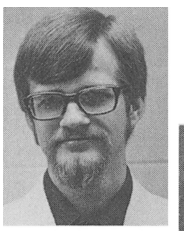
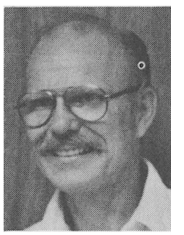
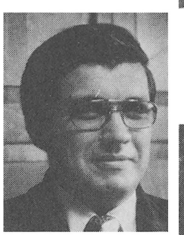
nuclear technology®

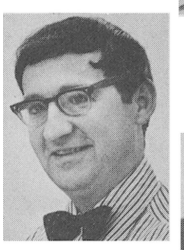
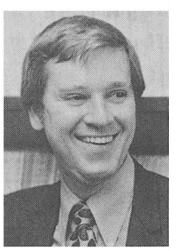
AUTHORS — FEBRUARY 1976

REACTORS

SIMULATED AND SIMULTANEOUS LOSS-OF-COOLANT ACCIDENT TESTING OF PROTECTIVE COATINGS FOR THE NUCLEAR INDUSTRY

W. F. Oberbeck, Jr.
K. G. Mayhan
D. R. Edwards
J. R. Lopata
J. F. Montle
D. R. Leritz

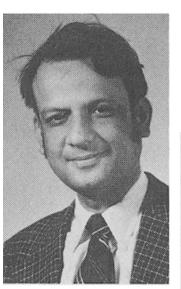
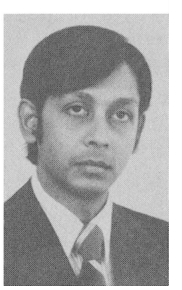




William F. Oberbeck, Jr. (top left) (BS, nuclear engineering, University of Missouri-Rolla, 1972) has for the past three years been with the Polymer Group at the Graduate Center for Materials Research, University of Missouri-Rolla, in pursuit of an MS in nuclear engineering through research on radiation effects in polymers. K. G. Mayhan (top right) (PhD, chemical engineering, University of Missouri-Rolla) is a professor of Chemical Engineering, Senior Investigator Graduate Center for Materials Research and Director of the Polymer Group at the Graduate Center for Materials Research. His current work is involved with polymers and coatings for biomedical applications. D. Ray Edwards (center left) (ScD, Massachusetts Institute of Technology, 1963) is professor and head of nuclear engineering at the University of Missouri-Rolla and is director of the University of Missouri-Rolla Reactor. His current interests include quality assurance and the effects of radiation on materials. James R. Lopata (center right) (BS, chemical engineering, Cornell University, 1967) is the power industry manager with Carboline Company, primarily serving the electric power generation field. John F. Montle (bottom left) (BS, chemical engineering, Washington University, St. Louis, 1958) is vice president of Research and Development for Carboline Company, St. Louis, Missouri. He has been a member of the National Association of Corrosion Engineers for several years and has been active in a variety of technical committee activities. Daniel R. Leritz (bottom right) (BS, chemistry, St. Louis University; MA, business administration, Washington University, St. Louis) is the group leader, Testing Department, at the Carboline Company, St. Louis, Missouri. Formerly, he was a chemist in the Health Physics Laboratory of the St. Louis County Health Department and was involved with radiological research.

THE PROBABILITY OF A TURBINE MISSILE HITTING A PARTICULAR REGION OF A NUCLEAR POWER PLANT

A. K. Bhattacharyya
S. K. Chaudhuri

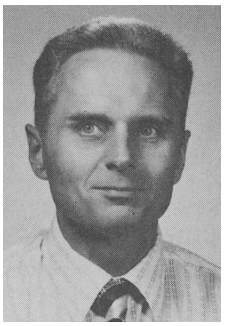



A. K. Bhattacharyya (top) (PhD, physics, Massachusetts Institute of Technology, 1970) is the manager of the Nuclear Technical Staff Group, United Engineers & Constructors, Philadelphia, Pennsylvania. His primary research interest at present concerns safety and risk assessment of nuclear power plant systems and operations. S. K. Chaudhuri (PhD, civil engineering, University of Pennsylvania, 1975) is employed by United Engineers & Constructors in Philadelphia, Pennsylvania. His current technical interest is in the general safety analysis of nuclear power plant structures including effects from missile impacts and earthquakes.

