nuclear technology®

AUTHORS — APRIL 1975

REACTOR SITING

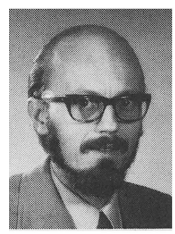
SELECTED ENVIRONMENTAL CONSIDERATIONS AND THEIR MEASURING PARAMETERS FOR NUCLEAR PLANT SITING

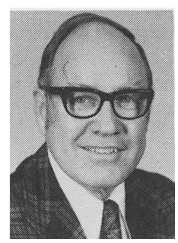
Jan A. Norris

Jan A. Norris (BS, civil engineering, University of Colorado, 1952; MS, nuclear engineering, University of Washington, 1970) has been a consulting engineer for some 20 years, more recently in the Naval Nuclear Power Department and the U.S. Atomic Energy Commission where he is now environmental project manager.

THE ENVIRONMENTAL ASSESSMENT MATRIX AS A SITE-SELECTION TOOL—A CASE STUDY

Thomas A. Tamblyn
Edward A. Cederborg

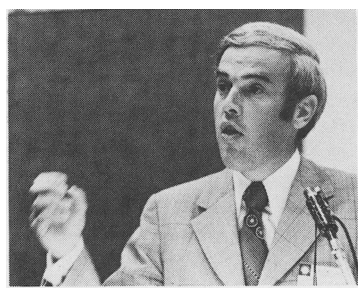




Thomas A. Tamblyn (left) (MS, environmental engineering, Northwestern University, 1963) and Edward A. Cederborg (BS, civil engineering, University of California, Berkeley, 1943) are presently employed by the Bechtel Power Corporation in its San Francisco Power Division, where they are currently engaged in developing site-selection tools and conducting site-selection studies for both nuclear and fossil-fueled power plants.

SITE ACCEPTABILITY AND POWER AVAILABILITY—NEEDED INSTITUTIONAL CHANGES

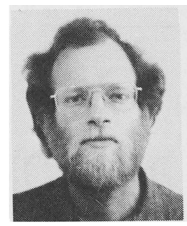
Joel E. Haggard

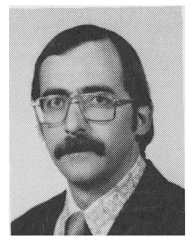


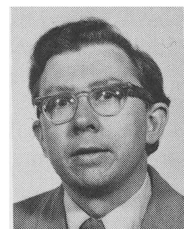
Joel Edward Haggard (BS, ME, University of Notre Dame, 1961; MS, nuclear engineering, University of Oklahoma, 1963; JD, University of Washington, 1971) is a partner in the law firm of Houghton, Cluck, Coughlin and Riley, Attorneys-at-Law, Seattle, Washington. Formerly a nuclear engineer with Bettis Atomic Power Laboratory, Haggard has represented an applicant on the licensing of five reactors at three sites before the state of Washington's Thermal Power Plant Site Evaluation Council. He is the former chairman of the Washington State Bar's Environmental Law Section.

