



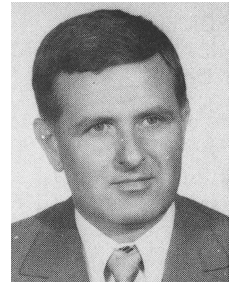
AUTHORS – JUNE 1977

REACTORS

AXIAL DISTRIBUTION OF VOID FRACTION IN SUB-COOLED BOILING

László Maróti

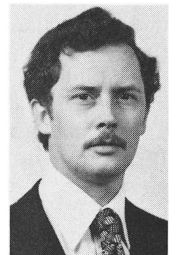
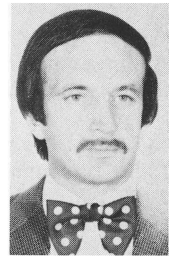
László Maróti (mechanical engineer, Technical University of Budapest, Hungary, 1957) is a senior research engineer at the Central Research Institute for Physics of the Hungarian Academy of Sciences. He is responsible for theoretical and experimental research work on reactor thermohydraulics. He is mainly interested in the problems of two-phase flow and boiling heat transfer.



STATISTICAL UTILITY THEORY FOR COMPARISON OF NUCLEAR VERSUS FOSSIL POWER PLANT ALTERNATIVES

*S. Garribba
A. Ovi*

S. Barribba (top) (Eng. Dr., nuclear engineering, Polytechnic Institute of Milan, Italy; MS, University of California, Berkeley) has, since 1972, been assistant professor of nuclear reactor design and head of the Nuclear Power Plants Laboratory at the Polytechnic Institute of Milan. His research activities center on problems of mechanical design of nuclear reactors, transport phenomena, reliability engineering, and energy economics. A. Ovi (Eng. Dr., nuclear engineering, Polytechnic Institute of Milan, Italy; MS, operations research, Massachusetts Institute of Technology) has been consulting with Euratom and with the Polytechnic Institute of Milan since 1973, while managing Development and Planning at CDI, a medical services company. He is now among the sponsors of GASP, a national interdisciplinary association for the study of social health problems and public utilities.

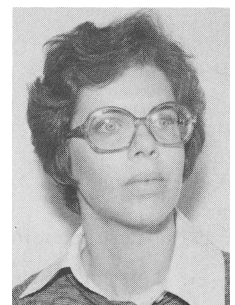


REACTOR SITING

INSTITUTIONAL AND ENVIRONMENTAL ASPECTS OF GEOTHERMAL ENERGY DEVELOPMENT

Ora R. Citron

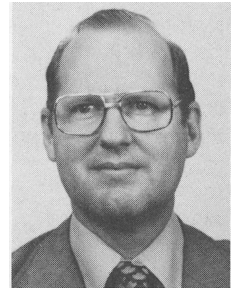
Ora R. Citron (BS, urban studies, University of Southern California, 1972; MPA, public policy and environmental administration, University of Southern California, 1974) was an energy policy analyst at the Jet Propulsion Laboratory in Pasadena, California, when this paper was written. Citron has spent substantial time in geothermal energy policy research, and currently participates as a staff member in the California Geothermal Energy Task Force. She is now an energy and natural resources consultant to the California State Assembly in the Office of Research.



EMPIRICAL INVESTIGATIONS OF THE DIFFUSION OF WASTE AIR PLUMES IN THE ATMOSPHERE

Kurt-Jürgen Vogt

Kurt-Jürgen Vogt (Dr. Ing., Technical University of Aachen, 1970) has been employed at the Jülich Nuclear Research Center since 1958 and is presently a member of a research team dealing with future environmental effects of nuclear industries there. He is also currently a consultant of the German Federal Ministry for Education and Science and of the Federal Ministry for Internal Affairs.

