



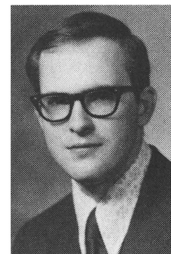
## AUTHORS — MARCH 1977

### REACTORS

#### OPTIMAL SYNTHESIS OF A POWER PLANT COOLING SYSTEM

L. T. Fan (top) (BS, chemical engineering, National Taiwan University, 1951; MS, chemical engineering, Kansas State University, 1954; MS, mathematics, West Virginia University, 1958; PhD, chemical engineering, West Virginia University, 1957) is professor and head of the Chemical Engineering Department and director of the Institute for Systems Design and Optimization at Kansas State University (KSU). His experience includes working as a production engineer at Kaohsiung Agricultural Chemical Works in Formosa from 1951 to 1952 and as an engineer with the U.S. Bureau of Mines in Morgantown, West Virginia, from 1956 to 1958. He has been at KSU since 1958. David F. Aldis (BS, chemical engineering, Kansas State University, 1973; MS, chemical engineering, Kansas State University, 1975) is a research assistant working under a cooperative agreement between the U.S. Grain Marketing Research Center and KSU, both at Manhattan, Kansas. He is presently studying grain drying. He formerly worked for 3-M Company as a factory process engineer at Nevada, Missouri.

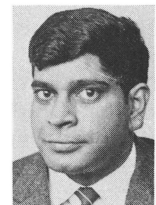
*L. T. Fan*  
*David F. Aldis*



#### PROPERTIES OF LIGHT WATER REACTOR CORE MELTS

Silvestre Nazaré (top) (Dr. Ing., Universität Karlsruhe, Germany, 1969) is a member of the scientific staff at the Institut für Material- und Festkörperforschung of the Nuclear Research Center, Karlsruhe, Federal Republic of Germany. His interests include the technology and mechanical properties of ceramic and multiphase materials. Gerhard Ondracek (Dr. rer. nat., Universität Stuttgart, Germany, 1964) is a group leader at the Institut für Material- und Festkörperforschung. His main interest is the evaluation of microstructure by stereological analysis and its influence on the properties of multiphase, porous, and nuclear materials. Brigitte Schulz (Dr. Ing., Universität Karlsruhe, Germany, 1974) is a member of the scientific staff at the Institut für Material- und Festkörperforschung. Her interests are in transport properties of ceramic and multiphase materials.

*S. Nazaré*  
*G. Ondracek*  
*B. Schulz*



## RELIABILITY ANALYSIS OF THE DECAY HEAT REMOVAL SYSTEM OF A 1000-MW(e) GAS-COOLED FAST BREEDER REACTOR

D. Bittermann (top) (Dipl. Ing., mechanical engineering, Technische Hochschule Darmstadt, 1970) joined the Gas-Cooled Fast Breeder Reactor Department of Siemens (now Kraftwerk Union, Federal Republic of Germany) in 1970. His main interests are in systems analysis and safety. J. Wehling (Ing. grad., physics, Fachhochschule Weck, 1965) is with Internationale Atomreaktorbau GmbH, Bensberg, Federal Republic of Germany. His main interests are in reliability analysis and safety.

*D. Bittermann  
J. Wehling*



## COMPARISON OF THE POWER DISTRIBUTION IN URANIUM AND PLUTONIUM FUEL ELEMENTS IN THE KWO CORE

Dieter Sommer (Dr. Ing., energy technology, University of Stuttgart, 1973) has been employed since 1969 at the Obrigheim Nuclear Power Station in the Department of Physics, his main duty being supervision of reactor operation at Kernkraftwerk Obrigheim. His special interests lie in the development of nuclear instrumentation and in the application of neutron noise.

