nuclear technology®

AUTHORS — AUGUST 1974

SAFEGUARDS

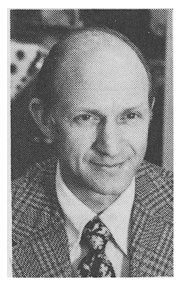
RECENT DEVELOPMENTS IN NUCLEAR FUEL CYCLE SAFEGUARDS

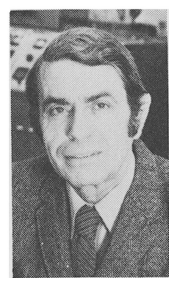
William C. Bartels

William C. Bartels (MS, Polytechnic Institute of Brooklyn, 1947) was active in nuclear reactor development from 1948 to 1969 with research in the reactor physics area. In 1958 he joined the U.S. Atomic Energy Commission, serving as Technical Assistant to three Commissioners. Since 1969 as Chief, Technology Branch, AEC Division of Nuclear Materials Security, he administers all assay and other technology development for nuclear materials security.

URANIUM ASSAY REQUIREMENTS OF NUCLEAR ACCOUNTABILITY AND SAFEGUARDS

Carleton D. Bingham
Morris W. Lerner





Carleton D. Bingham (left) (PhD, University of California, Los Angeles, 1959) has been Director of the New Brunswick Laboratory of the U.S. Atomic Energy Commission since 1971. He has been engaged in chemical and instrumental analysis of nuclear materials for nearly twenty years. Morris W. Lerner (MS, Tufts College; PhD, Rutgers University, 1955) has been with the New Brunswick Laboratory since its beginning in 1949. Since 1966 as Chief of the Analytical Developmental and Special Analysis Branch, he has been concerned with methods for the analysis of nuclear technology materials.

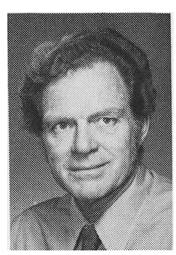
DESIGN CONCEPTS STUDY OF A SPECIAL NUCLEAR MATERIAL CARGO VEHICLE

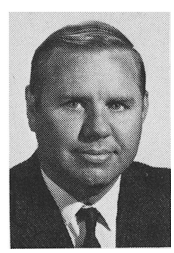
R. E. Reed

Robert E. Reed (Drake University, 1940-1942) is currently Project Leader of Secure Transport Systems. He joined Sandia Laboratories in 1948 and became a staff member in 1953.

A SYSTEM FOR COMMUNICATION WITH COMMERCIAL SPECIAL NUCLEAR MATERIAL SHIPMENTS

J. M. de Montmollin
T. A. Sellers

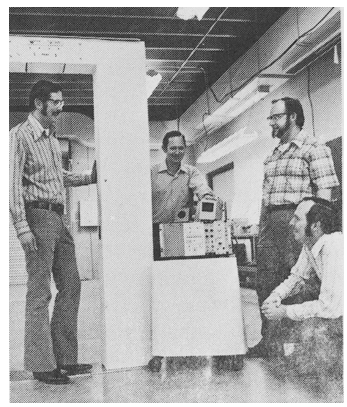




J. M. de Montmollin (left) (BS, electrical engineering, Georgia Institute of Technology, 1942) is a staff member in Sandia Laboratories' Information Systems Department. His principal activities are systems and operations analysis. T. A. Sellers (BS, electrical engineering, University of Oklahoma, 1958) is supervisor of a division engaged in the exploratory development of remote sensing and communication systems for various civil and military applications.

PORTAL MONITOR FOR DIVERSION SAFEGUARDS

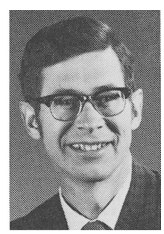
Thomas E. Sampson
Paul E. Fehlau
Gary M. Worth
Carl N. Henry



Thomas E. Sampson (bottom, right) (PhD, nuclear science, University of Michigan, 1969) joined Los Alamos Scientific Laboratory in 1969 and has been working in the area of nuclear safeguards. His research interests are neutron and gamma-ray detection techniques, and gamma ray and neutron spectroscopy and applications. Paul E. Fehlau (standing, right) (MS, physics, Ohio State University, 1966) joined Los Alamos Scientific Laboratory in 1966 and has been working in the application of neutron and gamma-ray detection techniques to the area of nuclear safeguards since 1971. Gary M. Worth (left), who has served in the U.S. Navy as an electronics technician and attended Foothills Junior College, Los Altos, California, was engaged in electronic countermeasure systems design and field testing until joining Los Alamos Scientific Laboratory where for the last six years he has been doing electronics design and field testing of systems for nuclear safeguards. Carl N. Henry (center) (MS, physics, Kansas State Teachers College, Emporia, Kansas, 1960) joined Los Alamos Scientific Laboratory in 1960 and has been working in the area of nuclear safeguards since 1966. His current interests include applications to nuclear safeguards of neutron and gamma-ray detection techniques.

