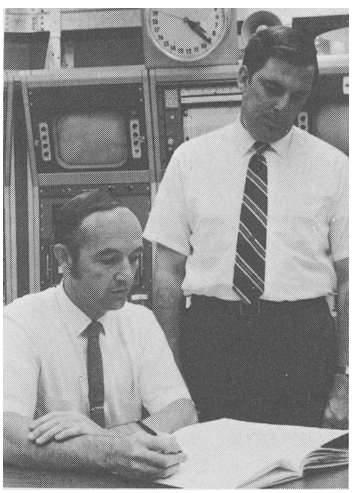
nuclear technology
CONTINUING NUCLEAR APPLICATIONS & TECHNOLOGY

AUTHORS — NOVEMBER 1971

REACTORS

ENRICHED URANIUM METAL CRITICALITY CALCULATIONS

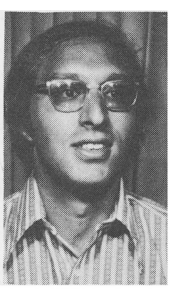
D. C. Hunt
D. C. Coonfield

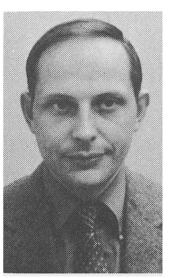


D. C. Hunt (left) (PhD, University of Colorado, 1961) is senior research physicist, Dow Chemical Company. He has worked in criticality experimentation, data analysis, and theoretical methods. Donald C. Coonfield (MS, University of Alaska, 1963) is research mathematician, Dow Chemical Company. He is active in the application of calculational methods to nuclear safety research.

WASTE HEAT AND FOG CONTROL

Robert Conn
Lawrence T. Papay

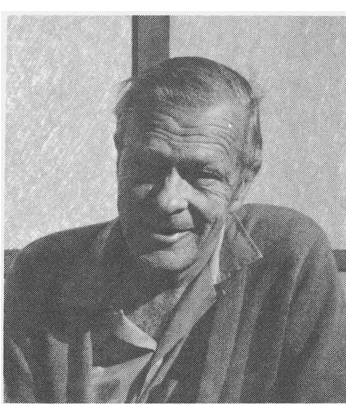




Robert Conn (left) (PhD, engineering science, California Institute of Technology) has been on the faculty in Nuclear Engineering at The University of Wisconsin since September 1970. His research interests include time-dependent problems in fast and thermal neutron physics and nonperturbative solutions to problems in scattering theory. Larry Papay (ScD, nuclear engineering, MIT) joined Southern California Edison Company in 1970 where he is director of research and development. He is presently involved in various research projects of interest to the electric utility industry.

A PRACTICAL APPROACH TO NUCLEAR CRITICALITY SAFETY II—CRITIQUE OF A MODEL

William Bradley Lewis



W. Bradley Lewis (PhD, chemistry, California Institute of Technology, 1933) is a generalist with experience in criticality safety. He was employed by Phillips in various supervisory capacities in applied science and mathematics from 1951 to his retirement in 1969. He is currently engaged in writing and consulting.

REACTOR SITING

PROBABILITY TREATMENT OF ATMOSPHERE DISPERSION FOR DOSE CALCULATIONS

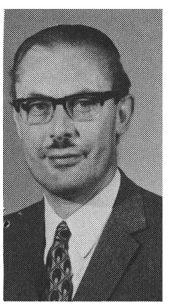
Keith Woodard

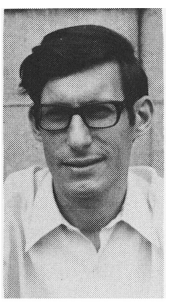
Keith Woodard (MS, nuclear engineering, University of California, Los Angeles, 1963) has been active in reactor licensing, safety analysis, and siting since joining Pickard, Lowe and Associates, Inc. in 1967. He previously worked as a project leader for the USAEC, Division of Reactor Licensing.

FUEL CYCLES

SAFEGUARDS INSPECTION—AN ANALYSIS OF DETECTION METHODS AND DIVERSION STRATEGIES

F. Servais
P. Goldschmidt



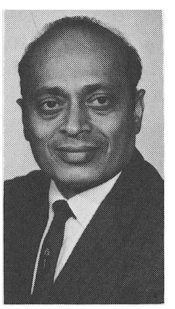


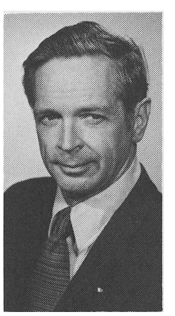
François Servais (left) (PhD, University of Louvain, 1954) is working in the Physics Group of Belgonucléaire (Brussels, Belgium). He is primarily involved with criticality and shielding studies concerning fuel systems of plutonium and plutonium-uranium mixtures. Pierre Goldschmidt (MS, nuclear engineering, University of California, Berkeley, 1966; PhD, University of Brussels, 1971) has been working for four years in the Fast Breeder Physics Groups of Belgonucléaire and is currently in the Dynamics and Safety Group.

