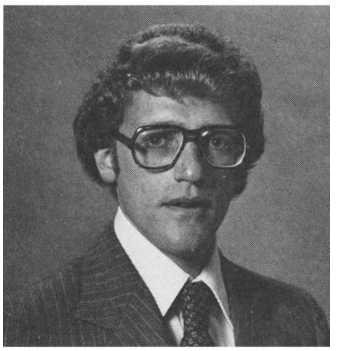
nuclear technology®

AUTHORS — SEPTEMBER 1980

REACTORS

FUELING MOVING RING FIELD-REVERSED MIRROR REACTOR PLASMAS

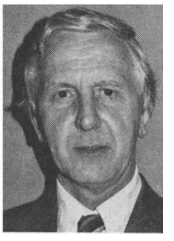
F. S. Felber



F. S. Felber (AB, physics, Princeton University, 1972; MA, physics, University of Southern California, 1973; MS, physics, University of Chicago, 1974; PhD, physics, University of Southern California, 1975) is a senior staff scientist in pulse power research and development at Maxwell Laboratories. His recent research includes high-density plasma pinches, tokamak fueling, laser-plasma interactions, and laser-driven targets. While a senior scientist in the Fusion Division at General Atomic Company, he participated in the preliminary conceptual design of the Moving Ring Field-Reversed Mirror.

AN APPLICATION OF INFORMATION DIVERGENCE TO NUCLEAR REACTOR NOISE ANALYSIS

J. Nagashima
D. G. Andrews



J. Nagashima (top) (BE, nuclear engineering, Osaka University, Japan, 1975; MASc, chemical engineering, University of Toronto, 1977; ME, nuclear engineering, Osaka University, 1978) is currently involved with loss-of-coolant accident experiments at the Electric Power Development Co., Ltd., Tokyo, with special interest in two-phase flow dynamics. **D. G. Andrews** (MA, engineering science, Cambridge University, 1943) carried out wartime research on underwater weapons, followed by design work on fast and thermal reactors and diffusion and chemical separation plants, and is currently professor of nuclear engineering at the University of Toronto. His major interests are reactor physics, flux measurement, radiation safety, and heat transfer.

REACTOR SITING

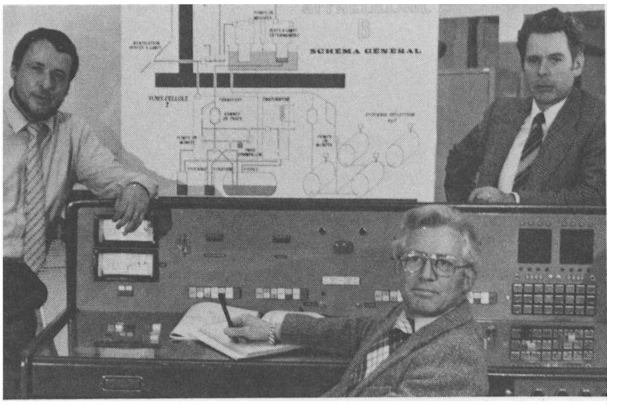
INHERENT SAFETY IN THE DESIGN OF FUTURE NUCLEAR PLANTS

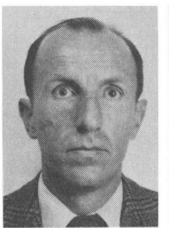
Edward Lantz

Edward Lantz (BS, physics, Case Institute of Technology, 1947; MS, physics, Union College, 1960) has been an engineering systems analyst at the U.S. Nuclear Regulatory Commission (NRC) since December 1975. He is a registered professional nuclear engineer in the State of California and has over 20 years of nuclear engineering experience, beginning with work on reactor safeguards and transients at the Knolls Atomic Power Laboratory in 1956. He is currently involved in the NRC evaluation of the operating experience of nuclear plants.