REACTOR SITING

HAZARDS TO NUCLEAR PLANTS FROM OFF-SITE RELEASE OF TOXIC VAPORS

Karl Hornyik

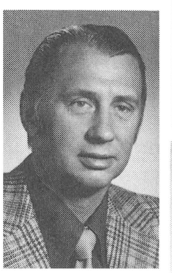


Karl Hornyik (PhD, nuclear engineering, University of Illinois, 1965) is associate professor of nuclear engineering at Oregon State University. He has studied in recent years a variety of man-made hazards to nuclear plants originating outside the plant, including aircraft crashes and effects of explosions.

FUELS

STRATEGY, DESIGN BASIS, AND RESULTS OF THE CARBIDE PROGRAM FOR SNR

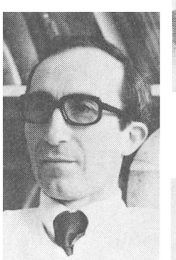
G. Karsten
G. Mühling
H. Plitz

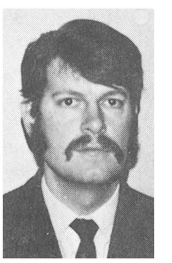


G. Karsten (top) (PhD, University of Münster) worked with Thyssen/AG as an engineer in automatic welding. Since 1964 he has been a scientist at the Nuclear Research Center, GfK/Karlsruhe, and is now manager of fuel development for fast reactors. G. Mühling (center) (PhD, inorganic chemistry, University of Karlsruhe) worked since 1962 with NUKEM and ALKEM GmbH, principally in the area of ceramic nuclear fuels. He is now with GfK, Karlsruhe, on the staff of the Fast Breeder Project. Helmuth Plitz (bottom) (Diploma Engineer, Technical University, Munich, 1964) was with AEG and KWU for 11 years. He has experience in design and irradiation in all types of fuel elements and is now with the Fast Breeder Project at Karlsruhe.

ACTINIDES AND FISSION PRODUCTS DISTRIBUTION IN FAST BREEDER NITRIDE FUEL

G. Giacchetti
C. Sari
C. T. Walker

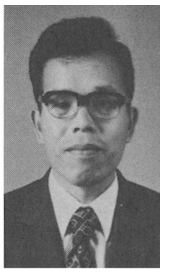


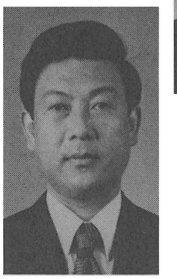


G. C. Giacchetti (top) (PhD, physical science, University of Milano, Italy) worked in neutron spectrometry and nuclear fuel development at CISE and AGIP-Nucleare in Milano. Since 1964 he has been working at the Plutonium Facilities, EURATOM, Karlsruhe, Germany. His interests include physical chemistry of irradiated fast breeder fuels. C. Sari (center) (PhD, physical chemistry, Universities of Milano and Torino, Italy) worked on solid chemistry at IENGF, Centro Studi Electrofisici, in Torino. Since 1960 he has worked at the Plutonium Facilities at Belgonucleaire (Belgium), the Engineering and Development Laboratory at Hanford (U.S.), and EURATOM (Karlsruhe, Germany). His interests include structures and thermodynamics of fast breeder reactor fuels. C. T. Walker (bottom) (A.I.M., 1970; diploma, metallurgy, University of Surrey, 1971; PhD, University of Surrey, 1974) is currently working with the electron microprobe at the Institute for Transuranium Elements, Karlsruhe. His interests include fuel cladding corrosion and the restructuring of nuclear fuels.