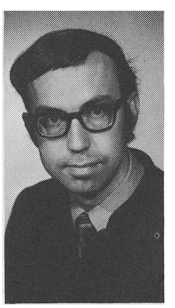
AEROSPACE

IN-FLIGHT COOLANT MANAGEMENT CONSIDERATIONS FOR THE NERVA REACTOR COOLDOWN

B. Misra
J. H. Altseimer
G. D. Hart



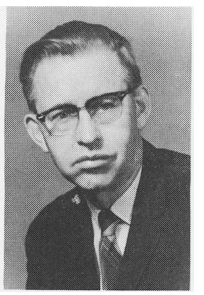




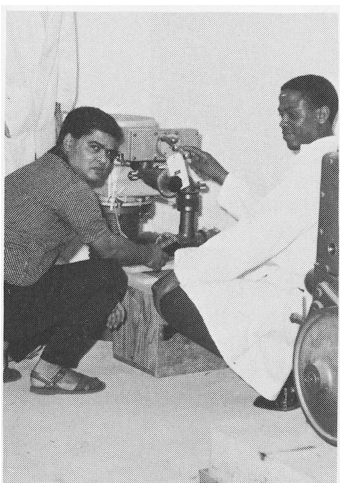
The authors have all been associated with the NERVA Nuclear Rocket Program at the Aerojet Nuclear Systems Company. Balabhadra Misra (top) (PhD, chemical engineering, Columbia University, 1955) was on the technical staff, Systems Analysis. His previous work included research on liquid metal heat transfer and development analysis on the SNAP-8 nuclear auxiliary power unit. He is a member of AIAA. John H. Altseimer (center) (engineer, Aeronautics and Jet Propulsion, California Institute of Technology, 1948) is a senior engineering specialist, Systems Analysis. His nuclear engine work has included engine test and data analyses, studies of engine compatibility with test and flight requirements, and supervision of the NERVA Mission Analysis and Applications Group. He is a member of ANS and AIAA. Gene D. Hart (bottom) (MS, nuclear engineering, Texas Technological University, 1962) was an engineering specialist, NERVA Requirements and Applications. His NERVA work included engine systems engineering and most recently he was manager of the NERVA propellant tank pressurization system trade study.

DENSITY DETERMINATIONS OF ALKALI METALS BY A GAMMA RADIATION ATTENUATION TECHNIQUE

I. G. Dillon
F. E. LeVert
P. A. Loretan
G. U. Menon
F. M. Siddiqi
H. J. Tarng

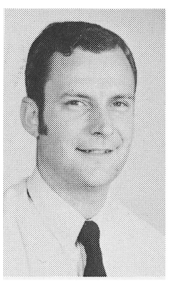


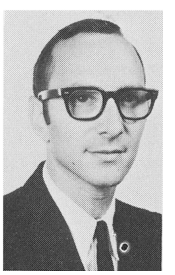
Ira G. Dillon (top) (PhD, chemical engineering, Illinois Institute of Technology, 1965) has been a professor and department head in the Mechanical Engineering Department, Tuskegee Institute, since 1965. His research interests include high temperature properties of alkali metals. From 1949 to 1965 he was employed by the Chemical Engineering Division of Argonne National Laboratory for research and development in nuclear fuel reprocessing. Philip A. Loretan (not pictured) (PhD, nuclear engineering, Iowa State University, 1965) is an associate professor in the Mechanical Engineering Department at Tuskegee Institute. He was assistant professor of nuclear engineering at Iowa State University from 1965 to 1968. His research interest is primarily in the field of heat transfer in reactor systems. Francis E. LeVert (right) (MS, nuclear engineering, University of Michigan, 1966) is an instructor in the Mechanical Engineering Department of Tuskegee Institute (on leave for doctoral studies). His research interest is in properties of alkali metals. Fasih M. Siddiqi (left) (MS, mechanical engineering, Tuskegee Institute, 1970) is an engineer for Optimal Systems Ineo., Atlanta, Georgia. His research interest is in properties of alkali metals. H. J. Tarng (not pictured) (BS, marine engineering, Taiwan Provincial College) is a graduate student at Tuskegee Institute. His research interest is in properties of alkali metals. G. U. Menon (not pictured) (MS, mechanical engineering, Tuskegee Institute, 1970) is an engineer for St. Regis Paper Company, Jacksonville, Florida. His research interest is in properties of alkali metals.



