



## AUTHORS — FEBRUARY 1978

### PLANT WATER CHEMISTRY

#### OXYGEN MONITORING AND CONTROL IN BOILING WATER REACTOR PLANTS

Wesley L. Pearl (center) [BS, chemical engineering, University of Washington, 1942; PhD, paper chemistry, Lawrence University (Institute of Paper Chemistry), 1951] is president of Nuclear Water and Waste Technology Corporation (NWT). He is involved primarily with consulting and research and development projects with electric power utilities in the fields of water chemistry, water treatment, corrosion, and gaseous, liquid, and solid radwaste treatment in boiling water reactor (BWR) and pressurized water reactor (PWR) systems. He previously was manager of the Chemical Engineering Development Subsection of the General Electric (GE) BWR Systems Department. William R. Kassen (left) (BS, mechanical engineering, San Jose State University, 1973) worked in the Atomic Power Equipment Department (APED) of GE from 1962 through 1974. He was responsible primarily for design, installation, and modification of the chemical engineering development test facilities in San Jose and at BWR sites. At present, he is involved in water chemistry and waste studies at several BWR and PWR installations for NWT. Stephen G. Sawochka (right) (BS, chemical engineering, Purdue University, 1959; MS, chemical engineering, California Institute of Technology, 1960; PhD, chemical engineering, University of Cincinnati, 1965) has been vice president of NWT since its formation in March 1974. Previously he was manager of Water Chemistry Development for the APED of GE in San Jose. At present, he is involved primarily with consulting and research and development projects with electric power utilities and the Electric Power Research Institute in the fields of water treatment, radioactivity buildup, corrosion, and gaseous, liquid, and solid radioactive waste treatment in BWR and PWR systems.

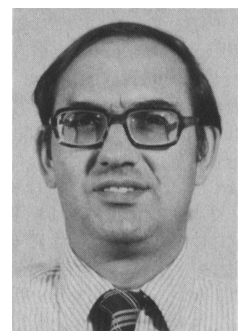
*W. L. Pearl*  
*W. R. Kassen*  
*S. G. Sawochka*



#### THE CONTROL OF COBALT-58 DISSOLUTION DURING REFUELING SHUTDOWNS OF PRESSURIZED WATER REACTORS USING A HYDROGEN PEROXIDE ADDITION

J. W. Kormuth (BA, chemistry, Washington and Jefferson College, 1961) is a senior engineer at Westinghouse Electric Corporation in the Chemistry Operations Group of the Nuclear Steam Generation Division. As such, he provides expertise in all areas of operating plant chemistry, answering internal as well as customer inquiries. In this area, his duties include consultation service during prestartup and on-site testing, data evaluation for plant chemistry problems, chemistry testing in support of other engineering groups, and training of station nuclear engineers and plant chemists.

