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.

Power Condenser Heat Transfer Technology (Computer Modeling, Design, Fouling)

Authors P. J. Marto and R. H. Nunn

Publisher Hemisphere Publishing Corporation, Washington, DC (1981)

Pages 490

Price $47.50

Reviewer Clyde C. Richard

In 1980 the Naval Postgraduate School in Monterey, California, hosted a workshop entitled "Modern Developments in Marine Condensers." The workshop was well attended by individuals from government, universities, and industry, from the United States and abroad, who have had active involvement in the advancement of the technologies related to marine surface condensers. Topical areas included in this workshop were: computer modeling, the effects of noncondensable gases, vapor shear and condensate inundation, enhancement, and fouling. Each topic was treated by a keynote paper followed by prepared discussions and an open discussion. A final panel discussion summarized important findings in power condenser heat transfer technology.

"Modern Developments in Marine Condensers" is a compilation of the papers, discussions, and findings of this meeting. The papers prepared for this meeting and presented in this text summarize the latest developments in marine condenser heat transfer technology. Beginning with a discussion of computational methods for designing land- and sea-based steam condensers for power plants, the reader is informed both quantitatively and qualitatively of recent developments aimed at improving condenser performance. The papers compiled in this text do an excellent job in presenting both governing heat transfer equations and graphical solutions for the various parameters that affect condenser design. The relationship among such variables as noncondensable gases, venting, deaeration, vapor shear and condensate inundation, and their effects on condenser performance and sizing are thoroughly discussed by the numerous presenters.

Further papers treat the newer technology of using enhanced surfaces to improve both external and internal heat transfer. The potential of using these surfaces to reduce both the size and weight of shipboard condensers has recently been realized. This text gives an excellent summary of the most recent research in this area and outlines the potential that exists for using such surfaces.

The last section of the text treats fouling of heat transfer surfaces as it relates to condenser design and performance. With today's interest in using new materials such as titanium in condenser design as well as the inability in some cases to use chlorination for condenser cleaning due to environmental limitations, fouling is an important subject for the engineer to understand. This text does justice to this area of study.

Overall this book does an excellent job in updating the reader with the newest developments in marine condenser heat transfer technology. By reading the papers as well as the comments and discussions, an engineer working in this technology is able to quickly review the most important aspects of condenser design and performance. By further study of this text, he is able to utilize the various quantitative information in his daily work. Further use can be made of the many excellent references presented by the various authors who contributed to this text. These references cover nearly every aspect of condenser work from design to operating problems.

Dr. Clyde C. Richard received his bachelor and master degrees in mechanical engineering from Rensselaer Polytechnic Institute, and his PhD in mechanical engineering from the University of Connecticut. He has been involved in power plant condenser work for over 15 years, having been employed by a major U.S. utility company, acted as a consultant to a utility on their condenser problems, and performed research studies on condenser waterbox hydraulics. Presently he is an associate professor at the U.S. Naval Academy and is involved in research studies to quantify the weight and volume reduction of a marine power plant condenser that uses enhanced tubes in a vertical orientation.

Neutron Radiography Handbook

Editors P. Von Der Hardt and H. Rottger

Publisher D. Reidel Publishing Company Hingham, Massachusetts (1981)

Pages 170

Price $26.00

Reviewer Gerald A. Schlapper

This handbook was prepared by the Euratom Working Group on Neutron Radiography. The book is written so

that it may be used by clients of neutron radiography services, design engineers, and practicing radiographers. Since this is a publication of the Commission of European Communities, information on available facilities and expertise is obviously oriented to the European community. However, as will be discussed, it will serve as a basic reference for anyone interested in the application of neutrons for nondestructive evaluation of materials.

The first chapter provides an introduction to the principles and applications of neutron radiography. The introductory material is primarily oriented toward possible clients of neutron radiography services. Discussions are included of the advantages and disadvantages of neutron and x-ray radiography, neutron sources that can be employed for radiography, types of film and converters for direct and indirect image production, techniques of energy tailoring to increase sensitivity, and test objects that can be employed to determine image quality.

