nuclear technology®

AUTHORS — MAY 1976

PLANT WATER CHEMISTRY

PREFACE: PLANT WATER CHEMISTRY

Paul Cohen

Paul Cohen (MS, chemistry, Carnegie Institute of Technology, 1941), after 13 years with the U.S. Bureau of Mines in Pittsburgh, joined the Westinghouse Nuclear Program at Bettis Field in 1949, where he was manager of coolant technology and loop irradiation testing programs for the Nautilus and Shippingport programs at Bettis. In 1959 he transferred to the Westinghouse Atomic Power Division where he was responsible for the development of chemical aspects of chemical shim for pressurized water reactors using boric acid. Since 1970 he has been a consultant in coolant technology for Westinghouse Nuclear Energy Systems.

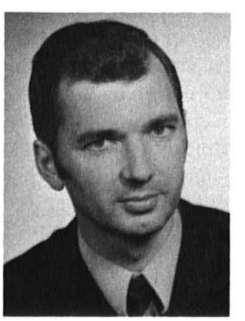
RECENT CONCERNS WITH REACTOR COOLANT CHEMISTRY TECHNOLOGY IN PRESSURIZED WATER REACTORS

J. H. Hicks

Jack H. Hicks (MS, chemical engineering, Virginia Polytechnic Institute, 1950) is a principal engineer with the technical staff, Nuclear Power Generation Division, Babcock & Wilcox Company. He has been associated with the design, construction, testing, and operation of stationary and marine nuclear power plants for the past 20 years with specific emphasis in water chemistry, chemical control and treatment systems, and waste disposal. His current interests and responsibilities involve the normal water chemistry and radiochemistry considerations for reactor coolant systems and associated auxiliary systems.

CHEMISTRY EXPERIENCE IN THE PRIMARY HEAT TRANSPORT CIRCUITS OF KRAFTWERK UNION PRESSURIZED WATER REACTORS

R. Riess



Rolf Riess (PhD, nuclear chemistry, Technical University Darmstadt, Federal Republic of Germany, 1968) is responsible for the coolant chemistry of Kraftwerk Union (KWU) nuclear power plants, for both pressurized and boiling water reactors. His responsibilities include the chemical startup of KWU nuclear power plants.

AMMONIA SUPPRESSES OXYGEN PRODUCTION IN BOILING WATER REACTORS

J. E. LeSurf
G. M. Allison

J. E. LeSurf (top) (BSc, chemistry, University of London, 1951) is head of the System Materials Branch, Atomic Energy of Canada Limited, Chalk River Nuclear Laboratories. He has been involved with corrosion problems in nuclear power production since joining the United Kingdom Atomic Energy Authority in 1957. His current interests are corrosion, wear, and mass transport in the primary and secondary sides of CANDU reactors, activity transport and decontamination, and waste management. G. M. Allison (BA, chemistry, University of Toronto, 1942) joined the Chalk River Laboratories of Atomic Energy of Canada Limited in 1948. Since 1954 he has been involved with problems relating to the chemistry of coolants in loops and power reactors, including fission-product releases from solid fuel, radiation decomposition of ammonia in boiling systems, and corrosion-product activity transport. His recent responsibilities are in the fields of waste management and decontamination.

MEASUREMENT OF FUEL ELEMENT CRUD DEPOSITS IN PRESSURIZED WATER REACTORS

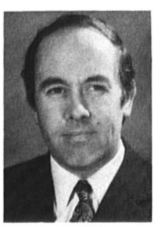
Yale Solomon
Josef Roesmer

Yale Solomon (top) (MS, physical chemistry, Illinois Institute of Technology, 1951) and Josef Roesmer (PhD, physical chemistry, Clark University, 1964) are fellow scientists in chemistry technology for Westinghouse Electric Corporation, Nuclear Energy Systems. Solomon has been involved in reactor coolant chemistry since 1950 at Argonne National Laboratories and with Westinghouse at the Bettis Atomic Power Laboratory from 1952 to 1972. Roesmer has been with Westinghouse since 1964 and has been responsible for crud studies at Nuclear Energy Systems since 1971.