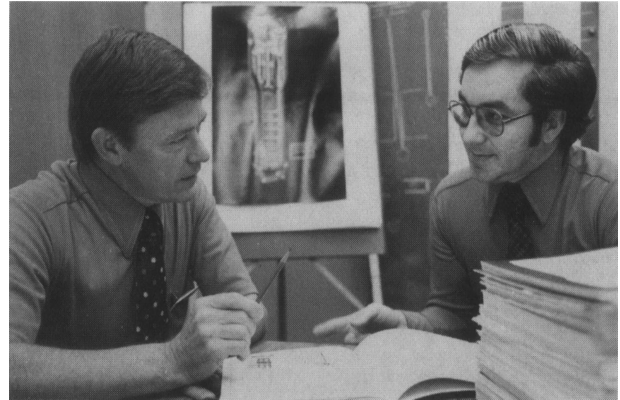
*J. W. Kormuth*



## UPDATE OF OPERATIONS WITH WESTINGHOUSE STEAM GENERATORS

D. D. Malinowski (right) (BS, Duquesne University, 1959; MS, Massachusetts Institute of Technology, 1963; JD, Duquesne University, 1976) is employed as a senior engineer in the Pressurized Water Reactor Systems Division of Westinghouse Nuclear Energy Systems. He has been involved with nuclear reactor technology since 1963, commencing with radiochemical studies at the Bettis Atomic Power Laboratory; radiochemical service work at Tracerlab; and, since 1968, with general chemistry and radiochemistry aspects of pressurized water reactors. His present area of activity concentrates on steam generator related programs, including in-plant studies and laboratory investigations. Wilson D. Fletcher (BS, chemistry, Hardin-Simmons University, 1950; MS, chemistry, Fordham University, 1960) is a consultant in Systems Technology for Westinghouse Nuclear Energy Systems, and has been engaged in development and plant operational programs pertaining to nuclear, chemical, and radiation systems since 1957. He is currently engaged in the management of development programs pertaining to all aspects of steam generator technology, and has been involved in the particulars of steam generator operating experiences since 1971. His interests are in chemistry, corrosion, and radiochemical aspects of nuclear systems.

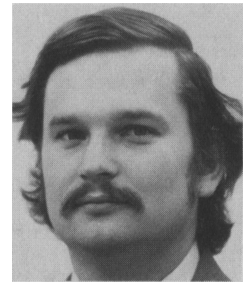
*D. D. Malinowski*  
*W. D. Fletcher*



## WATER CHEMISTRY CHARACTERIZATIONS OF A BOILING WATER REACTOR

Alan D. Miller (BS, chemical engineering, Iowa State University, 1968; PhD, chemical engineering, University of Wisconsin, 1973) is a senior engineer in the Water Chemistry Unit of the General Electric Company's Nuclear Energy Division in San Jose, California.

*A. D. Miller*

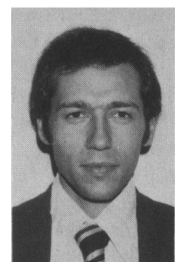
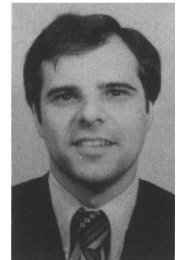


## REACTORS

### CONDENSING HEAT TRANSFER FOLLOWING A LOSS-OF-COOLANT ACCIDENT

William J. Krotiuk (top) (BS, mechanical engineering, Polytechnic Institute of Brooklyn, 1970; MS, nuclear engineering, Columbia University, 1972) has worked on various thermal-hydraulic computer problems involving fluid distribution and two-phase flow in fossil-fueled power plants at Combustion Engineering, Inc. Since 1972, he has been lead containment safety engineer for several light water reactor plants under construction at Ebasco Services Inc. His current responsibilities extend to many thermal-hydraulic safety problems involving two-phase flow, fluid hammer, shock phenomena, subcompartment transients, containment transients, gaseous detonations, thermal heat transfer, fluid mixing, two-dimensional fluid flow, and various associated computer codes. He is currently working toward an advanced degree in mechanical engineering at the Polytechnic Institute of New York. Michael B. Rubin (BS, mechanical engineering, New York University, 1973; MS, mechanical engineering, Cornell University, 1975) worked on evaluating alternate fuels, specifically methanol and hydrogen for internal combustion engine

*W. J. Krotiuk*  
*M. B. Rubin*



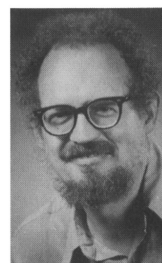
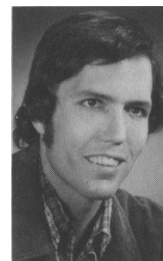
use, while at Cornell University. At Westinghouse Bettis Atomic Power Laboratory, he worked on various fluid mechanics problems related to naval nuclear power plants. Since late 1976, he has been the lead containment safety engineer for the Nuclear Pressurized Water Reactor Standardization Program at Ebasco Services Inc. His current responsibilities include containment transient analysis, subcompartment analysis, and piping analysis involving the use and modification of various thermal and fluid computer codes. He is presently working toward an engineering degree in mechanical engineering at the Polytechnic Institute of New York.

