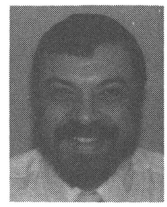
nuclear technology®

AUTHORS — APRIL 1987

FISSION REACTORS

NUFREQ/SLIP: AN IMPROVED DIGITAL COMPUTER MODEL FOR PREDICTING NUCLEAR THERMALLY INDUCED FLOW INSTABILITIES

Samir M. Sami
C. H. Le



Samir M. Sami (right) (B.Sc.A., M.Sc.A., and PhD, University of Montreal, Canada, 1981) has worked in the area of two-phase flow at various industries and institutions. He has specialized in the transient analysis of thermohydraulics and particularly thermohydraulic code developments for CANDU reactors. He is currently a professor of mechanical engineering, University of Sherbrooke, and is involved in various projects with Atomic Energy of Canada Ltd., Westinghouse Canada Ltd., Rolls-Royce Canada, Canair, Inc., and ASEA Ltd. **C. H. Le** (photo not available) is an undergraduate summer student in the Department of Mechanical Engineering, University of Sherbrooke.

FISSION PRODUCT TELLURIUM RELEASE BEHAVIOR UNDER SEVERE LIGHT WATER REACTOR ACCIDENT CONDITIONS

Jack L. Collins
Morris F. Osborne
R. A. Lorenz

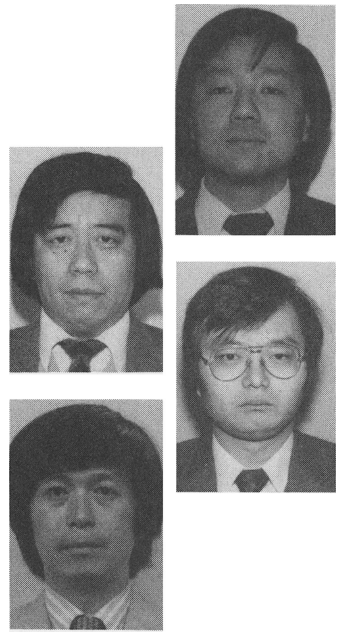
Jack L. Collins (right) (BS, chemistry, University of Tennessee, 1963) has worked in nuclear-related fields during most of his 23 years as a staff member at Oak Ridge National Laboratory (ORNL). His work activities have been in the areas of transuranium chemistry, advanced breeder reactor fuel development, and light water reactor (LWR) safety studies. He has a special interest in characterizing the chemical behavior of released fission products under severe LWR accident conditions. **Morris F. Osborne** (left) (BA, physics, University of North Carolina at Chapel Hill, 1953) has worked at ORNL for more than 30 years, specializing in safety studies of LWRs and high-temperature gas-cooled reactors since 1966. His primary interests are in the areas of fuel behavior and fission product release and behavior, especially under accident conditions. He represented the U.S. Nuclear Regulatory Commission in core melt research at Kernforschungszentrum Karlsruhe, Federal Republic of Germany, from 1975 to 1977. **R. A. Lorenz** (center) (BS, chemical engineering, Iowa State University, 1951) has worked in nuclear reactor safety at

ORNL since 1960. His work has included studies of the behavior of highly radioactive iodine on charcoal (desorption and ignition), in-reactor and hot cell fission product release experiments, and fission product release modeling.

NUCLEAR SAFETY

SAFER03 AND TRAC-BD1 ANALYSES OF A ROSA-III LARGE-BREAK EXPERIMENT ON A BOILING WATER REACTOR

Seihiro Itoya
Masami Kato
Nobuaki Abe
Hideo Nagasaka

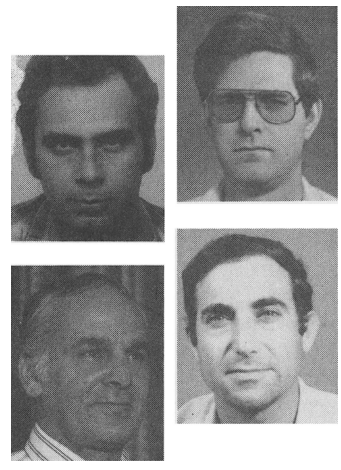


Seihiro Itoya (top right) (BS, applied mathematics, Science University of Tokyo, Japan, 1972) has worked at the research laboratory of Nippon Atomic Industry Group, Inc. (NAIG) for 14 years. He is a researcher of nuclear safety and transients, and his current interests include analysis of boiling water reactor (BWR) loss-of-coolant accidents (LOCA) and BWR plant analyzers. **Masami Kato** (top left) (MS, nuclear engineering, University of Nagoya, Japan, 1975) is a researcher and has worked at the NAIG research laboratory for 11 years. His current interests include analysis of BWR LOCAs and the fission product source term. **Nobuaki Abe** (bottom right) (MS, nuclear engineering, University of Osaka, Japan, 1978) is a research engineer and has worked at the NAIG nuclear research laboratory for 8 years. His current interests include analysis of BWR LOCAs and transients. **Hideo Nagasaka** (bottom left) (PhD, mechanical engineering, University of Keio, Japan, 1974) has worked for 11 years at the nuclear engineering laboratory of Toshiba Corporation. He is a manager of nuclear safety research, and his current interests include experiments and analysis of thermal-hydraulic behavior during a LOCA.