CHEMICAL ASSAY OF PLUTONIUM FOR SAFEGUARDS

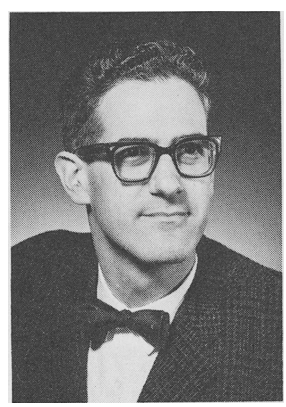
Darryl D. Jackson
James E. Rein
Glenn R. Waterbury



Darryl D. Jackson (top) (PhD, chemistry, University of New Mexico) is a staff member in the Analytical Chemistry Group, Los Alamos Scientific Laboratory. His recent work has been in development of automated instruments for chemical analysis of nuclear fuel cycle materials. James E. Rein (center) (PhD, chemistry, University of Illinois) is a supervisory staff member in the Analytical Chemistry Group of the Los Alamos Scientific Laboratory. His interest area is analytical chemistry of nuclear fuel cycle materials. Glenn R. Waterbury (bottom) (PhD, physical chemistry, Iowa State University) is the Group Leader of the Analytical Chemistry Group of the Los Alamos Scientific Laboratory. His interests are in the analytical chemistry of various materials including the actinides and nuclear fuel cycle materials.

SECURITY SEALS FOR SAFEGUARDS

C. Sastre



Cesar Sastre (MS, industrial engineering, University of Buenos Aires, 1952) is currently with the Technical Support Organization, Department of Applied Science, Brookhaven National Laboratory, in the position of staff nuclear engineer. From 1955 to 1968, he worked in experimental reactor physics, in the design of real-time computers for measurements, noise analysis, and computer modeling of reactors for accident analysis. He is involved in the analysis of safeguards systems for special nuclear safeguards, particularly the administrative, procedural, and physical control subsystems.

REACTORS

REMOVAL OF IODINE BY SPRAYS IN THE PSICO 10 MODEL CONTAINMENT VESSEL

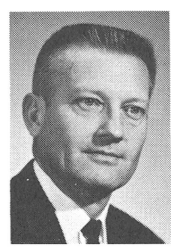
S. Barsali
R. Bovalini
F. Fineschi
B. Guerrini
S. Lanza
M. Mazzini
R. Mirandola

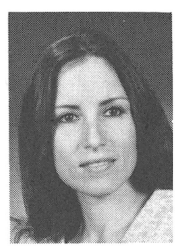
Sergio Barsali (standing, right) (PhD, nuclear engineering, University of Pisa, 1967) is assistant professor in machine drawing. Roberto Bovalini (seated, left) (PhD, nuclear engineering, University of Pisa, 1972) is now a researcher. Fabio Fineschi (standing, left) (PhD, nuclear engineering, University of Pisa, 1971) is now a researcher. Bruno Guerrini (seated, center) (PhD, mechanical engineering, University of Pisa, 1959) was appointed "Libero Docente" of nuclear engineering in 1965; he is currently professor of nuclear power plants and group leader of the research. Salvatore Lanza (standing, center left) (PhD, nuclear engineering, University of Pisa, 1967) is assistant professor of nuclear reactor materials technology. Marino Mazzini (seated, right) (PhD, nuclear engineering, University of Pisa, 1965) is assistant professor of accident analysis. Roberto Mirandola (standing, center right) (PhD, nuclear engineering, University of Pisa, 1964) is assistant professor of nuclear power plants.

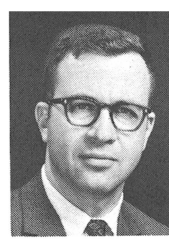
CHEMICAL PROCESSING

SURFACE DENSITY METHOD EMPLOYING UNIT SHAPE FACTOR (s/v) FOR THE STORAGE OF FISSILE MATERIALS

C. L. Schuske
D. Dickinson
S. J. Altschuler



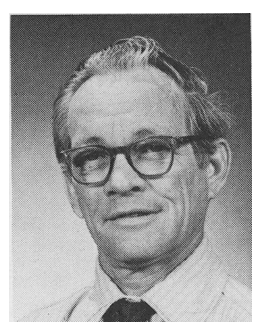




C. L. Schuske (top) (MS, physics, University of Southern California) is director of the Nuclear Safety Group at Dow Chemical U.S.A.'s Rocky Flats Division. His areas of interest are critical mass physics and process plant nuclear criticality safety. Deanne Dickinson (center) (PhD, mathematics, Massachusetts Institute of Technology) is a research specialist at Dow Chemical U.S.A.'s Rocky Flats Plant, working on computer calculations for nuclear safety. S. J. Altschuler (bottom) (BChE, The Cooper Union for the Advancement of Science and Art, 1957) is a research specialist at Dow Chemical U.S.A.'s Rocky Flats Division, working on computer calculations for nuclear criticality safety purposes.

SIMPLIFIED METHODS OF ESTIMATING THE RESULTS OF ACCIDENTAL SOLUTION EXCURSIONS

Grover Tuck



Grover Tuck (MS, physics, University of Idaho, 1961) is a research specialist at Dow Chemical U.S.A.'s Rocky Flats Division. His areas of interest are experimental critical mass physics and the analysis of nuclear excursions of the types which could occur in process plants.

A QUANTITATIVE STRAIN-AND-STRESS STATE CRITERION FOR FAILURE IN THE VICINITY OF SHARP CRACKS

T. J. Walker

Thomas J. Walker (PhD, mechanical engineering, Carnegie Institute of Technology, 1967) has been active in the following fields: nuclear power plant analysis, nuclear analysis for advanced reactor concepts, nuclear analysis for irradiations testing, criticality control standards, fracture mechanics, failure properties for reactor materials, applications of finite element methods in structural analysis, and fatigue failure. His current technical interests include failure criteria and fatigue limitations for design. He is associated with the Westinghouse Bettis Atomic Power Laboratory.