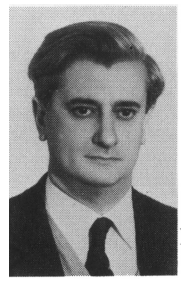
nuclear technology

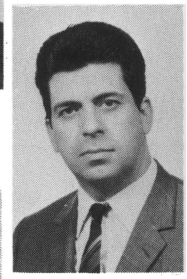
AUTHORS — MAY 1972

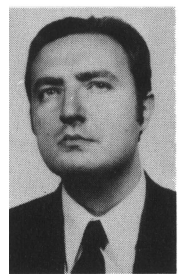
FUEL CYCLES

OPTIMAL OPERATIONAL STRATEGY IN NUCLEAR FUEL MANAGEMENT

P. Civita
P. Fornaciari
T. Mazzanti



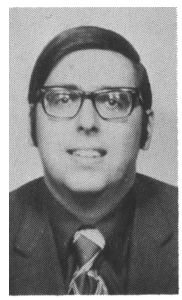




Paolo Civita (top) has been a senior analyst programmer at the ENEL Nuclear Design Center since 1965 and is concerned with process computers and automatic computations methods. Paolo Fornaciari (center) (PhD, electrical engineering, University of Bologna, Italy, 1955) worked in fuel cycles analysis at the Società Elettronucleare Italiana during 1956, and from 1957 to 1964 he was with Agip Nucleare in Latina and Organic Reactor Projects. Currently he is manager for Automation with the ENEL Nuclear Design Center where he has been employed since 1965. Tommaso Mazzanti (bottom) (PhD, electronic engineering, University of Rome, Italy, 1962) worked with the Società Elettronucleare Nazionale and was engaged in the design and installation of process computers in nuclear power plants from 1964 to 1965. Since 1966 he has been with the ENEL Nuclear Design Center where he is presently engaged in the development of computer application methods and automation for nuclear plants.

PRESSURIZED WATER REACTOR OPTIMAL FUEL MANAGEMENT

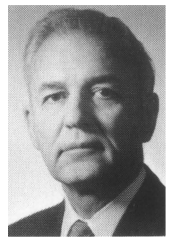
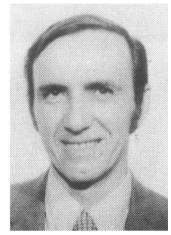
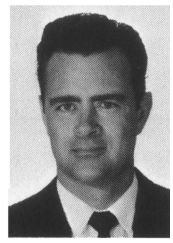
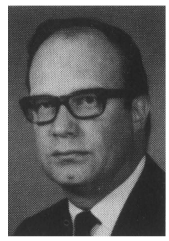
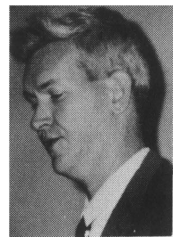
Barry N. Naft
Alexander Sesonske



Barry N. Naft (left) (PhD, nuclear engineering, Purdue University) joined Nuclear Fuel Services in 1971 as lead reactor engineer. He was previously associated with Westinghouse-NES in the area of nuclear design methods development. Alexander Sesonske (PhD, chemical engineering, University of Delaware, 1950) is professor of nuclear and chemical engineering at Purdue University. He also serves as assistant head of the Department of Nuclear Engineering. His current interests include liquid metal heat transfer, reactor safety, and licensing, as well as nuclear fuel management.

FIRST LOSS OF FLOW EXPERIMENT WITH AN FTR-TYPE FUEL PIN IN THE MARK-II LOOP

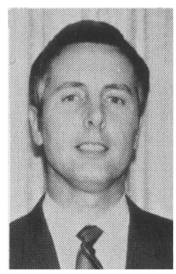
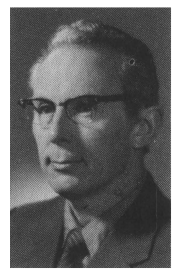
J. C. Carter
R. T. Purviance
J. F. Boland
C. E. Dickerman
J. E. Hanson

