BOOKS

Systems Approach to Air Pollution Control, R. J. Bibbero and I. G. Young, Wiley, New York (1974). 531 pages. $19.50.

The problem of air pollution control is so massive and intricate that it can be effectively approached only through a careful, systematic evaluation of the interrelationships of all its components. A so-called "systems approach" to air pollution control will have to involve cost-benefit tradeoffs among the multitude of competing interests. In contrast to a number of other books available, which consist of either collections of unrelated chapters written by different authors or a treatment of a specific aspect of air pollution, this book attempts to view the air pollution problems in a unified way from the broadest possible context.

After an introductory chapter and one on global sources, sinks, and residence times of air pollutants, the authors present a good discussion of the societal costs and effects of air pollution in Chapter 3. Chapter 4 contains an excellent summary of air pollution legislation enacted in the United States, which is perhaps the most easily accessible, exhaustive survey of its type. Unfortunately the authors do not attempt to comment on how the laws came to be enacted and why certain standards were adopted and not others. The history of the establishment of the current health-based air quality standards, for example, is a particularly revealing one into how profound legislative decisions are sometimes made on the basis of the scantest of evidence.

Chapter 5 contains a discussion of the types of control strategies one might construct. A rather unique discussion of the considerations in the design of an air monitoring network is the subject of Chapter 6. Chapter 7, devoted to the application of air pollution data, seems to be a collection of topics which did not fit well into any of the other chapters. The section on air pollution indexes is presented without critical interpretation and, from my point of view, could easily have been omitted. Mathematical models of air pollution is the subject of Chapter 8, most of which is based on Chapter 3 of *Meteorology and Atomic Energy—1968*, edited by D. H. Slade. Chapters 9 to 11 constitute an excellent treatment of pollutant measurement methods.

It is clear that this book is not intended for use as a textbook. It has no problems and virtually no examples. Where specific technical material is presented, it is often done so directly from other sources and without much explanation, assuming a prior understanding by the reader. For example, the log-normal distribution (p. 32) transfer functions of air quality monitors (p. 228), the optimization of an air quality data communication network (p. 246), equations for wind speed (p. 288), and plume rise formulas (p. 294) are simply presented with no development. However, the authors do not propose this book as a text.

Although not specifically stated, I suspect the best audience will be pollution control engineers, who are already familiar with control methods (which are not covered in this book) and will benefit from seeing the entire systems approach. Given the book's focus, it seems to me that its major failing is a lack of an attempt to develop and apply the methods of optimization to air pollution. The need for a cost-benefit optimization approach is repeatedly stressed, but the authors never really get around actually to applying optimization theory to some concrete examples. The reader is left with the impression, "It's a great idea, but how do I do it?"

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Liquefied Petroleum Gases: Guide to Properties, Applications and Usage of Propane and Butane, A. F. Williams and W. L. Lom, Wiley, New York (1974). 403 pages. $33.50.

Liquefied Natural Gas, W. L. Lom, Wiley, New York (1974). 178 pages. $18.00.

Both these books are quite complete and readable introductions to the LPG and LNG businesses, respectively. The authors are affiliated with the Esso Research Centre in Abingdon, England, and the books reflect a wealth of both individual and international corporate experience with these fuels. In fact, they almost could be titled "Everything You Always Wanted to Know About LPG (LNG) but Didn't Know How to Ask!"

The LPG book is divided into sections covering LPG sources, manufacture, physical and chemical properties, burning characteristics, bulk distribution and handling systems, and large- and small-scale uses. Because of the breadth of coverage, the book is not a complete handbook. However, descriptions are quite complete and highlight important factors. Extensive references and suggested further readings are provided for those who need additional information. This book should be of great value to anyone wishing to acquire an overview of the spectrum of LPG technology, ranging from LPG as a fuel to uses as chemical feedstocks, in farming or in the food industry. The book does not go into the economic and marketing aspects of the LPG business, although some worldwide usage statistics are provided.

One weakness of the book, in my view, is the rather cursory treatment of general safety and fire precautions. Less than three pages are devoted to this subject, and safe practice guidelines are presented in list form with little or no explanation. The authors include service and maintenance personnel in their suggested readership group; for such people the treatment of recommended safe practices is seriously inadequate and although the authors suggest further reading, they do not stress the importance of this for persons actually working with LPG systems.

Dr. Lom's book on LNG draws heavily on the published literature. He has organized the book well and covers topics which include a historical review of cryogenic and LNG technology, natural gas supply and demand, liquefaction plants, ships, storage and vaporization facilities, LNG utilization, safety, and future uses. Much valuable information is assembled in this book—the author undertook a monumental task and did quite well in selecting from the voluminous LNG literature to write a comprehensive book about LNG. Some minor contradictions and deficiencies will be obvious to specialists in particular aspects to LNG technology, but then this book is not intended for specialists except to provide them with an understanding of aspects of LNG technology outside of their specialty.

The book is weak in presenting physical property information for LNG. Some limited data are presented for methane and for the various pure components which may be found in LNG mixtures, but useful references to the considerable literature on LNG properties are not provided as they are in the LPG book. This volume, too, is weak in the safety area although a chapter is devoted to the subject. For example, specific hazardous distances are given for an incompletely defined LNG spill accident. The uses of high expansion foams and dry chemicals in controlling or extinguishing LNG fires