

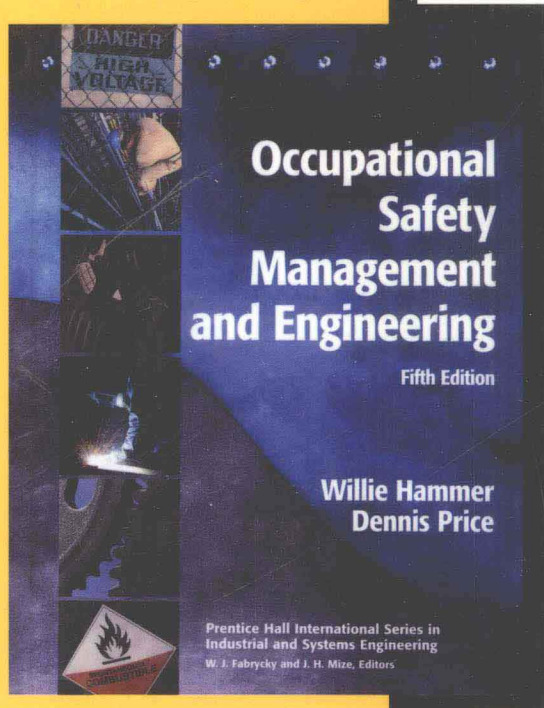
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国外大学优秀教材——工业工程系列（影印版）

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



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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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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

Contents

PREFACE

xv

CHAPTER 1 ACCIDENT LOSSES

1

Costs of Well-Being	1
The Industrial Revolution and Accidents	2
Increasing Hazards	3
Physical Effects of Accidents	4
Numbers of Accidents vs. Costs	6
Lessening Safety Costs	9
Accident Losses for Personnel vs. Equipment and Facilities	9
Increasing Magnitude of Accident Losses	11
Awards for Injuries	12
Bibliography	13
Exercises	13

CHAPTER 2 LIABILITIES AND SAFETY LEGISLATION

15

Statute Law	15
Common Law	16
Misadventure (Accident)	17
Strict Liability	17
Industrial Revolution	19
Negligence	19
American Laws	22
Steam Engines, Boats, and Locomotives	22
The Fourteenth Amendment and Safety	23
Liability Laws	23
Workers' Compensation Laws	24
Later Actions	25
Resurgence of Strict Liability	25
Limited Liability	27
Excused Negligence	27
Bibliography	27
Exercises	28

CHAPTER 3 WORKERS' COMPENSATION

29

Obligations to Employees 29
Workers' Compensation Laws 30
Problems of Nonuniformity 32
Coverages 34
Workers' Compensation Insurance 34
Costs of Workers' Compensation Insurance 34
Insurance Rating Systems 37
Keeping Workers' Compensation Costs Down 37
Workers' Compensation Reform 39
Requirements for Benefits 40
Disagreements 40
Injury Resulting from an Accident 41
Injury Arising out of Employment 41
Types of Disabilities 43
Monetary Disability Benefits 44
Death Benefits 44
Extent of Medical Benefits 44
Injury and Claim Notices 45
Hearings 45
Action against a Third Party 46
Inadequacy of Workers' Compensation 49
Bibliography 50
Exercises 50

CHAPTER 4 OSHACT AND ITS ADMINISTRATION

52

New Concepts of Accident Avoidance 53
Enactment of the Occupational Safety and Health Act (OSHAct) 55
Other Organizations 55
State Industrial Safety Programs 56
Responsibilities of Employers and Employees 58
Inspections 58
Violations and Penalties 59
Standards 62
Record Keeping 62
Impact of OSHA 62
OSHA and Hazard Minimization 64
Antagonism toward OSHA 64
The New Millennium 67
The New OSHA 68
Exercises 72

CHAPTER 5 STANDARDS, CODES, AND OTHER SAFETY DOCUMENTS	73
Uses for Standards and Codes	74
Mandatory vs. Voluntary Standards	76
Objections to Consensus Standards	79
Test Standards	80
Differences in Standards	81
Changing Standards	83
Inadequacies of Standards	83
Standards and Analyses	84
Proliferation of Standards	84
Status of OSHA Standards	84
Bibliography	85
Exercises	86
 CHAPTER 6 ENGINEERS AND SAFETY	 87
Accomplishments of Engineers	87
Engineering and Accidents	88
Steam Equipment and Accidents	88
Technical Societies and Safety	89
Inadequacy of Engineering Schools	89
Engineers as Causers of Accidents	90
Registration of Engineers	91
Possible Improvements in Registration	95
Bibliography	97
Exercises	97
 CHAPTER 7 MANAGEMENT AND ITS RESPONSIBILITIES	 98
Safety Policies	98
OSHAct and Management	100
Actions against Managers	100
Management Attitudes toward Safety	102
Middle Managers	106
Foremen/Forewomen and Safety	106
Procedural Safeguards	107
Management and Supervision	108
Safety Efforts of Other Managers	110
Hazardous Operations	112
Personnel	113
Personal Protective Equipment	114
Checklist for Managers	115