SURFACE DIFFUSION OF PLUTONIUM ON URANIUM DIOXIDE

Hirotaka Furuya
Masumichi Koizumi

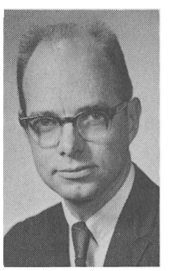




Hirotaka Furuya (top) (PhD, nuclear engineering, Osaka University, 1969) and Masumichi Koizumi (MS, chemistry, Hokkaido University, 1957) are chief and manager, respectively, of the research and development section at the Plutonium Laboratory of the Power Reactor and Nuclear Fuel Development Corporation. Their main interests are the studies on the pin performance of oxide fuel. They currently have additional interests in the development of a computer code for fuel pin performance and in the investigations of fuel properties used in this code, such as fuel-cladding interaction, material transports, and mechanical properties of oxide fuel.

METAMICTIZATION OF LITHIUM NIOBATE BY THERMAL NEUTRONS

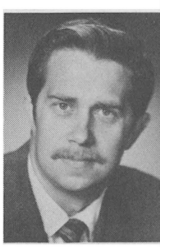
William Primak
T. T. Anderson

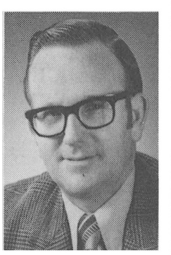


William Primak (top) (PhD, physical chemistry, Polytechnic Institute of Brooklyn, 1946) has since 1946 been at the Argonne National Laboratory (ANL), where he has been engaged in the investigation of radiation effects that may occur in reactor, accelerator, and other applications of non-metallic materials. His technical interests have been in dimensional changes and optical and electrical properties. T. T. Anderson (MS, mechanical engineering, Stanford University, 1958) is a mechanical engineer at ANL. He is working on transducer development for fast reactor safety experiments. His previous studies with the ANL Acoustic Surveillance Program included development of acoustic waveguides, high-temperature sodium-immersible microphones and accelerometers, and acoustic surveillance techniques and instrumentation.

CORROSION BEHAVIOR, MECHANICAL PROPERTIES, AND LONG-TERM AGING OF NICKEL-PLATED URANIUM

J. W. Dini
H. R. Johnson
C. W. Schoenfelder





J. W. Dini (top) (BS, metallurgical engineering, Cleveland State University) is a member of the technical staff at Sandia Laboratories, Livermore, California. He has been author or co-author on over 40 papers in the electroplating field. H. R. Johnson (center) (BS, chemical engineering, North Carolina State University, 1953; MA, natural science, San Jose State University, 1969) has been a member of the technical staff at Sandia Laboratories, Livermore, California, for the past 17 years. C. W. Schoenfelder (bottom) (BA, chemistry, San Francisco State College, 1953) has been a member of the technical staff at Sandia Laboratories, Livermore, California for 15 years. He has been author or co-author on numerous papers in the areas of inorganic synthesis and vacuum analytical chemistry. He also holds six patents in these same areas.

THERMAL DIFFUSION OF OXYGEN IN PuO_{2-y}

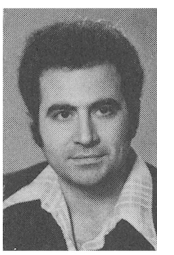
C. Sari
G. Schumacher

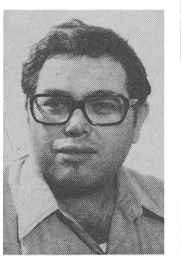
C. Sari (top) (PhD, physical chemistry, Universities of Milano and Torino, Italy) worked on solid chemistry at IENGF, Centro Studi Electrofisici, in Torino. Since 1960 he has worked at the Plutonium Facilities at Belgonucleaire (Belgium), the Engineering and Development Laboratory at Hanford (U.S.), and EURATOM (Karlsruhe, Germany). His major field of interest is in the structure and thermodynamics of fuel materials for fast breeder reactors. G. Schumacher (Dr. Ing., nuclear engineering, University of Karlsruhe, 1970) has been working since 1961 at the Institut für Neutronenphysik und Reaktortechnik of the Kernforschungszentrum Karlsruhe, Germany, in the field of thermodynamics of nuclear materials. His main interests are transport processes in fuel pins.

