



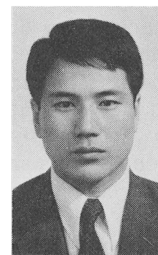
AUTHORS — AUGUST 1975

REACTORS

COMPARATIVE STUDY OF RADIOACTIVITY AND AFTER-HEAT IN SEVERAL FUSION REACTOR BLANKET DESIGNS

Robert W. Conn (top) (PhD, California Institute of Technology, 1968) is in the Nuclear Engineering Department of the University of Wisconsin and is director of the Wisconsin Fusion Technology Program. He has worked in nuclear reactor physics and transport theory and on problems related to molecular collision theory. His current interests center on technological problems in fusion systems, particularly plasma analysis, neutronics problems, and fusion reactor design, and on nuclear materials safeguards. Tak Yun Sung (center) (MS, nuclear engineering, University of Wisconsin, 1973) is a graduate student in nuclear engineering at Wisconsin and is engaged in the radioactivity calculations for potential fusion reactors. Mohamed A. Abdou (bottom) (PhD, nuclear engineering, University of Wisconsin, 1973) is currently responsible for controlled thermonuclear reactor (CTR) nucleonic analysis at Argonne National Laboratory (ANL). He is also engaged in the present ANL design effort for a Tokamak Experimental Power Reactor. In his work from 1970 to 1974 with the Wisconsin Fusion Reactor Design Study Project he conducted research on nuclear heating calculational models and CTR blanket and shield design.

*R. W. Conn
T. Y. Sung
M. A. Abdou*



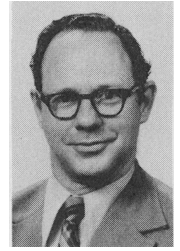
A FUSION DESIGN STUDY OF NONMOBILE BLANKETS WITH LOW LITHIUM AND TRITIUM INVENTORIES

Mohamed A. Abdou (left) (PhD, nuclear engineering, University of Wisconsin, 1973) is currently responsible for controlled thermonuclear reactor (CTR) nucleonic analysis at Argonne National Laboratory (ANL). He is also engaged in the present ANL design effort for a Tokamak Experimental Power Reactor. In his work from 1970 to 1974 with the Wisconsin Fusion Reactor Design Study Project he conducted research on nuclear heating calculational models and CTR blanket and shield design. Layton J. Wittenberg (right) (PhD, inorganic chemistry, University of Wisconsin, 1953) returned to the Madison campus for one year as a visiting scientist with the Fusion Feasibility Study Group. Since return to his permanent location (Monsanto Research Corporation, Mound Laboratory, Miamisburg, Ohio), he has been engaged in studies concerning the tritium handling and containment technology which will be required in the experimental controlled nuclear research program through

*Mohamed A. Abdou
Layton J. Wittenberg
Charles W. Maynard*



the 1980's. Charles W. Maynard (right) (BS, electrical engineering, University of Maryland; PhD, applied physics, Harvard University, 1961) has worked at Bettis Atomic Power Laboratory operated by Westinghouse Electric Company in the Reactor Theory and Methods section. He was appointed associate professor of nuclear engineering at the University of Wisconsin, Madison, in 1961 and became a professor in 1965. His research interests are centered on design and neutronics analysis of reactors.

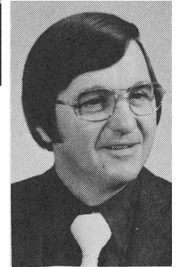


FUELS

DEVELOPMENT OF HIGH-PERFORMANCE URANIUM-METAL FUELS FOR SAVANNAH RIVER REACTORS

William R. McDonell (left) (PhD, chemistry, University of California, Berkeley, 1951) and Edward F. Sturcken (PhD, nuclear physics, St. Louis University, 1953, and visiting scientist, University of California, Berkeley, 1966-67) are research associates in the Nuclear Materials Division of the Savannah River Laboratory. Both participated in the early development of fuel elements for the Savannah River reactors, with emphasis on the effects of radiation on metallic uranium. McDonell is currently engaged in research on the material forms and containers for radionuclide heat and radiation sources. Sturcken is conducting crystallographic and microstructural studies of structure-property relationships, using electron microscopy and x-ray diffraction techniques.

