at the US Military Academy. Author of some 30 technical papers on reactor kinetics, reactor noise, neutron wave propagation, and nuclear engineering education and Editor of Noise Analysis in Nuclear Systems, *he received the 1962 ASEE (Southeastern Section) Award for the best technical paper. He holds several important posts in the ANS and in other professional societies. His BS degree in mechanical engineering was received with honors from the University of Illinois in 1948; his MS and PhD degrees in theoretical and applied mechanics were received from Iowa State University in 1950 and 1954.*

AN EXCELLENT STARTING POINT

Title Thermal Stress Techniques in the Nuclear Industry

Authors The Franklin Institute Research Laboratories; Z. Zudans, T. C. Yen, W. H. Steigelmann

Publisher American Elsevier Publishing Co., Inc. (1965)

Pages XXII + 583

Price $20.00

Reviewer Raymond J. Parsick

The authors rightly use the word "techniques" in the title of their book. It is an excellent summary of technical methods and tools for determining temperature distributions in components and resulting stresses. From several fields, the authors have assembled basic theories pertinent to thermal stress problems, and they present the digested material with admirable lucidity. Numerical examples amply illustrate applications of the theories. In addition, a considerable amount of quantitative information pertinent to specific problems is scattered throughout the book.

The authors begin with a rather superficial, but adequate, description of nuclear power plants, which is apparently intended for those not involved in reactor design.

Chapter 2 deals with determination of temperature distributions. Of necessity, emphasis is on techniques rather than published solutions by other authors. Some generalized solutions for temperature distributions in simple geometries is presented in this chapter, mostly in graphical form. Unfortunately, the graphs cause considerable eyestrain and numerical information is often difficult to extract. Fortunately, titles for many graphs contain a reference to their source, although the referenced source is not always the best place to obtain information. For example, the authors present some charts for central temperature change in semi-infinite bodies subjected to a step or ramp change in surface temperature. The references in the figure titles would send the reader to Carlson and Jaeger, *Conduction of Heat in Solids*, or to Schneider, *Conduction Heat Transfer*, excellent books for many purposes. However, National Bureau of Standards Monograph 2 presents the same information in 19 pages of tables which permit easy determination of not only temperature but also thermal stress distributions. Therefore, this chapter lacks clear quantitative information about known solutions for simple geometries but excels in presenting the approach and tools for more difficult problems.

With a similar emphasis, Chapters 3 and 4 deal with the techniques for determining elastic and plastic stresses and Chapters 5 and 6 discuss applications to plant components. The authors have done more than compile proven techniques for analyzing creep, thermal fatigue, axisymmetrical structures, and design considerations of reactor components. They have also added original material to fill several gaps in the literature. They provide procedures for analyzing arbitrarily shaped rings, axisymmetric redundant structures, and plates connected by elastic elements supported on an elastic foundation.

As a consequence of the emphasis on techniques, an engineer looking for a ready answer to a simple problem will have difficulty finding it in this book. However, an engineer entering the nuclear field who faces a new problem in thermal stress analysis will find this book an excellent starting point for the problem's solution.

Raymond J. Parsick worked at Bettis Atomic Power Laboratory on the thermal, hydraulic, and mechanical design of the nuclear reactors for the aircraft carrier Enterprise and the cruiser Longbeach, from conceptual design through the sea trials. Since 1962 he has worked at Brookhaven National Laboratory on the development of the Settled Bed Fast Reactor concept. His BS is from Carnegie Institute of Technology.

PURSUED BY OBSOLESCENCE

Title Beryllium - Its Metallurgy and Properties

Editor Henry H. Hausner

Publisher University of California Press, 1965

Pages 322

Price $9.00

Reviewer Norman P. Pinto

The development of beryllium technology proceeds at a relatively rapid rate, and broad surveys are periodically welcome to both user and producer. This volume provides a review of products and properties capably presented by contributors active in the field. Chapters on extraction and metallurgical fundamentals are generally reviews of prior work, but material on sheet rolling, forging, and casting is new and useful. Important data on product uniformity and reliability are presented and signal beryllium's coming of age.