstoffen mbH (DWK). In 1984-85, he was general manager at Wiederaufarbeitungsanlage Karlsruhe. Since 1986 he has been a member of the executive board of DWW (Wackersdorf reprocessing plant) and a member of the executive board of DWK since 1987.

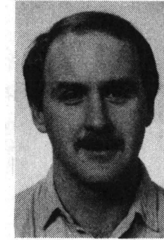
*Jürgen Furrer
Walter Weinländer*



CONCEPTUAL DESIGN OF A MEDICAL REACTOR FOR NEUTRON CAPTURE THERAPY

William A. Neuman (top) (BS, nuclear engineering, Pennsylvania State University, 1982; PhD, nuclear engineering, University of Arizona, 1988) is a senior scientist at the Idaho National Engineering Laboratory (INEL). Since 1982, he has been working on designs of advanced reactor configurations for unique applications. **James L. Jones** (BS, mechanical engineering, University of Texas, 1979; MS, nuclear engineering, Massachusetts Institute of Technology, 1981) is an engineering specialist at INEL, where he has been involved with many fusion and fission reactor safety-related research projects. He is currently pursuing a doctoral degree in nuclear science at Idaho State University.

*William A. Neuman
James L. Jones*



POWER FLATTENING IN A CATALYZED DEUTERIUM-DEUTERIUM FUSION-DRIVEN HYBRID BLANKET USING NUCLEAR WASTE ACTINIDES

Sümer Şahin (MS, mechanical engineering, 1967, and PhD, nuclear engineering, 1970, University of Stuttgart, Federal Republic of Germany; habilitation, physics, University of Ankara, Turkey, 1973) has worked at the Radiation Shielding Information Center, Oak Ridge National Laboratory, with a postdoctoral NATO fellowship; at the Institute of Nuclear Energy of the Swiss Federal Institute of Technology in Lausanne, Switzerland, as advanced research scientist; at the King Saud University of Riyadh, Saudi Arabia, as professor; and also as professor and dean of the Faculty of Engineering at the University of Erciyes, Kayseri, Turkey. In 1987, he served as secretary general and chief executive of the Turkish Scientific and Technical Research Council (TÜBİTAK) and was elected vice-chair of the United Nations Intergovernmental Committee on Science and Technology for Development. He is chair of the special commission of the State Planning Organization of Turkey for the Mainframe Planning of Scientific Research and Technology. Currently, he is a professor and the director of the Institute of Science and Technology at Gazi University, Ankara, Turkey. His research field covers neutron transport theory, fusion-fission (hybrid) reactors, thermionic spacecraft reactors, and radiation shielding.

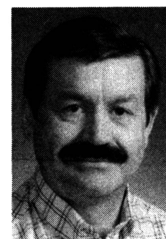
Sümer Şahin



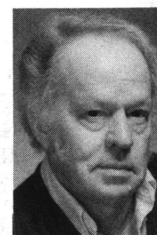
EPITHERMAL NEUTRON BEAM DESIGN FOR NEUTRON CAPTURE THERAPY AT THE POWER BURST FACILITY AND THE BROOKHAVEN MEDICAL RESEARCH REACTOR

Floyd J. Wheeler (top) (MS, nuclear engineering, University of Idaho, 1978) is a scientific specialist for EG&G Idaho, Inc. His background is in reactor physics, shielding, and physics software development. His current technical interest is radiation physics and software development for the boron neutron capture therapy (BNCT) program. **D. Kent Parsons** (bottom) (BS, nuclear engineering, Texas A&M University, 1979; MS, 1982, and D. Philosophy, 1984, nuclear engineering, Massachusetts Institute of Technology) is currently a staff member in Group X-7, Computational Physics, Los Alamos National Laboratory. He was previously with the reactor physics group of EG&G Idaho at the Idaho

*Floyd J. Wheeler
D. Kent Parsons
Brian L. Rushton
David W. Nigg*



National Engineering Laboratory (INEL). His current interests are discrete ordinates methods for neutral particle transport. **Brian L. Rushton** (top) (BS, mathematics, Idaho State University, 1961) has been affiliated with EG&G Idaho since 1961, involved entirely in reactor physics analysis. His current interests are in the area of BNCT and modular high-temperature gas-cooled reactor core physics. **David W. Nigg** (bottom) (BS, engineering physics, University of Kansas, 1972; ME, nuclear engineering, Texas A&M University, 1973; D. Eng., engineering sciences, University of Kansas, 1977) is currently manager of the Reactor and Radiation Physics Unit of EG&G Idaho at INEL. His recent technical interests have included neutron physics aspects of BNCT and the development of neutronics and radiation transport software suitable for use in a personal computer and engineering workstation environment.



RADIOACTIVE WASTE
MANAGEMENT

AN AUTOMATIC CONTROL ROD PROGRAMMING METHOD FOR A BOILING WATER REACTOR

Chuang Lin

Chuang Lin (PhD, nuclear engineering, University of California, Berkeley, 1983) is a professor of nuclear engineering at National Tsing Hua University, Taiwan. His primary areas of interest are core design automation, nuclear power plant simulation and control, and artificial intelligence applications to nuclear reactors.