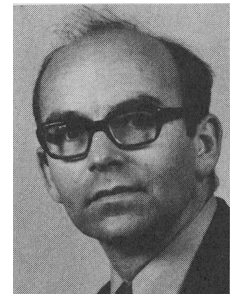
*W. R. McDonell
E. F. Sturcken*



EFFECT OF A LOSS OF FLOW ON A SINGLE LMFBR-TYPE FUEL PIN

H. Kwast (MSc, metallurgy, Technical University, Delft, The Netherlands, 1966) has been a member of the Materials Department of Reactor Centrum Nederland, Petten, since 1968. He is engaged in in-pile loss-of-cooling experiments on single LMFBR-type fuel pins. His main interests are related to all aspects of fuel pin behavior during accident conditions, failure mechanisms, and failure propagation.

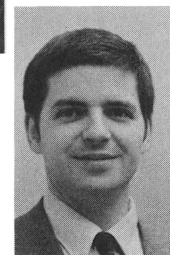
H. Kwast



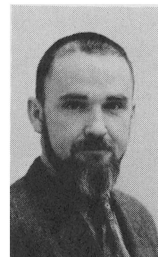
DESIGN OF PROTOTYPE CARBIDE SUBASSEMBLIES AND AN EVALUATION OF PROOF-TESTING PLANS IN THE FFTF

Joseph A. Vitti (left) (BS, mechanical engineering, City College of New York, 1956; MS, engineering, University of California, Los Angeles) is presently manager of carbide studies in the Fast Breeder Reactor (FBR) Department of Nuclear Power Systems, C-E Power Systems, Combustion Engineering, Inc. (C-E). He is responsible for C-E's government-sponsored work on the use and testing of carbide fuel in FBRs. Vitti has spent all of his career in the nuclear power field and has been involved for more than ten years in the design and analysis of fast reactors. His current interest involves the development of advanced reactor fuels for liquid-metal fast breeder reactors (LMFBRs). Patrick K. Doherty (right) (PhD, nuclear

*J. A. Vitti
P. K. Doherty
G. F. Di Lauro
J. C. Gilbertson
D. W. Stuteville*



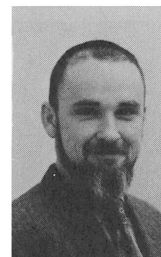
engineering, Purdue University, 1970) is a principal engineer in the fast breeder reactor department at C-E. He has worked on development of computer programs for thermal and fast reactor analysis with emphasis on programs for fast reactor neutronic calculations. His experience includes several neutronic studies of fast reactors. Recently, he has been studying the neutronic impact of carbide fuel on the Fast Flux Test Facility. Gerald F. di Lauro (top) (BS, Polytechnic Institute of Brooklyn, 1964; MS, engineering, Princeton University, 1969; MS, mechanical engineering, Northeastern University, 1972) is a supervisor of thermal hydraulic analysis in the Fast Breeder Development Department at C-E. He has been involved in the thermal aspects of LMFBR component design development, IHXs, and steam generators. For the past two years, he has been involved with core design problems. Jon C. Gilbertson (center) (MS, nuclear engineering, University of Wisconsin, 1962) is a supervisor of the reactor analysis unit of the Fast Breeder Reactor Development Department at C-E. His responsibilities include the analysis of safety, physics, thermal transients, and core optimization. Douglas W. Stuteville (bottom) (BS, marine engineering, U.S. Merchant Marine Academy, 1965; MS, prof. degree of nuclear engineering, Columbia University, 1970) is a principal engineer in the Fast Breeder Reactor Department at C-E. He is responsible for the development of C-E's target LMFBR design. His other responsibilities in C-E's FBR department have included core optimization, steam generator T/H, and accident analysis.



SAFETY MARGINS FOR SODIUM-BONDED CARBIDE FUEL

Eric R. Siegmann (left) (PhD, Northwestern University, 1971) is a principal engineer in Combustion Engineering's Fast Breeder Development Department. His current interests are with reactor safety. Jon C. Gilbertson (MS, nuclear engineering, University of Wisconsin, 1962) is a supervisor of the reactor analysis unit of the Fast Breeder Reactor Development Department at Combustion Engineering, Inc. His responsibilities include the analysis of safety, physics, thermal transients, and core optimization.

