DISTILLED DIALOGUE

Title Industrial Management in the Atomic Age

Author V. Lawrence Parsegian

Publisher Addison Wesley Publishing Co., Inc., 1965

Pages x + 374

Price $10.75

Reviewer James G. Cline

This book touches on features of atomic energy and its commercial development that should be of particular interest to those in both government and industry who exercise managerial responsibility for atomic related activities. The salient segments of the vast literature on the subject of atomic energy have been organized and distilled into readable form.

The author approaches, from a number of aspects, the impact the atomic energy program has had upon our society. Much can be learned from studying the history of how government, industry, and the community dealt with the problems atomic energy presented. Such study is of value not only as necessary background to the understanding and creative management of the peaceful atom, but as a case study of our society's ability to adapt to the demands and opportunities presented by new technologies in general. In raising questions of public vs private ownership, military security vs international control and commercial development, government patent rights vs the incentive to private ventures, regulatory responsibilities vs encouragement of development, atomic energy probes at the heart of matters that will be cause for concern over and over again as new technologies emerge. With the quickened pace of research and development, such technologies may be expected to come into being with greater frequency in the future and the time lag grows shorter between discovery and when our society must be prepared to respond adequately. Only by drawing upon tne best of the past and learning from our mistakes can we hope to meet this challenge.

This book is a valuable tool in that learning process as it traces the power of the atom from its discovery and employment as a weapon through the creation of the Atomic Energy Commission, the early efforts at obtaining international cooperation and commercial industrial participation, the development of atomic power reactors and their associated industries, and closes with a discussion of the present status in such areas as AEC contract policy, security and dissemination of information, safety, licensing and regulation, and insurance.

Although in certain aspects the author's assessment tends to be somewhat nostalgic, it is a significant contribution to the ever growing and important dialogue concerning the interaction of technology and the structure of our society.

James G. Cline is the Program Manager of the NYS Atomic and Space Development Authority. His prior experience includes management responsibilities in atomic energy in both federal and state government, involving power reactor development, nuclear space power system development, nuclear fuel reprocessing, and radioactive waste management. He co-authored the Atomic Industrial Forum's recent booklet "Atomic Power Waste Handling". His BSEE is from Marquette University and his MS in Nuclear Engineering is from New York University.

PICKS UP THE GRAPHITE GAUNTLET

Title Radiation Damage in Graphite

Author J. H. W. Simmons

Publisher Pergamon Press, 1965

Pages xii + 243

Reviewer Lamar P. Bupp

This book is a summary of the state of knowledge on graphite properties that change when the material is used in nuclear reactors. The text contributes to both the experimental and theoretical understanding of very complex phenomena in material, which is inherently important and practical to the emerging nuclear industry. The scope of the work covers twenty years of technology by an author who has made significant contributions to the field. Subject focus is primarily on commercially produced graphite in an environment of fission neutrons. However, the subject material is covered in sufficient depth to account for property changes in single crystals with the corresponding scientific interpretation of effects noted. The balance of basic and applied data and its interpretation makes this relatively short text a most interesting documentation of the subject for a sophisticated reader, be he a scientist or an engineer. The book covers the literature published up to 1964, and is noteworthy for its thorough and accurate referencing.

Study of irradiation effects on graphite has, in the past, been complicated by two general problems with quantitative observations—those associated with a precise description of commercial carbon products called "graphite" and those involved with a precise identification of the radiation environment. Because of this, there has been difficulty in interpreting data produced at one site for use at another. This is particularly frustrating to the engineer who must make decisions on design and use of commercial graphite in nuclear machines. This book addresses itself to this challenge and extends the correlations on irradiation doses to give the reader methods to interpret data produced and published from several centers of work. The rationale for a uniform scale of irradiation dose is well developed. For the scientist, these correlations may not be profoundly precise; but, for practical applications, an orderly method of approach is given that is complete with simple conversion factors.

The book does not delve deeply into the important distinctions between properties of perfect graphite

crystals and the complex properties of imperfect crystallites, bonded in a matrix of amorphous carbon, which is the more general form of commercial "graphite." In several parts of the book, the author cites the importance of source material and methods of manufacture, not only to the original properties of the graphite forms, but particularly to the changes in these properties with irradiation. The inexperienced reader, therefore, may be confused by commercial terminology for product grades, such as "Grade A, TSGBF, CSF, KC," and the like. Similarly, knowledge of physical properties affected by the manufacturing process is important to a thorough understanding of the subject. For this pragmatic background, an intensive student must heed the remarks in the Preface and seek information from other texts.

For the general expert on irradiation effects on materials, this book is an excellent reference. In clear, precise, scientific fashion the author covers all important aspects of graphite as a material that undergoes extensive property changes when irradiated with high energy neutrons. Practical observations, such as structural and thermal properties, dimensional effects, and stored energy are complemented by a well-balanced discussion on electrical and magnetic properties, the theory of atomic displacements, defect structures, and annealing effects.

Lamar P. Bupp is Manager of the Vallecitos Atomic Laboratory of the General Electric Company. For fifteen years, he has worked in the field of nuclear energy and contributed to early reports on irradiation effects to graphite. In addition to reactor oriented technology, he is experienced in chemical processing and the application of radioisotopes. He received his PhD in Physical Chemistry from the Oregon State University in 1951, having received a BS degree in Chemistry from the University of California at Berkeley.

BOOK ANNOUNCEMENTS

Although the following books will not be reviewed, they may be of interest to some of our readers:

Atlas of Radiation Dose Distributions, E. W. Webster and K. C. Tsien, compilers, International Atomic Energy Agency, 1965, 50 pp, 155 charts, $15.00

The Theory of Quantum Liquids, Vol. I: Normal Fermi Liquids, David Pines and Philippe Nozieres, Benjamin, 1966, 355 pp, $15.00

Notes...Nuclear Rocket Propulsion, Clayton W. Watson, ed., National Science Foundation, 966 pp, $12.50

Plasma Physics and Controlled Nuclear Fusion Research, International Atomic Energy Agency, 1966, Vol. I, 778 pp,£4.13.3; Vol. II, 1100 pp,£6.9.6

Radioisotope Sample Measurement Techniques in Medicine and Biology, International Atomic Energy Agency, 1966, 700 pp, $15.00

Nuclear Materials Management, International Atomic Energy Agency, 1966, 888 pp, $18.00

Isotopes and Radiation in Soil-Plant Nutrition Studies, International Atomic Energy Agency, 1966, 610 pp, $12.00

Selected Reviews in Reactor Technology—1965, Leonard E. Link, ed., U.S. Atomic Energy Commission, 1966, 439 pp, $4.50

Iterative Solution of Elliptic Systems, Eugene L. Wachspress, Prentice-Hall, 1966, 299 pp, $12.95