DISSOLUTION AND STORAGE EXPERIMENT WITH 4.75-wt%-^{235}U-ENRICHED UO_2 RODS

J. C. Manaranche
D. Mangin
L. Maubert
G. Colomb
G. Poullot

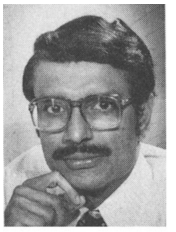


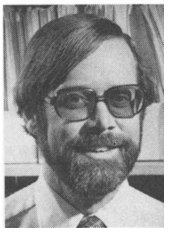


Jean C. Manaranche (top photo, left) (Ecole Centrale de Lyon, 1958; Docteur de l'Université de Lyon, 1960) joined the Commissariat à l'Energie Atomique (CEA) in 1963 and first worked at the Military Applications Division in the field of environmental testing, quality control, and nondestructive testing of nuclear materials and assemblies. In 1977, he joined the Nuclear Safety Department of CEA, where he is presently head of the Section of Experimental Studies on Nuclear Safety and Criticality at Valduc. **Daniel Mangin** (top photo, right) (Institut National des Sciences Appliquées de Lyon, 1962) joined CEA in 1964, and has been responsible for the preparation and reprocessing of fissile solutions used in critical experiments. Since 1972, he has been responsible for the criticality experimental programs at Valduc. **Louis Maubert** (bottom, left) (PhD, physics, Institut National des Sciences et Techniques Nucléaires, 1960) has been involved at Fontenay-aux-Roses in criticality research in the Nuclear Safety Department of CEA. His work has involved neutronics codes, generation of computational criticality data, and definition and analysis of critical experiments. His current technical interests include most aspects of criticality measurements and studies. **Guy Colomb** (top photo, center) (Ecole d'Electricité et de Mécanique Industrielles de Paris, 1955) joined CEA at Valduc in 1966, and has worked in the field of health physics and decontamination. Since 1973, he has been involved in criticality experimental programs and is responsible for the supervision of the critical approaches. **Gilles Poullot** (bottom, right) (licence es sciences, University of Paris, 1964) is a research scientist at the Nuclear Safety Department of CEA at Fontenay-aux-Roses, where he has been actively involved in the achievement of the Monte Carlo code MORET and in analysis of numerous criticality experiments.

CHARACTERIZATION OF ORGANICS IN LEACHATES FROM LOW-LEVEL RADIOACTIVE WASTE DISPOSAL SITES

A. J. Francis
C. R. Iden
B. J. Nine
C. K. Chang





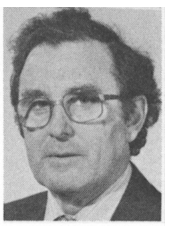
Arokiasamy J. Francis (top) [BS (Ag), 1963, and MS (Ag), 1965, Annamalai University, India; PhD, microbiology, Cornell University, 1971] is a microbiologist at Brookhaven National Laboratory (BNL). His research interests are in the areas of microbial transformation of radioactive wastes, migration and persistence of organoradionuclide complexes in the environment, biodegradation of pesticides and organic wastes, and the effect of energy related activities on soil microbial processes. **Charles R. Iden** (bottom) (BA, chemistry, Lafayette College, 1964; PhD, physical chemistry, The Johns Hopkins University, 1971) is an instructor in the Department of Pharmacological Sciences at the State University of New York (SUNY), Stony Brook and director of the Mass Spectrometer Facility.

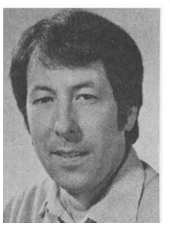
His research interests include the toxicology of trace organic compounds in the environment and quantification of drugs and metabolites in biological fluids. **Beverly J. Nine** (top) (AAS, biochemistry, Long Island Agricultural and Technical Institute at Farmingdale, New York, 1957; BS, chemistry, Adelphi University, 1964) is a chemistry associate at BNL. Her interests include analysis of organic compounds, radionuclides, and heavy metals. **Chung K. Chang** (bottom) (BS, chemistry, Tung Hai University, Taiwan, 1961; MS, biochemistry, University of Missouri-Rolla, 1968) is a technical specialist at the SUNY-Stony Brook Mass Spectrometer Facility. His interests include analysis by gas chromatography, high-pressure liquid chromatography, and mass spectrometry.

MATERIALS

NUMERICAL CALCULATIONS OF THE EFFECT OF RECOMBINATION ON SINK STRENGTHS IN THE RATE THEORY OF VOID SWELLING, IRRADIATION CREEP, AND GROWTH

R. Bullough
M. H. Wood

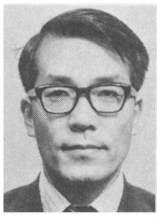


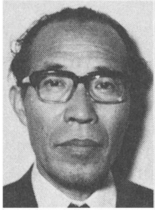


Ron Bullough (top) (BSc, mathematics, 1952, PhD, theoretical metallurgy, 1955, and DSc, theoretical physics, 1970, University of Sheffield, United Kingdom) joined the U.K. Atomic Energy Authority (UKAEA) in the Theoretical Physics Division at Harwell in 1963, where he is now a senior staff group leader. His research interests include the theory of radiation damage, crystal defects, and mechanical properties of solids. He has spent periods as visiting professor at the Universities of Illinois and Wisconsin, and at Renssalaer Polytechnic Institute and as visiting scientist at the National Bureau of Standards and at Oak Ridge National Labortory. **Mel Wood** (BSc, chemistry, University of Leeds, 1969; PhD, theoretical chemistry, University of Manchester, 1972) had a two-year stay in Strasbourg, France, where his research activities were in the field of quantum chemistry. He joined the UKAEA in the Theoretical Physics Division at Harwell, where he is now a senior scientific officer. His current research activities are in the theory of radiation damage in nuclear fuels and structural materials, reactor safety analysis, and energy research and development strategy.