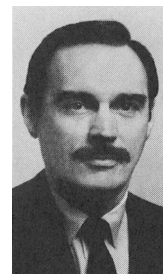
*E. R. Siegmann
J. C. Gilbertson*



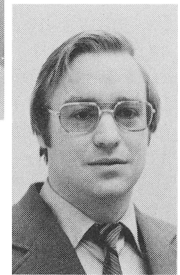
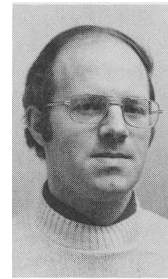
OPTIMUM PIN DIAMETER FOR LMFBR CARBIDE FUELS

Richard C. Noyes (left) (BS, mechanical engineering, Cornell University; MS, nuclear engineering, University of California at Los Angeles) is manager of fast breeder reactor (FBR) engineering development, Nuclear Power Systems, C-E Power Systems of Combustion Engineering, Inc., and is responsible for the development of components, systems, and methods related to C-E's commercial FBR effort. He joined C-E in 1967 and has held consulting staff engineering and fast breeder engineering positions. He was previously a research engineer and specialist for Atomic International. Patrick K. Doherty (right) (PhD, nuclear engineering, Purdue University, 1970) is a principal engineer in the Fast Breeder Reactor Department at C-E. He has worked on development of computer programs for thermal and fast reactor analysis with emphasis on programs for fast reactor neutronic calculations. His experience includes several neutronic studies of fast reactors. Recently, he has been studying the neutronic impact of

*R. C. Noyes
P. K. Doherty
S. A. Caspersson
N. Hanus
D. W. Stuteville*



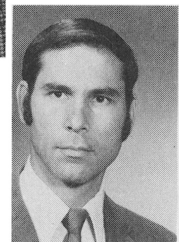
carbide fuel on the Fast Flux Test Facility. Sten A. Caspersson (left) (MS, nuclear engineering, University of Wisconsin, 1968) is a senior engineer in C-E's Fast Breeder Development Department. His current interests include advanced fuels comparisons, core optimization, radial blanket fuel management, thermal transient analysis, liquid-metal fast breeder reactor (LMFBR) economics, and fast reactor safety. Douglas W. Stuteville (right) (BS, marine engineering, U.S. Merchant Marine Academy, 1965; MS, nuclear engineering, Columbia University, 1970) is a principal engineer in the Fast Breeder Reactor Department at C-E. He is responsible for the development of C-E's target LMFBR design. His other responsibilities in C-E's FBR department have included core optimization, steam generator T/H, and accident analysis.



DESIGN AND MANUFACTURE OF GAS TAGS FOR FFTF FUEL AND CONTROL ASSEMBLIES

C. A. Strand
R. E. Schenter

C. A. Strand (left) (BS, chemical engineering, Montana State University, 1951) is development engineer in charge of fuel and control assembly tag gas capsule fabrication at the Hanford Engineering Development Laboratory (HEDL). He is also engaged in process development work and in the preparation of RDT Standards for liquid-metal fast breeder reactor mixed oxide fuel and components. R. E. Schenter (PhD, physics, University of Colorado, 1963) is a fellow scientist at HEDL. His primary area of experience is in the theoretical calculations of neutron reaction cross sections. He is presently chairman of the fission product subcommittee of the "Cross Section Evaluation Working Group" and chairman of the task force on "Nuclear Data for Fission Product Decay Heat and Burnup Calculations."

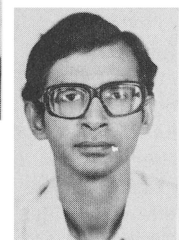
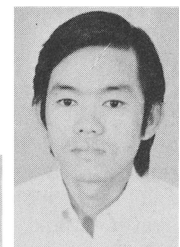