POPULATION DISTRIBUTION CONSIDERATIONS IN NUCLEAR POWER PLANT SITING

Joel E. Kohler
Albert P. Kenneke
Brian K. Grimes



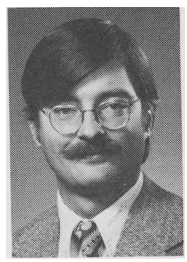


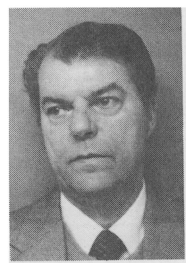


Joel E. Kohler (top) (BA, mathematics, Temple University, 1969; ME, nuclear engineering, New York University, 1972) has for the past two and one-half years been employed by the U.S. Atomic Energy Commission (USAEC) in the field of reactor safety as a site analyst in the Accident Analysis Branch. In October 1974, Kohler assumed the responsibilities of Reactor Inspector, Regulatory Operations, Region III, Glen Ellyn, Illinois. His current technical interests include siting considerations relevant to nuclear power plant siting as well as gaining experience with operating power reactors by participating as a reactor inspector in the USAEC's reactor inspection program. Albert P. Kenneke (center) (MPH, environmental health, University of Michigan, 1959; MS, radiation biology, University of Rochester, 1957; BS, physics, St. Joseph's College, 1956) is technical coordinator for site safety in the Directorate of Licensing. In 1971 he was appointed to his present position, which involves the development of alternative methods and procedures for the technical review of the safety and environmental aspects of nuclear facility siting. Brian K. Grimes (bottom) (MS, nuclear engineering, University of Washington, 1964) has for the past 11 years been employed by the USAEC in the field of reactor safety as the licensing project manager for a number of nuclear power facilities and, for the last 3 years, as chief of the Accident Analysis Branch. His current technical interests include external hazards to nuclear power facilities, the role of probabilistic analysis in reactor safety, and quantitative assessment of post-accident fission product removal by engineered safety features.

SITING CONSIDERATIONS FOR RADIOACTIVITY IN REACTOR EFFLUENTS DURING NORMAL OPERATION

Joseph M. Graf
Peter O. Strom

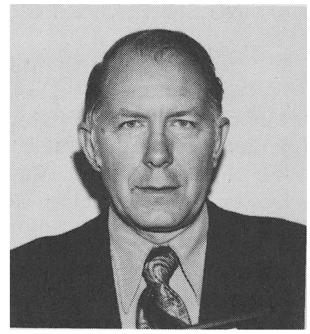




Joseph M. Graf (left) (PhD, nuclear engineering, University of Virginia, 1974) joined the Health Physics Group at the Los Alamos Scientific Laboratory in November. Previously, he was with the Radiological Assessment Branch, Directorate of Licensing, U.S. Atomic Energy Commission (USAEC) where he was responsible for the radiological impact portion of the environmental impact statements for a number of light-water-reactor license applications. Peter O. Strom (Cand. Real., nuclear chemistry, University of Oslo, 1964) is presently with the Directorate of Regulatory Standards of the USAEC. His current interests are in the areas of radiological dose modeling and guides for radiation dose criteria. Previously, he was with the Radiological Assessment Branch where he worked with environmental dose modeling.

SAFETY EVALUATIONS OF THE HTGR AS RELATED TO 10 CFR 100 SITING REQUIREMENTS

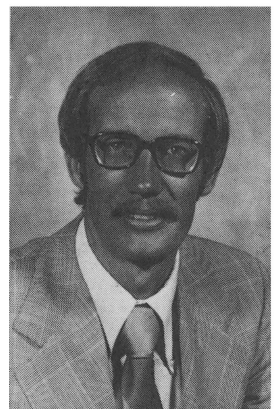
T. R. Moffette



Thomas R. Moffette (MS, industrial management, Massachusetts Institute of Technology, 1954; MS, nuclear science, Carnegie Institute of Technology, 1958) has been with General Atomic since 1959, where he managed safety analysis and licensing for the first commercial gas-cooled reactors in the United States (Peach Bottom 1 and Fort St. Vrain) and served on the ANS-2 Committee on Power Reactor Site Criteria. He is currently in Tokyo, Japan, as manager of engineering for General Atomic International's Asia-Pacific Division.

SENSITIVITY OF ATMOSPHERIC DIFFUSION ESTIMATES TO METEOROLOGICAL DATA RECOVERY AND ACCURACY

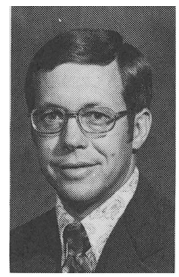
Keith Woodard

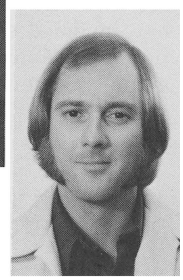


Keith Woodard (MS, nuclear engineering, University of California, Los Angeles, 1963) has been active in reactor licensing, safety analysis, and siting since joining Pickard, Lowe and Associates, Inc. in 1967. For the past five years he has been responsible for directing meteorological programs at a number of nuclear plant sites, and has been active in development of computer models which incorporate statistical treatment of weather data for use in site evaluations.

