REVIEW QUESTIONS

1. Define the term *emergency*.
2. Explain the rationale for emergency preparation.
3. List and explain the four main components of the Emergency Planning and Community Right-to-Know Act.
4. Describe how a company's emergency response effort should be coordinated.
5. How do OSHA standards relate to emergency preparation?
6. Explain how you would provide first-aid training if you were responsible for setting up a program at your company.
7. Besides training, what other first-aid preparation should a company take?
8. What are the critical elements of OSHA's standard for evacuation planning?
9. Describe the essential components of an EAP and explain how to build the needs of personnel with disabilities into the plan.
10. How can a company localize its EAP?
11. Define the following emergency response concepts: ERT, ERN, and TRT.
12. What is an expert system? How can one be used in responding to an emergency?
13. What is trauma?
14. Why should a company include trauma response in its EAP?
15. Describe how a company may respond to the trauma resulting from a workplace emergency.
16. What elements should a disaster recovery plan contain?
17. How can employers prepare for the threat of terrorism?
18. Explain the precautions that should be taken before resuming business after a disaster.

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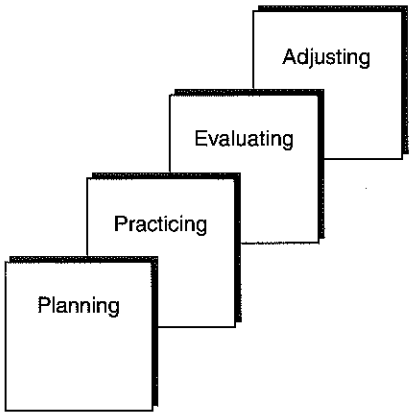
Figure 25–1
Elements of emergency preparation.



Ideally, all those involved should be able to respond properly with a minimum of hesitation. This can happen only if all exigencies have been planned for and planned procedures have been practiced, evaluated, and improved.

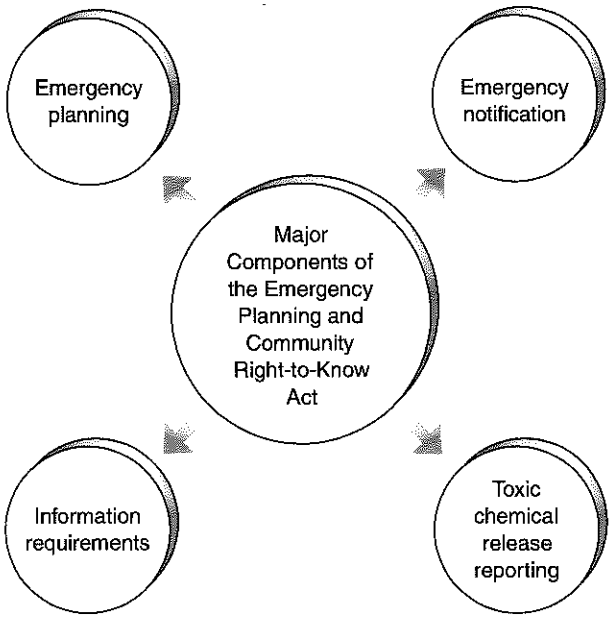
A quick and proper response—which results because of proper preparation—can prevent panic, decrease the likelihood of injury and damage, and bring the situation under control in a timely manner. Because no workplace is immune to emergencies, preparing for them is critical. An important component of preparation is planning.

EMERGENCY PLANNING AND COMMUNITY RIGHT-TO-KNOW ACT

Title III of the Superfund Amendments and Reauthorization Act of 1986 (SARA) is also known as the **Emergency Planning and Community Right-to-Know Act (EPCRA)**. This law is designed to make information about hazardous chemicals available to a community where they are being used so that residents can protect themselves in the case of an emergency. It applies to all companies that use, make, transport, or store chemicals.

Safety and health professionals involved in developing emergency response plans for their companies should be familiar with the act's requirements for **emergency planning**. As shown in Figure 25–2, the EPCRA includes the four major components discussed in the following paragraphs.

Figure 25–2
Parts of an emergency response plan.



Emergency Planning

The emergency planning component requires that communities form **local emergency planning committees (LEPCs)** and that states form **state emergency response commissions (SERCs)**. LEPCs are required to develop emergency response plans for the local communities, host public forums, select a planning coordinator for the community, and work with the coordinator in developing local plans. SERCs are required to oversee LEPCs and review their emergency response plans. Plans for individual companies in a given community should be part of that community's larger plan. Local emergency response professionals should use their community's plan as the basis for simulating emergencies and practicing their responses.

Emergency Notification

The **emergency notification** component requires that chemical spills or releases of toxic substances that exceed established allowable limits be reported to appropriate LEPCs and SERCs. Immediate notification may be verbal as long as a written notification is filed promptly. Such reports must contain at least the following information: (1) the names of the substances released, (2) where the release occurred, (3) when the release occurred, (4) the estimated amount of the release, (5) known hazards to people and property, (6) recommended precautions, and (7) the name of a contact person in the company.

Information Requirements

Information requirements mean that local companies must keep their LEPCs and SERCs and, through them, the public informed about the hazardous substances that the companies store, handle, transport, or use. This includes keeping comprehensive records of such substances on file, up-to-date, and readily available; providing copies of material safety data sheets for all hazardous substances; giving general storage locations for all hazardous substances; providing estimates of the amount of each hazardous substance on hand on a given day; and estimating the average annual amount of hazardous substances kept on hand.

Toxic Chemical Release Reporting

The **toxic chemical release reporting** component requires that local companies report the total amount of toxic substances released into the environment as either emissions or hazardous waste. Reports go to the Environmental Protection Agency (EPA) and the state-level environmental agency.

ORGANIZATION AND COORDINATION

Responses to emergencies are typically from several people or groups of people, including medical, firefighting, security, and safety personnel as well as specialists from a variety of different fields. People in each of these areas have different but interrelated and often interdependent roles to play in responding to the emergency. Because of their disparate backgrounds and roles, both organization and coordination are critical.

A company's **emergency response plan** should clearly identify the different personnel and groups that respond to various types of emergencies and, in each case, who is in charge. One person should be clearly identified and accepted by all emergency responders as the **emergency coordinator**. This person should be knowledgeable, at least in a general sense, of the responsibilities of each individual emergency responder and how

each relates to those of all other responders. This knowledge must include the **order of response** for each type of emergency set forth in the plan.

A company's safety and health professional is the obvious person to organize and coordinate emergency responses. However, regardless of who is designated, it is important that (1) one person is in charge, (2) everyone involved knows who is in charge, and (3) everyone who has a role in responding to an emergency is given ample opportunities to practice in simulated conditions that come as close as possible to real conditions.