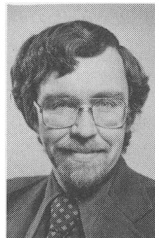
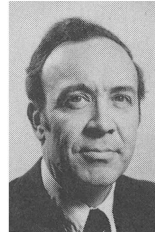


FUEL CYCLES

SOME ASPECTS OF THE THORIUM FUEL CYCLE IN HEAVY-WATER-MODERATED PRESSURE TUBE REACTORS

S. Banerjee (top left) (PhD, chemical engineering, University of Waterloo, 1968) worked at Atomic Energy of Canada Limited (AECL), Pinawa, in the Chemical Technology Branch, as head of the Reactor Analysis Branch, and as acting director of the Applied Science Division. At present, he is a professor of engineering physics at McMaster University. His current interests are in thorium fuel cycle analysis and safety. S. R. Hatcher (top right) (PhD, chemical engineering, University of Toronto, 1958) worked at AECL, Chalk River and Pinawa, Manitoba in the Chemical Engineering Branch and as head of the Chemical Technology Branch. At present, he is director of the Applied Science Division, with overall responsibility for thorium fuel cycle programs at AECL. A. D. Lane (center left) (MSc, mechanical engineering, University of Birmingham, 1958) worked at AECL, Chalk River, in the Fuel Engineering Branch. At present, he is head of the Fuel Development Branch at AECL, Pinawa. His current responsibilities include establishing industrial production for thorium fuels and investigating novel fuel fabrication routes. H. Tamm (bottom right) (PhD, mechanical engineering, University of Saskatchewan, 1971) worked as assistant professor of engineering at the University of Guelph. At present, he is a member of the Fuel Development Branch at AECL, Pinawa. His current interests are in development of computer codes for nuclear power systems studies and demonstration irradiations of thorium fuels. J. I. Veeder (bottom left) (BSc, physics, Leeds University, 1951) worked in the Fuel Engineering Branch at AECL, Chalk River. He is presently a member of the Reactor Physics Branch at Chalk River. His current interests include reactor physics and logistics of fuel cycles.

*S. Banerjee
S. R. Hatcher
A. D. Lane
H. Tamm
J. I. Veeder*

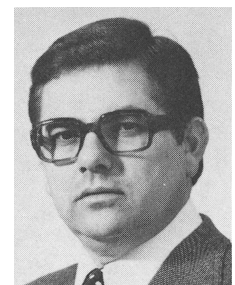


FUELS

HIGH-PRESSURE CAPSULE FOR THE IRRADIATION OF FUEL SWELLING SPECIMENS IN THE FR2 REACTOR

Heinz E. Haefner

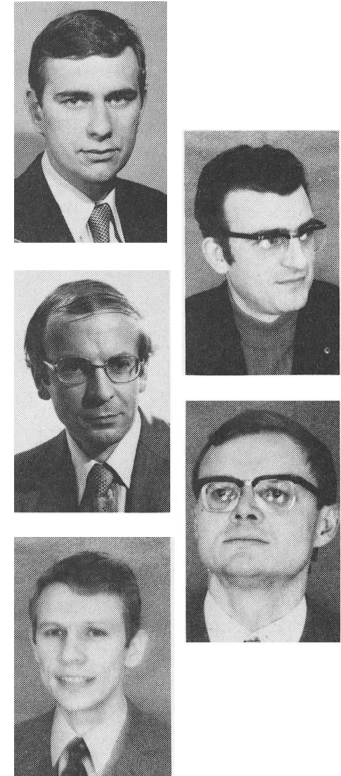
Heinz E. Haefner has an engineering background and for the past 15 years has been working in the field of fuel development for fast breeder reactors at the Karlsruhe Nuclear Research Center. His current main interest is in irradiation technology for fuel and fuel rod tests.