ENVIRONMENTAL EFFECTS OF COOLING SYSTEM ALTERNATIVES AT INLAND AND COASTAL SITES

Russell M. Miner
John W. Warrick

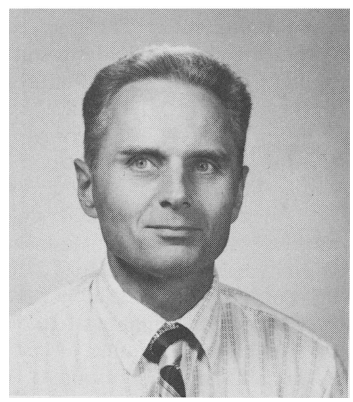




R. M. Miner (left) (MS, mechanical engineering, New Mexico State University, 1964) is with URS Energy Services Company as director of Environmental Engineering and is responsible for evaluating cooling system alternatives. He also conducted analytical and physical model studies for once-through systems. His current responsibilities include the development of utility study programs which respond to EPA's power plant effluent limitations, and studies related to siting thermal power plants. John W. Warrick (BS, biological science, California State Polytechnic University, 1970) has been employed by Pacific Gas and Electric Company since July 1970. He has worked on field studies evaluating the effects of thermal discharges from the company's eight operating fossil fuel plants on aquatic life in the San Francisco Bay-Delta, Humbolt Bay, and the Pacific Ocean. Recently he has conducted studies at the two 1000-MW unit Diablo Canyon Nuclear Power Plant site near San Luis Obispo, California.

HAZARDS TO NUCLEAR PLANTS FROM SURFACE TRAFFIC ACCIDENTS

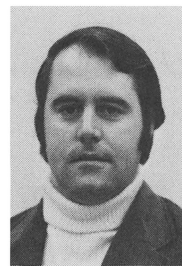
Karl Hornyik



Karl Hornyik (PhD, nuclear engineering, University of Illinois, 1965) is assistant professor of nuclear engineering at Oregon State University. He has been working with Portland General Electric on various aspects of nuclear power plant safety and siting, including analysis of hazards to nuclear plants from air traffic.

SITING ENVELOPE FOR STANDARDIZED PLANTS

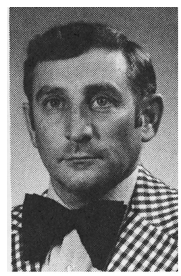
W. D. Gilbert
J. F. Quirk



W. D. Gilbert (left) (MS, chemical engineering, University of Washington, 1949) is manager, Safety and Standards, Nuclear Energy Division, General Electric Company. He joined General Electric in 1950 where he was employed at the Hanford Works. He is currently a member of ANS-50 Systems Engineering Committee and was chairman of ANS-22 Subcommittee for the preparation of the ANSI N212 Nuclear Safety Criteria for Boiling Water Reactor Plants. Joseph F. Quirk (BS, University of Portland, 1966) has been involved with implementing standardization, particularly establishing requirements associated with a standard plant design. He is a technical leader in the BWR Standardization Group, where his main interests are in the areas of licensing and product safety. He is currently a member of ANSI 2.12 Industry Working Group.

SITE SELECTION AND EVALUATION OF ALTERNATIVES BY UNITED STATES UTILITIES

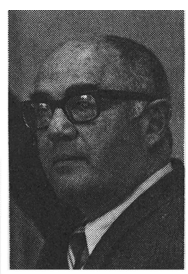
A. David Rossin
Barry L. Nichols

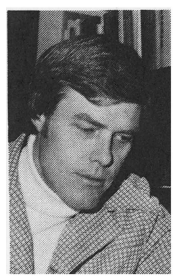


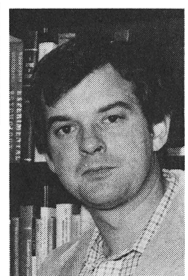
A. David Rossin (left) (BS, engineering physics, Cornell University, 1954; MBA, Northwestern University, 1963; MS, nuclear engineering, Massachusetts Institute of Technology, 1955; PhD, metallurgy, Case Western Reserve University, 1966) is staff assistant to the director of Environmental Affairs of Commonwealth Edison Company. Siting is one area of his responsibilities. Formerly with Argonne National Laboratory, his previous experience includes extensive research on reactor safety, radiation embrittlement of steel in nuclear reactors, and development of damage models using neutron dosimetry. Barry L. Nichols (BS, natural science, University of Wisconsin, 1964) is manager of the National Environmental Studies Project for the Atomic Industrial Forum. His research in botany has included studies of the influence of thermal discharges in the movement of reservoir fishes; he has also worked on other problems on thermal dishcarges and waste heat utilization.

