Objectives

When you have completed this module, you will be able to do the following:

1. Explain the idea of a safety culture and its importance in the construction crafts.
2. Identify causes of accidents and the impact of accident costs.
3. Explain the role of OSHA in job-site safety.
4. Explain OSHA's General Duty Clause and 1926 CFR Subpart C.
5. Recognize hazard recognition and risk assessment techniques.
6. Explain fall protection, ladder, stair, and scaffold procedures and requirements.
7. Identify struck-by hazards and demonstrate safe working procedures and requirements.
8. Identify caught-in-between hazards and demonstrate safe working procedures and requirements.
9. Define safe work procedures to use around electrical hazards.
10. Demonstrate the use and care of appropriate personal protective equipment (PPE).
11. Explain the importance of hazard communications (HazCom) and Material Safety Data Sheets (MSDSs).
12. Identify other construction hazards on your job site, including hazardous material exposures, environmental elements, welding and cutting hazards, confined spaces, and fires.

Trade Terms

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Prerequisites

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Part I
1.0.0 INTRODUCTION

When you take a job, you have a safety obligation to your employer, co-workers, family, and yourself. In exchange for your wages and benefits, you agree to work safely. You are also obligated to make sure anyone you work with is working safely. Your employer is likewise obligated to maintain a safe workplace for all employees. The ultimate responsibility for on-the-job safety, however, rests with you. Safety is part of your job. In this module, you will learn to ensure your safety and that of the people you work with by adhering to the following rules:

- Follow safe work practices and procedures.
- Inspect safety equipment before use.
- Use safety equipment properly.

To take full advantage of the wide variety of training, job, and career opportunities the construction industry offers, you must first understand the importance of safety. Successful completion of this module will be your first step toward achieving this goal. Subsequent modules offer more detailed explanations of safety procedures and opportunities to practice them.

2.0.0 IMPORTANCE OF SAFETY

On a typical job site, there are often many workers from many trades in one place. These workers are all performing different tasks and operations. As a result, the job site is constantly changing and hazards are continually emerging. These hazards can jeopardize your safety. Your employer will make every effort to plan safety into each job and to provide a safe and healthful job site. Ultimately, your safety is in your own hands. Throughout the workday, you may perform tasks that may be repeated with little conscious thought. This routine work can dull alertness and increase the chances of an accident. Safety consciousness is a vital part of your work. Safety training is conducted to make you aware that dangers exist all around you every day. The time you spend learning and practicing safety procedures can save your life and the lives of others.

2.1.0 Safety Culture

Your boss might say, “I want my company to have a perfect safety record.” What does that mean? A safety record is more than the number of days a company has worked without an accident. Safety is a learned behavior and attitude. Safety is a way of working that must be incorporated into the company as a culture.

A safety culture is created when the whole company sees the value of a safe work environment. Creating and maintaining a safety culture is an ongoing process that includes a sound safety structure and attitude, and relates to both organizations and individuals. Everybody in the company, from management to laborers, must be responsible for safety every day they come to work.

There are many benefits to having a safety culture. Companies with strong safety cultures usually have:

- Fewer at-risk behaviors
- Lower accident rates
- Less turnover
- Lower absenteeism
- Higher productivity

A strong safety culture can also lower your company’s experience modification rate (EMR), which leads to winning more bids and keeping workers employed. Contractors with high EMRs are sometimes excluded from bidding. Factors that contribute to a strong safety culture include:

- Perceiving safety as a core value
- Strong leadership
- Establishing and enforcing high standards of expectation and performance
- The involvement of all employees
- Effective communication and commonly understood agreed-upon goals
- Using the workplace as a learning environment
- Encouraging workers to have a questioning attitude
- Good organizational learning and responsiveness to change
- Providing timely response to safety issues and concerns
- Continually monitoring performance

3.0.0 ACCIDENTS: CAUSES AND RESULTS

No person is immune to an accident. Accidents can happen to anyone at any time, in any place. Both poor behavior and poor working conditions can cause accidents. You can help prevent accidents by using safe work habits, understanding what causes accidents, and learning how to prevent them.
The lessons you will learn in this module will help you work safely. You will be able to spot and avoid hazardous conditions on the job site. By following safety procedures and being aware of the need for safety, you will help keep your workplace free from accidents and protect yourself and your co-workers from injury or even death.

An accident is defined as an unplanned event that may or may not result in personal injury or property damage. Accidents are often categorized by their severity and impact, as follows:

- **Near-miss** – An unplanned event or occurrence in which no one was injured and no damage to property occurred, but during which either could have happened. Near-miss incidents are warnings which should not be overlooked or taken lightly.
- **Property damage** – An unplanned event that resulted in damage to tools, materials, or equipment, but no injuries.
- **Minor injuries** – Personnel may have received minor cuts, bruises, or strains, but the injured workers returned to full duty on their next regularly scheduled work shift.
- **Serious or disabling injuries** – Personnel received injuries that resulted in temporary or permanent disability. Included in this category would be lost time accidents, restricted duty or motion cases, and those which resulted in permanent partial or permanent total disability.
- **Fatalities**.