EFFECT OF GAMMA RADIATION ON THE RELEASE OF CORROSION PRODUCTS FROM CARBON STEEL AND STAINLESS STEEL IN HIGH TEMPERATURE WATER

Kenkichi Ishigure
Norihiko Fujita
Takaaki Tamura
Keichi Oshima





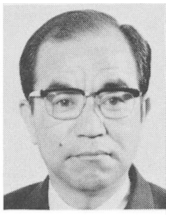
Kenkichi Ishigure (top) (BS, 1962, and PhD, 1967, applied chemistry, University of Tokyo, Tokyo, Japan) is an associate professor in the Department of Nuclear Engineering of the University of Tokyo. His current research interests include water chemistry of nuclear reactors, radiation effects on materials, and industrial applications of radiation. **Norihiko Fujita** (center) (BS, 1969, MS, 1971, and PhD, 1977, nuclear engineering, University of Tokyo) is a director of the Research Development Division of the Industrial Research Institute, Japan. He is currently involved in corrosion phenomena in high temperature water. His research interests include corrosion, air and water pollution, LNG stability, and effective cultivation of plankton, **Takaaki Tamura** (bottom) (BS, 1945, and PhD, 1958, chemistry, University of Tokyo) is a

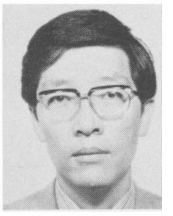
professor of the Nuclear Research Engineering Laboratory at the University of Tokyo. His research interests include distillation, purification, and separation of liquids and gases, air and water pollution, and operation techniques of nuclear reactors. **Keichi Oshima** (right) (BS, 1944, and PhD, 1959, applied chemistry, University of Tokyo) is a professor in the Department of Nuclear Engineering at the University of Tokyo. His interests lie in radiation chemistry and reactor chemistry, as well as energy system and policy analysis.

ISOTOPES SEPARATION

URANIUM ISOTOPE ENRICHMENT BY CHEMICAL METHOD

Maomi Seko
Tetsuya Miyake
Kohji Inada
Kunihiko Takeda



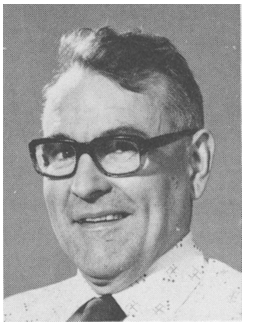


Maomi Seko (top right) (BS, electrical engineering, Tokyo University, 1948; PhD, nuclear engineering, Tokyo Institute of Technology, 1961) is the president director and executive vice president and general manager, Technology Research and Development Administration of Asahi Chemical Industry Co., Inc. He was awarded the OKOUCHI prize and The Chemical Society of Japan prize for research in electrohydrodimerization. **Tetsuya Miyake** (top left) (BS, applied chemistry, Tokyo University, 1959; MS, chemical engineering, University of Minnesota, 1965) is a laboratory head for the Uranium Enrichment Research Project by a chemical exchange process. He has been working since 1959 with Asahi in its Research and Development Division. His interest is mainly in the application of ion-exchange resin and membrane. **Kohji Inada** (bottom right) (BS, 1965, and MS, 1969, chemistry, Osaka University) is a senior chemist of bench-scale research on uranium isotope enrichment by a chemical exchange method at Asahi. He has been engaged in the development of electrodimerization of acrylonitrile and the separation of xylene isomers with zeolite adsorbent. **Kunihiko Takeda** (bottom left) (BS, physical chemistry, Tokyo University, 1966) is a senior chemist for the Uranium Enrichment Research Project of the Research and Development Division of Asahi, where he has been involved in the preparation of ion-exchange resin and membrane and their application. His interests include basic phenomena of separation processes and preparation of organic and inorganic adsorbents.

FUELS

AN APPRAISAL OF THE EFFECT OF GRAPHITE INTERLAYERS ON THE TOLERANCE OF WATER REACTOR FUEL RODS TO POWER RAMP DEFECTS

E. Smith



Edwin Smith (BSc, mathematics, Nottingham University, 1952; PhD, metallurgy, Sheffield University, 1955) has been professor of metallurgy at Manchester University since 1968, and head of the department since 1970. From 1961 to 1968, he was head of the Metallurgical Engineering Section of Central Electricity Research Laboratories, Leatherhead, Surrey, and from 1955 to 1961, he was a research scientist for Associated Electrical Industry, Ltd., Research Laboratory, Aldermaston. His current research interests include fuel rod failure problems and application of fracture mechanics procedures to nuclear reactor problems, and his general research interests are in mechanical properties and fracture of engineering materials.