RESULTS OF THE POSTIRRADIATION EXAMINATIONS OF THE RAPSODIE-I EXPERIMENT FUEL PINS

Didier Haas (top left) (ingénieur civil physicien, Liège University, Belgium, 1971) joined Belgonucleaire in 1972 to work in the Postirradiation Group for Fast Breeder Reactors. His current interests include the in-pile testing of fast reactor fuel subassemblies and the behavior of irradiated fuel and structural materials. José Van de Velde (top right) (Higher Technical Institutes of Ghent and Brussels, Belgium) is a technical engineer for electromechanics and nuclear engineering. His experience includes hot-cell development in hot laboratory and postirradiation examinations of light water reactor (LWR) and liquid-metal fast breeder reactor (LMFBR) fuel experiments. Marcel Gaube (center left) (civil engineer, Ecole de Mines de Mons, Belgium, 1963) joined Belgonucleaire in 1965 to work on the VULCAIN Project (Spectral Shift Reactor). From 1967 to 1971 he worked on the design of high-temperature reactor (HTR) fuels. Since 1972, his current interests have been in the study of the behavior under irradiation of HTR, LWR, and LMFBR fuels. Jacques Ketels (bottom right) (Higher Technical Institutes of Ghent and Brussels, Belgium) is a technical engineer for chemistry and nuclear engineering. He is responsible for microprobe analysis and TEM examination of irradiated fuel. Constant Von Loon (bottom left) (Higher Institute of Mechelen, Belgium) is a specialist for the ceramographic examination of LWR, HTR, and fast breeder reactor fuel elements.

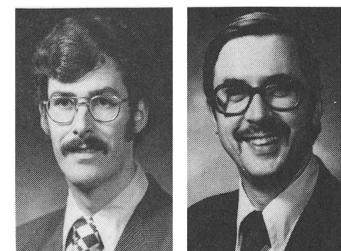
*D. Haas
J. Van de Velde
M. Gaube
J. Ketels
C. Van Loon*



IN-LINE MONITORING OF EFFLUENTS FROM HIGH-TEMPERATURE GAS-COOLED REACTOR FUEL PARTICLE PREPARATION PROCESSES BY MASS SPECTROMETRY

DeWayne A. Lee (group photo, second from right) (BA, chemistry, Concordia College, Moorhead, Minnesota, 1943) is working in time-of-flight mass spectrometry and development of analytical methods for nuclear technology in the Analytical Chemistry Division of Oak Ridge National Laboratory (ORNL). Dante A. Costanzo (group photo, second from left) (PhD, analytical chemistry, Michigan State University, 1965) is a group leader with major interests in analytical chemistry in nuclear technology, working in the Analytical Chemistry Division of ORNL. David P. Stinton (bottom left) (MS, ceramic engineering, Virginia Polytechnic Institute, 1974) is a lead engineer in the Metals and Ceramics Division at ORNL. He is involved in the process development and characterization of carbon and silicon carbide coatings for high-temperature gas-cooled reactor (HTGR) fuel. J. A. Carpenter, Jr. (bottom right) (BS, metallurgical engineering, 1963, and PhD, materials engineering science, 1970, Virginia Polytechnic Institute and State University) is at ORNL in the Fuel Cycle Engineering Group, working on the carbonization of resin-based HTGR fuel microspheres. Prior to coming to ORNL in 1975, he was with the Chrysler Corporation in Detroit, Michigan, engaged in work associated with the development of the catalytic converter. William T. Rainey, Jr. (group photo, left) (PhD, organic chemistry, University of North Carolina, 1949) works in the Analytical Chemistry Division of ORNL in the field of organic analysis and instrument development, especially in gas chromatography in combination with mass spectrometry (GC/MS), related to applications in environmental and energy-related projects.

*D. A. Lee
D. A. Costanzo
D. P. Stinton
J. A. Carpenter, Jr.
W. T. Rainey, Jr.
D. C. Canada
J. A. Carter*

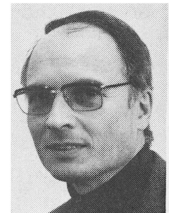
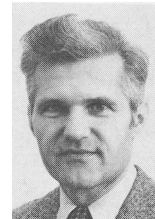


David C. Canada (group photo, right) (PhD, biochemistry, Purdue University, 1973) works in the Analytical Chemistry Division at ORNL. His interests are in the separation and analysis of complex organic mixtures, high-resolution GC/MS, metastable analyses, and on-line computer data processing. Joel A. Carter (group photo, center) (PhD, chemistry, University of Tennessee, 1970) is a section head in the Analytical Chemistry Division of ORNL, working in the areas of mass and emission spectroscopy, especially on techniques of trace methodology.