*Dieter Sommer*

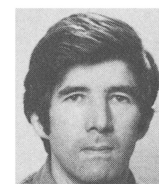
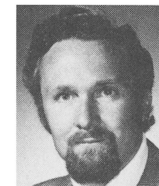


## FUELS

### MECHANICAL RESPONSE OF $UO_2$ SUBJECTED TO TRANSIENT HEATING

Bernard J. Wrona (top left) (BS, 1972, MS, 1974, metallurgical engineering, Illinois Institute of Technology) has been working on nuclear fuels as a member of the Materials Science Division of Argonne National Laboratory (ANL) since 1962. He is presently principal investigator in developing the direct-electrical-heating (DEH) apparatus and lead experimentalist in several programs that use the apparatus to study the response of nuclear oxide and carbide fuels to applied power transients. J. T. A. Roberts (top right) (BSc, 1965, MSc, 1966, and PhD, 1968, Manchester University, England) is program manager of core materials in the Nuclear Systems and Materials Department of the Electric Power Research Institute (EPRI). Prior to joining EPRI in 1974, he was group leader of the Ceramic Properties Group at ANL, where he directed research on reactor-safety-related fuel element materials properties. Thomas M. Galvin (bottom left) (AS, electronics, DeVry Technical Institute, 1966) has been at ANL since 1966 and a member of the Materials Science Division since 1974. His present assignments include assisting in modifications to improve the capabilities of the DEH apparatus and performing DEH tests on oxide and carbide fuels. Geoffrey T. Higgins (bottom right) (PhD, metallurgy, University of Manchester, 1957) is a professor for the Department of Metallurgical and Materials Engineering with The Illinois Institute of Technology. He is currently doing research on grain boundary migration phenomena, texture development in steels, and aluminum alloys.

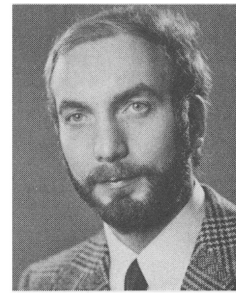
*B. J. Wrona  
J. T. A. Roberts  
T. M. Galvin  
G. T. Higgins*



**THE OVERALL PROBABILITY OF DETECTION IN CONNECTION WITH THE OPTIMIZATION OF SAFEGUARDS EFFORT**

Günter Hartmann (Diplom, mathematics, University of Heidelberg, 1972) is presently a member of the Institute for Applied Systems Analysis at the Nuclear Research Center, Karlsruhe, Federal Republic of Germany. He is working on theoretical problems of material accountancy.

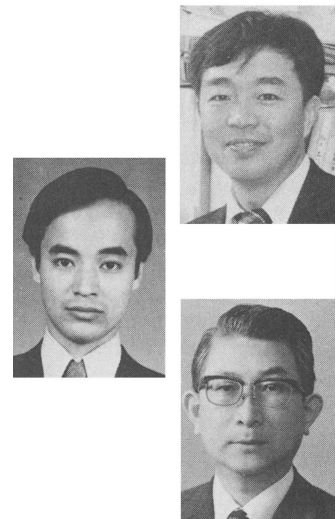
*Günter Hartmann*



**EQUILIBRIUM PRESSURE AND SOLUBILITY OF HYDROGEN IN LIQUID LITHIUM**

Hiroji Katsuta (top) (PhD, engineering of metallic materials, Tohoku University, 1969) is a research scientist at the Molten Materials Laboratory, Japan Atomic Energy Research Institute (JAERI). His interests are in non-metallic impurity behavior in liquid metals and molten salts, the effect of impurities on compatibility, and hydrogen (tritium) permeation through metal membranes in contact with molten materials. Takahiro Ishigai (center) (MS, nuclear engineering, Nagoya University, 1976) is now at Fujitsu Limited working as a computer system engineer. Kazuo Furukawa (bottom) (Dr. Sci., chemistry, Kyoto University, 1960) is a chief at the Molten Materials Laboratory at JAERI. His interests are in molten materials science and technology, such as inorganic liquid structure chemistry, sodium technology, molten salt reactor technology, and fusion reactor blanket chemistry.