Safety Information System 115
Bibliography 118
Exercises 119

CHAPTER 8 THE CHANGING ROLES OF SAFETY PERSONNEL 120

Safety Laws and Safety Engineers 121
Safety Personnel 122
“Safety Man” 123
Safety Engineer 123
Production and Processing Losses 125
Growing Areas within Safety 125
Bibliography 126
Exercises 126

CHAPTER 9 PERSONNEL 127

Disabled Personnel in the Workplace 128
Older Personnel in the Workforce 130
Human Error 130
Designing and Planning Errors 131
Production Errors 132
Operations Errors 135
Two-Person Concept 136
Human vs. Machine 136
The Biochemical Machine 137
Motivation 138
Violence in the Workplace 139
Judgment 141
Accident-Prone Persons 142
Quantitative Error Prediction 144
Human Factors Engineering 145
Procedural Means of Accident Prevention 146
Critical Operations 146
Responsibilities of the Individual Worker 149
Procedure Analysis 151
Outputs of Procedure Analysis 155
Contingency Analysis 155
Bibliography 157
Exercises 157

CHAPTER 10 PROMOTING SAFE PRACTICES 159

The Behavior-Based Safety Approach 160
The Regulatory Approach: Safety Rules 162
Employee Participation 162

Critical Incident Technique	163
Other Methods	164
Suggestion Programs	164
Union Participation	165
Safety Training	165
In-depth Training	167
Maintaining Awareness	168
General Comments on Safety Committees	168
Safety Committee Duties	169
Bibliography	170
Exercises	170

CHAPTER 11 APPRAISING PLANT SAFETY

171

New Plants and Equipment Designs	172
Existing Plants and Equipment	172
Indicating Plant Hazards	173
Safety Inspections	174
Checklists	175
Quantitative Appraisals	176
Problems with Validity of Statistics	176
Problems with Quantitative Rates	178
Validity of Statistical Comparisons	179
Risk Assessments	180
Acceptance of Risk	184
Risk Communication	186
Bibliography	187
Exercises	187

CHAPTER 12 HAZARDS AND THEIR CONTROL

189

Determining Existence of Hazards	190
Eliminating and Controlling Hazards	192
Isolation, Lockouts, Lockins, and Interlocks	194
Failure Minimization	200
Safety Factors and Margins	200
Monitoring	203
Warning Means and Devices	206
Safe Procedures	207
Backout and Recovery	207
Damage Minimization and Containment	211
Physical Isolation	211
Weak Links	212
Escape, Survival, and Rescue	213
Bibliography	214
Exercises	214

CHAPTER 13	PLANNING FOR EMERGENCIES	215
Medical Responses in Emergencies	215	
Bibliography	228	
Exercises	228	
CHAPTER 14	ACCIDENT INVESTIGATIONS	229
Investigating Board Chairman's Responsibilities	232	
Contributing Personnel	232	
Conducting the Investigation	234	
Accident Reports	235	
Corrective Actions	237	
Insurance Claims	237	
Other Aspects of Accident Investigations	239	
Exercises	239	
CHAPTER 15	SAFETY ANALYSIS	240
General	240	
Preliminary Hazards Analysis	241	
Failure Modes and Effects Analysis	245	
Fault-Tree Analysis (FTA)	245	
Fault Tree Symbols	246	
Safety Analysis Methods Mandated for Process		
Safety Management	254	
Bibliography	257	
Exercises	258	
CHAPTER 16	ACCELERATION, FALLS, FALLING OBJECTS, AND OTHER IMPACTS	259
Falls	259	
Preventive Measures Against Falls	262	
Impacting Objects	265	
Other Acceleration Effects	267	
Bibliography	270	
Exercises	270	
CHAPTER 17	MECHANICAL INJURIES	271
Cutting and Tearing	271	
Shearing	272	
Crushing	272	
Breaking	273	

Machine Guards and Safety Devices	273
Guards	274
Precautionary Measures	276
Exercises	277

CHAPTER 18 WORK-RELATED MUSCULOSKELETAL DISORDERS 279

Musculoskeletal Disorders (MSDs): Work Related or Not Work Related?	280
The Effects of WMSDs	281
Worker-related Factors Associated with MSDs	282
Carpal Tunnel Syndrome	283
Nonoccupational Factors of CTS	283
Low Back Pain	284
Back Belts	286
Ergonomics: A Program to Control WMSDs	287
Bibliography	290
Exercises	290

