

BOOK REVIEWS

Selection of books for review is based on the editor's opinions regarding possible reader interest and on the availability of the book to the editor. Occasional selections may include books on topics somewhat peripheral to the subject matter ordinarily considered acceptable.



Modern Formulas for Statics and Dynamics

Authors Walter D. Pilkey and Pin Yu Chang
Publisher McGraw-Hill Book Company (1978)
Pages 418
Price \$18.50
Reviewer Allan J. Malvick

This book is an excellent reference for the structural engineer who must design or analyze complex bars, beams, shafts, cylinders, plates, and spherical shells. The authors correctly state that the book begins where the simple stress and strain formula books leave off and attempts to fill the gap between handbook formulas and general-purpose computer programs. While no derivations of formulas are provided, references are comprehensively supplied.

The authors' style is clear and forthright, but this will be apparent only to experienced structural analysts. This book furnishes additional proof that the linear theory of structures and solids is both simple in concept and exceedingly complex in mathematical description of solutions. Indeed, the collection of formulas and tables in this book can only be described as colossal.

The authors state that a background in elementary mechanics of solids is necessary to use the book. In the reviewer's opinion, at least a recently acquired master's degree with an emphasis in solid mechanics and dynamics is also required. This is not a criticism of the book, but rather an acknowledgment of the difficulty and complexity of the subject. Unless the user has extensive training and experience, and understands the underlying theory, he is running a grave risk of misusing the formulas and arriving at irrelevant or disastrous results.

The authors also state that all computations required by the methods of this book can be completed within two minutes by a computer and within two hours by hand calculation. In the reviewer's opinion, this is true only if the user is thoroughly familiar with the notation, analysis, and background theory, and only if the computer program to

be used is present on the computer and is producing valid output. Otherwise the user can expect to spend days or even weeks getting familiar with the topic, writing or procuring the computer program, and installing and supplying input data to the program.

The authors claim thorough verification of formulas, text, and example problems. While the reviewer in his relatively brief study of the book did not observe any errors, he would advise the user to check any formulas he intends to use, or at least obtain independent verification. Nevertheless, this book will be invaluable to the structural analyst or to anyone who desires a ready reference to the subject of mechanics of solids.

Allan J. Malvick (BS, civil engineering, and ScD, engineering science, The University of Notre Dame) is a registered professional engineer, and is presently professor of civil engineering and engineering mechanics at the University of Arizona in Tucson. Dr. Malvick has written several papers in the fields of stability and elasticity of astronomical mirrors.

Storage of Spent Fuel Elements

(Proceedings of the Nuclear Energy Agency Seminar, Madrid, June 1978)

Publisher Organization for Economic Cooperation and Development Publications Center (1978)
Pages 348
Price \$15.00 (soft cover)
Reviewer Anthony Foderaro

This book is the written record of a seminar sponsored by the Organization for Economic Cooperation and Development (OECD) in June 1978, a little over a year after President Carter had announced that the U.S. would indefinitely

defer civilian nuclear fuel reprocessing. The participants in this seminar, from 17 countries and 3 international bodies, met to exchange past experiences and to consider future methods for the short-, intermediate-, and long-term storage of spent fuel elements.

Twenty-one papers were presented in four technical sessions. Most of the papers were followed by brief but valuable discussion periods in which the authors answered questions from the audience. A fifth session consisted of summaries of the four technical sessions followed by informative and sometimes lively panel discussions.