REACTORS

THE APPLICATION OF ADVANCED GAS COOLED REACTOR MATERIALS

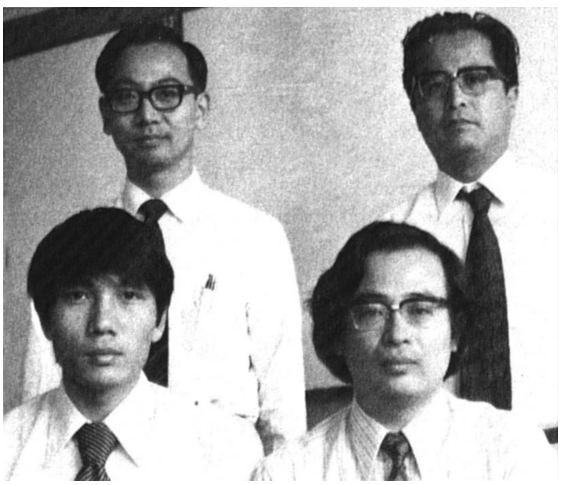
L. Henderson
R. Stead



L. Henderson (top) (BSc, metallurgy, University of Durham, United Kingdom, 1955) joined Clarke Chapman Limited and has worked covering the fabrication, materials properties, and component substantiative test programme in nuclear steam generator technology. His principal duties involved dealing with the problems of ensuring integrity of AGR heat exchangers. He is currently divisional director of the Advanced Technology Division (Materials Research), responsible for initiation of improved fabrication technology in conjunction with prediction of materials response to the total manufacturing route involved. R. Stead (BSc Hons, mechanical engineering, University of Durham, United Kingdom, 1959) was formerly the manager of the Nuclear Engineering Department, Power Plant Division, Clarke Chapman Limited, and was responsible for design and project engineering activities associated with steam generators for gas-cooled reactors. He is currently the manager of the Contract Engineering Department responsible for engineering activities for large fired boilers and ancillary equipment for utilities.

A MAN-MACHINE COMMUNICATION SYSTEM FOR BOILING WATER REACTOR CORE MANAGEMENT PLANNING

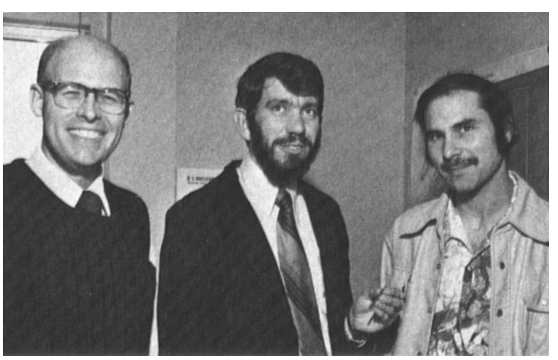
Osamu Yokomizo
Hiroshi Motoda
Takashi Kiguchi
Renzo Takeda



Osamu Yokomizo (bottom left) (MSc, nuclear engineering, Tokyo University, 1973) is a member of the mechanical engineering section of the Atomic Energy Research Laboratory (AERL), Hitachi, Ltd., Japan. His current interests include hydraulic stability of a boiling channel, noise analysis of BWRs, and core management of nuclear reactors. Hiroshi Motoda (bottom right) (PhD, nuclear engineering, Tokyo University, 1972) is a member of the core management section of the AERL. His interests include nuclear fuel management, on-line core performance prediction, core performance evaluation, and noise analysis of BWRs. Takashi Kiguchi (top left) (PhD, nuclear engineering, Tokyo University, 1975) is a member of the same section of the AERL. In addition to BWR core management, his interests include man-machine communication in nuclear reactor control systems. Renzo Takeda (top right) (BSc, electrical engineering, Kyoto University, 1960) is a member of the advanced reactor section of AERL. His interests include core design of commercial advanced thermal reactors.

