

Solutions Manual

Safety, Health, and Environmental Concepts
for the Process Industry

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Chapter 1

The Process Employee's Role in Safety, Health, and Environment

Learning Objectives

Upon completion of this chapter the student should be able to:

- Describe how a process technician's role has changed in the last 30 years
- Discuss the importance of employee safety to the process industries
- Discuss the importance of environmental, safety, and industrial hygiene compliance to the process industries
- List five roles of today's process technician
- Explain the importance of those five roles to the process industry
- Explain what is meant by "reasonable risk"
- Explain why all risk cannot be removed from process industry jobs
- Discuss the roles a process technician performs in the area of environmental compliance
- Discuss how performance indicators are valuable to both management and labor

Key Concepts

The purpose of this chapter is to discuss the role of the process employee in terms of their compliance with federal, state and local safety, health, and environmental (SH&E) regulations. Concern for the safety of personnel and equipment is vital to employees and management alike. Each has a personal stake in safety. The company (management) is concerned about safety because it is (1) an ethical responsibility and (2) it affects the bottom-line (profits). Employees are concerned because, after 25 years of service, they would like to retire healthy and vigorous enough to enjoy their retirement. Most companies have continuous safety programs which deal with day-to-day precautions that must be taken while performing work. They also have mandates from certain federal, state, and local regulatory agencies that require periodic training and testing on specific safety topics.

Process safety decisions are often risk-based because they concern issues that are not often amenable to simple rules or covered by existing codes or regulations. A risk-based decision inherently includes economics as one consideration. The

processing Industry has learned to manage risk. Historically, safety had been regarded as a low-tech job but in today's business environment, safety must be managed just like any other business function. Managers recognize that a safe worker is productive worker. Better safety records translate into real dollar savings in terms of lower insurance premiums, and lower workman compensation costs.

End of Chapter Review Questions

1. The three process employees responsible for safety and environmental compliance on a processing unit are the _____, _____ and _____.

Process technician, instrument technician, analyzer technician

2. List five roles of a process employee today.

Technical expertise, regulatory knowledge, communication skills, computer literacy, interpersonal skills, problem solver, trainer, quality and continuous improvement

3. (T/F) Safety is an attitude.

True

4. Explain the importance of those five roles to the process industry.

An industrial society has constant technological changes technicians must keep up with; to maintain regulatory compliance requires employees be educated on site regulatory requirements; to prevent mistakes and promote productivity employees should be able to communicate via computer, radio, phone, orally, etc.; computer literacy is necessary because of the numerous microprocessors on a unit, computer-based training, and unit data entry; interpersonal skills are required to have a smoothly functioning team; problem solving is important because it is the employee's unit they must solve problems, not management; all employees will be required to participate in training new hires at some time; quality and continuous improvement is every employee's job and needed to promote efficiency and competitiveness.

5. Explain what is meant by "reasonable risk."

Risk reduced to an acceptable level.

6. (Choose the two best) Better safety performance translates into dollar savings by:

Lower site insurance premiums

Lower workman compensation costs

7. Explain why working in the processing industry is a lot like playing in a football game.

Like football, there is training, protective equipment, and rules to protect the employee.

8. Two reasons environmental compliance is important to a processing site are _____ and _____.

Community relations and fines and penalties

9. Three reasons for an employee to be computer literate are _____, _____, and _____.

Entering unit data, computer-based training, work orders, time sheets, payroll

10. _____ are important because you will be assigned to a crew that you will have to get along with for twenty or more years.

Interpersonal skills

Chapter 2

History of the Safety and Health Movement

Learning Objectives

Upon completion of this chapter the student should be able to:

- List three reasons for improvements in industrial safety.
- List four important events in the history of the safety movement after 1900.
- Discuss how settlement houses played a part in occupational safety.
- Discuss organized labor's part in the safety movement.
- List five occupational diseases and their causes.
- List the Three E's of safety and explain the function of each.
- Identify three important safety organizations and explain their roles in safety.

Key Concepts

Safety and health awareness has a long history. There is evidence of occupational safety and health efforts as far back as the time of the Egyptian pharaohs. The Code of Hammurabi, circa 2000 BC, contained clauses that could be interpreted as early attempts at workers' compensation. There is also evidence of concern for safety and health during the time of the Romans.

Milestones in the development of the safety movement in the United States include the following: first recorded safety program in 1892, creation of the Bureau of Mines in 1907, passage of the first effective workers' compensation law in the United States in 1911, and passage of OSHA in 1970. Organized labor has played a crucial role in the development of the safety movement in the United States. Particularly important was the work of unions to over-turn anti-labor laws inhibiting safety in the workplace.

Specific health problems associated with the workplace have contributed to the development of the modern safety and health movement. These problems include lung diseases in miners, various cancers caused by contact with various industrial chemicals (benzene), and lung cancer tied to asbestos. Widely used accident prevention techniques to reduce accidents in the workplace include failure

minimization, fail-safe designs, isolation, lockouts, screening, personal protective equipment, redundancy, and timed replacements.

End of Chapter Review Questions

1. Three reasons for improvements in industrial safety today are:

Legislative pressure

Costs of accidents

Recognition of the importance of safety and health

2. The purpose of the National Safety Council is to:

Prevent losses arising from accidents and unhealthy work environments

3. (T/F) The safety movement in the America began just after the Civil War.

True

4. The _____ was established in 1869 to study industrial accidents and report information about those accidents.

National Safety Council

5. Pathological workplace conditions led to the development of field of study called _____.

Occupational health

6. The _____ became models that inspired some companies to initiate some occupational health and safety activities.

Settlement houses

7. The _____ rule held that employers were not liable for workplace injuries that resulted from the negligence of other employees.

Fellow servant rule

8. The _____ stated that if actions of employees contributed to their own injuries the employer was not held liable.

Doctrine of contributory negligence

9. _____ held that people who accept a job assume the risks that go with it.

Concept of assumption of risk

10. Mercury was famous for causing two diseases, which were the _____ and _____ diseases.

Minimata and Mad Hatter's diseases

11. The Three E's of safety are _____, _____ and

_____.

engineering, education, enforcement

12. The most important of the Three E's is _____.

engineering

13. Explain the function of each of the Three E's in safety.

Use engineering controls to eliminate the hazard or reduce its severity; educate employees about hazards, the dangers they pose, and how to protect themselves; enforce failure to follow safety rules with penalties

14. _____ is required to publish annually a comprehensive list of all known toxic substances.

NIOSH

15. (T/F) OSHA requires a qualified first-aid person available during all working hours.

True

