

# Contents

<b>Preface</b>		<b>9</b>
<b>CHAPTER 1</b>	<b>The Safety and Health Manager</b>	<b>13</b>
	A Reasonable Objective	14
	Safety versus Health	16
	Role in the Corporate Structure	17
	Resources at Hand	18
	Summary	23
	Exercises and Study Questions	24
	Research Exercises	25
<b>CHAPTER 2</b>	<b>Development of the Safety and Health Function</b>	<b>26</b>
	Workers' Compensation	27
	Recordkeeping	31
	Accident Cause Analysis	45
	Organization of Committees	46
	Safety and Health Economics	47
	Training	52
	Job Placement Testing	54
	The Smoke-Free Workplace	54
	Bloodborne Pathogens	56
	Workplace Violence	57
	Summary	58
	Exercises and Study Questions	59
	Research Exercises	63
<b>CHAPTER 3</b>	<b>Concepts of Hazard Avoidance</b>	<b>64</b>
	The Enforcement Approach	65
	The Psychological Approach	67
	The Engineering Approach	69
	The Analytical Approach	77
	Hazard-Classification Scale	88
	Summary	95
	Exercises and Study Questions	95
	Research Exercises	98
	Standards Research Questions	99

<b>CHAPTER 4</b>	<b>Impact of Federal Regulation</b>	<b>100</b>
	Standards	100
	NIOSH	105
	Enforcement	106
	Public Uproar	112
	Role of the States	113
	Political Trends	115
	Immigrant Workers	122
	Summary	123
	Exercises and Study Questions	123
	Research Exercises	124
	Standards Research Questions	125
<b>CHAPTER 5</b>	<b>Information Systems</b>	<b>126</b>
	Hazard Communication	127
	International Standards	132
	Environmental Protection Agency	133
	Department of Homeland Security	138
	Computer Information Systems	138
	Summary	140
	Exercises and Study Questions	141
	Research Exercises	142
	Standards Research Questions	142
<b>CHAPTER 6</b>	<b>Process Safety and Disaster Preparedness</b>	<b>143</b>
	Process Information	144
	Process Analysis	148
	Operating Procedures	149
	Training	149
	Contractor Personnel	150
	Acts of Terrorism	151
	Workplace Security	154
	Summary	155
	Exercises and Study Questions	155
	Research Exercises	156
	Standards Research Questions	156
<b>CHAPTER 7</b>	<b>Buildings and Facilities</b>	<b>157</b>
	Walking and Working Surfaces	158
	Exits	169
	Illumination	170
	Miscellaneous Facilities	172
	Sanitation	175
	Summary	176
	Exercises and Study Questions	176

	Research Exercises	178
	Standards Research Questions	178
<b>CHAPTER 8</b>	<b>Ergonomics</b>	<b>179</b>
	Facets of Ergonomics	179
	Workplace Musculoskeletal Disorders	183
	Affected Industries	186
	Ergonomics Standards	186
	WMSD Management Programs	189
	Ergonomic Risk Analysis	191
	NIOSH Lifting Equation	192
	Sources of Ergonomic Hazards	200
	Summary	209
	Exercises and Study Questions	210
	Research Exercises	211
	Standards Research Question	211
<b>CHAPTER 9</b>	<b>Health and Toxic Substances</b>	<b>212</b>
	Baseline Examinations	212
	Toxic Substances	213
	Measures of Exposure	223
	Standards Completion Project	227
	Detecting Contaminants	227
	Summary	236
	Exercises and Study Questions	237
	Research Exercises	241
	Standards Research Questions	242
<b>CHAPTER 10</b>	<b>Environmental Control and Noise</b>	<b>243</b>
	Ventilation	243
	ASHRAE Standards and Indoor Air Quality	252
	Industrial Noise	254
	Radiation	268
	Summary	269
	Exercises and Study Questions	270
	Research Exercises	273
	Standards Research Questions	274
<b>CHAPTER 11</b>	<b>Flammable and Explosive Materials</b>	<b>275</b>
	Flammable Liquids	275
	Sources of Ignition	280
	Standards Compliance	282
	Combustible Liquids	284
	Spray Finishing	286
	Dip Tanks	289

