

BOOK REVIEWS

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



THE ESSENCE OF SAFETY

Title The Technology of Nuclear Reactor Safety, Vol. 1, Reactor Physics and Control

Editors T. J. Thompson and J. G. Beckerley

Publisher The M I T Press, 1964

Pages xii + 743

Price \$25.00

Reviewer Paul F. Gast

According to the editors, "The primary purpose of these volumes is to collect in one place in an organized fashion the essence of the safety information concerning reactor technology. . .". The first volume of this essence runs to some 700 double-column pages of smaller than average type. The second volume, not yet issued, will be subtitled *Reactor Materials and Engineering*, and will presumably be of comparable length. Two of the 11 chapters in the first volume were prepared by the editors while the remaining nine were written by other well-known experts. These include: "The Reactor Core" by J. R. Dietrich, "General Reactor Dynamics" by E. P. Gyftopoulos, "The Doppler Coefficient" by L. W. Nordheim, "Criticality" by H. C. Paxton and G. R. Keeping, "Sensing and Control Instrumentation" by A. Pearson and C. G. Lennox, "Mathematical Models of Fast Transients" by W. E. Nyer, "Water Reactor Kinetics" by J. A. Thie, "Kinetics of Solid-Moderator Reactors" by H. B. Stewart and M. H. Merrill, and "Fast Reactor Kinetics" by W. J. McCarthy, Jr. and D. Okrent. An introductory chapter and one on "Accidents and Destructive Tests" by the editors round out the volume.

As the reader no doubt already suspects, review of such a book by a single reviewer can at best be inadequate. The impulse to tell some funny stories and go home was thwarted by the fact that none seem to have been invented about reactor dynamics or the Doppler coefficient, not even any unsuitable for publication. (All refutations of this statement should be forwarded directly to the reviewer.)

The value of the book to an individual will depend strongly on the importance that he attaches to having the material in one place, since much of it has already appeared elsewhere. Still, the book is considerably more than a collection of individual review papers. Efforts by the editors to organize the volume so as to cover the field without large gaps or needless duplication have been suc-

cessful. Although there is cross referencing between the chapters, each has been maintained self-sufficient to the degree that it can be intelligibly read separately. Points that the reader may find obscure are more likely to be cleared up in one of the bibliographical references than in some other portion of the book.

The individual chapters are on the whole well written. Anyone with a modest amount of background in reactor physics who is approaching for the first time one of the subjects covered, or who is seeking a "refresher", would find the appropriate chapter a good starting point. The extensive reference lists are a handy guide for beginning a deeper dig, if one is so inclined. Another useful feature is the "cut-off date" given for each chapter, which clearly indicates where, or should it be when, the search of the literature for more recent developments should begin. However, the chapter on "The Reactor Core" is an exception; it is intended to be introductory to the remainder of the book rather than to the subject of core design per se.

This reviewer must confess failure as a tiger (cf. *Nuclear Applications* 1, No. 2, 185, (1965)). The closest he can come is to point out that, as a matter of historical fact, foreign or misplaced objects have been a much more frequent cause of local coolant obstruction than has the "plugging—by crud deposits" given as a representative cause on pages 24 and 36.

The book has at least the normal frequency of typos, some of which are hidden in the mathematical expressions where they could trap the inexperienced or unwary. Among the nonmathematical kind, the misplacement of a set of lines at a crucial point in the reconstruction of the SL-1 accident somewhat spoils the punch of that particular paragraph.

It is unlikely that more than a few individuals will have a deep interest in all of the subjects covered in this book or even in a substantial fraction of them. This, together with its price, makes it a library reference work rather than one to be added to the personal collection of the usual reactor physicist or engineer.

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