Studies have shown that for every serious or disabling injury, there were 10 injuries of a less serious nature and 30 property damage accidents (Figure 1). A further study showed that 600 near-miss incidents occurred for every serious or disabling injury.

3.1.0 Accident Costs

When an accident happens, everyone loses—the injured worker, the employer, and the insurance company. Accidents cost billions of dollars each year and cause much needless suffering. The National Safety Council estimates that the organized safety movement has saved more than 4.2 million lives since it began in 1913. This section examines why accidents happen and how you can help prevent them.

---

**Figure 1** Accident ratio study.
Accident costs are often classified as direct and indirect. Direct costs include medical costs and other workers' compensation insurance benefits, as well as liability and property damage insurance payments. Of these, claims under workers' compensation, the insurance that covers workers on the job, are the most substantial of direct costs.

Indirect or hidden costs can be compared to the hidden nine-tenths of an iceberg, with the tip of the iceberg representing the direct or insured costs (Figure 2). Studies have shown that the hidden costs of accidents can and usually do exceed the direct costs of accidents from two to seven times. These hidden expenses include the costs associated with:

- Training replacement workers
- Accident investigation and corrective measures
- Scheduling delays
- Lost productivity
- Repairing damaged equipment and property
- Absenteeism

Many contract awards are based, in part, on a company's safety record. Therefore, accidents can also result in the loss of future jobs, which affects the company's financial position. This can mean layoffs, hiring freezes, or inability to purchase new equipment or tools. In this way, an accident indirectly affects everyone on the job site.

3.2.0 What Causes Accidents?
You may already know some of the main causes of accidents. They include the following:

- Failure to communicate
- Poor work habits
- Alcohol or drug abuse
- Lack of skill
- Intentional acts
- Unsafe acts
- Rationalizing risks
- Unsafe conditions
- Management system failure

3.2.1 Failure to Communicate
Many accidents happen because of a lack of communication. For example, you may learn how to do things one way on one job, but what happens when you go to a new job site? You need to communicate with the people at the new job site to find out whether they do things the way you have learned to do them. If you do not communicate clearly, accidents can happen. Remember that different people, companies, and job sites do things in different ways.

NOTE
Toolbox talks are one way to effectively keep all workers aware and informed of safety issues and guidelines. Toolbox talks are short, 5- to 10-minute meetings that review specific health and safety topics.
If you think that people know something without talking with them about it, then you are assuming that they know. Assuming that other people know and will do what you think they will do can cause accidents.

**CAUTION**

Never assume anything! It never hurts to ask questions, but disaster can result if you don’t ask. For example, do not assume that an electrical current is turned off. First ask whether the current is turned off, then check it yourself to be completely safe.

All work sites have specific markings and signs to identify hazards and provide emergency information (Figure 3). Learn to recognize these types of signs:

- Informational
- Safety
- Caution
- Danger
- Temporary warnings

Informational markings or signs provide general information. These signs are blue. The following are considered informational signs:

- No Admittance
- No Trespassing
- For Employees Only

Safety signs give general instructions and suggestions about safety measures. The background on these signs is white; most have a green panel with white letters. These signs tell you where to find such important areas as the following:

- First-aid stations
- Emergency eye-wash stations
- Evacuation routes
- Material Safety Data Sheet (MSDS) stations
- Exits (usually have white letters on a red field)

Caution markings or signs tell you about potential hazards or warn against unsafe acts. When you see a caution sign, protect yourself against a possible hazard. Caution signs are yellow and have a black panel with yellow letters. They may give you the following information:

- Hearing and eye protection are required
- Respirators are required
- Smoking is not allowed

Danger markings or signs tell you that an immediate hazard exists and that you must take certain precautions to avoid an accident. Danger

*Figure 3* Communication tags/signs.
signs are red, black, and white. They may indicate the presence of the following:

- Defective equipment
- Flammable liquids and compressed gases
- Safety barriers and barricades
- Emergency stop button
- High voltage

Safety tags are temporary warnings of immediate and potential hazards. They are not designed to replace signs or to serve as permanent means of protection. Learn to recognize the standard accident prevention signs and tags (Table 1).

### 3.2.2 Poor Work Habits

Poor work habits can cause serious accidents. Examples of poor work habits are procrastination, carelessness, and horseplay. Procrastination, or putting things off, is a common cause of accidents. For example, delaying the repair, inspection, or cleaning of equipment and tools can cause accidents. If you try to push machines and equipment beyond their operating capacities, you risk injuring yourself and your co-workers.

Machines, power tools, and even a pair of pliers can hurt you if you don’t use them safely. It is your responsibility to be careful. Tools and machines don’t know the difference between wood or steel and flesh and bone.

Work habits and work attitudes are closely related. If you resist taking orders, you may also resist listening to warnings. If you let yourself be easily distracted, you won’t be able to concentrate. If you aren’t concentrating, you could cause an accident.