CHEMICAL PROCESSING

REMOVAL OF SUSPENDED ALUMINA PARTICLES FROM HEAVY WATER BY ELECTROADSORPTION ON FIBROUS CARBON ELECTRODES

Haim Tobias
Efraim Taragan
Yoram Oren
Abraham Soffer



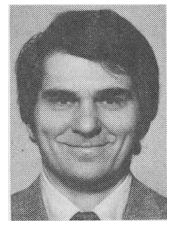
Haim Tobias (top right) (MSc, chemistry, Ben-Gurion University, Israel, 1979) has worked in surface chemistry and electrochemistry at the Nuclear Research Centre-Negev (NRCN) since 1974. He specializes in the uses of carbons and graphites as electroadsorbents. **Efraim Taragan** (top left) (BSc, mechanical engineering, Israel Institute of Technology, 1973) has worked at the NRCN since 1977 as a senior mechanical engineering designer. **Yoram Oren** (bottom right) (PhD, electrochemistry, Weizmann Institute of Science, 1978) has worked at the NRCN since 1968. His main interests include electrochemical separation processes and electrochemistry of carbon and graphites. **Abraham Soffer** (bottom left) (PhD, electrochemistry, Israel Institute of Technology–Haifa, 1969) has worked at the NRCN since 1968

and is the head of the surface chemistry and electrochemistry group. His main interests include the electrochemistry and surface science of carbons and graphites and separation processes from the liquid and gas phases on carbon and graphite adsorbents and membranes.

MATERIALS

CRACKING AND RELOCATION OF MIXED-OXIDE FAST-REACTOR FUEL

Timothy S. Roth
A. Biancheria

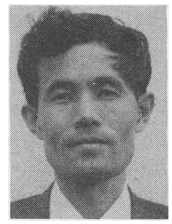


Timothy S. Roth (right) (PhD, physics, Carnegie-Mellon University, 1972) is a research associate at Carnegie-Mellon University in artificial intelligence and expert systems. From 1972 to 1986 he worked for Argonne National Laboratory and for Westinghouse Electric Corporation doing computer modeling of thermal, mechanical, and materials performance of breeder-reactor fuel pins and also analysis of fuel-pin experiments carried out in the Experimental Breeder Reactor II and TREAT reactors. **A. Biancheria** (photo not available) (PhD, Clark University) has been active in the fuels and fuel rod performance areas.

RADIOISOTOPES AND ISOTOPE SEPARATION

EXPOSURE BUILDUP FACTORS OF HIGH-ENERGY GAMMA RAYS FOR WATER, CONCRETE, IRON, AND LEAD

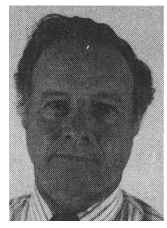
Hideo Hirayama



Hideo Hirayama (PhD, nuclear engineering, Kyoto University, Japan, 1976) is a research associate at the National Laboratory for High Energy Physics in Japan. He is working in the field of radiation shielding of high-energy accelerators. His current interest is the electron photon transport calculations in various fields by using the EGS4 Monte Carlo code.

COAL ANALYSIS WITH GAMMA RAYS FROM CAPTURE OF ^{252}Cf NEUTRONS—EXPERIMENTAL EQUIPMENT DESIGNS AND RESULTS

Dick Duffey
Peter F. Wiggins



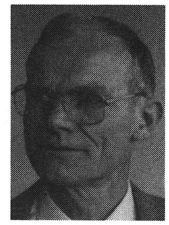
Dick Duffey (top) (BS, Purdue University; MS, University of Iowa; PhD, University of Maryland) has worked with the U.S. Atomic Energy Commission. He started the nuclear engineering program at the University of Maryland in 1954 and established the nuclear reactor project there in 1957, and he has continued to be a professor of nuclear engineering at the University of Maryland. His research interests are in the area of neutrons in engineering applications. **Peter F. Wiggins** (MarE, State University of New York Maritime College, 1958; MME, mechanical engineering, New York University, 1961; PhD, nuclear engineering,

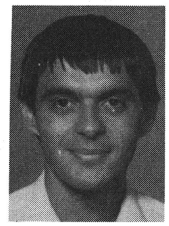
University of Maryland, 1970) has been a faculty member at the U.S. Naval Academy since 1962. His research interests are in neutron capture gamma rays.