Following the initial material, more detailed information is presented to aid the designer in constructing or analyzing a facility for radiographic evaluation of materials. This section of the text contains a wealth of tabular data on converter foils and their characteristics, collimator design, and choice of the neutron source. The third section of this chapter briefly surveys applications of neutron radiography and includes references that list in detail all current areas of application. Illustrative radiographs are included in this presentation. The introductory chapter concludes with a series of appendixes that, in addition to a reference listing, discuss terminology employed in radiography, provide thermal neutron cross-section data of elements and common materials, and supply equations for the calculation of irradiation and transfer times and void resolution capabilities. The introductory chapter is 90 pages in length, more than one-half of the pages in the handbook, and provides users of neutron radiography with a working knowledge of the basics of this technique of nondestructive testing.

The second chapter describes in detail recommended practices for neutron radiography of nuclear fuel assemblies, a major application area for neutron radiographic techniques. Preferred practices are cited based on data supplied by experienced radiographers. The chapter is very detailed to include, as acknowledged clearly by the authors, American Society for Testing Materials (ASTM) practices. This chapter includes information to be specified on a purchase order for radiography services, information to be logged by the radiography technician, use of image quality indicators, and recommended techniques for startup, marking, and specimen identification. Again, this information is of use to a possible client, design engineer, or practicing radiographer.

Chapter 3 of the handbook discusses indicators (proposed by the Neutron Radiography Working Group) for the testing of beam purity, sensitivity, and dimensional accuracy. The authors state that the indicators used are in agreement with existing ASTM standards or with revisions of these standards that are currently under review. The material discussed in this chapter provides the reader with a background in the technique for quantitative and qualitative assessment of neutron radiography test results.

Chapter 4 contains an abbreviated photographic atlas of defects revealed by neutron radiography in light water reactor fuel. Twenty radiographs of "typical" defects are supplied. References are provided for the reader who finds it necessary to review a more complete series. Following the fourth chapter, tabular data are provided to document neutron radiography installations in the European community. Techniques of exposure and modes of qualitative and quantitative analysis are outlined. These tables are followed by 26 diagrams of the neutron radiography facilities utilized by this group. Individuals outside the European community may find these data to be of reference use since it supplies data on those facilities with unique capabilities that are not duplicated outside the community.

In summary, this handbook will serve as a valuable reference for those individuals using or considering use of neutron radiography as a method of nondestructive testing. Symbols and terminology unique to this process are clearly defined. Numerous illustrations, tables, and figures enhance data presented in the text. There are only a limited number of typographical errors although the publisher has chosen to vary the size of type at what appear to be random locations throughout the text. This variation in type size is obvious, a minor irritant to the reader.

While on the staff of the University of Missouri Research Reactor Facility, Dr. Schlapper was involved in the design of experimental facilities dedicated to nondestructive evaluation of materials. With coworkers he has published several articles on the use of tailored energy neutron beams to produce tomographic images of biological and material specimens. Since January 1981, Dr. Schlapper has served as a faculty member of the Nuclear Engineering Department and Radiological and Health Engineering Program at Texas A&M University.

Hormesis with Ionizing Radiation

Author	T. D. Luckey
Publisher	CRC Press, Incorporated Boca Raton, Florida (1980)
Pages	225
Price	$66.00 domestic; $76.00 foreign
Reviewer	Gerald A. Schlapper

Is it possible that anything that is quite harmful in excess may be of no harm or indeed may even be of benefit at low doses? This is the question posed by Dr. T. D. Luckey in his book, *Hormesis with Ionizing Radiation*. This text examines data on effects of low doses of ionizing radiation and answers the question posed in the affirmative. Such a view will no doubt provoke controversy with acceptance from the "pronuke power" contingent while the "anti" coalition will probably reject the views expressed with only limited review of the data presented.

To read (and, to a greater extent, review) this publication does present a problem, for I admit that a claim of bias due to professional background could be made. A true attempt was made to limit bias, and hopefully I have been more successful than many of the anti group who claim to review data from the nuclear industry from an "independent" viewpoint. This publication cannot be