Union Carbide's Texas City plant employs 1,500 workers and several hundred additional contract personnel. Safety is a high priority. Consequently, emergency planning is a fundamental part of the company's safety and health program. Emergency responders include emergency medical technicians, nurses, physicians, and production workers who are assigned specific emergency response duties. They are coordinated by a designated emergency director.[1]

Union Carbide's administrator of health services stresses the need for organization and coordination of emergency response teams. According to Marley, "Often staff physicians and nurses don't know the quickest, safest route to an emergency site. That's why emergency medical teams need to be organized and trained."[2]

Workers in the plant are obviously also knowledgeable about traffic flow, access routes, exit points, emergency approaches, and shortcuts. Because of this, Union Carbide's approach to emergency response "provides a method for dispatching EMTs and ambulance drivers to the scene while nursing and medical staff remain in radio communication and available for consultation or to receive patients if necessary."[3]

Another unique aspect of emergency planning and response at Union Carbide is how responses are coordinated: "The planning and coordination of all emergency response belongs to the **emergency response management team (ERMT)**. Composed of shift emergency directors and a full-time fire chief, this group unifies all emergency groups and equipment into a single, coordinated effort" (emphasis added).[4]

OSHA STANDARDS

All Occupational Safety and Health Administration (OSHA) standards are written for the purpose of promoting a safe, healthy, accident-free, hence emergency-free workplace. Therefore, **OSHA standards** play a role in emergency prevention and should be considered when developing emergency plans. For example, exits are important considerations when planning for emergencies. Getting medical personnel in and employees and injured workers out quickly is critical when responding to emergencies. The following sections of OSHA's standards deal with emergency preparedness:

Emergency Action Plan	29 CFR 1910.38
Exit arrangements	29 CFR 1910.37(e)
Exit capacity	29 CFR 1910.37(c),(d)
Exit components	29 CFR 1910.37(a)
Exit workings	29 CFR 1910.37(q)
Exit width	29 CFR 1910.37(c)
Exterior exit access	29 CFR 1910.37(g)
Occupational Health and Environmental Controls	29 CFR 1926.65, Appendix C
Hazardous Materials	29 CFR 1910.120, Appendix C

A first step for companies developing emergency plans is to review these OSHA standards. This can help safety and health personnel identify and correct conditions that may exacerbate emergency situations before they occur.

Basic First Aid

- Cardiopulmonary resuscitation
- Severe bleeding
- Broken bones and fractures
- Burns
- Choking on an obstruction
- Head injuries and concussion
- Cuts and abrasions
- Electric shock
- Heart attack
- Stroke recognition
- Moving an injured person
- Drug overdose
- Unconscious victim
- Eye injuries
- Chemical burns
- Rescue

Figure 25–3
Sample course outline for first-aid class.

FIRST AID IN EMERGENCIES

Workplace emergencies often require a medical response. The immediate response is usually first aid. First aid consists of lifesaving measures taken to assist an injured person until medical help arrives.

Because there is no way to predict when first aid may be needed, providing **first-aid training** to employees should be part of preparing for emergencies. In fact, in certain cases, OSHA requires that companies have at least one employee on-site who has been trained in first aid (CFR 1910.151). Figure 25–3 contains a list of the topics that may be covered in a first-aid class for industrial workers.

First-Aid Training Program

First-aid programs are usually available in most communities. The continuing education departments of community colleges and universities typically offer first-aid training. Classes can often be provided on-site and customized to meet the specific needs of individual companies.

The American Red Cross provides training programs in first aid specifically geared toward the workplace. For more information about these programs, safety and health professionals may contact the national office of the American Red Cross at 202-639-3200 (www.redcross.org).

Safety Tip

Failure to Warn the Community Can Be Costly

The hazards associated with accidents or incidents can extend beyond the walls of the facility in question to the surrounding community. This is why companies must have emergency plans in place for notifying the community and regulatory agencies when an accidental release poses a threat. Failure to notify its neighbors cost a food manufacturing company in Zanesville, Ohio, $43,829 in fines. When a refrigeration system's pressure relief valve malfunctioned, 820 pounds of anhydrous ammonia was released into the atmosphere. The company failed to notify local community officials and the National Response Center until three hours after the discharge.

Source: From "Didn't Warn Neighbors Promptly about Hazard," *Facility Manager's Alert* 9, no. 187: 3.

The National Safety Council (NSC) also provides first-aid training materials. The First Aid and Emergency Care Teaching Package contains a slide presentation, overhead transparencies, a test bank, and an instructor's guide. The council also produces a book titled *First Aid Essentials*. For more information about these materials, safety and health professionals may contact the NSC at 800-832-0034 (www.nsc.org).

Beyond Training

Training employees in first-aid techniques is an important part of preparing for emergencies. However, training is only part of the preparation. In addition, it is important to do the following:

1. *Have well-stocked first-aid kits available.* First-aid kits should be placed throughout the workplace in clearly visible, easily accessible locations. They should be properly and fully stocked and periodically checked to ensure that they stay fully stocked. Figure 25–4 lists the minimum recommended contents for a workplace first-aid kit.

2. *Have appropriate personal protective devices available.* With the concerns about AIDS and hepatitis, administering first aid has become more complicated than in the past. The main concerns are with bleeding and other body fluids. Consequently, a properly stocked first-aid kit should contain rubber surgical gloves and facemasks or mouthpieces for CPR.

3. *Post emergency telephone numbers.* The advent of 911 service has simplified the process of calling for medical care, police, or firefighting assistance. If 911 services are not available, emergency numbers for ambulance, hospital, police, fire department, LEPC,

- Sterile gauze dressings (individually wrapped in sizes 4 × 4 and 8 × 10 inches)
- Triangular bandages
- Roll of gauze bandages (at least 2 inches wide)
- Assorted adhesive bandages
- Sealed moistened towelettes
- Adhesive tape
- Absorbent cotton
- Sterile saline solution
- Mild antiseptic for minor wounds
- Ipecac syrup to induce vomiting
- Powdered activated charcoal to absorb swallowed poisons
- Petroleum jelly
- Baking soda (bicarbonate of soda)
- Aromatic spirits of ammonia
- Elastic wraps
- Scissors
- Tweezers
- Needles
- Sharp knife or stiff-backed razor blades
- Medicine dropper (eye dropper)
- Measuring cup
- Oral thermometer
- Rectal thermometer
- Hot water bag
- Wooden safety matches
- Flashlight
- Rubber surgical gloves
- Face masks or mouthpieces
- Blanket
- Splint

Figure 25–4
Minimum recommended contents of workplace first-aid kits.

and appropriate internal personnel should be posted at clearly visible locations near all telephones in the workplace.

4. *Keep all employees informed.* Some companies require all employees to undergo first-aid training; others choose to train one or more employees in each department. Regardless of the approach used, it is important that all employees be informed and kept up-to-date concerning basic first-aid information. Figures 25–5 and 25–6 are first-aid fact sheets of the type used to keep employees informed.