CHAPTER 19 HEAT AND TEMPERATURE

291

Effects on Personnel	291
Classification of Burn Severities	296
Burns to the Eye	297
Other Temperature Effects on Personnel	297
High Temperatures	298
Additional Effects	305
Bibliography	311
Exercises	311

CHAPTER 20 PRESSURE HAZARDS

312

Unfired Pressure Vessels	314
Discharges from Safety Valves	317
Dynamic Pressure Hazards	317
Water Hammer	319
Negative Pressure (Vacuums)	320
Testing of Pressure Systems	320
Leaks	321
Effects of Leakage	323
Leak Detection	324
Dysbarism and Decompression Sickness	324
Compressed-Gas Cylinders	328
Bibliography	336
Exercises	340

CHAPTER 21 ELECTRICAL HAZARDS

341

Shock 341
Other Factors 342
Causes of Shock 344
Electrical Insulation Failures 346
Equipment Failures 347
Other Shock Protection 349
Static Electricity 354
Lightning 359
Ignition of Combustible Materials 361
Containment of Discharges 361
Inherently Safe Devices 361
Heating and Overheating 365
Circuit and Equipment Protection 366
Unit Protection 367
Why an Open Circuit? 368
Exercises 374

CHAPTER 22 FIRES AND FIRE SUPPRESSION

375

Fuels 375
Oxidizers 378
Gases 379
Flammable and Combustible Liquids 379
Flammable Solids 386
Ignition 387
Ignition Sources 394
Ignition Delay 394
Effects of Fire on Personnel 396
Fire Detection Systems 399
Fire Classifications 400
Fire Suppression 401
Extinguishing Systems 408
Bibliography 419
Exercises 419

CHAPTER 23 EXPLOSIONS AND EXPLOSIVES

425

Industrial Usage and Problems 425
Materials That Will Explode 429
Explosive Effects 431
Preventing Explosion Damage 434
Bibliography 439
Exercises 439

CHAPTER 24 HAZARDS OF TOXIC MATERIALS	440
Toxic Materials	440
Routes to Injury Sites	441
Hypoxia	441
Hypoxic Hypoxia	445
Mechanisms of Toxic Agents	448
Measurement of Toxicity	458
Detection of Toxic Agents	461
Respiratory Protective Equipment	461
Bibliography	475
Exercises	476
CHAPTER 25 ENVIRONMENTS	477
OSHA and EPA	477
Types of Environments	480
Natural and Induced Environments	480
Controlled Environments	484
Closed or Free Environments	484
Hazards of the Environment	486
Detecting Adverse Environments	486
Protection against the Environment	489
Industrial Ecology	492
Bibliography	495
Exercises	496
CHAPTER 26 CONFINED-SPACE ENTRY	497
What Is a Confined Space?	498
Atmospheric Hazards	500
Physical Hazards	501
Chemical, Biological, Radiation	501
Management Responsibilities for Confined Spaces	501
Bibliography	504
Exercises	505
CHAPTER 27 RADIATION	506
Ionizing Radiation	508
Factors Affecting Exposure and Risk	512
Sources of Ionizing Radiation	512
Beneficial Uses of Ionizing Radiation	515
Fears of Nuclear Radiation	515
Ionizing/Nonionizing Interface	519

Nonionizing Radiations 519
Radio Frequency Radiation of Wireless Communication
Devices 527
Bibliography 531
Exercises 531

CHAPTER 28 VIBRATION AND NOISE 532

Effects of Vibration, Sound, and Noise 533
Mechanism of Hearing Injuries 541
Elements of a Hearing Conservation Program (HCP) 542
Annoyance 547
Distraction 547
Interference and Masking 548
Other Vibration Effects 548
Bibliography 554
Exercises 554

CHAPTER 29 COMPUTERS AND SAFETY 557

Safety Uses of Computers 558
Safety Problems to Workers 559
Accidents with Computerized Equipment 559
Computer Inabilities 559
Programming Errors 562
Avoiding Human Errors 562
Safety Data Processing 562
Avoiding Safety Problems 563
Computer Controls against Hazards 563
Computers and Hazard Analyses 564
Simulations 564
Software Hazard Categories 565
Software Analysis 565
Software Hazard Analysis Techniques 567
Tailoring Software Analysis 572
Robots and Accidents 573
For the Future 575
Bibliography 575
Exercises 575

BIBLIOGRAPHY 577

INDEX 583