J. C. Carter (top left) (U.S. Naval Academy and Columbia University) is a nuclear engineer at Argonne National Laboratory. Currently his interest is in establishing the relevance of experimental data to the dynamics of nuclear reactors. R. T. Purviance (top right) (Lincoln College and Marquette University) is an engineering assistant at Argonne National Laboratory. His interests are in the instrumentation of the Mark-II loop and in the analysis of the test results. J. F. Boland (center right) (MS, electrical engineering) was associated with the Naval Reactor Program from 1952 through 1956. Since joining Argonne National Laboratory in 1957 he has participated in the EBR-I, Borax, ZPR-III, APPR, and EBR-II programs and is currently manager of the TREAT facility. C. E. Dickerman (bottom right) (PhD, Iowa) is section head of the Fuel Dynamics section of the Reactor Analysis and Safety Division. He plans and directs all the fast fuel testing experiments in the Mark-II TREAT facility. John E. Hanson (bottom left) (MS, mechanical engineering, University of Idaho), associated with the Fast Flux Test Facility Project since 1966, is manager of Component Testing at WADCO Corporation. He is responsible for steady-state and transient irradiation testing in support of the Fast Test Reactor driver fuel and for the technical direction of FFTF-related in-reactor testing in the national LMFBR Safety Development Program.

FUEL ROD ENRICHMENT DETERMINATION BY GAMMA-RAY SPECTROMETRY

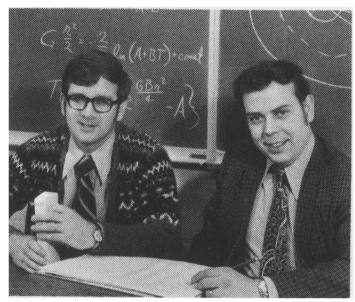
A. D. Vaughn
R. I. Smith

Arlie D. Vaughn (left) (AB, mathematics, Rockhurst College; MS, nuclear engineering, University of Washington) has worked in nuclear fuel design, measuring neutronic and lattice parameters in the Physical Constants Testing Reactor. Concurrently he worked on the development of gamma scanning techniques for irradiated fuels as part of the Joint Technical working Group of the U.S./Canada TRUST Program. Richard I. Smith (BS, physics, Washington State University; MS, applied physics, UCLA) has been employed at Hanford since 1957 working in the area of experimental reactor physics. He is presently manager of the Reactor Neutronics Section of the Reactor Physics Department at Battelle-Northwest.

A SIMPLE METHOD OF CALCULATING THE RADIAL TEMPERATURE DISTRIBUTION IN A MIXED-OXIDE FUEL ELEMENT

R. O. Meyer
B. J. Buescher

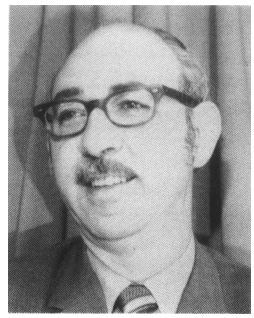


R. O. Meyer (left) (PhD, physics, University of North Carolina) and B. J. Buescher (PhD, physics, University of Arizona) have worked in the field of diffusion in metals and alloys. They are employed in the Materials Science Division of Argonne National Laboratory, investigating the migration of actinides and fission products in LMFBR fuels.

RADIOACTIVE WASTE

RADIOACTIVE WASTE MANAGEMENT AND RADIATION EXPOSURE

Morton I. Goldman



Morton I. Goldman (MS, sanitary engineering; ScD, nuclear engineering, Massachusetts Institute of Technology) is vice president and general manager of the Environmental Safeguards Division of NUS Corporation and a consultant in power plant siting, safeguards, waste disposal, and environmental studies. Prior to joining NUS, he served in the U.S. Public Health Service in a variety of radiation/environmental assignments.