Global Technologies

500 Anchors Street • Industrial Park • Fort Walton Beach, Florida 32748

First-Aid Fact Sheet No. 16
Moving an Injured Person

If a victim has a neck or back injury, do not move him unless it must be done to prevent additional injuries. If it is absolutely essential to move the victim, remember the following rules of thumb:

1. Call for professional medical help.
2. Always pull the body lengthwise, never sideways.
3. If there is time, slip a blanket under the victim and use it to pull him to safety.
4. If the victim must be lifted, support all parts of the body so that it does not bend or jackknife. (Use a spine board and cervical collar.)

Figure 25–5
First-aid fact sheet.

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First-Aid Fact Sheet No. 12
ABCs of First Aid

If a fellow employee is injured and you are the first person to respond, remember the ABCs of first aid.

A = Airway
Is the airway blocked? If so, clear it quickly.

B = Breathing
Is the victim breathing? If not, begin administering artificial respiration.

C = Circulation
Is the victim bleeding severely? If so, stop the bleeding.
Is there a pulse? If not, begin administering CPR.

Figure 25–6
First-aid fact sheet.

HOW TO PLAN FOR EMERGENCIES

Developing an **emergency action plan (EAP)** is a major step in preparing for emergencies. A preliminary step is to conduct a thorough analysis to determine the various types of emergencies that may occur. For example, depending on geography and the types of products and processes involved, a company may anticipate such emergencies as the following: fires, chemical spills, explosions, toxic emissions, train derailments, hurricanes, tornadoes, lightning, floods, earthquakes, or volcanic eruptions.

- It encourages employees to express their feelings about the incident. This alone is often enough to get people back to normal and functioning properly.
- It allows employees to see that they are not alone in experiencing traumatic reactions (for example, nightmares, flashbacks, shocking memories) and that these reactions are normal.[20]

Convincing Companies to Respond

Modern safety and health professionals may find themselves having to convince higher management of the need to have a TRT. Some corporate officials may not believe that trauma even exists. Others may acknowledge its presence but view trauma as a personal problem that employees should handle on their own.

In reality, psychological trauma that is left untreated can manifest itself as **posttraumatic stress disorder**, the same syndrome experienced by some veterans of Vietnam and other wars. This disorder is characterized by "intrusive thoughts and flashbacks of the stressful event, the tendency to avoid stimulation, paranoia, concentration difficulties, and physiological symptoms such as rapid heartbeat and irritability."[21]

The American Psychiatric Association included posttraumatic stress disorder in its *Diagnostic and Statistical Manual* as far back as 1980.[22] Jeffrey T. Mitchell, president of the American Critical Incident Stress Foundation, likens preventing posttraumatic stress disorder to working with cement. Wet cement can be molded, shaped, manipulated, and even washed away. However, once it hardens, there is not much one can do with it.[23] This is the rationale for early intervention.

In today's competitive marketplace, companies need all their employees operating at peak performance levels. Employees experiencing trauma-related disorders will not be at their best. Safety and health professionals should use this rationale when it is necessary to convince higher management of the need to provide a company-sponsored trauma response team.

RECOVERING FROM DISASTERS

Many organizations put a great deal of effort into planning for disaster response, including emergency evacuation. But what about after the disaster? According to John Kauffman, 43 percent of U.S. companies that experience a disaster have no recovery plan.[24] Recovering quickly is the key to staying in business. Approximately 70 percent of businesses that close down for a month or more as a result of a disaster either will never reopen or will fail within three years.[25]

A comprehensive disaster recovery plan should have at least the following components: recovery coordinator, recovery team, recovery analysis and planning, damage assessment and salvage operations, recovery communications, and employee support and assistance. The overall goal of a disaster recovery plan is to get an organization fully operational again as quickly as possible.

Recovery Coordinator

There must be one person who has ultimate responsibility and authority for disaster recovery. This person must have both the ability and the authority to take command of the situation, assess the recovery needs, delegate specific responsibilities, approve the necessary resources, interact with outside agencies, and activate the organization's overall response.

Recovery Team

The recovery team consists of key personnel to whom the disaster coordinator can delegate specific responsibilities. These responsibilities include facility management, security,

human resources, environmental protection (if applicable), communications, and the various personnel needed to restart operations.

Recovery Analysis and Planning

This phase involves assessing the impact of the disaster on the organization and establishing both short- and long-term recovery goals. The more recovery analysis and planning that can be done, the better. One of the ways to do this is to consider various predictable scenarios and plan for them. This is the business equivalent of the war-gaming activities that take place in the military.

Damage Assessment and Salvage Operations

This component of the plan has two elements: preparedness and recovery. The preparedness element should include the following information: (1) a comprehensive inventory of all property at the facility in question; (2) a checklist of the items on the inventory that are essential for maintaining the facility; (3) a list of all personnel who will aid in the recovery (make sure to have fully trained and qualified backup personnel in case a primary player is not available or is injured during the emergency); (4) a list of all vendors, contractors, and so on whose assistance will be needed during the damage assessment and salvage phase of recovery; (5) a worksheet that can be used to document all actions taken during recovery operations; and (6) procedures for quickly establishing a remote operational site.

The recovery element should include procedures for securing workspace for the recovery team and coordinator; identifying areas of the facility that must be accessible; maintaining security at the facility against looting and vandalism; analyzing and inspecting damage to the facility and reporting it to the recovery coordinator; assessing the extent of damage to goods, supplies, and equipment; photographing and videotaping damage to the facility; taking appropriate action to prevent additional damage to the facility; repairing, restoring, and resetting fire detection and suppression equipment; and investigating accidents.

Recovery Communications

Communication is one of the most important considerations in disaster recovery. This component of the plan should deal with both who is to be notified and how that is to take place. The "how" aspects concern backup procedures for telephone service, e-mail, and so forth. Will cell phones be used? Will radio stations be part of the mix? Will "walkie-talkie" type radios be used for communicating on-site? The following list contains the types of entities who might have to be contacted as part of the disaster recovery operation:

- Customers
- Vendors and suppliers
- Insurance representatives
- Employees' families
- Appropriate authorities
- Media outlets (radio and television stations and newspapers)

Employee Support and Assistance

After a disaster, employees are likely to need various types of assistance, including financial, medical, and psychological. Kauffman recommends the following steps for developing this component of the disaster recovery plan:

1. Determine postdisaster work schedules and provide them to employees. Include overtime work if it will be necessary, and make sure employees know that flexibility in scheduling work hours will be important until the recovery is complete.

