



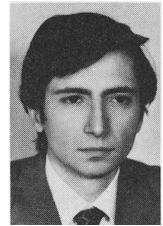
AUTHORS — OCTOBER 1975

REACTORS

ASSESSMENT OF THE RELIABILITY OF THE CNEN'S CALCULATIONAL METHODS FOR THE NEUTRONIC DESIGN OF PWRs

M. A. Gaafer (not pictured) (PhD, reactor physics, University of Cairo, 1974) is associated with the Atomic Energy Agency of Egypt. His current interests are in calculational models for physics core design. L. Mango (top) (PhD, physics, University of Rome, 1961) is professor of computing sciences at the University of Calabria in Italy. Her interests are in applied mathematics and computer codes. F. V. Orestano (center) (PhD, physics, University of Rome, 1971) is professor of nuclear physics at the University of Calabria. His interests are in LWR physics and fuel cycles. F. Pistella (bottom) (PhD, physics, University of Rome, 1967) is associated with the CNEN LWR division, where he is responsible for core design.

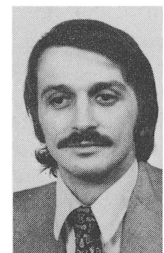
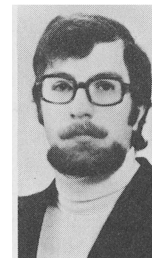
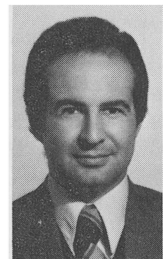
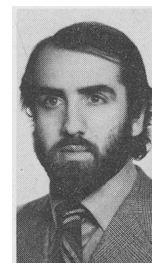
*M. A. Gaafer
L. Mango
F. V. Orestano
F. Pistella*



USE OF THE "LAGRANGIAN AND EULERIAN POINTS OF VIEW" IN THE TRANSIENT CRITICAL HEAT FLUX CALCULATIONS FOR BWR ROD BUNDLES AND EXPERIMENTAL VERIFICATIONS

V. Marinelli (top left) (PhD, nuclear engineering, Politecnico di Torino, 1967) worked at CNEN until 1969. He was technical leader of thermohydraulic studies at Gruppo Progettazione e Sperimentazione of the Plutonium Program until 1974 and is now head of System Engineering Service, where he is involved with reactor safety problems. A. Pellei (top right) (PhD, nuclear engineering, University of Pisa, 1967) served as an assistant professor of applied physics at the School of Engineering, Pisa University. Since 1969 he has been at AGIP Nucleare, where he worked in the Irradiation Tests Department. He is presently interested in thermal hydraulics of LWR fuel elements and in the economics of the nuclear fuel cycle. P. Vallero (bottom left) (PhD, nuclear engineering, Politecnico di Torino, 1975) works in the area of thermal hydraulics. C. Vitanza (bottom right) (physicist, University of Milano, 1971) has been at AGIP Nucleare since 1973 and is interested in thermal hydraulic computer codes for LWR fuel elements. He is also interested in creep studies.

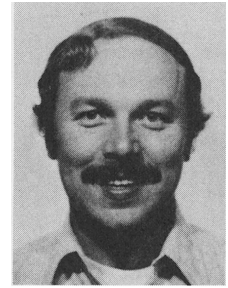
*V. Marinelli
A. Pellei
P. Vallero
C. Vitanza*



PLASMA SIMULATION USING PARTICLE CODES

W. L. Kruer

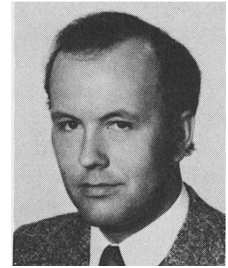
William L. Kruer (PhD, Princeton University, 1969) is currently group leader for laser plasma theory at the Lawrence Livermore Laboratory. Prior to joining the laser fusion program at Livermore, he was on the research staff of the Princeton Plasma Physics Laboratory. His principal research interests lie in the area of plasma theory and simulation.