## FUEL CYCLES

### WASTE MANAGEMENT CONSIDERATIONS FOR FUSION POWER REACTORS

T. E. Botts (top) (BS, engineering, University of California at Los Angeles, 1969; MS, materials science, 1970; PhD, solid state physics, The University of Nottingham, 1974) is a member of the Fusion Technology Group at Brookhaven National Laboratory (BNL). His interests include fusion reactor safety and environmental impact. James R. Powell (BS, chemical engineering, Carnegie Tech, 1953; ScD, nuclear engineering, Massachusetts Institute of Technology, 1958) started at BNL in 1956, initially on advanced fission reactor programs and then on applications of superconductivity, including magnetic levitation and power transmission. For the past five years, he has been involved in fusion technology programs at BNL, and he is currently head of the Fusion Technology Group.

*T. E. Botts  
J. R. Powell*

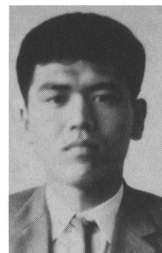
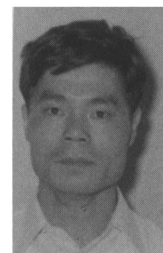


## MATERIALS

### IMPURITY INTERACTION ANALYSIS IN MESH-PACKED COLD TRAPS

M. Murase (top right) (M, mechanical engineering, Kyoto University, 1973) is a scientist at Atomic Energy Research Laboratory (AERL), Hitachi Ltd. His current interests are mass transfer phenomena in fast breeder reactors and two-phase flow instability in boiling water reactor (BWR) channels. I. Sumida (top left) (B, physics, Tokyo University, 1963) is a senior scientist at AERL, Hitachi Ltd. His current interests are two-phase flow phenomena in a fuel assembly of a BWR and technical problems of solar power generating systems. K. Kotani (bottom right) (M, nuclear engineering, Osaka University, 1968) is a scientist at AERL, Hitachi Ltd. His current interests are application of heat pipes to nuclear instruments and boiling transition phenomena in BWRs. H. Yamamoto (bottom left) (M, nuclear engineering, Osaka University, 1970) is a scientist at AERL, Hitachi Ltd. His current interest is particle trapping phenomena on solid surfaces in a sodium vapor trap.

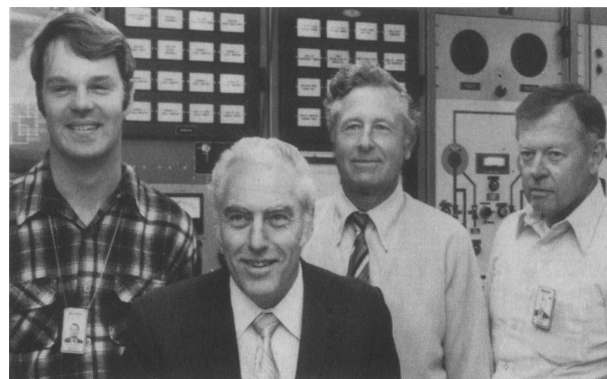
*Michio Murase  
Isao Sumida  
Koichi Kotani  
Hajime Yamamoto*



