

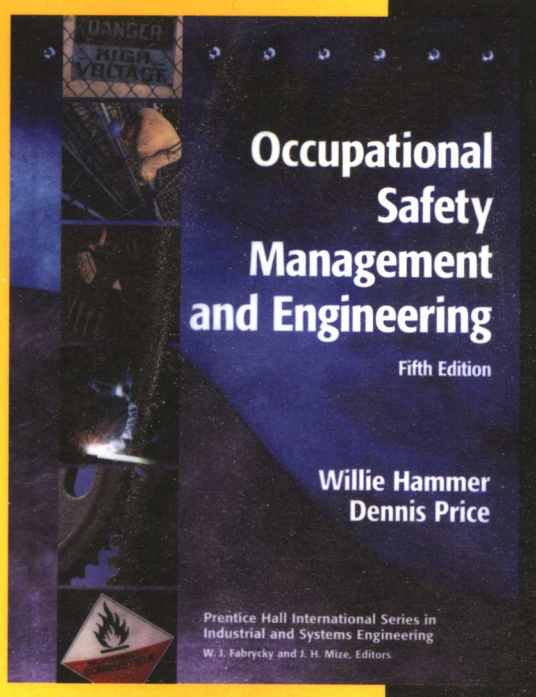
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国外大学优秀教材——工业工程系列（影印版）

Willie Hammer, Dennis Price

职业安全管理 与工程

（第5版）



清华大学出版社

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Occupational Safety Management and Engineering

FIFTH EDITION

职业安全管理与工程 （第5版）

Willie Hammer
Dennis Price



清华大学出版社



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Forward

This textbook series is published at a very opportunity time when the discipline of industrial engineering is experiencing a phenomenal growth in China academia and with its increased interests in the utilization of the concepts, methods and tools of industrial engineering in the workplace. Effective utilization of these industrial engineering approaches in the workplace should result in increased productivity, quality of work, satisfaction and profitability to the cooperation.

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Gavriel Salvendy

Department of Industrial Engineering, Tsinghua University

School of Industrial Engineering, Purdue University

April, 2002

前 言

本教材系列的出版正值中国学术界工业工程学科经历巨大发展、实际工作中对工业工程的概念、方法和工具的使用兴趣日渐浓厚之时。在实际工作中有效地应用工业工程的手段将无疑会提高生产率、工作质量、合作的满意度和效果。

该系列中的书籍对工业工程的本科生、研究生和工业界中需要解决工程系统设计、运作和管理诸方面问题的人士最为适用。

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普渡大学工业工程学院（美国）
2002年4月

PREFACE

Willie Hammer noted in his Preface to the fourth edition:

Occupational safety has changed since the first edition of this book came out in 1976. The United States is still the greatest industrial nation in the world, but many of its industries, its workers, the types of work they do, laws, public attitudes, and numerous other factors have changed. And so have the safety concerns of the workers, and their dependents, other relatives, neighbors, and the public in general.

He closed the opening paragraph of that preface saying, "This edition attempts to incorporate some of the most notable safety considerations that have taken place since earlier editions." Now, this edition makes that same attempt. The interim between the last edition and this edition was marked with some of the most dramatic changes in occupational history.

It is my privilege to make the additions and deletions that reflect some of the changes in occupational safety engineering and management since the last edition of this text about twelve years ago. One of the most dramatic changes to occupational safety comes from the proliferation of technology and the information revolution of this past decade. Software safety is now recognized as a part of occupational safety engineering and management. Software controls the energy of industry's machinery and products. This fifth edition reflects this industrial revolution by presenting the elements of a software hazard analysis program and software hazard analysis techniques. Severity-of-consequences hazard ratings, program size, and complexity are criteria used to determine the extent of software analysis to be employed for safety. The technical tools for software analysis, such as Code Walk-Throughs, Event Tree, Soft Tree, and Sneak Circuit Analysis, are applied to safety. Software safety analysis is an essential tool for the new millennium safety engineer.

The past decade has magnified the prevalence of computers in the workplace and the electronic office. Along with this has come the ubiquity of work-related musculoskeletal disorders. The repetitive motion injuries that sometimes result in these disorders involve various worker tasks, but cumulative trauma disorders to keyboard operators have drawn attention to this problem. A new chapter, Chapter 18, Work-Related Musculoskeletal Disorders, addresses this phenomenon. Evidence of the work-relatedness of musculoskeletal disorders, factors associated with them, the back belt controversy, and the steps to establish an ergonomics program to control these injuries are discussed.

During the past ten to fifteen years, another hazard has received special attention from researchers and regulators. It is the topic of a second new chapter, Chapter 26, Confined Space Entry. New confined space entry regulations now affect hundreds of thousands of work facilities and millions of workers. The hazards of confined spaces are described in Chapter 26, and guidelines for elements of a confined-spaces entry program are given briefly.

In addition to two new chapters, this edition reflects some significant changes in safety engineering and management since the last edition. Existing chapters have been revised to include these current topics, some arising out of new research, standards, and regulations. Discussions of workers with disabilities (Americans with Disabilities Act), workplace violence, older workers safety, and bloodborne pathogens (Bloodborne Pathogen Standard) are added to the chapter on Personnel, Chapter 9. In the past decade, behavior-based safety (BBS) programs have become a strong part of the safety movement. Chapter 10, Promoting Safe Practices, now includes a discussion of BBS. Chapter 15, Safety Analysis, includes the elements of a Process Safety Management Program and a discussion of What-if, Checklist, Hazard and Operability Study (HAZOP) and other analytic techniques now mentioned in the 29 Code of Federal Regulations. Nuclear waste, and various legal issues are new additions to other chapters. The book's contents have been revised to update topics, such as workers' compensation and workers' compensation fraud, fault tree analysis, hearing protection, environmental protection, fire protection, OSHA violation policy, the Emergency Planning and Community Right-to-Know Act, and system safety analysis. In many places, recent statistics now replace older data. Fifty-four references have been added.

The order of the chapters is changed. The first five chapters are on general introductory and administrative topics. Chapters six through fifteen are on subjects of concern to safety management and planning. The remaining chapters address safety engineering and program management of specific hazards.

These are some of the changes since the last edition: In the new millennium, workers participate more in their own protection than in the past. Managers are held more accountable for worker safety and health than before. Courts and lawyers have more influence in occupational safety than in the past. Communities are more involved in industrial safety than before. Safety engineering and management is more complicated.

My goal has been to maintain the basic no-nonsense, approach to safety that has characterized past editions. More information for managers of safety programs is given than in the past. Although much has changed, much has remained the same. The basic hazards (and preventative measures) from falls, mechanical injuries, heat and temperature, pressure, electricity, fires, explosions, toxic materials, radiation, and vibration and noise remain about the same. This revised edition retains and updates these topics and includes more details on some.

This edition is a small token of respect for Willie Hammer, whose dedication to the noble profession of safety engineering and management resulted in the first four editions of this text.

Dennis Price

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