INFLUENCE OF THE RADIAL TEMPERATURE GRADIENT ON CLADDING DILATATION

H. Venker (top) (PhD, metallurgy, University of Münster, Germany, 1967) is a delegate from Euratom to the Fast Breeder Project at Karlsruhe, Germany. His current research interests are in fuel-cladding interactions and irradiation damage of reactor alloys. M. Bober (center) (Dr. Ing., University of Karlsruhe, 1968) and G. Schumacher (bottom) (Dr. Ing., University of Karlsruhe, 1970) have been working since 1961 at the Institut für Neutronenphysik und Reaktortechnik at Kernforschungszentrum Karlsruhe in the field of thermodynamics of nuclear materials. Their main interests are in transport processes in fuel pins and thermodynamic and thermophysical properties of fuel materials at high temperatures.

H. Venker
M. Bober
G. Schumacher

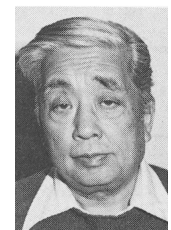
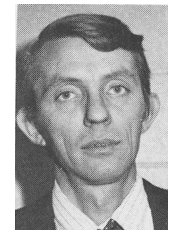


MATERIALS

FATIGUE CRACK PROPAGATION IN TYPES 304 AND 308 STAINLESS STEEL AT ELEVATED TEMPERATURES

David T. Raske (top) (PhD, theoretical and applied mechanics, University of Illinois, 1972) is a mechanical engineer in the Metals Properties Group of the Materials Science Division at Argonne National Laboratory (ANL). His interests are in the fatigue and fracture behavior of structural materials. He is currently involved in a program on the elevated-temperature low-cycle fatigue behavior of liquid-metal fast breeder reactor structural materials. Craig F. Cheng (MS, physical chemistry, BS, chemical engineering, Massachusetts Institute of Technology, 1940) is a metallurgical engineer in the Corrosion Group of the Materials Science Division at ANL. He has previously been associated with the General Electric Company (Large Steam Turbine Division and KAPL), the International Nickel Company Research Laboratory, and U.S. Steel, among others.

D. T. Raske
C. F. Cheng

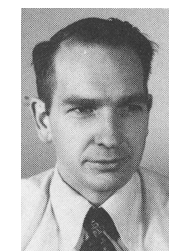


RADIOISOTOPES

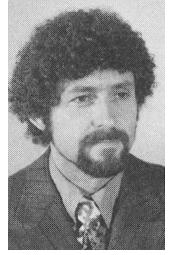
A REUSABLE FRAME GREENHOUSE THAT SAVES MONEY AND ERECTION TIME AND REDUCES WASTE GENERATION

W. O. Greenhalgh (right) [BS (1962), and MS (1964), chemistry, Brigham Young University] is an advanced scientist in the Chemical Engineering Group at the Hanford Engineering Development Laboratory (HEDL). He is presently working on volume reduction and immobilization methods

W. O. Greenhalgh
D. T. Ott



of nuclear wastes. He has 12 years of nuclear experience, including that of waste management supervisor responsible for routine plant decontamination and waste disposal services. D. T. Ott is a senior technician in the Fast Flux Test Facility Testing and Operations Group at HEDL. He has 15 years experience in electro-mechanical hot-cell operations related to processing of high- and low-level wastes, fuel reprocessing, and interim examination of spent reactor fuel, as well as extensive experience in radiation control practices involving containment and decontamination of materials.



TECHNIQUES

14.7-MeV NEUTRON CAPTURE CROSS-SECTION MEASUREMENTS WITH IMPROVED ACTIVATION TECHNIQUE

*G. Magnusson
I. Bergqvist*

Goran Magnusson (top) is an undergraduate student at the University of Lund. He is presently working on a PhD thesis in experimental nuclear physics concerning measurements of MeV neutron cross sections. Ingvar Bergqvist (PhD, physics, University of Lund, Sweden, 1963) is a professor of physics at the University of Lund. He has worked for extended periods at Oak Ridge National Laboratory, Chalk River Nuclear Laboratories, and Los Alamos Scientific Laboratory. His present work has been focused on capture reactions in the giant-dipole-resonance region.