Your safety is affected not only by how you do your work, but also by how you act on the job site. This is why most companies have strict policies for employee behavior. Horseplay and other inappropriate behavior are forbidden. Workers who engage in horseplay and other inappropriate behavior on the job site will be fired.

These strict policies are for your protection. There are many hazards on construction sites. Each person’s behavior—at work, on a break, or at lunch—must follow the principles of safety.

The man pouring the liquid on his co-worker in Figure 4 may look as if he’s just having fun by playing a prank on his co-worker. In fact, what he’s doing could cause his co-worker serious, even fatal, injury. If you horse around on the job, play pranks, or don’t concentrate on what you are doing, you are showing a poor work attitude that can lead to a serious accident.

### 3.2.3 Alcohol and Drug Abuse

Alcohol and drug abuse costs the construction industry millions of dollars a year in accidents, lost time, and lost productivity. The true cost of alcohol and drug abuse is much more than just money; of course. Substance abuse can cost lives. Just as drunk driving kills thousands of people on our highways every year, alcohol and drug abuse kills on the construction site. Examine the person in Figure 5. Would you want to be like him or be working near him?

### Table 1 Tags and Signs

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<td>White</td>
<td>Red panel with white or gray letters</td>
<td>Do Not Operate</td>
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<td></td>
<td>Do Not Start</td>
</tr>
<tr>
<td>White</td>
<td>Black square with a red oval and white letters</td>
<td>Danger</td>
</tr>
<tr>
<td>Yellow</td>
<td>Black square with yellow letters</td>
<td>Unsafe</td>
</tr>
<tr>
<td>White</td>
<td>Black square with white letters</td>
<td>Do Not Use</td>
</tr>
<tr>
<td>Yellow</td>
<td>Red/magenta (purple) panel with black letters and a radiation symbol</td>
<td>Radiation Hazard</td>
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<tr>
<td>White</td>
<td>Fluorescent orange square with black letters and a biohazard symbol</td>
<td>Biological Hazard</td>
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Figure 4  Horseplay at work can be dangerous.

**Think About It**

Look at the man who's trying to play a prank on his co-worker in Figure 4. Think of ways in which this work situation could be safer.

- No hard hat
- No safety goggles
- No gloves
- Breaking shop rules

Using alcohol or drugs creates a risk of injury for everyone on a job site. Many states have laws that prevent workers from collecting insurance benefits if they are injured while under the influence of alcohol or illegal drugs.

Would you trust your life to a crane operator who was high on drugs? Would you bet your life on the responses of a co-worker using alcohol or drugs? Alcohol and drug abuse have no place in the construction industry. A person on a construction site who is under the influence of alcohol or drugs is an accident waiting to happen—possibly a fatal accident.

People who work while using alcohol or drugs are at risk of accident or injury, and their

**Did You Know?**

Stress creates a chemical change in your body. Although stress may heighten your hearing, vision, energy, and strength, long-term stress can harm your health.

Not all stress is job-related; some stress develops from the pressures of dealing with family and friends and daily living. In the end, your ability to handle and manage your stress determines whether stress hurts or helps you. Use common sense when you are dealing with stressful situations. For example, consider the following:

- Keep daily occurrences in perspective. Not everything is worth getting upset, angry, or anxious about.
- When you have a particularly difficult workday scheduled, get plenty of rest the night before.
- Manage your time. The feeling of always being behind creates a lot of stress. Waiting until the last minute to finish an important task adds unnecessary stress.
- Talk to your supervisor. Your supervisor may understand what is causing your stress and may be able to suggest ways to manage it better.
co-workers are at risk as well. That’s why your employer probably has a formal substance abuse policy. You should know that policy and follow it for your own safety.

You don’t have to be abusing illegal drugs such as marijuana, cocaine, or heroin to create a job hazard. Many prescription and over-the-counter drugs, taken for legitimate reasons, can affect your ability to work safely. Amphetamines, barbiturates, and antihistamines are only a few of the legal drugs that can affect your ability to work or operate machinery safely.

Think About It

If the man in Figure 5 doesn’t kill himself first, he will almost certainly kill someone else eventually. How many violations can you identify?

- Consuming alcohol on the job site
- Not following proper safety procedures for operating a motorized vehicle near hazardous materials
- Not using both hands to drive the vehicle
- Not wearing a seat/safety belt
- Not wearing a hard hat
- Not wearing safety glasses or goggles

3.2.4 Lack of Skill

You should learn and practice new skills under careful supervision. Never perform new tasks alone until you’ve been checked out by a supervisor.

Lack of skill can cause accidents quickly. For example, suppose you are told to cut some $2 \times 8$ boards with a circular saw, but you aren’t skilled with that tool. A basic rule of circular saw operation is never to cut without a properly functioning
guard. Because you haven’t been trained, you don’t know this. You find that the guard on the saw is slowing you down. So you jam the guard open with a small block of wood. The result could be a serious accident. