



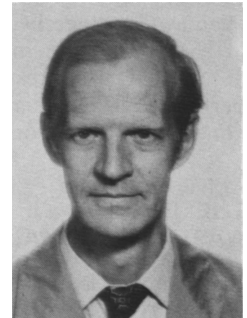
AUTHORS — OCTOBER 1978

REACTORS

HEAT COST IN A SWEDISH AGROTHERMAL PLANT

Jörgen Christensen

Jörgen Christensen (MA, political science, Stockholm University, 1969; MSc, chemical engineering, Royal Institute of Technology, Copenhagen) is with the Stockholm County Council. In addition, since 1966 he has been a consulting engineer, serving as an advisor primarily to Swedish governmental agencies, the Nordic Council of Ministers, the United Nations, etc., on problems of water supply by nonconventional methods, environmental impact and utilization of waste heat, power plant siting and cooling, supply of certain raw materials, etc. As a senior scientist with the Swedish Atomic Energy Company, he previously worked extensively with the development of D₂O steam turbines.



ENERGY CASCADING IN LARGE DISTRICT HEATING SYSTEMS

Franz Wolfgang Mayer

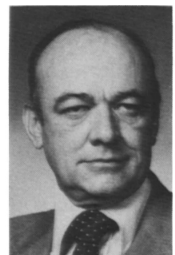
F. W. Mayer (Cand. Ing., Institute of Thermal Power and Nuclear Engineering, Graz University of Technology, 1975) is currently involved with the utilization of waste heat at the Institute of Thermal Power and Nuclear Engineering in Graz, Austria, with special interest in low-temperature heating systems.



ICE POND COOLING OF A POWER PLANT

*George C. Geisler
J. A. Urbanski
W. F. Witzig*

George C. Geisler (top) (BS, electrical engineering, Bucknell University, 1950; MS, industrial engineering, 1970) is a research associate in nuclear engineering at The Pennsylvania State University. He has done research in radioactive waste disposal, reliability, and reactor instrumentation and control. **John A. Urbanski** (center) (BS, mechanical engineering, Clarkson College of Technology, 1975; MS, nuclear engineering, The Pennsylvania State University, 1977) is a fluid systems engineer at the Knolls Atomic Power Laboratory, with special interests in reactor plant thermodynamics and heat transfer. **Warren F. Witzig** (bottom) (BS, electrical engineering, Rensselaer Polytechnic Institute, 1942; MS, electrical engineering, 1944; PhD, physics, University of Pittsburgh, 1952) is currently professor and department head of nuclear engineering at The Pennsylvania State University. His special interests include fuel management, reactor design, nuclear safety and licensing, and environmental problems associated with radiation waste and thermal effects.



SENSITIVITY OF PEAK CLADDING TEMPERATURES TO LOSS-OF-COOLANT ACCIDENT REFLOOD PARAMETERS

Richard N. Oehlberg (top) (PhD, physics, University of Notre Dame, 1972; MPA, research and development administration, University of Southern California, 1976) is a project manager in the Safety and Analysis Department at the Electric Power Research Institute (EPRI). Prior to joining EPRI, he was a program manager in the Fuel Behavior Research Branch in the Office of Water Reactor Safety Research of the U.S. Nuclear Regulatory Commission (NRC) (formerly the U.S. Atomic Energy Commission), specializing in light water reactor (LWR) fuel rod behavior, accident analysis, fuel pin computer code development, and experimental verification. Currently, his interests include transient LWR fuel behavior, structural response, and fluid-structure interactions. **Harold H. Scott** (BS, chemical engineering, University of Missouri-Rolla, 1968) is a reactor engineer in the Division of Reactor Safety Research at NRC. His interests include test fuel irradiations and fuel performance calculations related to determination of gap conductance and stored energy.

*Richard N. Oehlberg
Harold H. Scott*



THE EFFECTS OF NOZZLE-TO-TARGET DISTANCE ON WASTAGE IN SMALL-LEAK SODIUM-WATER REACTIONS

Naomichi Kanegae (top right) (MS, nuclear engineering, Tohoku University, 1969) is an assistant senior engineer of the Steam Generator Safety Section, Oarai Engineering Center, Power Reactor and Nuclear Fuel Development Corporation (PNC), Japan. His current interests are in the design of steam generators in the liquid-metal fast breeder reactor (LMFBR) and in sodium-water reactor technology, such as material wastage due to sodium-water reaction and leak detector development. **Koh Hashiguchi** (top left) (MS, chemical engineering, Yokohama National University, 1971) is now an engineer in the power and control laboratory at the Toshiba Research and Development Center. His interests are sodium technology, heat and mass transfer concerned with fast reactors, such as shield plug heat insulation, sodium mist and deposition phenomena, sodium-water reaction, purification, etc. **Ichiro Ikemoto** (bottom right) (MS, nuclear engineering, Kyoto University, 1970) is a research engineer of the Steam Generator Safety Section, Oarai Engineering Center, at PNC. His current interests are in sodium-water reaction technology in the LMFBR steam generators, such as material wastage due to sodium-water reaction and leak detector development in connection with the design and operation of the steam generators. **Masao Hori** (bottom left) (ME, Tokyo University) is the head of the Fast Reactor Safety Laboratory at PNC. His interests are in safety-related research and development on LMFBRs, especially on sodium boiling, fuel failure propagation, fuel-sodium interaction, and sodium-water reactions.

*Naomichi Kanegae
Koh Hashiguchi
Ichiro Ikemoto
Masao Hori*



REACTOR SITING

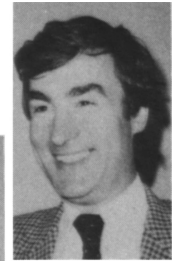
INVESTIGATION OF ACTIVITY RELEASE DURING LIGHT WATER REACTOR CORE MELTDOWN

Helmut Albrecht (right) (Dipl. Phys., Dr. rer. nat., Universities of Göttingen and Karlsruhe, 1971) has been working at Kernforschungszentrum Karlsruhe (KFK) since 1963 in the fields of nuclear physics and radiochemistry. Since 1972, he has been investigating activity release problems during nuclear reactor

*H. Albrecht
V. Matschoss
H. Wild*



accidents. He is a member of the Core Melt Expert Group of the BMFT (Secretary of Research and Technology, Bonn). **V. Matschoss** (top) (Dr. Ing., TH-Darmstadt, 1976) was involved for three years in the development of separation methods in the gas phase. Since 1976, he has been a research scientist at KFK. His primary interests include activity release during core meltdown and reactor safety problems. **H. Wild** (bottom) (Dipl. Phys., Universities of München and Bonn, 1966) was engaged at first in the field of ionization sources. After one year of industry activity, he began work at KFK in the fields of aerosol physics and radioactive inventories of reactors. His current interest is safety research of light water reactors. He is a member of a standardization committee of nuclear technology.

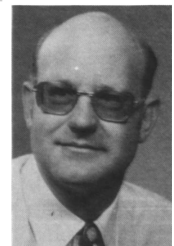


FUEL CYCLES

SUBCRITICALITY GUIDELINES FOR LIQUID-METAL FAST BREEDER REACTOR SPENT FUEL SHIPPING CASK DESIGNS

*J. S. Philbin
S. A. Dupree*

J. S. Philbin (top) (BSME, University of Notre Dame, 1964; MS, nuclear engineering, Northwestern University, 1969; PhD, nuclear engineering, University of Illinois, 1971) is a member of the technical staff in the Reactor Design and Development Division of Sandia Laboratories. He has worked on research reactor design and operations, criticality, and safety analysis. He is currently pursuing design concepts for a high-fluence gas-cooled pulse reactor. **S. A. Dupree** (PhD, nuclear engineering, Purdue University, 1968) is a member of the technical staff of Sandia Laboratories. He has worked in the field of radiation transport, shielding, and effects for several years. His recent emphasis has been on source characterization, shielding, and criticality problems associated with fast reactor spent fuel.

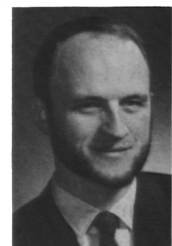


FUELS

CHEMICAL THERMODYNAMICS OF THE SYSTEM Cs-U-Zr-H-I-O IN THE LIGHT WATER REACTOR FUEL-CLADDING GAP

*Theodore M. Besmann
Terrence B. Lindemer*

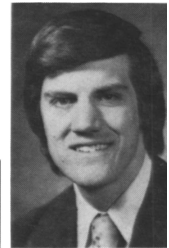
Theodore M. Besmann (top) (BE, chemical engineering, New York University, 1970; MS, nuclear engineering, Iowa State University, 1971; PhD, nuclear engineering, Pennsylvania State University, 1976) is with Oak Ridge National Laboratory (ORNL), where he is studying the phase equilibria and thermodynamics of actinide-carbon oxygen systems for application to liquid-metal fast breeder reactors (LMFBRs), with some additional work on oxide nuclear fuel-fission product interactions. **T. B. Lindemer** (PhD, met. eng., University of Florida, 1966) is a group leader in the Chemical Technology Division at ORNL. His primary interest for the last ten years has been the thermodynamics and kinetics of systems involving high-temperature gas-cooled reactor and LMFBR fuels and fission products.



AN IMPROVED FINITE DIFFERENCE METHOD TO EVALUATE HEAT TRANSFER IN FUEL PINS WITH ECCENTRICALLY PLACED PELLETS

G. W. McNair (top) (BS, MS, nuclear engineering, Oregon State University, 1976, 1977) has been employed at Battelle-Pacific Northwest Laboratories since graduation. His research is in the area of reactor safety and neutronics. **K. L. Peddicord** (BSME, University of Notre Dame, 1965; MS, PhD, nuclear engineering, University of Illinois, 1967, 1972) has been an assistant professor of nuclear engineering at Oregon State University since 1975. His teaching and research activities are in reactor thermal-hydraulics and nuclear fuels. From 1972 to 1975, he worked in the Advanced Fuels Program at the Swiss Federal Institute for Reactor Research, Würenlingen, Switzerland.

