maintenance. His research fields are in computer-aided design and optimization, mass transfer, and process control.

Dr. Rehm's industrial experience has been in process development and equipment design with Universal Oil Products, Chevron Research, and the Monsanto Company. He is a current or former member/chairman of three national committees of the American Institute of Chemical Engineers.

High Pressure Measurement Techniques

Editor G. N. Peggs

Publisher Applied Science Publishers, London (1983)

Pages 404

Price $81.50

Reviewer Thomas R. Rehm

This reference book on the principles and devices used in the measurement, generation, and application of high and ultra-high pressures consists of nine chapters, each written by an expert in the field of high-pressure measurement. The thoroughness and understandability of each of these chapters are excellent. Chapters 1 and 2 cover in a clear and precise way the fundamentals of measurement techniques at steady pressures and at ultra-high dynamic pressures. Historical and current methods are presented with advantages and disadvantages discussed for both situations.

Chapters 3 and 4 explain secondary methods for high-pressure measurement from the standpoint of fixed reference points and from the standpoint of detailed descriptions of the actual apparatus and principles utilized in metrology. In Chapters 5, 6, and 7, the specific details of a number of devices are described, including pressure transducers based on electrical resistance, piezo-electric resonance, time of transit, relative dielectric permittivity, optical effects, and elastic deformation principles. In particular, those gauges based on electrical resistance are thoroughly covered as to materials, behavior, and range of application. Methods of dynamic pressure measurement are also thoroughly discussed.

Chapters 8 and 9 are presented in a more practical vein in that they deal with high-pressure generation and containment and with the description of a number of industrial applications of high pressure from both a physical and chemical standpoint. Each of these chapters contains a very thorough and exhaustive list of references for further investigation by the reader.

Although the material presented is often of a highly technical nature and often based on complex mathematical development, the accompanying text is so clearly written that both the novice and the expert in the field cannot help but come away from a reading of the text with a greatly enhanced understanding of the fundamentals of high-pressure measurement.

Thomas R. Rehm, professor of chemical engineering at the University of Arizona, Tucson, Arizona, taught chemical engineering from 1960 to 1966 at the University of Denver and at the University of Arizona since 1966. His teaching areas are in the plant and equipment design, mass transfer, and material and energy balance fields. He has also spent 20 years in the supervision of research and teaching laboratory operations along with equipment specification, purchase, and maintenance. His research fields are in computer-aided design and optimization, mass transfer, and process control.

Dr. Rehm's industrial experience has been in process development and equipment design with Universal Oil Products, Chevron Research, and the Monsanto Company. He is a current or former member/chairman of three national committees of the American Institute of Chemical Engineers.

Nuclear Engineering Data Bases, Standards and Numerical Analysis

Author Jacek Jedruch

Publisher Van Nostrand Reinhold Company, Inc., New York (1985)

Pages 295

Price $58.50

Reviewer Walter Loewenstein

This book is an attempt to fill a very practical need. Diverse sources of information, data, computing methods, regulations, and standards are described along with examples that make much of the material come alive. The references are comprehensive and provide a substantive basis for further and in-depth follow-up. The attempt is successful in providing a book that tells the reader where to go and what to do and provides practical insights on how to do it without exhaustively dwelling on why things are done. Emphasis on the latter in most text and reference books tends to detract from the practical need that this volume fills.

The chapter on experiments in nuclear reactor engineering is somewhat disappointing. It is very brief and, as such, portions seem dated. The major disappointment is a lack of reference to the large amount of experimental data being extracted from operating nuclear power plants. These results are very instrumental in sharpening methods and data for design and safety analyses. The extraordinary and convoluted scaling analyses needed to prudently use the data cited (e.g., LOFT and Semiscale) to the operating nuclear steam supply system are barely referred to.

With Chap. 2, the author provides a guide on who does what and identifies current organizations that may be contacted for information. The growing impact of legal, business, and security aspects of codes and data is also described here. This chapter is very useful and a promise for the remainder of the book.

The chapter on data centers describes several. It also provides insight into coolant properties (e.g., light water) used for computation beyond identification of the source. For example, Table 12 describes the specific computational formalism that is extremely valuable for a novice in large-scale computation.

The chapter on property and performance data bases is very qualitative but useful for reference and introduction.

The chapter on machine methods of nuclear design provides insights into why computer codes are as they are today in terms of historical main-frame limitations. The chapter also treats some code systems. However, no reference to recent developments (e.g., supercomputers) that may markedly impact future methods development is cited.

The choice and description of representative codes for nuclear design are extremely helpful in facilitating insight into the many acronyms that are frequently used to identify complex codes along with their functions, input, and output. The same observation applies to the chapter on structural, thermohydraulic, and safety analyses. The values of these chapters might have been enhanced with more figures for various codes (such as Fig. 7 on p. 196).

The last two chapters on engineering society serials and standards and federal regulations, guides, and serials convey the complexity of dealing with a maturing technology in practical engineering.

The topical bibliography is extensive, but both this and the references in the chapter will soon require updating.

This book is an extremely useful reference. It is a supplement for the usually more academic approaches to the theory and practice of analysis within the nuclear industry. The novice practitioner can use the book as a road map to productive activities. The student can use the book to supplement the traditional academic approach to put theory into practice. The experienced practitioner can use the book to provide insights into how to expeditiously approach a new, to him, problem. The manager can get insights into a myriad of engineering computations.

The tabular presentations are profuse and add markedly to the usefulness of the book. A few more figures throughout the text would provide easier insight into the descriptive material (e.g., WAM-BAM on p. 205). To retain its value, periodic updating of the book might be considered.

To summarize, the experiment was a success, though not without flaws. None of the latter are serious.

Walter B. Loewenstein is the deputy director of the Nuclear Power Division and director of the safety technology department of the Electric Power Research Institute (EPRI) in Palo Alto, California. Throughout his professional career at EPRI and earlier at Argonne National Laboratory he has been concerned with the development and practice of large-scale computational methods. He is a fellow of the American Nuclear Society and the American Physical Society and served on the U.S. Atomic Energy Commission's advisory committee on reactor physics and the Organization for Economic Cooperation and Development's European-American committee on reactor physics. In recent years he has been active in international cooperative safety research projects that support and feature large-scale computations. His responsibilities at EPRI include the development and testing of computational packages for the U.S. electric utilities in real-time and off-line environments.