2. Plan for the whole range of employee-assistance services that might be needed, including medical, transportation, financial, shelter, food, water, clothing, and psychological services (trauma, shock, and stress counseling).
3. Plan for the provision of grief counseling. The best way to handle this is to assign grief counseling to the company's employee assistance program provider.
4. Plan for the possible need to relocate the facility as part of disaster recovery.
5. Plan to give employees opportunities to participate in personal actions taken on behalf of fatally injured employees and their families. Work for employee consensus before deciding what to do for these families.
6. Plan to fully inform all employees about what happened, why, how the company is responding in the short term, and how it will respond in the long term. Be sure to build in ways to let employees know the company cares about them and will do everything possible to protect their safety.[26]

TERRORISM IN THE WORKPLACE

"The events of Sept. 11 and the ongoing threat of bioterrorism in American workplaces have many people living and working in fear. Unquestionably, the world has changed, and few of us are happy with the direction. It's important to put everything in perspective, however, and consider the proper role of the employer."[27] This section describes the roles that employers and their safety and health personnel can play in preparing for, preventing, and responding to terrorist attacks in the workplace.

Role of the Employer

There is no question that the threat of terrorist attacks has become an ever-present reality in today's workplace. Because this is the case, employers clearly have a role to play in preparing for terrorist attacks, taking all prudent precautions to prevent them, and in responding properly should an attack occur. Because terrorism threatens the safety and health of employees, it is more than just a security issue; it is also an occupational safety and health issue.

Chip Dawson summarizes the roles of employers and safety and health professionals relating to terrorism in the workplace:

Run a safe and caring operation. Employees watch the nightly news and read their morning newspapers. They know what is going on in their world. As a result, many are discomfited by the possibility that they or their workplace might become the target of a terrorist attack. Consequently, the first responsibility of the employer is to run a safe operation in which employees know their safety is a high priority. Many of the engineering, administrative, training, and enforcement actions taken to make the workplace safe from occupational hazards will also help mitigate the threat of terrorism.

Listen to employees. Employees are concerned about the threat of terrorism, and they have a right to be. Employers should take the concerns of employees seriously, and deal with them. Answer questions, communicate openly and frequently, and refer employees who need professional help to the employee assistance program.

Train employees. Security and safety procedures do little good unless employees know what they are and how to use them. In addition, personnel in certain positions need to have specialized knowledge relating to terrorism. For example, mailroom personnel need to be trained in how to screen incoming mail for biohazards and explosives.

Communicate. Talk with employees openly and frequently. Let them know what the company knows. It is better for employees to hear news from the company than to receive it in the form of third-party gossip and rumors. Before giving out

chap 16

Ethics
Ethics credo
Ethics philosophy
Front-page test
Full-potential approach
Gray area
Legality
Locus of control
Machiavellianism
Mirror test
Morality
Morning-after test
Perspective
Purpose
Role-reversal test
Values
Whistle-blowing

REVIEW QUESTIONS

1. Define the term *morality*.
2. Define the term *ethics*.
3. Briefly explain each of the following ethics tests: morning-after, front-page, mirror, role-reversal, and commonsense.
4. What is the safety and health professional's role with regard to ethics?
5. Briefly explain the following approaches to handling ethical behavior: best-ratio, black-and-white, and full-potential.
6. Briefly explain a company's role with regard to ethics.
7. Explain how one should proceed when facing an ethical dilemma.
8. Write a brief ethics philosophy for a chemical company.
9. List the individual and social factors that may influence an employee's ethical behavior.
10. What questions should safety and health professionals ask when making decisions that have an ethical component?
11. Explain the most common problems associated with whistle-blowing.

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CHAPTER

ETHICS AND SAFETY

26

Major Topics

- An Ethical Dilemma
- Ethics Defined
- Ethical Behavior in Organizations
- Safety and Health Professionals' Role in Ethics
- Company's Role in Ethics
- Handling of Ethical Dilemmas
- Questions to Ask When Making Decisions
- Ethics and Whistle-Blowing

Practically everyone agrees that business practices of industrial firms should be above reproach with regard to ethical standards. Few people are willing to defend unethical behavior. For the most part, industry in the United States operates within the scope of accepted legal and ethical standards.

This is important because "Companies and business people who wish to thrive long-term must adopt sound ethical decision-making practices. Companies and people who behave in a socially responsible manner are much more likely to enjoy ultimate success than those whose actions are motivated solely by profits. Knowing the difference between right and wrong and choosing what is right is the foundation for ethical decision making. In many cases, doing the right thing often leads to the greatest financial, social, and personal rewards in the long run."[1]

However, unethical behavior does occur frequently enough that modern safety and health professionals should be aware of the types of ethical dilemmas that they may occasionally face and should know how to deal with such issues. How to deal successfully and effectively with ethics on the job is the subject of this chapter.

AN ETHICAL DILEMMA

According to Stead, Worrell, and Stead,

> Managing ethical behavior is one of the most pervasive and complex problems facing business organizations today. Employees' decisions to behave ethically or unethically are influenced by a myriad of individual and situational factors. Background, personality, decision history, managerial philosophy, and reinforcement are but a few of the factors which have been identified by researchers as determinants of employees' behavior when faced with ethical dilemmas.[2]

Consider the following example of an ethical dilemma:

Mil-Tech Manufacturing Company is a Department of Defense contractor that produces air and watertight aluminum containers for shipping nonnuclear munitions such

as missiles, bombs, and torpedoes. Business has been good and Mil-Tech is prospering. However, the company's management team has a problem.

Mil-Tech has been awarded a contract to produce 10,000 boxes in six months. The company's maximum capacity is currently 1,000 boxes per month. Unless Mil-Tech can find a way to increase its capacity, the company will be forced to add new facilities, equipment, and personnel—an expensive undertaking that will quickly eat up the projected profits of the new contract.

The most time-consuming bottleneck in the production of the boxes is the painting process, the last step. The problem is with the paint that Mil-Tech uses. It poses no health, safety, or environmental hazards, but it is difficult to apply and requires at least two hours to dry. Clearly, the most expeditious way to increase productivity is to find a paint that is easier to apply and takes less time to dry.

The production manager has been searching frantically for a substitute paint for two weeks and has finally found one. The new paint is easy to apply, and it dries almost on contact. However, it is extremely toxic and can be dangerous to anyone exposed to it at any time before it dries. Personal protective equipment (PPE) and other hazard-prevention techniques can minimize the health problems, but they must be used properly with absolutely no shortcuts. In addition, it is recommended that every employee who will work with the paint complete three full days of training.

Mil-Tech's management team is convinced that the union will not consent to the use of this paint even if the PPE is purchased and the training is provided. To complicate matters, the supplier of the paint cannot provide the training within a time frame that meets Mil-Tech's needs. In a secret meeting, top management officials decide to purchase PPE, use the new paint, and forgo the training. More importantly, the management team decides to withhold all information about the hazards associated with the new paint.