MATERIALS

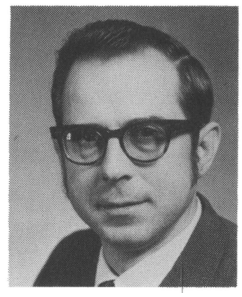
THE EFFECT OF STRESS RATIO ON THE ELEVATED TEMPERATURE FATIGUE-CRACK PROPAGATION OF TYPE 304 STAINLESS STEEL

Lee A. James

Lee A. James (MS, mechanical engineering, University of Washington, 1965) spent eight years as a stress analyst and structural designer with The Boeing Company. He then moved to the Hanford Works where he is engaged in fracture mechanics and fatigue-crack propagation research.

IN-PILE DIMENSIONAL CHANGES OF ZIRCALOY-4 TUBING HAVING LOW HOOP STRESSES (LIGHT WATER BREEDER REACTOR DEVELOPMENT PROGRAM)

Ray C. Daniel

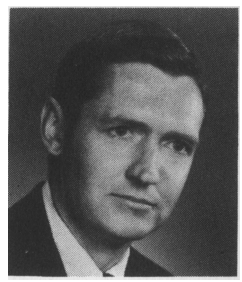


R. C. Daniel (BS, University of Pittsburgh, 1965; PhD, Carnegie-Mellon University, 1967) joined Bettis Atomic Power Laboratory in 1956 and simultaneously continued studies in materials science. He is principally interested in fuel element irradiation behavior and the mechanical properties of reactor materials.

NUCLEAR EXPLOSIVES

PROJECT RULISON—SUMMARY OF RESULTS AND ANALYSES

Miles Reynolds, Jr.

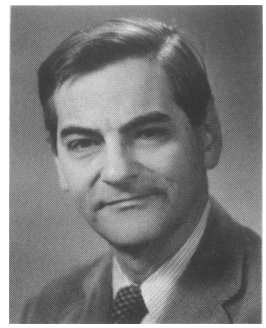


Miles Reynolds, Jr. (BS, chemical engineering, University of Colorado, 1954) has been Austral Oil Company's project engineer for Rulison since the project's inception in 1966. He is a vice president of both Austral Oil Company Incorporated and its wholly owned subsidiary, Austral Nuclear Engineering Corporation.

INSTRUMENTS

NOTE ON DETECTABILITY ENHANCEMENT ON WEAK NEUTRON BURST SIGNALS THROUGH MULTIPLICATION

K. G. Porges

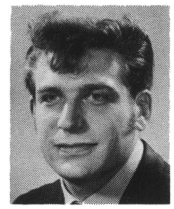


Karl G. Porges (PhD, University of California, 1953) is a nuclear physicist at Argonne National Laboratory with major interests in nuclear cross sections, excitation functions and other nuclear parameters, reactor and neutron physics, x rays, and instrument design. He is currently engaged in measurement of neutron spectra of burst-stimulated assemblies by time-of-flight.

ANALYSIS

MEASUREMENT OF THE URANIUM-235 CONTENT IN A SPENT MTR TYPE FUEL ELEMENT USING THE DELAYED-NEUTRON YIELD TECHNIQUE

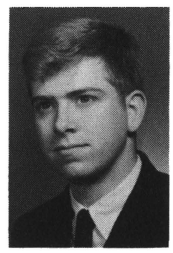
R. H. Augustson
C. N. Henry
C. R. Weisbin



R. H. Augustson (top) (PhD, physics, Rensselaer Polytechnic Institute, 1961), C. R. Weisbin (center) (Eng ScD, nuclear science and engineering, Columbia University, 1970), and C. N. Henry (bottom) (MS, physics, Kansas State Teachers College, 1960) are staff members at Los Alamos Scientific Laboratory working on nondestructive assay techniques for measurement of fissionable material in the nuclear fuel cycle. These techniques form an important part of the nuclear materials safeguards program.

VECTOR ANALYSIS OF TIME-DEPENDENT GAMMA-RAY SPECTRA

W. L. Filippone
F. J. Munno



W. L. Filippone (left) (PhD, nuclear engineering, University of Maryland, 1970) is presently associated with the Department of Nuclear Engineering at the Instituto Politecnico Nacional in Mexico. F. J. Munno (PhD, nuclear engineering, University of Florida, 1964) is an associate professor of nuclear engineering at the University of Maryland. He is presently engaged in studies in dosimetry.