GAS TAG IDENTIFICATION OF FAILED REACTOR ASSEMBLIES–III. TAG RATIOS FOR THE FAST FLUX TEST FACILITY CORES I THROUGH IV

N. J. McCormick
R. E. Schenter
R. P. Omberg



N. J. McCormick (center) (PhD, nuclear engineering, University of Michigan, 1965) is a professor of nuclear engineering at the University of Washington. He recently spent a year's leave-of-absence with the Palo Alto office of Science Applications, Inc. (SAI). He is now a consultant to SAI and to the Hanford Engineering Development Laboratory, where he has been engaged in the development of methods for identification of failed assemblies in fast reactors. R. E. Schenter (right) (PhD, physics, University of Colorado, 1963) is a fellow scientist at the Hanford Engineering Development Laboratory. His primary area of experience is in the theoretical calculations of neutron reaction cross sections. He is presently chairman of the fission-product subcommittee of the Cross Section Evaluation Working Group and chairman of the Atomic Energy Commission task force on "Nuclear Data for Fission-Product Decay Heat and Burnup Calculations." R. P. Omberg (left) (PhD, engineering science, University of California, Berkeley, 1969) is manager of methods development at the Hanford Engineering Development Laboratory. He is currently interested in advanced liquid-metal fast breeder reactor core design, and in the evaluation of long-range nuclear energy development strategies.

MATERIALS

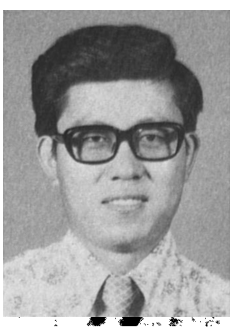
LIQUID LITHIUM PENETRATION OF STRESSED ARMCO IRON

W. Jordan
W. L. Bradley
D. L. Olson

William Jordan (top) (BS, metallurgical engineering, 1973; MS, metallurgical engineering, 1975, Colorado School of Mines) is currently a student at the Conservative Baptist Theological Seminary in Denver, Colorado. Walter L. Bradley (center) (PhD, materials science, University of Texas, 1969) is an associate professor of metallurgical engineering at the Colorado School of Mines. He is concerned with research in the areas of corrosion, reactive metals, and joining. David L. Olson (bottom) (PhD, materials science, Cornell University, 1970) is an associate professor of metallurgical engineering at the Colorado School of Mines. He is concerned with research in the areas of corrosion, reactive metals, and joining.

REACTION OF EUROPIA WITH AUSTENITIC STAINLESS STEEL

Paul C. S. Wu

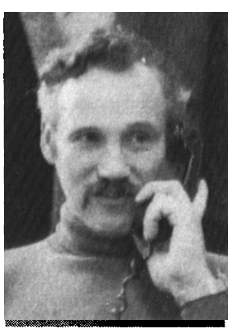


Paul C. S. Wu (PhD, metallurgy, Iowa State University, 1972) worked at Ames Laboratory from 1967 to 1972 in the areas of sodium technology and nuclear materials. He has been with the Westinghouse Advanced Reactors Division since 1972, working in the area of materials development for sodium-cooled fast breeder reactors. His current interests are in the areas of high-temperature mechanical behaviors including low-cycle and creep fatigue interaction of stainless steels and super alloys.

RADIOISOTOPES

RADIOISOTOPE BATTERY USING SCHOTTKY BARRIER DEVICES

F. K. Manasse
A. N. Tse



Fred Manasse (right) (PhD, theoretical physics, Princeton University, 1962) is currently director of the Center for Teaching Innovation at Drexel University. His interests include the development of educational modules and methodologies in science and engineering subjects aimed at individualizing instruction, solid state electronics and device physics, bioengineering, the development of educational technological apparatus, and applications for computers in instruction, management, or instrumentation. He is active in consulting activities related to research and fabrication of electronic devices in nuclear, biomedical, microwave, digital, and optical areas. Anthony Tse (photo not available) (PhD, engineering, Dartmouth College, 1973) has been employed by the U.S. Nuclear Regulatory Commission since 1973. He was employed by the Cambridge Nuclear Corporation from 1965 to 1971. From 1968 to 1971 he worked as a consultant to Sanders Nuclear Corporation. In 1972, he worked at Oak Ridge National Laboratory.

ESTIMATION OF IRRADIATION HISTORY OF A SPENT FUEL BY GAMMA-RAY SPECTROSCOPY

Kanji Tasaka

Kanji Tasaka (BS, 1965; PhD, nuclear engineering, Tokyo University, 1975) has been engaged in problems of fission products and transplutonium elements for several years at the Japan Atomic Energy Research Institute. He is currently interested in the safety of light-water reactors in connection with the loss-of-coolant accident.