expected, the content and style of the book reflect the European vantage points of the authors and editors.

The book is divided into six chapters. The first five chapters are devoted to direct radiation damage effects in fissile materials. Chapter 6 is devoted to the secondary effect of swelling.

Chapter 1 is a refreshing "Reminder of the Generalities" concerning fuel burnup, energy release and partition in fission, energy dissipation, and displacement cascades. Chapters 2 and 3, constituting the main thrust of the book, cover radiation damage to α-uranium. Chapter 2 is devoted to radiation effects at high burnup, i.e., under conditions of point-defect saturation. Chapter 3 covers initial stages of radiation damage, i.e., those effects having to do with point defects. Discussed in both Chaps. 2 and 3 is the recently discovered decrease in the rate of instantaneous radiation-induced growth with increase in burnup. Chapter 4 is a very brief discussion of fission damage in uranium compounds, including the carbide and various oxides. Chapter 5 is devoted to a discussion of self-irradiation in plutonium and the absence of satisfactory explanations for the observed effects. Chapter 6, entitled "Some By-Products of Irradiation in Fissile Materials," constitutes the secondary thrust of the book. It covers the effects of the presence of fission products on the physical properties of fuels; this chapter also contains a particularly thorough discussion of the transport of gaseous fission products in fuels.

The quality of the printing and of the presentation of the figures and the many plates is excellent. The same cannot be said for the writing style and mechanics. Early chapters of the book are marred by distracting errors and jarring idioms. Either the authors (editors and proofreaders) improved or the reviewer became more tolerant, for the final chapters of the book seemed to be much more easily read.

Three-fourths of the literature citations are for materials published in 1968 or earlier. One-fourth of the literature cited is in report form (mostly reports of French institutions) or in the categories "private communication" and "to be published." There are some instances of ambiguous citations.

Study of this book would benefit those persons seeking an understanding of basic knowledge, theoretical and experimental, on the subject of radiation damage to uranium metal. The authors give only very brief attention to plutonium and to alloys and oxides of uranium and plutonium. The book will have little influence on nuclear reactor fuel fabrication or management. That is not the purpose of the book, for, in the words of the authors, the purpose is ". . . focusing our blurred image of radiation damage in fissile materials, with the hope that it will initiate some new experiments in order to improve our knowledge on this topic."

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Nuclear Power Plant Systems and Equipment

Author	Kenneth C. Lish
Publisher	Industrial Press, Inc.
Pages	183
Price	$17.50
Reviewer	C. K. Anderson

Almost exclusively the industrial and academic development of nuclear power plants has focused on the reactor core and the primary system. While this attention has resulted in a significant number of important improvements in these areas, the so-called balance-of-plant, which encompasses 60 to 70% of the total cost of a nuclear power plant, has remained relatively constant. Perhaps there is no potential for further improvement in the design of secondary systems, but I rather doubt it. Instead, the problem may be more attributable to the lack of understanding of the unique problems associated with nuclear power plant systems and to the wide gap in the industry-wide attention to these problems.

Unfortunately, Kenneth C. Lish's book, *Nuclear Power Plant Systems and Equipment*, spans only a very small part of this gap. On the positive side, Mr. Lish's book adequately presents the atmosphere in which the plant designer must function. The attention to AEC jurisdictions and organizations and to the many code regulations and criteria are particularly noteworthy and should benefit a novice designer.

Basically, however, the book is a compendium of partially organized facts which only infrequently give the reader any insight into the basis for the design or the reasons why something is done as it is. For this reason, the book will not be very useful for motivating design improvements. For the same reason, the long-term usefulness of this book will wane as the facts change—some of which has already occurred with the advent of the BWR/6 and with practical design experience with the HTGR. Essentially, this book is a two-year-old "material list" of power plant equipment which will satisfy the needs of neither the industry nor many of its members.

The style of the book amplifies the above conclusions. The very superficial treatment of nuclear history and reactor design concepts contained in the first four chapters tends to bore readers having nuclear experience and offers no real help to non-nuclear personnel. The organizational choppiness and the heavy technical jargon do not encourage the reader to continue. The occasional error, as in the reference to Fig. 6-1 (p. 25) which does not exist, or the over simplified statements, such as "fast neutrons have to be moderated or slowed down into thermal neutrons to participate in the fissioning process" (p. 2), only serve to detract further from the usefulness of this book.

Practically speaking, however, *Nuclear Power Plant Systems and Equipment* will probably sell by virtue of its title alone because there is a clear need for reference sources on this subject. My own approach to this book was quite enthusiastic, but it was not until Chap. 5 that my initial enthusiasm was even vaguely justified.

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ogy, 1969), a principal engineer in the Proposal Engineering Department of Combustion Engineering, Inc., is responsible for proposal development, economic analysis, and engineering development of commercially viable fuel management and reactor design concepts. Mr. Anderson is a member of the American Nuclear Society and the author of several publications covering a range of reactor-related subjects.

The Practitioner's Shell Model

Author	George F. Bertsch
Publisher	American Elsevier Publishing Company, Inc. (1972)
Pages	206
Price	$11.95
Reviewer	Atam P. Arya

The monograph *The Practitioner's Shell Model* by George F. Bertsch is well-written, precise, and to the point. It is customary for the author to mention in the Preface the level of the material contained in the book, the recommended use of the book, and the readers to whom it is addressed. Although the author has mentioned that the monograph grew out of lectures at Michigan State University, the type of audience is not indicated.

To some extent, the title of the monograph is misleading. The emphasis is on shell model, but the topics treated are many and varied. The numerous references to the original work provided throughout the monograph are useful in expanding its scope.

According to this reviewer, the monograph may be used by theoretical nuclear physicists, high energy physicists, and interested theoreticians outside physics. The monograph can also be very useful to those students who are entering fields of theoretical research. However, to fully benefit from this monograph, the student must have a sound theoretical preparation in atomic and nuclear physics beyond the first-year graduate level.

The mathematical expansions and the physical explanations seem to be cut short throughout the monograph, but this might have been necessary in order to fit all the topics in two hundred pages. In many places the author has not defined the terminology and symbols used.

In short, reading this monograph is smooth provided the reader is already familiar with the material. It can prove useful to all those who will be involved in advanced applications and use of the shell model in any basic research situation.

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