MEASUREMENT AND CALCULATION OF NEUTRON SPECTRA AT A SODIUM-IRON INTERFACE

Friedbert Kappler

Friedbert W. Kappler (PhD, University of Karlsruhe, 1974) is a physicist at the Institut für Neutronenphysik und Reaktortechnik, Kernforschungszentrum Karlsruhe, West Germany. His current work is in the measurement and calculation of fast-neutron spectra of multiplying and nonmultiplying assemblies.

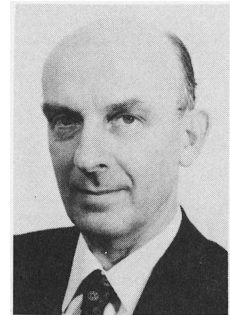


REACTOR SITING

RATIONALE OF REACTOR SITE SELECTION FOR PUBLIC SAFETY

J. R. Beattie

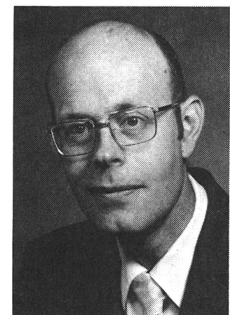
J. R. Beattie (BSc, St. Andrews University, Scotland, 1947; PhD, Sheffield University, England, 1954) joined the United Kingdom Atomic Energy Authority's Safety Branch, now the Authority Safety and Reliability Directorate, in 1957. His interests include gas-cooled reactor technology, fission-product behavior, risk analysis, health physics, and meteorological problems arising from accident conditions, as well as environmental aspects of nuclear power production processes during normal operational conditions.



FLOW OF RADIOACTIVE FLUID THROUGH THE SOIL SURROUNDING A POWER-REACTOR STATION AFTER A CORE MELTDOWN ACCIDENT

J. H. Pitts

John H. Pitts (BS, mechanical engineering, Stanford, 1955; MS, University of California at Berkeley, 1958) is presently completing a PhD program at the University of California at Davis. He joined the Lawrence Livermore Laboratory in 1959 to help with the successful "Pluto" nuclear-powered ramjet engine. He served as project engineer to conduct basic research in thermodynamics and fluid dynamics, and as a group leader for the development of nuclear-space electric-power systems. Recently his attentions have focused on fluid flow through porous materials, where he has made contributions to assure containment of radioactive matter released during underground nuclear detonation, nuclear stimulation of petroleum products, and hypothetical reactor accidents.

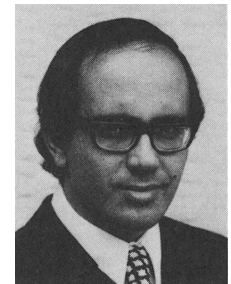


IN-CORE FUEL MANAGEMENT VIA PERTURBATION THEORY*John O. Mingle*

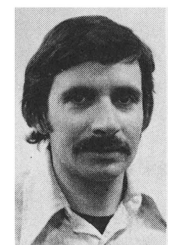
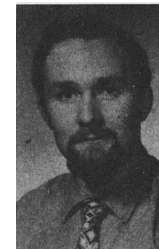
John O. Mingle (BS, 1953; MS, chemical engineering, Kansas State University, 1958; PhD, chemical engineering, Northwestern University, 1960) is Black and Veatch Distinguished Professor of Nuclear Engineering and director of the Institute for Computational Research in Engineering at Kansas State, where he has been associated with the Nuclear Engineering Department for 15 years. He has published extensively in the fields of applied and computational reactor theory and nuclear fuel management.

**SPENT FUEL TRANSPORTATION ON HIGHWAYS—THE RADIOACTIVE DOSE TO THE TRAFFIC***George Yadigaroglu*

George Yadigaroglu (Diploma, mechanical engineering, Ecole Polytechnique Fédérale-Lausanne, Switzerland, 1962; ScD, nuclear engineering, Massachusetts Institute of Technology, 1970) is assistant professor of nuclear engineering at the University of California, Berkeley. His major technical interests are in the areas of nuclear safety and siting, including probabilistic risk evaluation, and environmental effects of nuclear power generation.