HEAT TRANSFER AND FLUID FLOW

A TEST OF SOME CONDENSATION MODELS IN THE PRESENCE OF A NONCONDENSABLE GAS AGAINST THE ECOTRA EXPERIMENT

Philippe J. Vernier
Philippe Solignac



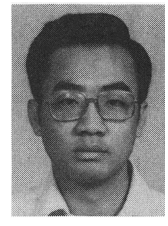


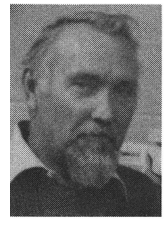
Philippe J. Vernier (top) (Ingénieur, Ecole Nationale Supérieure d'Hydraulique de Grenoble, France, 1954) is currently a senior scientist at the Service d'Etudes Thermohydrauliques of the Département des Réacteurs à Eau, Centre d'Etudes Nucléaires de Grenoble. Previously he was with the Service des Transferts Thermiques, where his main interests were in thermal hydraulics of nuclear reactors (mixed forced-natural convection, flow excursions due to boiling) and two-phase flow modeling (balance equations, vapor generation rate). Presently his activity centers on interfacial phenomena for multicomponent flow modeling (condensation with noncondensable gas, liquid film instability). **Philippe Solignac** (Ingénieur, Ecole Centrale des Arts et Manufactures, Paris, France, 1983) is presently a research engineer at the Centre de Recherches of Cegedur Pechiney in Voreppe, France.

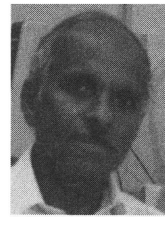
ANALYSES

A MONTE CARLO MODEL FOR ON-LINE NEUTRON CAPTURE PROMPT GAMMA-RAY ANALYSIS OF COAL IN TRANSMISSION GEOMETRY

Y. L. Yuan
R. P. Gardner
K. Verghese



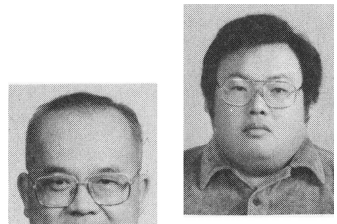




Y. L. Yuan (top) [PhD, nuclear engineering, North Carolina State University (NCSU), 1984] is an engineer at the Consolidated Edison Company of New York. He has worked on Monte Carlo modeling of radiation transport and on the development of nuclear plant simulation models. He is currently working on reload safety analysis of nuclear reactors. **R. P. Gardner** (center) (PhD, fuels technology, Pennsylvania State University, 1961) is professor of nuclear and chemical engineering and director of the Center for Engineering Applications of Radioisotopes at NCSU. His spectra of interests cover mathematical modeling and simulation of radiation transport in nuclear gauges and analyzers and radiotracer measurements in industrial processes. His current projects include tracer measurements in pulsed-column solvent extraction and Monte Carlo modeling of X-ray fluorescence and neutron capture gamma-ray analyzers and of nuclear tools for oil-well logging. **K. Verghese** (bottom) (PhD, nuclear engineering, Iowa State University, 1963) is professor of nuclear engineering and associate director of the Center for Engineering Applications of Radioisotopes of NCSU. In addition to Monte Carlo simulation of neutron and gamma-ray transport for nuclear analyzers and oil-well logging using nuclear methods, he is also engaged in research on characterization of photon detectors for use in industrial measurement applications.

A MINIATURE SPARK COUNTER FOR PUBLIC COMMUNICATION AND EDUCATION

Cheng-Hsin Mao
Pao-Shan Weng

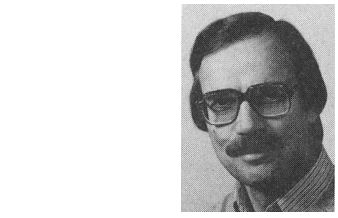


Cheng-Hsin Mao (top) (Li-Ming Institute of Technology, Taiwan, 1974) has been a technologist at the Nuclear Science and Technology Development Center of National Tsing Hua University (NTHU) since 1974. His primary research interests include radiation detection and measurements. **Pao-Shan Weng** (PhD, nuclear engineering, Texas A&M University, 1966) is a professor at NTHU. His primary research interests include health physics and nuclear applications.

NUCLEAR FUELS

FISSION GAS BUBBLES IN URANIUM-ALUMINIDE FUELS

Gerard L. Hofman



Gerard L. Hofman (PhD, metallurgy, University of Florida, 1971) has been with Argonne National Laboratory in the Experimental Breeder Reactor II and Material Science Divisions. He is presently working on the development of low-enriched fuels for research and test reactors, the development of metallic fuel for the Integral Fast Reactor, and on failed fuel element behavior.