

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.



Nuclear Energy Technology: Theory and Practice of Commercial Nuclear Power

Author Ronald Allen Knief
Publisher Hemisphere Publishing Corporation, New York (1981)
Pages 605
Price \$27.95
Reviewer John C. Courtney

Dr. Knief's first textbook is an excellent presentation of the current technology of nuclear energy. His writing is clear and crisp, and tables and figures have been carefully selected to illustrate the general and specific points of knowledge. The level of detail is appropriate for an introductory text, and the topical coverage and sequence of development are logical. The practical orientation makes *Nuclear Energy Technology* useful for people outside the nuclear community who need an overview of fission power. Dr. Knief's extensive reference lists and bibliography are valuable leads for those who wish to pursue a subject in more depth.

The level of presentation is appropriate for undergraduates in engineering and the sciences. Because of the broad coverage, it would be easy for an instructor to select specific topics on which to concentrate. The text is flexible enough to be used in several types of courses. If additional quantitative material were used to supplement the text, it could be used for graduate level courses for nonnuclear majors. My only complaint about the book, and a minor one at that, is the lack of numerical examples and challenging problems.

The first chapter gives an overview of the basic concepts of reactors and the nuclear fuel cycle. Appendix III treats the need for fission power in the United States; Chap. 1 and Appendix III could be used together as an introductory short course on nuclear energy directed at nontechnical people.

Chapters 2 through 7 cover the basics of nuclear physics, reactor theory, and heat removal. Design descriptions of domestic and foreign reactor systems, covered in Chaps. 11 through 15, illustrate how these basic concepts are implemented. Appendix IV is a concise tabulation of the characteristics of seven types of power reactors. Economics and current concerns at the front and back ends of the fuel cycle are outlined in Chaps. 8, 9, and 10.

A strong point in this text is the treatment of reactor

safety and safeguards in Chaps. 16 through 20. An entire chapter is devoted to a description of the March 1979 accident at Three Mile Island, Unit 2. Events that led to the incident and the consequences, political and technical, are clearly explained. A highlight of the text is the chapter on nuclear safeguards. Dr. Knief's interest in this topic is apparent from the detailed treatment of the various aspects of this complex subject.

The last chapter is a brief overview of the basic concepts of nuclear fusion. Both magnetic and inertial confinement techniques are clearly outlined. Some of the problems of engineering a practical fusion system are covered realistically.

In summary, *Nuclear Energy Technology* is an exceptionally well-written, up-to-date text that is suitable for undergraduate instruction or for self-study. The coverage may lack depth in some areas, but the breadth and variety of topics overcome this disadvantage so that an interested reader could pursue specific areas of interest.

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Borehole and Shaft Plugging

(Proceedings of a Workshop by the Organization for Economic Cooperation and Development's Nuclear Energy Agency and the U.S. Department of Energy held in Columbus, Ohio, May 7-9 1981)

Publisher Organization for Economic Cooperation and Development, 2, rue André-Pascal, 75775 Paris-Cedex 16, France
Pages 434
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Reviewer Jaak J. K. Daemen