Camillo Garcia, Mil-Tech's safety and health manager, was not invited to the secret meeting. However, the decisions made during the meeting were slipped to him anonymously. Garcia now faces an ethical dilemma. What should he do? If he chooses to do nothing, Mil-Tech employees may be inappropriately exposed to an extremely hazardous substance. If he confronts the management team with what he knows, he could fall into disfavor or even lose his job. If he shares what he knows with union leaders, he may be called on to testify about what he knows. This is an example of the type of ethical dilemma that safety and health professionals face on the job.

ETHICS DEFINED

There are many definitions of the term *ethics*. However, no one definition has emerged as universally accepted. As applied to business, the concept means ". . . *written and unwritten codes of principles and values that govern decisions and actions within a company. In the business world, the organization's culture sets standards for determining the difference between good and bad decision making and behavior. In the most basic terms, a definition for business ethics boils down to knowing the difference between right and wrong and choosing what is right.*"[3]

According to Arlow and Ulrich, ethical dilemmas in the workplace are more complex than ethical situations in general.[4] They involve societal expectations, competition, and social responsibility as well as the potential consequences of an employee's behavior on customers, coworkers, competitors, and the public at large. The result of the often-conflicting and contradictory interests of workers, customers, competitors, and the general public is a natural tendency for ethical dilemmas to occur frequently in the workplace.

Anytime that ethics is the topic of discussion, such terms as **conscience**, **morality**, and **legality** are frequently heard. Although these terms are closely associated with ethics, they do not, by themselves, define it. For the **purpose** of this book, **ethics** is defined as follows:

> Ethics is the application of morality within a context established by cultural and professional values, social norms, and accepted standards of behavior.

Figure 26–1
Guidelines to determine what is ethical.

Guidelines for Ethical Choices

1. Apply the morning-after test
2. Apply the front-page test
3. Apply the mirror test
4. Apply the role-reversal test
5. Apply the commonsense test

Morality refers to the **values** that are subscribed to and fostered by society in general and individuals within society. Ethics attempts to apply reason in determining rules of human conduct that translate morality into everyday behavior. **Ethical behavior** is that which falls within the limits prescribed by morality.

How, then, does a safety and health professional know if someone's behavior is ethical? Ethical questions are rarely black and white. They typically fall into a **gray area** between the two extremes of right and wrong. Personal experience, self-interest, point of view, and external pressure often cloud this gray area further.

Guidelines for Determining Ethical Behavior

Guidelines are needed for safety and health professionals to use when trying to sort out matters that are not clearly right or wrong. First, however, it is necessary to distinguish between the concepts of *legal* and *ethical*. They are not the same thing. Just because an option is legal does not necessarily mean it is ethical.

In fact, it is not uncommon for people caught in the practice of questionable behavior to use the "I didn't do anything illegal" defense. A person's behavior can be well within the scope of the law and still be unethical. The following guidelines for determining ethical behavior assume that the behavior in question is legal (Figure 26–1):

- Apply the **morning-after test**. This test asks, "If you make this choice, how will you feel about it tomorrow morning?"
- Apply the **front-page test**. This test encourages you to make a decision that would not embarrass you if printed as a story on the front page of your hometown newspaper.
- Apply the **mirror test**. This test asks, "If you make this decision, how will you feel about yourself when you look in the mirror?"
- Apply the **role-reversal test**. This test requires you to trade places with the people affected by your decision and view the decision through their eyes.
- Apply the **commonsense test**. This test requires you to listen to what your instincts and common sense are telling you. If it feels wrong, it probably is.

A four-question test anyone can use to determine if a given decision is ethical is as follows:

1. Is the decision truthful?
2. Is the decision fair to all stakeholders?
3. Will the decision generate goodwill for my organization?
4. Is the decision beneficial to all stakeholders? [5]

If a potential course of action is not legal, no further consideration is in order. If an action is not legal, it is also not ethical. If an action is balanced, it is fair to all involved. This means that safety and health professionals and their team members have responsibilities that extend well beyond the walls of their unit, organization, and company. If a course of action is in keeping with your own moral structure, it will make you feel good about yourself. "Another way of making sure decisions are truly ethical is by using the publicity test. Ask yourself how you would feel if your actions were published in your hometown newspaper. If you would be comfortable having your parents, grade school teachers, and other people find out what you did, chances are that your decision is an ethical one. However,

if you would not want these individuals to learn about your actions, you probably need to rethink your decision."[6]

These tests and guidelines will help safety and health professionals make ethical choices in the workplace. In addition to internalizing the guidelines themselves, safety and health professionals may want to share these values with all employees with whom they interact.

ETHICAL BEHAVIOR IN ORGANIZATIONS

Research by Trevino suggests that ethical behavior in organizations is influenced by both individual and social factors.[7] Trevino identified three personality measures that can influence an employee's ethical behavior: (1) ego strength, (2) Machiavellianism, and (3) locus of control.

An employee's **ego strength** is his or her ability to undertake self-directed tasks and to cope with tense situations. A measure of a worker's **Machiavellianism** is the extent to which he or she will attempt to deceive and confuse others. **Locus of control** is the **perspective** of workers concerning who or what controls their behavior. Employees with an internal locus of control feel that they control their own behavior. Employees with an external locus of control feel that their behavior is controlled by external factors (for example, rules, regulations, their safety and health professional).

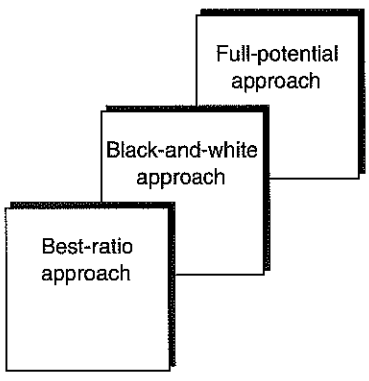
Social factors also influence ethical behavior in organizations.[8] These factors include gender, role differences, religion, age, work experience, nationality, and the influence of other people who are significant in an individual's life. Luthans and Kreitner state that people learn appropriate behavior by observing the behavior of significant role models (parents, teachers, public officials, and so on).[9] Because safety and health professionals represent a significant role model for their team members, it is critical that they exhibit ethical behavior that is beyond reproach in all situations.

SAFETY AND HEALTH PROFESSIONALS' ROLE IN ETHICS

Using the guidelines set forth in the previous section, safety and health professionals should be able to make responsible decisions concerning ethical choices. Unfortunately, deciding what is ethical is much easier than actually doing what is ethical. In this regard, trying to practice ethics is like trying to diet. It is not so much a matter of knowing you should cut down eating, it is a matter of following through and actually doing it.