Explosives	289
Liquefied Petroleum Gas	291
Conclusion	293
Exercises and Study Questions	293
Research Exercises	294
Standards Research Questions	295
<b>CHAPTER 12 Personal Protection and First Aid</b>	<b>296</b>
Protection Need Assessment	297
Personal Protective Equipment (PPE) Training	298
Hearing Protection	298
Eye and Face Protection	300
Respiratory Protection	302
Confined Space Entry	315
Head Protection	318
Miscellaneous Personal Protective Equipment	318
First Aid	321
Conclusion	322
Exercises and Study Questions	322
Research Exercises	324
Standards Research Questions	325
<b>CHAPTER 13 Fire Protection</b>	<b>326</b>
Mechanics of Fire	327
Industrial Fires	327
Fire Prevention	328
Dust Explosions	329
Emergency Evacuation	329
Fire Brigades	331
Fire Extinguishers	332
Standpipe and Hose Systems	334
Automatic Sprinkler Systems	335
Fixed Extinguishing Systems	335
Summary	337
Exercises and Study Questions	337
Research Exercises	339
Standards Research Questions	339
<b>CHAPTER 14 Materials Handling and Storage</b>	<b>340</b>
Materials Storage	341
Industrial Trucks	342
Passengers	347
Cranes	349
Slings	363

Conveyors	367
Lifting	368
Summary	370
Exercises and Study Questions	370
Research Exercise	373

<b>CHAPTER 15 Machine Guarding</b>	<b>374</b>
General Machine Guarding	374
Safeguarding the Point of Operation	384
Power Presses	391
Heat Processes	411
Grinding Machines	411
Saws	413
Miscellaneous Machine Guarding	418
Miscellaneous Machines and Processes	421
Industrial Robots	422
Summary	425
Exercises and Study Questions	426
Standards Research Questions	429

<b>CHAPTER 16 Welding</b>	<b>430</b>
Process Terminology	430
Gas Welding Hazards	434
Arc Welding Hazards	441
Resistance Welding Hazards	442
Fires and Explosions	443
Eye Protection	445
Protective Clothing	446
Gases and Fumes	447
Summary	450
Exercises and Study Questions	451
Research Exercises	453
Standards Research Questions	453

<b>CHAPTER 17 Electrical Hazards</b>	<b>455</b>
Electrocution Hazards	455
Fire Hazards	468
Arc Flash	473
Test Equipment	475
Frequent Violations	477
Summary	478
Exercises and Study Questions	479
Research Exercises	482
Standards Research Questions	482

<b>CHAPTER 18 Construction</b>	<b>483</b>
General Facilities	484
Personal Protective Equipment	486
Fire Protection	490
Tools	490
Electrical	492
Ladders and Scaffolds	493
Floors and Stairways	497
Cranes and Hoists	497
Heavy Vehicles and Equipment	502
ROPS	502
Trenching and Excavations	505
Concrete Work	509
Steel Erection	511
Demolition	511
Explosive Blasting	512
Electric Utilities	514
Summary	515
Exercises and Study Questions	515
Research Exercises	518
 <b>APPENDICES</b>	
<b>A OSHA Permissible Exposure Limits</b>	<b>519</b>
<b>B Medical Treatment</b>	<b>537</b>
<b>C First-Aid Treatment</b>	<b>538</b>
<b>D Classification of Medical Treatment</b>	<b>540</b>
<b>E Highly Hazardous Chemicals, Toxics, and Reactives</b>	<b>542</b>
<b>F Standard Industrial Classification (SIC) Code</b>	<b>546</b>
<b>G States Having Federally Approved State Plans for Occupational Safety and Health Standards and Enforcement</b>	<b>548</b>
<b>Bibliography</b>	<b>549</b>
<b>Glossary</b>	<b>558</b>
<b>Index</b>	<b>566</b>