MATERIALS

DIFFUSION OF LINEARLY DISTRIBUTED MATERIAL IN AN EVAPORATING SLAB

A. Sy Ong
E. E. Teixeira
R. K. Nair

A. Sy Ong (top) (PhD, nuclear engineering, North Carolina State University, 1970) is currently at the Research Center of the Brazilian Petroleum Company, PETROBRAS. He is engaged in the application of radioisotope techniques in the petroleum industry. His earlier research activities were in the area of diffusion. Lt. Col. E. E. Teixeira (center) (MSc, nuclear engineering, Instituto Militar de Engenharia, Rio de Janeiro, 1974) heads the Nuclear Engineering Department at the Instituto Militar de Engenharia. He is also active in setting up the Nuclear Information Center of Brazilian Nuclear Energy Commission. The study of nuclear materials is his area of interest. R. K. Nair (bottom) (PhD, nuclear engineering, University of Florida, 1970) is currently a professor at the Instituto Militar de Engenharia. His major interest is in reactor physics. He also takes interest in the mathematical models employed in isotope applications.



THE INFLUENCE OF FUEL MICROSTRUCTURE ON IN-PILE DENSIFICATION

Walston Chubb (lower right) (MS, metallurgical engineering, University of Missouri, 1949) has been involved in the development of nuclear fuels and materials since 1951. He is currently involved in fuel rod performance analysis and development of design codes. A. Carl Hott (upper left) (MA, geology, Columbia University, 1961) has been active in the evaluation of irradiation effects in ceramic nuclear fuels since graduation. His current interests include fuel pellet design and development. Bruce M. Argall (lower left) (BS, engineering, Harvey Mudd College, 1968) has been concerned with fuel materials properties and pellet design since graduation. Oxide and mixed oxide fuels are his current interests. Gerry R. Kilp (upper right) (PhD, physical metallurgy, Iowa State University, 1957) has worked in the fields of fuels performance and materials development since 1962. Since 1972 he has been manager of materials design for the Nuclear Fuel Division of Westinghouse.

*W. Chubb
A. C. Hott
B. M. Argall
G. R. Kilp*

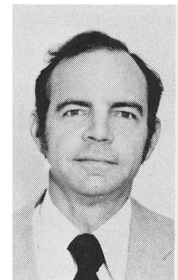
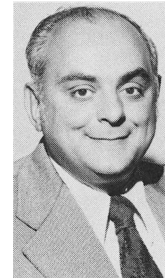


SHIELDING

PANEL DISCUSSION: ENGINEERING PROBLEMS IN POWER REACTOR SHIELDING

John Locante (left) (BS, electrical engineering, University of Pittsburgh, 1954) is manager, Safety and Licensing Group, Westinghouse Advanced Reactors Division. His current work involves licensing activities associated with the Fast Flux Test Facility and the Clinch River Breeder Reactor Plant. Wayne M. Lowder (not pictured) (AB, Harvard University, 1954) is a physicist in the Radiation Physics Division, USAEC Health and Safety Laboratory, New York City. His special interests include cosmic radiation and environmental gamma radiation from natural and manmade sources. B. A. Engholm (right) (BS, physics, California Institute of Technology, 1952), a graduate of ORSORT, is currently leader of the Shielding Section, General Atomic. W. E. Kreger (not pictured) (PhD, nuclear physics, University of Illinois) is leader of the Radiation Protection Section, Directorate of Licensing, U.S. Nuclear Regulatory Commission. His current interest is in radiation protection and occupational exposure at nuclear facilities.

*J. Locante
W. M. Lowder
B. A. Engholm
W. E. Kreger*



SHIELDING DESIGN AND ANALYSIS METHODS FOR PRESURIZED WATER REACTORS

Joseph J. Sapyta (right) (PhD, physics, University of Notre Dame, 1969) is unit manager, Physics and Radiation Transport Unit, Nuclear Power Generation Division, Babcock and Wilcox Company, Lynchburg, Virginia. His current technical interests are computer code applications to core physics and nuclear radiation shielding design of commercial light-water reactors. G. L. Simmons (PhD,

*J. J. Sapyta
G. L. Simmons*



Catholic University of America) has been with SAI Services, Inc. since 1973; prior to that he was with the Radiation Theory Section of the National Bureau of Standards and the Babcock and Wilcox Company. He is presently chairman of the ANS 6.2 Shielding Benchmark Problem Group. His current interests include radiation source term prediction and occupational radiation exposure analysis. He is presently involved in applying radiation analysis techniques to design problems for nuclear power plants.