It is this fact that defines the role of safety and health professionals with regard to ethics. Their role has three parts. First, they are responsible for setting an example of ethical behavior. Second, they are responsible for helping fellow employees make the right decision when facing ethical questions. Finally, safety and health professionals are responsible for helping employees follow through and actually undertake the ethical option once the appropriate choice has been identified. In carrying out their roles, safety and health professionals can adopt one of the following approaches (Figure 26–2): the best-ratio approach, the black-and-white approach, or the full-potential approach.

Figure 26–2
Three basic approaches to handling ethical problems.



Safety Fact

Models for Determining Ethical Behavior

In addition to the various tests that can be used for determining ethical behavior, there are also numerous models:

- Categorical imperative (black and white)
- Conventionalistic ethic (anything legal is ethical)
- Disclosure rule (explain actions to a wide audience)
- Doctrine of the mean (virtue through moderation)
- The Golden Rule (do unto others . . .)
- Intuition rule (what is right is just known)
- Market ethic (whatever makes a profit is right)
- Means–end ethic (end justifies the means)
- Might-equals-right ethic (self-explanatory)
- Organizational ethic (loyalty to the organization)
- Practical imperative (treat people as ends, not means)
- Equal freedom (full freedom unless it deprives another)
- Proportionality ethic (good outweighs the bad)
- Professional ethic (do only what can be explained to your peers)
- Revelation ethic (answers revealed by prayer)
- Rights ethic (protect rights of others)
- Theory of justice (impartial, even-handed)

Best-Ratio Approach

The **best-ratio approach** is the pragmatic approach. Its philosophy is that people are basically good and under the right circumstances behave ethically. However, under certain conditions, they can be driven to unethical behavior. Therefore, the safety and health professional should do everything possible to create conditions that promote ethical behavior and try to maintain the best possible ratio of good choices to bad. When hard decisions must be made, the appropriate choice is the one that does the most good for the most people. This is sometimes referred to as *situational ethics*.

Black-and-White Approach

Using the **black-and-white approach**, right is right, wrong is wrong, and circumstances are irrelevant. The safety and health professional's job is to make ethical decisions and carry them out. It is also to help employees choose the ethical route. When difficult decisions must be made, safety and health professionals should make fair and impartial choices regardless of the outcome.

Full-Potential Approach

Safety and health professionals who use the **full-potential approach** make decisions based on how the outcomes affect the ability of those involved to achieve their full potential. The underlying philosophy is that people are responsible for realizing their full potential within the confines of morality. Choices that can achieve this goal without infringing on the rights of others are considered ethical.

Decisions made may differ, depending on the approach selected. For example, consider the ethical dilemma presented at the beginning of this chapter. If the safety and health manager, Camillo Garcia, applies the best-ratio approach, he may decide to keep quiet, encourage the proper use of PPE, and hope for the best. On the other hand, if he takes the black-and-white approach, he will be compelled to confront the Mil-Tech management team with what he knows.

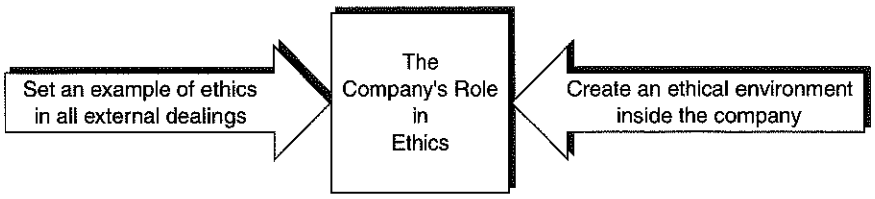


Figure 26–3
Ethics cannot be practiced in a vacuum. The company has a critical role to play.

COMPANY'S ROLE IN ETHICS

Industrial firms have a critical role to play in promoting ethical behavior among their employees. Safety and health professionals cannot set ethical examples alone or expect employees to behave ethically in a vacuum. A company's role in ethics can be summarized as (1) creating an internal environment that promotes, expects, and rewards ethical behavior; and (2) setting an example of ethical behavior in all external dealings (Figure 26–3).

Creating an Ethical Environment

A company creates an **ethical environment** by establishing policies and practices that ensure all employees are treated ethically and then enforcing these policies. Do employees have the right of due process? Do employees have access to an objective grievance procedure? Are there appropriate safety and health measures to protect employees? Are hiring practices fair and impartial? Are promotion practices fair and objective? Are employees protected from harassment based on race, gender, or other reasons? A company that establishes an environment that promotes, expects, and rewards ethical behavior can answer "yes" to all of these questions.

One effective way to create an ethical environment is to develop an **ethics philosophy** and specific, written guidelines for implementing that philosophy that are shared with all employees. Martin Marietta Corporation of Orlando, Florida, has a *Code of Ethics and Standards of Conduct* that is shared with all employees. The code begins with the following statement of philosophy:

> Martin Marietta Corporation will conduct its business in strict compliance with applicable laws, rules, regulations, and corporate and operating unit policies, procedures, and guidelines, with honesty and integrity, and with a strong commitment to the highest standards of ethics. We have a duty to conduct our business affairs within both the letter and the spirit of the law.[10]

Discussion Case

What Is Your Opinion?

The city council members are in a real quandary about the request from International Plastics Corporation (IPC) to open a new plant on a 100-acre plot owned by the city. On one hand, the city needs the new jobs that the IPC plant would bring—badly. High unemployment is the city's most serious problem, and every member of the city council ran on a job-creation platform in the last election. On the other hand, the council members have learned that IPC is not always a good corporate citizen in spite of its claims to the contrary.

Several cities with IPC plants have had problems enforcing their safety and health regulations. The consensus among other cities is that IPC officials say all the right things until contracts are signed. Then, all of a sudden, they begin to procrastinate, stonewall, and break promises. Should the city council allow IPC to build the new plant? What is your opinion?

OHSMS
Preliminary hazard analysis (PHA)
Probability
Related expertise
Risk analysis
Risk assessment
Safety policy
Self-assessments
Severity
Strategic planning
Technic of operations review (TOR)

REVIEW QUESTIONS

1. Define the term *hazard.*
2. What is the purpose of preliminary hazard analysis?
3. Explain why experience and related expertise are so important when conducting a preliminary hazard analysis.
4. Why is cost-benefit analysis such a critical part of hazard analysis and prevention?
5. Briefly describe the following detailed hazard analysis methodologies: FMEA, HAZOP, HEA, FTA, and TOR.
6. What is the most fundamental weakness of both FMEA and HAZOP? How can it be overcome?
7. Name and briefly explain two approaches to HEA.
8. Why did it take so long for TOR to be adopted?
9. What is the most important strength of TOR?
10. Name five widely applicable hazard prevention strategies.
11. Explain the two options given to organizations by HAZWOPER for responding to a chemical spill.
12. What is risk assessment? How is it used?
13. Explain the principal concerns of the safety manager.
14. List the major components of an OHSMS.