A METHOD FOR INTEGRATING SOCIETAL AND TECHNICAL JUDGMENTS IN ENVIRONMENTAL DECISION MAKING

John B. Burnham
Stanley M. Nealey
William S. Maynard



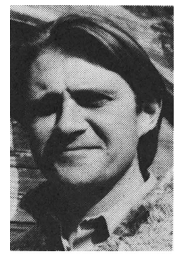


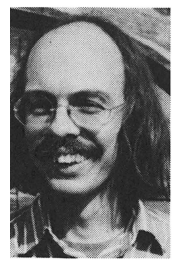
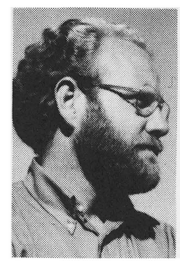
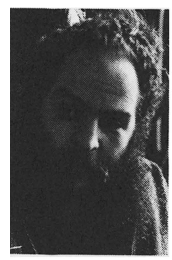
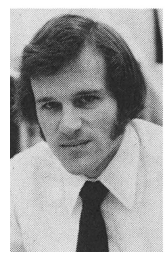


John B. Burnham (top) (BS, metallurgical engineering, Stanford University, 1947) is chiefly concerned with decision making theory, particularly in the field of energy resources. He is currently manager of the Planning and Assessment Section in the Systems Department at Battelle's Pacific Northwest Laboratory, Richland, Washington. Stanley M. Nealey (center) (PhD, psychology, University of California, 1964) joined the Battelle Human Affairs Research Centers in Seattle, Washington after teaching at the University of Illinois and California State University. His current interests include studies of organizational leadership and societal impacts of the energy crisis. William S. Maynard (bottom) (PhD, industrial-organizational psychology, Colorado State University, 1974) has interest areas that include methods for obtaining public input for environmental and technological decision making and the measurement of environmental and organizational attitudes and perceptions.

A METHOD FOR THE QUANTIFICATION OF AESTHETIC VALUES FOR ENVIRONMENTAL DECISION MAKING

Grant R. Jones
Ilze Jones
Brian A. Gray
Bud Parker
Jon C. Coe
John B. Burnham
Neil M. Geitner