The papers and the country or international organization of origin are as follows: "Spent Fuel Storage—Philosophies and Experience," Germany; "Spent Fuel Storage—The Magnitude of the Problem," OECD; "U.S. Spent Fuel Policy—A Status Report," U.S.; "Prospects of Spent Fuel Management in Spain," Spain; "NRC Analysis of the Environmental Impacts and Licensing Policies for Expanded Spent Fuel Storage in the United States," U.S.; "The U.S. Department of Energy Program to Support the Design and Licensing of a Spent Fuel Storage Basin," U.S.; "An International View of Spent Fuel Storage as One Aspect of Fuel Cycle Safety," OECD; "La Surete des Installations Francaises de Stockage des Elements Combustibles Irradies de la Filiere à Eau Legere," France; "Study on Separate Spent Fuel Storage Facility," Finland and Sweden; "A Central Spent Fuel Storage in Sweden," Sweden; "Safety Aspects on the Design of a Swedish Spent Fuel Storage Facility," Sweden; "Evaluation of the Problems Associated with ENEL's Irradiated Fuel Management," Italy; "Cost and Implications of a Middle-Term Program for Storage of Spent Fuel in a Nuclear Power Station (BWR)," Spain; "Comparison of Concepts for Independent Spent Fuel Storage Facilities," Austria; "Expansion of Capacity of Spent Fuel Pools and Associated Problems," Spain; "Design Bases for U.S. Department of Energy Storage Basin," U.S.; "Behaviour of Spent LWR Fuel Assemblies," Germany; "Impacts of Reactor-Induced Defects on Spent Fuel Storage," U.S.; "Normal and Compact Spent Fuel Storage in Light Water Reactor Power Plants," Germany; "The Encapsulation of Magnox Type Fuel Elements for Extended Storage in Cooling Ponds," United Kingdom; and "Neutron Analysis of Spent Fuel Pools," Spain.

The papers, 20 in English, 1 in French, are almost uniformly clear and concise, well written and well illustrated. Together they constitute an excellent introduction to almost all aspects of spent fuel storage: experience with stored fuel for two decades, magnitudes of future storage requirements in the U.S. and in Europe, philosophies of various governments, safety and environmental aspects, licensing of facilities, designs of at-reactor pools and away-from-reactor pools and dry-storage facilities, specific technical problems such as criticality, temperature, and radioisotope-release limitations, and estimated costs of at-reactor storage and away-from-reactor wet and dry storage.

Anthony Foderaro (PhD, physics, University of Pittsburgh) is professor of nuclear engineering at the Pennsylvania State University. He has just completed his twenty-fifth year in the nuclear power field with experience in industrial research and design followed by teaching, academic research, and consulting. He is the author of two books and co-author of three more.

Energy Dictionary

<i>Author</i>	Daniel Hunt
<i>Publisher</i>	Van Nostrand Reinhold Ltd. (1979).
<i>Pages</i>	518
<i>Price</i>	\$22.50
<i>Reviewer</i>	James G. McCray

The *Energy Dictionary* was compiled and written with the concept of collecting all of the important terms associated with the educational disciplines involving all aspects of energy and energy systems. In addition to the more than 4000 definitions and 320 charts and figures, there is a short preface entitled "Energy Overview," which strongly reflects the current administration's concepts of a comprehensive and effective national energy plan.

In that many of the definitions are specific to a particular discipline or may have different definitions in different disciplines, I believe the dictionary would be more effective if it had been organized into separate sections by energy categories, as was done in the bibliography.

The major value of this book is that of a quick reference for non-technical people working in the general energy area or technical people not working in their area of expertise.

James G. McCray, acting director of the Nuclear Fuel Cycle Research Program at the University of Arizona, is a retired U.S. Army officer who has had a great variety of engineering experience including civil, electrical, mechanical, and nuclear. He has spent the last seven years working with nuclear engineering problems and currently is involved in both high- and low-level nuclear waste management research.

Advances in Nuclear Physics

<i>Editors</i>	J. W. Negele and Erich Vogt
<i>Publisher</i>	Plenum Press (1979)
<i>Pages</i>	420
<i>Price</i>	\$37.50
<i>Reviewer</i>	D. A. Bromley

This volume is the eleventh in a now classic series on advances in nuclear physics; the series was originally edited by Michel Baranger and Erich Vogt; in recent years John Negele has replaced Baranger.

The volumes typically contain five or six definitive review articles on some topic in modern nuclear physics prepared by internationally recognized experts in the field. As such, the series represents one of the most useful reference sources for the kind of review that is essential not only for those working in the specific fields covered, but