ENDNOTES

1. Society of Manufacturing Engineers (SME), *Tool and Manufacturing Engineers Handbook* vol. 6 (Dearborn, MI: Society of Manufacturing Engineers), 12–17.
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3. R. G. Hallock, "Technic of Operations Review Analysis: Determine Cause of Accident(Incident," *Safety & Health* 60, no. 8: 38–39, 46.
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6. Ibid.
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SAFETY MANAGEMENT CONCERNS

Students studying occupational safety might become safety engineers, technologists, technicians, specialists, or managers. Some who begin their careers serving in a technical capacity (engineer, technologist, technician, specialist, etc.) might eventually find themselves called upon to manage a team or department of safety professionals. Safety managers should be familiar with most of what is presented in this book. However, when working in a safety management position, their principal concerns will be as follows:

Strategic Planning

Safety managers work with key decision makers in organizations to ensure that safety and health are included in their strategic plans. An organization's strategic plan should have either a broad goal or a guiding principle (corporate value statement) that speaks to maintaining a safe and healthy work environment.

Safety Policy

Safety managers work with other key decision makers in organizations to develop a written policy that summarizes the organization's commitment to maintaining a safe and healthy work environment. This policy should also explain the responsibilities of managers, supervisors, and employees for maintaining a safe and healthy work environment.

Written Procedures

An organization's **safety policy** is translated into more specific language through the development of written policies. Safety managers should ensure that their employers put all the following in writing: job descriptions that include responsibilities for safety and health; general safety rules that apply to all employees; procedures for specialized and hazardous operations; standard operating procedures for processes, systems, and equipment (including safe operation); program for communicating with employees about safety information, issues, and concerns; emergency plan with all its subordinate plans; employee orientation program; near-miss procedures; safety suggestions procedures; procedures for job hazard analysis; and safety manual.

Employee Training

Safety managers are responsible for ensuring that both new and experienced employees receive the training they need to do their jobs safely. This involves the following types of responsibilities: arranging and scheduling training for new employees; arranging and scheduling retraining for experienced employees in need of updating; arranging training for employees whose jobs have changed in some way; identifying and assigning instructors to conduct training; monitoring and evaluating training that is provided; documenting training; and ensuring that supervisors receive the training they need in order to play their critical role in maintaining a safe and healthy work environment.

Communication

Safety managers are responsible for ensuring that employees, supervisors, and managers are fully informed about safety and health policies, practices, concerns, and other information. Some of the methods used by safety managers to communicate with stakeholders on a regular basis are safety meetings, daily personal contact (management by walking around, or MBWA), safety committees, and publications such as newsletters, e-mail, memorandums, and so on.

Human Resource Management

Safety managers work closely with **human resource management** personnel on personnel issues relating to safety and health. These issues include blood testing immediately following accidents, drug testing as part of the preemployment screening, developing and implementing corporate wellness programs, and monitoring injured employees who are placed in back-to-work programs.

Self-Assessments

An important responsibility of safety managers is helping supervisors and employees play their roles in maintaining a safe and healthy workplace. One of the ways safety managers do this is by developing checklists they can use in conducting safety-oriented **self-assessments** in their areas of responsibilities. Several such checklists are contained in various chapters of this book.

Safety and Health Promotion

Safety managers are responsible for establishing promotional programs that keep employees, supervisors, and managers focused on safety and health issues. The purpose of promotional programs is to remind people to think of safety first. The best programs encompass safety on the job as well as off the job. An employee injured at home might not cost the company any money in workers' compensation premiums, but does cost the company in lost time, the temporary loss of expertise the experienced employee brings to the job, and in the work added to other employees to make up for his or her absence.

Accident Investigation and Reporting

Safety managers are responsible for establishing a structured system for investigating accidents and near misses and for reporting the results of the investigations. They are also responsible for providing the training needed to allow supervisors and other personnel to participate in accident investigations in a positive, helpful manner. Included in this area of responsibility are accident cause analysis and workers' compensation filing and follow-up.

Ongoing Monitoring

Safety managers are responsible for ensuring that workplace hazards and the requirements of applicable regulatory agencies are properly monitored on a continuous basis. Hazards include noise, chemicals, smoke, fumes, dust, ergonomics, and any other potential problems that might be present in the workplace. Of course, monitoring hazards is just one aspect of the safety manager's job. The following checklist will help safety managers identify and monitor a number of issues:

1. Have you identified all the standards from OSHA and other agencies that apply to your organization? Do you have electronic access to the latest editions of these standards?
2. Are you familiar with the most recent workers' compensation legislation in your state?
3. Are you implementing workers' compensation cost-reduction strategies?
4. Are you monitoring the workplace for ergonomic hazards? Are you applying OSHA's voluntary ergonomic guidelines?
5. Are you monitoring employee stress levels and implementing appropriate stress-reduction strategies?
6. Are all machines properly guarded?
7. Have you instituated a comprehensive lockout/tagout program?
8. Have you implemented an effective slip-and-fall prevention program based on OSHA's Fall Protection Standard?

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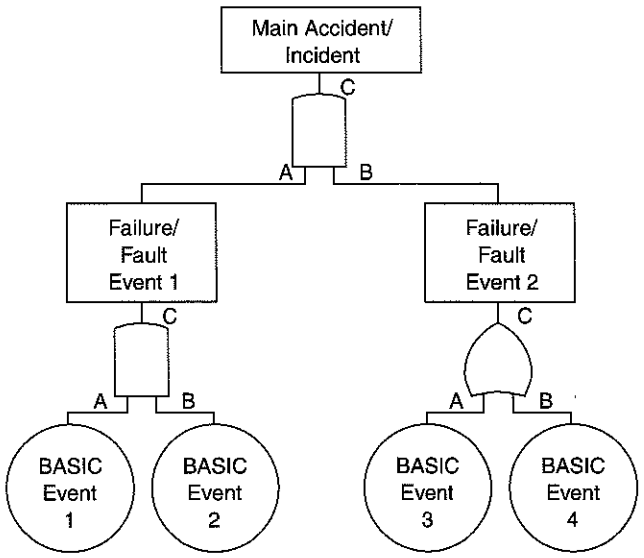
Figure 27–8
Sample fault tree.



(frequency of occurrence: 10^{-4}/day); 5 = Reasonably probable (frequency of occurrence: 10^{-3}/day); 6 = Frequent (frequency of occurrence: 10^{-2}/day).[5]

The lowest rating (1) means it is impossible that a given error will be committed or a given failure will occur. The highest rating (6) means it is very likely that a given error will be committed frequently or a given failure will occur frequently. Notice the quantification of frequency levels for each level of probability. For example, the expected frequency of occurrence for a probability level of remote is 10 to the negative fifth power per day.