G. W. McNair
K. L. Peddicord



RADIOACTIVE WASTE

MIGRATION OF RADIONUCLIDE CHAINS IN GROUND-WATER

Vern C. Rogers (PhD, nuclear engineering, Massachusetts Institute of Technology, 1969) has since 1974 been involved with the engineering and environmental assessment of uranium mill tailings and with nuclear waste management at Ford, Bacon & Davis, Utah, Inc. His interests include radiation pathway and risk analysis, gamma-ray spectroscopic analysis, and reactor core performance evaluation.

V. C. Rogers

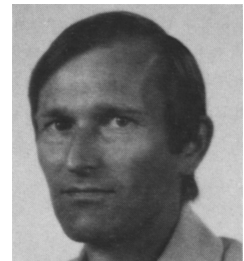


MATERIALS

A CRITICISM ON FUEL ROD STRUCTURAL ANALYSIS

K. Lassmann (Dipl. Ing., 1967; Dr. Ing., 1973) is a member of the scientific staff of the Institute of Reactor Technology (IRT), Technological University of Darmstadt, Federal Republic of Germany. Presently, he is head of the Fuel Element Structural Analysis Group at IRT and teaches students in the subject of reactor technology.

K. Lassmann

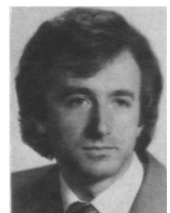
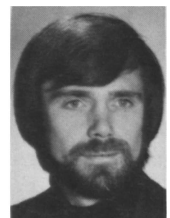


ISOTOPES SEPARATION

INFLUENCE OF FLOW-FIELD STRUCTURE ON URANIUM ISOTOPE SEPARATION IN THE SEPARATION NOZZLE

Wolfgang Berkhahn (top) (Dr. Ing., physics, University of Karlsruhe, 1977) is a member of the scientist staff of the Institut für Kernverfahrenstechnik at Kernforschungszentrum Karlsruhe (KFK). His interests include gas kinetics and fluid dynamics. **Wolfgang Ehrfeld** (center) (Dr. Ing., physics, University of Karlsruhe, 1968) is head of a research group working on the development of the separation nozzle process at KFK. His interests include aerodynamic methods for uranium enrichment and rarefied gas dynamics. **Gunther Krieg** (bottom) (Dr. Ing., physics, University of Karlsruhe, 1970) worked in the field of condensed molecular beams for generation and investigation of clusters before he joined the separation nozzle group at KFK in 1974. His current interest lies in the analysis of rarefied gas flows.

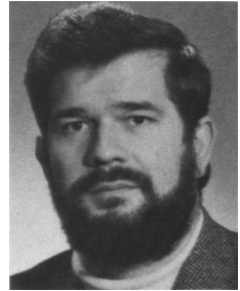
W. Berkhahn
W. Ehrfeld
G. Krieg



TEMPERATURE MEASUREMENT BY RATIO PYROMETERS OF MELTING POOL SURFACES

A. Mack

A. Mack (Dipl. Ing., Technical University of Karlsruhe, 1970) has been working on problems of nuclear safety at the Karlsruhe Nuclear Research Center since 1972. His present activity is centered around the design and instrumentation of test rigs for reactor safety experiments.



THE SENSITIVITY OF THE FIRST WALL RADIATION DAMAGE TO FUSION REACTOR BLANKET COMPOSITION

*J. M. Barnes
R. T. Santoro
T. A. Gabriel*

J. M. Barnes (center) (BS, mathematics, University of Arkansas, 1965) is a member of the Computer Sciences Division at Oak Ridge National Laboratory (ORNL). He is involved in the neutronic analysis of fusion reactor blankets and shields, neutral beam injectors, radiation effects in materials, and the analysis of integral experiments for fusion reactor shields. **R. T. Santoro** (left) (MS, physics, University of Tennessee, 1967) is a member of the Neutron Physics Division at ORNL. His current interests are in neutron transport and neutron interactions with matter related to fusion reactor design. He is currently involved in the neutronic investigations of reactor blanket and shield design, neutral beam injectors, radiation streaming from penetrations, radiation effects in materials, and the analysis of integral experiments for fusion reactor shields. **T. A. Gabriel** (right) (PhD, physics, University of Tennessee, 1969) is a member of the Neutron Physics Division at ORNL. His interests are in neutron transport and neutron interactions with matter, related to electronuclear fuel production, nuclear instrument design, and fusion reactor engineering. A large part of his recent effort has been devoted to neutronic analysis of magnetically confined fusion reactors, in support of blanket design for a reactor conceptual design team, and to the ORNL fusion reactor irradiation effects program.

