exporting harm to the future, without an equal concern for exporting the peculiar benefits of coal and oil.

Since 1964, Donald A. Daavettila has been a teacher of nuclear-power-related courses at Michigan Technological University where he is an associate professor of physics. After receiving his master's degree from Michigan Tech in 1958, through a cooperative thesis program with Argonne National Laboratory, he attended and taught at the International School of Nuclear Science and Engineering at Argonne. Then, following a year as an experimental physicist at the Enrico Fermi Nuclear Plant, he joined the Tech faculty. His interests include environmental effects of power production, radiation measurements, and nuclear waste disposal. Parts of two recent summers were spent with nuclear waste study groups at Battelle's Pacific Northwest Laboratories and Rockwell Hanford Operations as a NORCUS summer faculty appointee.

Iodine-129: Evaluation of Releases from Nuclear Power Generation

Publisher National Council on Radiation Protection and Measurement (1983)

Pages 74

Price $10.00

Reviewer Geoffrey G. Eichholz

Iodine-129 is a long-lived ($T^{1/2} = 1.57 \times 10^7$ yr) radioisotope of iodine produced with a relatively low yield in nuclear fission. As an anion and as an elemental species that is easily assimilated into the food chain, it has received a great deal of attention in assessments of the long-term impact of nuclear power plant effluents and of radioactive waste disposal. This little booklet summarizes concisely what is known about sources of ^{129}I, thyroid exposures from dietary sources, metabolic constraints on ^{129}I organ concentrations, control technology, and measurement techniques. An extensive bibliography, to 1982, rounds off the presentation.

Though the actual doses projected by the various calculational models are quite small, the report draws attention to the major discrepancies in the estimates obtained with some models that are based on assumptions that are considered unrealistic. The report does not deal with dose commitments associated with different waste disposal schemes, but it is evident that ^{129}I would not be expected to be a major contributor to any long-range population dose. The review of measurement methods seems excessively brief, consisting of little more than a literature review.

The overall format and coverage conform with that of other National Council on Radiation Protection reports. The report is a worthy addition to the series and can serve as a ready reference on matters concerning this radioisotope.

Geoffrey G. Eichholz is Regents' Professor of Nuclear Engineering at the Georgia Institute of Technology, which he joined in 1963. He obtained his PhD in physics at the University of Leeds, England, and was awarded the DSc degree in 1979. He has edited the book Radioisotopes Engineering *and is the author of* Environmental Aspects of Nuclear Power *and* Principles of Nuclear Radiation Detection, *both published by Ann Arbor Science Publishers. His research interests include the migration of radioactive wastes, environmental surveillance problems, radiation detector development, industrial radiation applications, nuclear materials technology, and the health physics of nonionizing radiations.*

Computational Methods for Turbulent, Transonic and Viscous Flows

Editor J. A. Essers

Publisher Hemisphere Publishing Corporation (1983)

Pages 360

Price $49.95

Reviewer Efstathios E. Michaelides

This compendium edited by J. A. Essers presents the reader with recent advances in the field of numerical methods for turbulent, transonic, and viscous flows. Apparently, it emanates from a series of lectures the authors gave in 1981 at the Von Karman Institute. There are six review articles in it which present in detail the following topics:

1. "Numerical Methods for Coordinate Generation": The approach to this subject is based on numerical integration of Schwartz-Christoffel transformations and yields simple, accurate, and flexible grids. The technique of grid generation also generates body-fitted coordinates. Examples for grid generation are given for flow past a hexagon, a six-point cross, an airfoil, and a circular cylinder.

2. "Introduction to Multigrid Methods for the Numerical Solution of Boundary Value Problems": This part starts with a short summary of difference schemes and finite element methods. It then proceeds with a full exposition of the linear two-grid and multigrid methods with their modifications, as well as the multigrid method of the second kind. Among the examples given, there is one of the Bernard problem in natural convection and another of the steady-state Navier-Stokes equations.

3. "Higher Level Simulations of Turbulent Flows": This part is a thorough review of advanced turbulence modeling, one of the most comprehensive and informative this reviewer has seen. It is worth acquiring the book for this 90-page part alone. Here large eddy simulation is discussed with subgrid scale models and the numerical methods used in such simulation. Homogeneous flows, free shear flows, and bounded flows are examined. Examples of large eddy simulations are given in meteorological and environmental flows, as well as directions in which this branch of modeling is proceeding. The only drawback of this part is that its author seems to place more emphasis on advances made within his own research group.