Severity levels can also be rated, with the likely consequence of an accident or failure event of that severity. The least severe incidents (1) are not likely to cause an injury or damage property. The most severe incidents (4) are almost certain to cause death or serious property damage. Critical accidents (3) may cause severe injury or major loss. Marginal accidents (2) may cause minor injury, minor occupational illness, or minor damage.[6]

HAZARD PREVENTION AND DETERRENCE

All the methods and procedures discussed in this chapter have been concerned with identifying potential hazards. This section deals with using the information learned during analysis to prevent accidents and illnesses. The SME recommends the following hazard control methods:

- Eliminate the source of the hazards.
- Substitute a less hazardous equivalent.
- Reduce the hazards at the source.
- Remove the employee from the hazard (for example, substitute a robot or other automated system).
- Isolate the hazards (for example, enclose them in barriers).
- Dilute the hazard (for example, ventilate the hazardous substance).
- Apply appropriate management strategies.
- Use appropriate personal protective equipment (PPE).
- Provide **employee training**.
- Practice good housekeeping.[7]

For every hazard identified during the analysis process, one or more of these hazard control methods will apply. Figure 27–9 shows the steps involved in implementing hazard control methods. The first step involves selecting the method or methods that are most likely to produce the desired results. Once selected, the method is applied and monitored to determine if the expected results are being achieved.

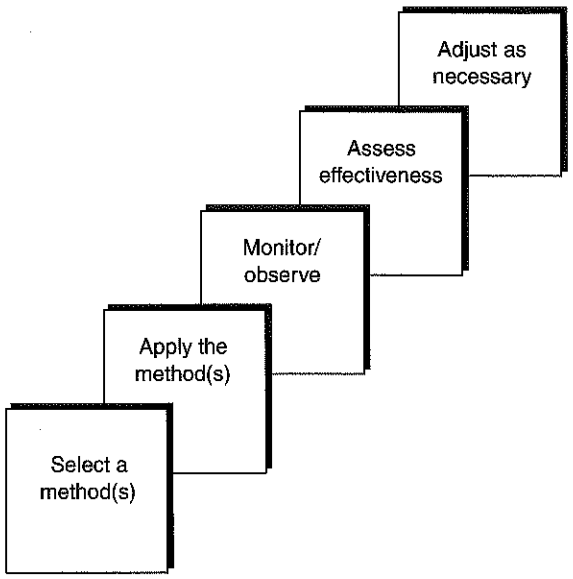


Figure 27–9
Steps for implementing hazard control measures.

Monitoring and observing are informal procedures. They should be followed by a more formal, more structured assessment of the effectiveness of the method. If the method selected is not producing the desired results, adjustments should be made. This may mean changing the way in which the method is applied or dropping it and trying another method.

The example of Crestview Container Corporation's (CCC) problems with toxic paint illustrates how the process works. CCC produces airtight aluminum containers for transporting electromechanical devices. The containers must be painted as the last step in the production process. Although the specified paint was supposed to be only slightly toxic—a problem that should have been resolved by using PPE—paint station operators complained frequently of various negative side effects.

The CCC safety and health professional, working with management, solved the problem by applying the following steps:

1. *Select a method.* Of the various methods available, the one selected involved eliminating the source of the hazard (the toxic paint). CCC personnel were tasked with testing various nontoxic paints until one was found that could match the problem paint in all categories (for example, ease of application, drying time, quality of surface finish). After 40 different paints were tested, a nontoxic substitute was found.
2. *Apply the method.* The new paint was ordered and used on a partial shipment of containers.

Safety Fact

What to Include in a Hazards Inventory

An excellent tool for getting the work of safety and health personnel organized, prioritized, and properly focused is the ***hazards inventory***. Such an inventory is a comprehensive list of all hazards associated with all processes and work tasks in a company. A hazards inventory should include at least the following information:

- Process descriptions
- Associated hazards
- Controls relating to the hazards
- Department location of each process
- Names of supervisors of all personnel who work on each process (including telephone numbers)
- Number of employees who work on each process
- Medical information relating to the hazards
- Historical information about the process and related hazards

3. *Monitor/observe.* The safety and health professional, along with CCC's painting supervisors, monitored both employee performance and employee complaints concerning the paint.
4. *Assess effectiveness.* To assess effectiveness, employee complaints were tabulated. The number of complaints was down to a negligible amount and not serious in nature. Productivity was also assessed. It was found that the new paint had no noticeable effect on productivity, negative or positive.
5. *Adjust as necessary.* CCC found that no adjustments were necessary.

OSHA PROCESS SAFETY STANDARD

The Occupational Safety and Health Administration (OSHA) Process Safety Standard has relevance from the perspective of hazard prevention, relating specifically to chemical hazards. OSHA's standard for process safety is found in 29 CFR 1910.119. Its purpose is to prevent *catastrophic* accidents caused by major releases of highly hazardous chemicals. To comply with this standard, companies must have written operating procedures, mechanical integrity programs, and formal incident investigation procedures. Other key elements are as follows:

1. *Coverage.* Although the Process Safety Standard is typically associated with large chemical and petrochemical processing plants, its coverage is actually much broader than this. Any company is covered that uses the threshold amount of a chemical listed in the standard, or 10,000 pounds or more of a flammable material on-site in one location.

2. *Employee participation.* Section (c) of the standard requires that employees be involved in all aspects of the process safety management program. In addition, employees must be given access to information developed as part of the program.

3. *Process Safety Information (PSI).* Section (d) of the standard requires organizations to establish and maintain process safety information files. Information in these files includes chemical, process, and equipment data.

4. *Process Hazard Analyses (PHAs).* Section (e) of the standard requires that companies conduct process hazard analyses for all processes covered by the standard. Like any other hazard analysis, the PHAs are supposed to identify potential problems so that prompt **corrective action or preventive measures** can be taken.

5. *Standard Operating Procedures (SOPs).* Section (f) of the standard requires employers to establish and maintain written standard operating procedures for using chemicals safely. The requirement applies to handling, processing, transporting, and storing chemicals.

6. *Requirements for contractors.* Section (h) of the standard describes the special requirements imposed on companies that contract portions of their work to other companies. Complying with the standard is a matter of making sure that contractors comply. The following requirements are imposed by Section (h):

- Screen contractors before issuing a contract to ensure that they have a comprehensive safety and health program in place.
- Orient contractors concerning the chemicals with which they may be required to work or be around, the emergency action plan, and other pertinent information.
- Evaluate contractors periodically to ensure that their safety performance is acceptable.
- Maintain an OSHA injury and illness log for the contractor that is separate from, and in addition to, that of the host company.

OSHA's Regulation for Chemical Spills

OSHA issues a special regulation dealing with chemical spills. The standard (29 CFR 1910.120) is called the **Hazardous Waste Operations and Emergency Response (HAZWOPER)**