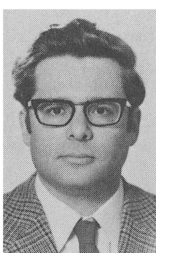
RADIATION

TRANSMISSION OF GAMMA RADIATION THROUGH FINITE CYLINDRICAL BARRIERS

E. Elias
Y. Segal
A. Notea





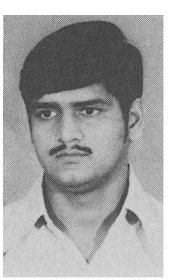


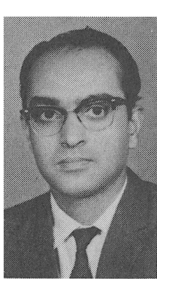
E. Elias (top) (DSc, nuclear engineering, Technion - Israel Institute of Technology, Haifa, Israel, 1975) is working in the Department of Nuclear Engineering in the Technion - Israel Institute of Technology on the development and optimization of nuclear techniques for industrial applications. Y. Segal (center) (DSc, nuclear science, Technion, Israel, 1964) specializes in the transport of photons and neutrons in geometrical configurations appearing in nuclear gauges and measuring systems which leads to a deeper understanding of their functions. He is also studying the meaning of the information obtained from nuclear measuring systems through a general approach to the characterization and optimization of source-medium-detector assemblies. A. Notea (bottom) (PhD, Hebrew University, Jerusalem, Israel, 1969) is senior lecturer in the Department of Nuclear Engineering, Technion, Israel. For seven years he worked at the IRR-1 reactor of the Israel AEC. For the past six years he has been engaged in radiation engineering—the development and applications of radiation gauging techniques mainly for industry.

TECHNIQUES

A PROTON RECOIL SCINTILLATION TECHNIQUE FOR ESTIMATING NEUTRON ENERGY SPECTRA

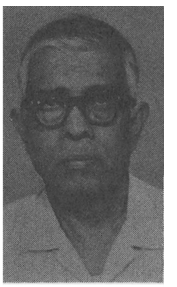
P. K. Sarkar
K. N. Kirthi
A. K. Ganguly





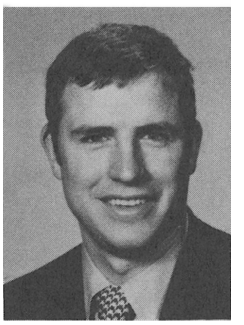
P. K. Sarkar (left) (MSc, physics, Bombay University) is interested in neutron dosimetry and spectrum measurements, spectrum analysis, scattering of charged and uncharged particles, and the study of the random sampling technique in Monte Carlo calculations. K. N. Kirthi (right) (MSc, physics, Mysore University) is concerned with neutron dosimetry and spectrum measurements, flux measurements by activation technique using threshold detectors, and safety aspects of radiation and training. A. K.

Ganguly (right) (DSc, chemistry, Calcutta University) is director of the Chemical Group at Bhabha Atomic Research Centre and is involved in radiation physics and radiation chemistry, stopping of charged particles, atomic absorption spectrophotometry, binary nuclear fission phenomenon, and neutron spectrum and dose measurement.



IMPROVED NONDESTRUCTIVE DETERMINATION OF TWO-DIMENSIONAL RADIAL ISOTOPIC DISTRIBUTIONS IN IRRADIATED FUEL PINS

John R. Phillips



John R. Phillips (PhD, chemistry, University of New Mexico, 1973) has been with the Analytical Chemistry Group of the Los Alamos Scientific Laboratory since 1968, working primarily on the nondestructive gamma-scanning examination of the liquid-metal fast breeder reactor fuel pin.