TWO METHODS OF DETERMINING ppm QUANTITIES OF PLUTONIUM-236 IN PLUTONIUM-238

F. K. Tomlinson
W. H. Smith
D. W. Eppink
G. R. Hagee





F. Keith Tomlinson (left) (MS, Miami University) is currently a senior health physicist at Mound Laboratory. During the past year he has been involved in personnel lung counting of ^{238}Pu using recently developed phoswich detectors. Warren H. Smith (PhD, Syracuse University) is presently isotopes separation manager at Mound Laboratory. During the past year he was ^{238}Pu fuels development manager and worked on the development of fuel forms for use in isotopic heat sources. (Biographical data and pictures not available for G. R. Hagee and D. W. Eppink.)

THE DETECTION EFFICIENCY DEPENDENCE OF SUBCRITICALITY MEASUREMENTS BY THE POLARITY SPECTRAL COHERENCE METHOD

N. J. Ackermann, Jr.
A. R. Buhl

Norbert J. Ackermann, Jr. (right) (PhD, University of Tennessee, 1971) is a nuclear engineer in the Instrumentation and Controls Division at the Oak Ridge National Laboratory. At ORNL he is involved in the development of a subcriticality measurement system for LMFBRs. His main interests are theoretical and experimental reactor kinetics and dynamics and the development of nuclear instrumentation. Anthony R. Buhl (PhD, University of

Tennessee, 1967) is a nuclear engineer with the same division and is also involved in the development of a subcriticality measurement system for LMFBRs. His primary interests are in theoretical and experimental methods development for fast reactor kinetics and dynamics.

FUELS

EFFECTS OF DIFFERENT FISSION PRODUCTS IN THE BETA-GAMMA AUTORADIOGRAPHY

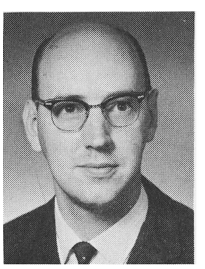
Ciro Candela
Catello F. Cesarano
Gaetano Trezza

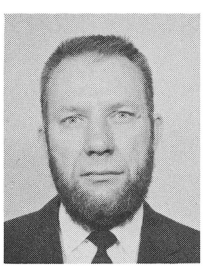
Ciro Candela (left) has been a member of the postirradiation analyses group of the Hot Operation Laboratory since 1968. He is involved with microstructure analysis of ceramic fuel or cladding materials. Gaetano Trezza (center) has been a member of the postirradiation analyses group of the Hot Operation Laboratory since 1966. His area of interest includes macro- and microscopic examination of fuel specimens. Catello F. Cesarano (right) has been involved with hot laboratories design and operation since 1957. After nearly two years in the Hot Laboratory Division at Brookhaven, he became group leader and then director of the Hot Operation Laboratory of CNEN (Italy).

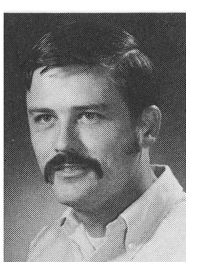
RADIOISOTOPES

A STUDY OF MINE DETECTION BY MEANS OF NEUTRON-INDUCED GAMMA RAYS

F. R. Mynatt
R. G. Alsmiller, Jr.
L. R. Williams







Fred R. Mynatt (top) (PhD, nuclear engineering, University of Tennessee, 1969) worked as section head of the Transport Methods Development Section, Computing Technology Center, Union Carbide Corporation, in Oak Ridge. He then transferred to the Oak Ridge National Laboratory where he is presently head of the Reactor Shielding Group in the Neutron Physics Division. R. G. Alsmiller, Jr. (center) (PhD, physics, University of Kansas, 1957) is associate director of the Neutron Physics Division at Oak Ridge National Laboratory. For several years he has directed the theoretical research in this division in the areas of high-energy nucleon reactions and high-energy nucleon transport with applications to the shielding of manned spacecraft and high-energy accelerators. Larry R. Williams (bottom) has been a computer programmer for several years at the Computing Technology Center, Union Carbide Corporation, in Oak Ridge and more recently in the Neutron Physics Division of the Oak Ridge National Laboratory. His major interest has been in the application of the discrete ordinates method to reactor and weapons shielding problems.