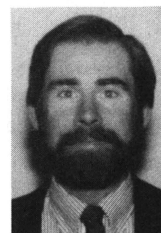


RADIOISOTOPES AND
ISOTOPE SEPARATION

A $^3\text{He}^{++}$ RADIO-FREQUENCY QUADRUPOLE ACCELERATOR FOR POSITRON EMISSION TOMOGRAPHY

*Ali E. Dabiri
William K. Hagan
Donald A. Swenson
Kenneth A. Krohn*

Ali E. Dabiri (top) (BS, engineering, Teheran Polytechnic, Iran, 1967; MS, 1969, and ScD, 1971, engineering, Massachusetts Institute of Technology) is a chief engineer at Science Applications International Corporation (SAIC). He has worked on many aspects of fusion engineering issues, including first-wall and blanket design of alternative fusion fuel reactors. He is currently involved in accelerator technology studies. Past work includes gas/solid interactions, energy conservation, and energy systems. **William K. Hagan** (center) (PhD, physics, University of California, San Diego, 1986) has worked at SAIC since 1977, where he is a division manager. His interests include nuclear radiation transport and shielding, particle accelerator design and application, fusion power, plasma physics, turbulent systems, and artificial neural networks. **Donald A. Swenson** (bottom) (BS, physics/mathematics, University of Alabama, 1953; PhD, physics/mathematics, University of Minnesota, 1958) is a senior accelerator physicist at SAIC. He was involved in the design of a 70-MeV proton linac for the Strategic Defense Initiative Neutral Particle Beam Program, and designed and built a compact, 1-MeV deuteron accelerator for the FAA. He conceived, designed, and proposed a dust-particle accelerator based on the radio-frequency (rf) quadrupole structure. He played a major role in the design



and construction of the Los Alamos Meson Physics Facility. His interests include rf cavity structures, rf power systems, rf power propagation, rf power control, rf mode spectra, microwave measurements, electromagnetic field effects, electromagnetic field calculations, particle beam dynamics, particle beam diagnostics, and accelerator control systems. **Kenneth A. Krohn** (right) (BA, chemistry, Andrews University, 1966; PhD, physical chemistry, University of California, Davis, 1971) is a professor of radiology and radiation oncology and adjunct professor of chemistry at the University of Washington, Seattle. He is the director of the positron emission tomography (PET) chemistry group and overall director of the PET oncology program. His research interests have centered on the use of short-lived isotopes for studies of human biology, especially in cancer research. He has developed numerous new radiopharmaceuticals and standard methods for cyclotron targetry, radiochemistry, and robotics for radiopharmaceutical synthesis.



HEAT TRANSFER
AND FLUID FLOW

ANALYSIS OF A FLUID-MECHANIC MODEL OF A HORIZONTAL TEE-JUNCTION

Yin-Pang Ma (top right) (BS, mechanical engineering, Chung-Cheng Institute of Technology, Taiwan, 1977) is a doctoral student in the Department of Nuclear Engineering at National Tsing Hua University (NTHU). He has 5 years of experience in nuclear power plants and 3 years of experience in reactor safety analysis. His research interests include reactor safety analysis and phase separation of two-phase flow in branching conduits. **Bau-Shei Pei** (top left) (BS, nuclear engineering, NTHU, Taiwan, 1975; MS, 1980, and PhD, 1981, nuclear engineering, University of Cincinnati) is a professor in the Department of Nuclear Engineering at NTHU. His research interests are two-phase flow and heat transfer, reactor safety analysis, and severe core damage study. **Wei-Keng Lin** (bottom right) (BS, chemistry, NTHU, Taiwan, 1976; MS, 1984, and PhD, 1986, chemical and nuclear engineering, University of Maryland) is an associate professor in the Department of Nuclear Engineering at NTHU. His research interests are heat transfer and two-phase flow, thermodynamics, flow dynamics, and instrument design. **Yih-Yun Hsu** (bottom left) (BS, National Taiwan University, Taiwan, 1952; MS, 1957, and PhD, 1958, University of Illinois) is a professor in the Department of Chemical and Nuclear Engineering at the University of Maryland. His research interests are two- and three-phase flow and heat transfer.

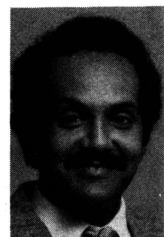
*Yin-Pang Ma
Bau-Shei Pei
Wei-Keng Lin
Yih-Yun Hsu*



ANALYSIS OF A NUCLEAR POWER PLANT USING RELAP5/MOD2 WITH MODIFIED BUNDLE HEAT TRANSFER CORRELATIONS

Yassin A. Hassan (right) (BS, nuclear engineering, University of Alexandria, Egypt, 1968; MS, nuclear engineering, University of Illinois, 1975; MS, mechanical engineering, University of Virginia; PhD, nuclear engineering, University of Illinois, 1979) is on the faculty of the Department of Nuclear Engineering at Texas A&M University. He was previously with Babcock &

*Yassin A. Hassan
Parvez Salim*



Wilcox for 7 years. His interests include computational and experimental fluid flow, two-phase flows, and nuclear reactor safety. **Parvez Salim** (right) (BSc, mechanical engineering, Aligarh Muslim University, India, 1985; MS, nuclear engineering, Texas A&M University, 1989) is a graduate student of nuclear engineering at Texas A&M University, College Station, Texas. Thermal hydraulics of nuclear reactor systems is his area of interest, and he has been working on the computational and modeling aspects of this discipline.

