Kentucky where he has been since 1966. He teaches courses across the spectrum of the thermal sciences and has published more than 60 papers on heat transfer in plasma systems, heat transfer in frost layers, and thermophysical property measurement.

Computational Methods in Reactor Shielding

Author	James Wood
Publisher	Pergamon Press, Inc., Elmsford, New York (1982)
Pages	441
Price	$19.50
Reviewer	Nicholas Tsoulfanidis

This book would be very useful to practicing nuclear engineers, especially those involved in "small" shielding problems like designing the shield for a spent fuel assembly or any other portable radioactive source. The book would not be terribly useful to those who want to learn how to design a complete shield for a nuclear reactor. For educational purposes, *Computational Methods in Reactor Shielding* could be used for an undergraduate course and as a supplement to a course for graduate students.

I enjoyed reading the first five chapters. I loved the way the author presents concepts, definitions, and quantities of interest. After a brief introduction describing the structure of the book, the author discusses, in Chap. 2, "Radiation Quantities and Units." The SI units are given in an Appendix only, a surprising omission, since for quite a few years the SI units have been in use along with the rads and rems. The gamma-ray flux-to-dose rate conversion curve is given without a proper reference and it does not coincide with the ANSI/ANS-1977 standard.

"Radiation Sources" are described in Chap. 3 in an excellent form except for Table 3.3, which contains many numbers impossible to read (unfortunately this defect, which is due to the publisher and not the author, is present again in Tables 6.1 and 6.2). In Chap. 4, the "Attenuation of Gamma Rays" is discussed lucidly and succinctly. The concept of the buildup factor is presented very well and a computer program is provided for the calculation of a buildup factor for multilayer shields.

The "Applications of the Point Kernel Technique" make up Chap. 5. All the geometries encountered in practice are included, and the program CASK is supplied for the use of the reader. Many exercises based on CASK are included, exercises which make excellent educational tools if the book is used for instruction.

In contrast to the first five chapters which are excellent, in my opinion, the last two dealing with "Neutron Attenuation" and "Transport Theory Methods" are somewhat disappointing. There is a disparity here, in the following sense: The first five chapters deal with point isotopic sources in simple geometries for which the point kernel techniques apply, especially for photons. For neutrons, however, the same techniques have only limited value and one needs to perform transport calculations. Chapter 7, titled "Transport Theory Methods," would be expected to provide what it claims, but it does not. It discusses the Monte Carlo method in great detail, which is fine. Then, it presents the moments method, which was developed mainly for gammas and has found very limited use in the last 10 yr, perhaps longer. The discrete ordinates method, the main method widely used for both neutrons and gammas (along with Monte Carlo), is missing. This is a major defect in an otherwise very good book.

Computational Methods in Reactor Shielding will make a fine addition to a practicing nuclear engineer's library. The only other similar book available is Schaeffer's *Reactor Shielding for Nuclear Engineers*. Having seen both, I side with Mr. Wood's work.

Nicholas Tsoulfanidis is professor and chairman of the Nuclear Engineering Department at the University of Missouri-Rolla. His undergraduate training in physics was at the University of Athens, Greece followed by graduate studies in nuclear engineering at the University of Illinois. Dr. Tsoulfanidis' research areas are radiation transport and nuclear fuel cycle. He is the author of a book, Measurement and Detection of Radiation, *published in 1982, and of many technical papers.*