## CRITICALITY STUDIES FOR A NEUTRON MULTIPLIER

R. C. Lloyd (second from left) (BS, physics, Augustana College, 1949; MS, physics, South Dakota State, 1951) is a staff scientist at Battelle-Pacific Northwest Laboratories (PNL). His current interests are in experimental research in criticality carried out at the Critical Mass Laboratory, and he is also involved in a work group for ANS Standards. S. R. Bierman (right) (BS, chemical engineering, Texas Technological University, 1956; MS, nuclear engineering, University of Washington, 1963) has been involved in both the chemical processing industry and criticality research and analysis. He is currently a staff scientist at the Critical Mass Laboratory at PNL, where he has been active in both the generation of basic experimental criticality data and the utilization of these data in performing criticality analyses of production plant systems. E. Duane Clayton (second from right) (PhD, physics, University of Oregon, 1952) is currently associate manager of nuclear criticality at PNL, and is a research associate professor in the University of Washington's Department of Nuclear Engineering. He is a pioneer in criticality studies with plutonium, and since its inception in 1961, has been director of the Plutonium Critical Mass Laboratory of PNL. He is currently chairman of Work Groups 12 and 15 within Subcommittee ANS-8 (Fissionable Materials Outside Reactors) of the ANS Standards Committees. His current technical interests include most aspects of criticality measurements and studies. B. M. Durst (left) (MS, nuclear engineering, Louisiana State University, 1974) is a research engineer at PNL and has participated in both experimental and computational criticality studies at the Plutonium Critical Mass Laboratory of PNL.

*R. C. Lloyd*  
*S. R. Bierman*  
*E. D. Clayton*  
*B. M. Durst*



## NUCLEAR EXPLOSIVES

## LEAD-210 FROM NUCLEAR EXPLOSIONS IN THE ENVIRONMENT

Zbigniew Jaworowski (top) (MD, Medical Academy, Kraków, 1952; PhD, natural sciences, Institute of Nuclear Research, 1963; DSc, radiobiology, Institute of Nuclear Research, 1967) is head of the Department of Radiation Hygiene at the Central Laboratory for Radiological Protection in Warsaw. His current interests include world-wide migration of radioactive and heavy-metal pollutants in the atmosphere, effects of industrial pollution in the population, and biological effects of tritium. Ludwika Kownacka (center) (MS, geophysics, University of Warsaw, 1964) works in the Department of Radiation Hygiene of the Central Laboratory for Radiological Protection. She is conducting research on the vertical transport of air masses and particles in the atmosphere and on the horizontal dispersion of industrial pollutants from the point sources of emissions. Kazimierz Grotowski (bottom) (PhD, physics, Jagiellonian University, Kraków, 1956) is a professor of physics at the Institute of Physics of Jagiellonian University and also at the Institute of Nuclear Physics in Kraków. His interests include nuclear reactions involving alpha particles, clustering effects

*Zbigniew Jaworowski*  
*Ludwika Kownacka*  
*Kazimierz Grotowski*  
*Krzysztof Kwiatkowski*



in nuclei, low activity measurements, environmental protection, and radioactive dating. Krzysztof Kwiatkowski (right) (PhD, physics, University of Maryland, 1976) is with the Institute of Physics of Jagiellonian University. His main area of interest is medium energy physics, especially nuclear reactions induced by protons and neutrons.



## INSTRUMENTS

### AUTONOMOUS SYSTEM FOR CONTROL OF AN EXPERIMENT WITH SCINTILLATION AND ČERENKOV COUNTERS

Dušan Kollár (top) (Ing., applied physics, Slovak Technical University, Bratislava, 1963; PhD, experimental physics, 1976) is senior scientist in the Department of Nuclear Physics, Comenius University, Bratislava, Czechoslovakia. From 1968 to 1977, he has been involved in various aspects of the optimization of photomultiplier working conditions of scintillation and Čerenkov counters for high-energy physics experiments at the Joint Institute for Nuclear Research (JINR), Dubna, USSR. In the past years, his primary area of activity has been in automation of physical experiments. Lubica Kollárová (center) (Ing., electrical engineering, Slovak Technical University of Bratislava, 1963) has spent the last 8 years at the JINR. She is interested in the development of digitally controlled CAMAC modules and computer software. Pavel Horváth (bottom) (Ing., electronic engineering, Slovak Technical University, Bratislava, 1956; PhD, theoretical electronics, 1965) is a senior scientist at the Institute of Physics, Slovak Academy of Sciences, Bratislava. His current research interests are in nuclear physics instrumentation and automation of physical experiments. From 1968 to 1973, he participated in high-energy physics experiments at the Laboratory of Nuclear Problems, JINR.

*Dušan Kollár  
Lubica Kollárová  
Pavel Horváth*