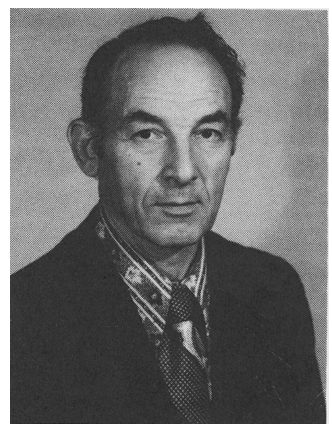



Grant R. Jones (top left) (BA, University of Washington, 1962; MLA, Harvard University, 1966) is a registered landscape architect and partner in the planning/architecture/landscape-architecture firm of Jones and Jones. His interest in visual/aesthetic evaluation dates back to post-graduate research at Harvard University, Landscape Architecture Research Office. Since founding his firm in 1969, he has evolved and applied quantification methods to the evaluation of natural systems and further refined the methods for assessing landscape values for aesthetic protection as well as for recreation at various scales. Ilze Jones (top right) (B. Arch., University of Washington, 1961) is a principal partner of Jones and Jones and responsible for the urban design and architectural research of the firm. Brian A. Gray (upper center left) (BA, Georgia Institute of Technology, 1967; MLA, University of Pennsylvania, 1973) is currently an associate in the firm of Jones and Jones. He joined the firm in 1972 and has contributed significantly to the refinement and adaptation of the quantification of the aesthetic values method and successfully employed it in numerous environmental impact assessments dealing with scenic values. Gray is also co-author of "Measuring the Social Attitudes and Aesthetic and Economic Considerations which Influence Transmission Line Routing" (BNWL-1837, Battelle Pacific Northwest Laboratory). Bud Parker (center right) (BLA, University of California, Berkeley, 1970) was an associate with Jones and Jones from 1971 to 1973, and was primarily involved with early conceptual development of the visual analytical techniques. Jon Charles Coe (lower center left) (BLA, University of California, Berkeley, 1964; MLA, Harvard University, 1966) is an associate in the firm of Jones and Jones and contributed the illustrations for this study. John B. Burnham (bottom right) (MS, metallurgical engineering, Stanford University, 1947), Battelle Pacific Northwest Laboratory, has spent 25 years in nuclear fuel materials research, the development of nuclear fuels and fuel manufacturing processes, and testing methods for quality control in fuels fabrication. His current efforts are directed toward engineering and economic analyses centered on fuel cycle and power cost analyses and studies. Neil M. Geitner (bottom left) (MS, engineering, University of Washington, 1969) was at the University when this work was done. He is currently an environmental engineer with Gilbert Associates, Inc., Reading, Pennsylvania.

A METHODOLOGY FOR EVALUATING COMMUNITY ACCEPTANCE OF POWER PLANTS

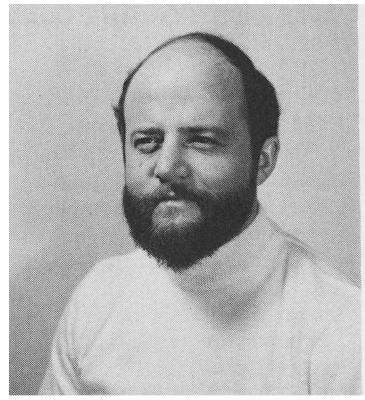
Eugene W. Sucov
Chok Ken Liang



Eugene W. Sucov (PhD, physics, New York University, 1959) is an advisory scientist in the Human Sciences Department at the Westinghouse Research Laboratories. Author of over 25 papers in the fields of applied solid-state and gas-discharge physics, he is presently applying quantitative methods of analysis to applied social science problems. Chok Ken Liang (not pictured) (PhD, sociology, University of Pittsburgh, 1973) is professor of sociology at Hong Kong University. His area of interest is the quantitative study of community conflict and the dynamics of conflict resolution.

THE IMPACT OF ZONING ON THE SITING OF THE SKAGIT NUCLEAR POWER PROJECT

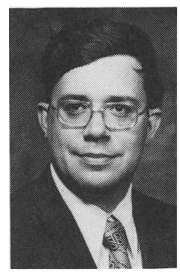
Michael V. Stimac

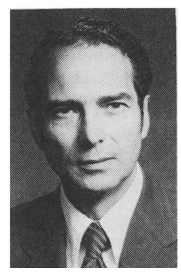


Michael V. Stimac (BS, electrical engineering, University of Washington, 1968) has participated in the U.S. Naval Nuclear Power Program 1968-1972. He joined Puget Sound Power and Light Company in October 1972. He is presently the nuclear licensing engineer with the responsibility for the Environmental Report for the Skagit Nuclear Power Project.

A REGIONAL SITING SURVEY FOR THERMAL PLANTS IN THE STATE OF OHIO

Michael L. Elkins
J. J. DiNunno





Michael L. Elkins (left) (BS, mechanical engineering, Norwich University, 1964; MS, nuclear engineering, University of Maryland, 1969) is currently located in Dunedin, Florida as a staff engineer and as the southeastern area technical representative for the Environmental Safeguards Division of NUS Corporation. Over the past several years, Elkins has served as the project manager for, or actively participated in, six major siting studies. In addition, he collaborated with DiNunno on the development of the NUS siting methodology. Joseph J. DiNunno (BS, electrical engineering, Pennsylvania State University, 1942; MS, electrical engineering, University of Maryland, 1954) has been corporate vice-president and general manager, Environmental Safeguards Division, NUS Corporation, since 1973 and is responsible for environmental engineering and impact assessments of all projects having potentially significant environmental impact. He is a major contributor to existing rules and procedures governing the siting and safety review of nuclear facilities.