**OBSERVATIONS OF IRRADIATED FUEL BEHAVIOR UNDER SIMULATED ACCIDENT HEATING CONDITIONS***J. T. A. Roberts**B. J. Wrona**D. Fischer**J. A. Buzzell*

John T. A. Roberts (top left) (BSc, MSc, and PhD, metallurgy, University of Manchester, England) is a program manager in the Nuclear Power Division, Systems and Materials Department, at Argonne National Laboratory. His responsibilities embrace core materials research for both LWRs and FBRs. Current interests include plutonium utilization, Zircaloy and UO_2 properties, and pilot UO_2 -Zr bundle irradiations. Bernard J. Wrona (top right) (BS and MS, metallurgical engineering, Illinois Institute of Technology) has been a member of the Materials Science Division of Argonne National Laboratory since 1962. He has extensive experience in ceramic fabrication, mechanical properties, and high-temperature materials. Presently, he is principal investigator in developing the direct electrical heating (DEH) apparatus and various programs involving transient studies of nuclear oxides, carbides, and nitrides that utilize DEH equipment as the primary tool. Donald F. Fischer (bottom left) (BS, chemistry, University of Illinois, 1951) has been a member of the Chemical Engineering Division of the Argonne National Laboratory since 1955. He has extensive experience in the areas of metal oxidation and ignition, thermal-gradient migration, and high-temperature enthalpy studies on nuclear fuels and materials. He is currently involved in high-temperature enthalpy measurements on advanced fuels. John A. Buzzell (bottom right) (undergraduate,

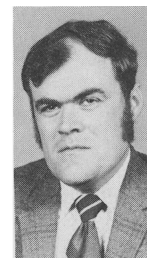


electrical engineering) is a senior technician in the Materials Science Division at Argonne National Laboratory. He has eight years prior experience in hot cell and nuclear reactor operations.

ANALYTICAL STRESS ANALYSIS SOLUTION FOR A SIMPLIFIED MODEL OF A REACTOR FUEL ELEMENT

David E. Lamkin (top) (PhD, nuclear engineering, University of Arizona, 1974) is assistant professor of nuclear engineering at Texas A&M University. His current interests are in reactor fuel elements. Richard L. Brehm (BS, aeronautical engineering, University of Michigan, 1956; MS, nuclear engineering, University of Michigan, 1958; PhD, engineering, University of California, Los Angeles, 1966) is a professor of nuclear engineering at the University of Arizona. Over the past several years he has been engaged in problems relating to the behavior of fast reactor oxide fuels.

*David E. Lamkin
Richard L. Brehm*



MATERIALS

A RELATIONSHIP BETWEEN EQUIVALENT CHROMIUM CONTENT AND IRRADIATION-INDUCED SWELLING IN TYPE 316 STAINLESS STEEL

John F. Bates (left) (BS, physical metallurgy, Colorado School of Mines, 1969) has been working in the area of in-reactor behavior of materials for several years and is currently studying the effects of compositional varieties on swelling in core components. George L. Guthrie (right) (PhD, physics, Carnegie Institute of Technology, 1957) is currently working on the experimental and theoretical characterization of swelling and creep of reactor materials.

*J. F. Bates
G. L. Guthrie*



INSTRUMENTS

AN ULTRASONIC TREPANNING TECHNIQUE FOR RADIAL SAMPLING OF CERAMIC FUEL PELLETS

F. L. Yaggee (right) (BSE, chemical and metallurgical engineering; MS, metallurgy, University of Michigan) has experience at Argonne National Laboratory (ANL) in nuclear fuels research, fabrication of EBR-I, EBR-II, and ZPR fuel loadings, development of ferrous and nonferrous cladding alloys, and research relevant to failure mechanisms in fuel cladding. The present sampling technique was developed while he was on loan to the Reactor Analysis and Safety Division. His current technical interests include cyclotron simulation of a reactor environment for studies of radiation effects on cladding behavior and the study of failure mechanisms in ribbed, GCFR-type cladding. G. M. Dragel (left) is a senior engineering technician. His 26 years of experience at ANL include work in aqueous corrosion of nuclear fuels, mechanical properties of uranium compounds, and plutonium glove box and hot cell work. He is currently involved in the examination of irradiated fuels and cladding by electron microscopy.

*F. L. Yaggee
G. M. Dragel*

