

A Guideline for Chemical Process Quantitative Risk Analysis, by the Center for Chemical Process Safety, American Institute of Chemical Engineers, New York, NY, 1989, ISBN 0-8169-0402-2, 585 pp., \$230.

This volume is the fifth in a series of guidelines being prepared by the Center for Chemical Process Safety established by the American Institute of Chemical Engineers in 1985. The term "Chemical Process Quantitative Risk Analysis" is used to emphasize the unique character of the risk analysis methodology applied to the chemical process industries. CPQRA (the acronym used for the method) identifies those areas where operations, engineering or management systems may be modified to reduce risk, as well as identify the most economical way to do it. It is one component of an organization's total risk management and can be applied at any stage in the life of a facility. Even though the techniques are complex, costly, and require trained personnel, more and more companies are recognizing the prospects of tangible results by investing in CPQRA.

In effect, this volume is a handbook that introduces the techniques of CPQRA in sufficient detail to allow technically trained individuals to begin elementary risk analysis studies of a chemical process. One chapter is devoted to techniques used for consequence analysis, including physical models for fire, explosions and dispersion of flammable or toxic materials. Another chapter reviews techniques for estimating incident frequency, such as fault tree analysis, event tree analysis and common-cause failures. An important chapter discussed commonly used risk measures, guidelines for their selection and methods of calculation. The creation of specific data bases is presented in a separate chapter, summarizing some publicly available sources, as well as data sources for processes and plants, physical and chemical properties and the environment. An excellent section on estimating equipment reliability is included. Other topics that are treated in the book include: domino effect incidents, techniques of determining the probability that protective systems have failed and reliability analysis of programmable electronic systems.

Two case studies are examined to aid in understanding and applying the techniques presented in the book. One estimates the risk from a chlorine tank car loading facility due to potential exposure to toxic vapors, while the second considers the risk from a distillation column in a flammable liquid service. The authors caution that the risks generated are intended as examples, rather than as true risks of a real installation. However, the detail of the procedures presented makes an excellent self-study for the novice in predicting risks of a real situation that may be faced in industry.

Without a doubt, this book is must reading for anyone with responsibility in designing or operating chemical facilities. It should be readily available in com-

pany libraries, as well as school libraries where chemistry or chemical engineering programs are offered (A supplemental book – Guidelines for Process Equipment Reliability Data – should be acquired together with this volume).

LESLIE E. LAHTI

Guidelines for Process Equipment Reliability Data, by the Center for Chemical Process Safety, American Institute of Chemical Engineers, New York, NY, 1989, ISBN 0-8169-0422-7, 303 pp., \$120.00.

This book supplements the above-reviewed volume of the series of guidelines being prepared by the Center for Chemical Process Safety established by the American Institute of Chemical Engineers in 1985, namely; A Guideline for Chemical Process Quantitative Risk Analysis (CPQRA). It provides information on how equipment reliability data is obtained in order to perform a quantitative risk analysis, such as a CPQRA. The book deals with rates of equipment failures and can be most helpful in developing generic reliability data for common types of equipment.

Making equipment reliability data commonly available requires the collection of raw data, conversion of the data into failure rates and a framework or taxonomy in which the failure rates can be stored. The book has met its goal of establishing such a framework, to which people can add information and truly develop a strong system. One especially useful chapter suggests a system for obtaining specific plant information on operations and how one might treat that data, in order to create plant-specific failure rate data or add to a generic data base.

The authors expect that the Center for Chemical Process Safety will update this book, as well as the generic data base when new information becomes available. It is a useful piece of work to go along with the volume on CPQRA.

LESLIE E. LAHTI

Methods for Assessing and Reducing Injury from Chemical Accidents, edited by P. Bourdeau and G. Green, John Wiley, Chichester, 1989, ISBN 0-471-92278-1, 303 pp., £51.00.

This book is the result of a workshop held in 1987 in New Delhi, India. It is based on a study carried out by the Scientific Group on Methodologies for the Safety Evaluation of Chemicals (SGOMSEC). SGOMSEC is an international organization, sponsored by the International Program on Chemical Safety and the Scientific Committee on Problems of the Environment (in cooperation