*Hiroji Katsuta  
Takahiro Ishigai  
Kazuo Furukawa*



**SODIUM PURIFICATION BY COLD TRAPPING AT THE EXPERIMENTAL BREEDER REACTOR II**

John T. Holmes (top) (MS, chemical engineering, University of California, Berkeley, 1960) worked at Argonne National Laboratory in Idaho (ANL-Idaho) on nuclear fuel cycle development during the 1960's, and in the 1970's he supervised numerous liquid-metal purity monitoring and control projects both in the laboratory and with the Experimental Breeder Reactor II (EBR-II). He is currently working on the world's largest solar energy test facility [5 MW(th)], to be operated by Sandia Laboratories near Albuquerque, New Mexico. Charles Smith (bottom right) (MS, chemistry, Cornell University, 1948) is at present a staff chemist in the EBR-II Plant Chemistry Group at ANL-Idaho. Previously he has worked at Battelle Northwest Laboratories in Fast Flux Test Facility Plant Instrumentation, at Atomics International in sodium and gas technologies, and at General Electric Company in tritium production. Marilyn M. Osterhout (bottom center) (MS, chemistry, University of Florida, 1972) has been employed at ANL-Idaho in the EBR-II Plant Chemistry Group since 1974. Previously, she taught upper-level math and science in the Maryland public school system. W. Harvey Olson (bottom left) (BSME, Colorado State University, 1959) has been involved in the operation of sodium-cooled reactors since 1959. He is presently supervisor of the EBR-II Plant Chemistry Group at ANL-Idaho.

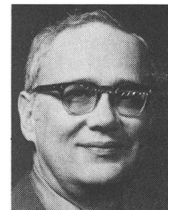
*J. T. Holmes  
C. R. F. Smith  
M. M. Osterhout  
W. H. Olson*



### A CALIFORNIUM-252 FISSION SPECTRUM IRRADIATION FACILITY FOR NEUTRON REACTION RATE MEASUREMENTS

J. A. Grundl (top right) (PhD, physics, University of New Mexico, 1965), V. Spiegel (bottom right) (PhD, physics, University of Notre Dame, 1956), C. M. Eisenhauer (top center) (BS, math, City University of New York, 1951), H. T. Heaton II (bottom left) (MS, physics, University of Maryland, 1964), and D. M. Gilliam (top left) (PhD, nuclear engineering, University of Michigan, 1973) are members of the Center for Radiation Research at the U.S. National Bureau of Standards, engaged in the development of reference neutron fields and the standardization of integral reaction rate measurements for nuclear technology. J. E. Bigelow (pictured alone) (ScD, chemical engineering, Massachusetts Institute of Technology, 1956) is transuranium materials coordinator at Oak Ridge National Laboratory. He is experienced in fuel reprocessing pilot plant operations and in the separation and purification of transplutonium elements. In his current assignment at the transuranium processing plant, he coordinates the activities of the facility with the needs of researchers at many government laboratories. He works quite closely with the researchers in some special projects.

*J. A. Grundl*  
*V. Spiegel*  
*C. M. Eisenhauer*  
*H. T. Heaton II*  
*D. M. Gilliam*  
*J. Bigelow*



### THE APPLICATION OF SPGOL-FIRE IN THEORETICAL ANALYSIS AND EXPERIMENTAL COMPARISON

Lucy Wu Person (BS, chemical engineering, National Taiwan University, 1956; PhD, nuclear chemistry, University of California, Berkeley, 1961) has been an assistant computer scientist in the Reactor Analysis and Safety Division of Argonne National Laboratory since 1973. She has worked on SAS codes. Her current interests are in methodology for statistical evaluation of reactor safety and reliability analysis, mass and heat transfer for transient fluid flows, and computer software engineering and its related problems.

*Lucy Wu Person*