4. The fourth part, "Numerical Methods for Two- and Three-Dimensional Recirculating Flows," presents a brief review of the alternatives encountered in the application of

finite difference methods to the subject. Spatial and temporal discretization, implicit and explicit methods, are discussed as well as nonlinearity. Finally, the coupled pressure-velocity system of equations is reviewed and methods to formulate and solve it are presented.

5. "The Computation of Transonic Potential Flow" is the subject of the fifth part of the book and presents the discretization of the potential equation, the iterative algorithms employed, grid generation, and several engineering applications. Viscous flows are discussed here as well as applications of the multigrid method.

6. The last part of the book, "Calculation of Steady Transonic Flow by Euler Equations with Relaxation Methods," basically extends several relaxation methods to solving the Euler equations. This results in a first-order convergence rate and creates the possibility of using this technique in fast algorithms for inviscid transonic flows with rotation.

Overall, the book is very well written by six experts in the field of numerical methods. It appears that it will appeal to scientists and engineers with interest and expertise in the subject. It combines review and new techniques in computational methods; a great deal of the material presented is original and comes with a sufficient number of references. The authors and the editor have done an excellent job in producing a scientific compendium, concise and informative about a field that is rapidly expanding.

Born in Thessaloniki, Greece, Dr. Efstathios E. Michaelides studied at the University of Oxford, England (BA, engineering science and economics, 1977) and at Brown University (MS, 1979, and PhD, 1980, engineering science). Since the summer of 1980, he has held the position of assistant professor at the University of Delaware, Department of Mechanical and Aerospace Engineering. His research interests are multiphase flow, energy conversion, geothermal energy applications, and irreversible thermodynamics. He has contributed about 45 papers to the scientific and technical literature.

Social and Economic Aspects of Radioactive Waste Disposal: Considerations for Institutional Management

Publisher National Academy Press (1984)

Pages 175

Price $14.50

Reviewer Raymond L. Murray

This book is the latest in a series of studies by the National Research Council on radioactive waste management. They began in 1957 with the recommendation on underground disposal in salt. The present study was sponsored by the U.S. Department of Energy. A panel held nine meetings starting in March 1980, received many briefings, and interviewed ~100 individuals.

In order to assess the relevance of the expertise and possible bias, this reviewer ascertained the professional affiliations of the panel members. It was composed almost entirely of university faculty representing social science, sociology, economics, political science, and law, with a sprinkling of hard scientists or engineers. One person strongly supported nuclear power; several were opposed.

The purpose of the study was to identify major socioeconomic aspects of high-level radioactive waste repositories, assuming that such facilities would be used. The panel soon noted that there are two definitions of "socioeconomic," one related only to measurable effects, the other to a broad spectrum of both tangible and intangible effects, including psychological. The group adopted the latter definition.

The panel extended the study to embrace the topics of transportation and temporary storage. It limited itself, however, to spent fuel management, disregarding reprocessing. It also excluded consideration of low-level waste or defense waste, restricted itself to effects over the next 50 yr, and did not address the general subject of nuclear power and its alternatives.

One of the first observations was that there is little available information among the social sciences relative to impact assessment, but the panel concluded that the study could help relieve that deficiency.

In Chap. 1, a set of questions was posed in four categories: Public Response, The Waste Management Network, Site Effects, and Institutional Issues. Of the 36 questions, only half were addressed, at least in part. At this point in reading the book, some readers who are familiar with the larger subject of nuclear energy will be concerned that some important questions have not been asked, such as,

1. What would be the impact on nuclear power production of failure to establish a viable waste management program?

2. What is the relationship between successful implementation of nuclear power and the social and economic welfare of the public?

Without the perspective provided by answers to these questions, the study may be seen to lack credibility and usefulness to the extent hoped by the panel.

The rest of Chap. 1 lists the 19 major findings, kindly provided at the beginning by the authors. Many of the observations are well known to the nuclear community: that support by the public for nuclear power has declined, in part because of the assumed association with nuclear weapons, in part because of fears about health and safety; that the level of knowledge on the part of laymen is very low and should be improved; that mistrust of government is common; and that public participation in decisionmaking about sites is vital.

Other findings are less obvious. One is that the transportation of spent fuel and/or wastes will apparently involve a very large flow of trucks and rail cars through a large portion of the United States. This conclusion was drawn from a comprehensive study for the panel done by Oak Ridge National Laboratory. The panel notes that a great deal of research is still needed on socioeconomic aspects of this above-ground part of the picture.

The panel states that there is much yet to be done on a programmatic basis related to participation by the public in determining socioeconomic effects and mitigating them,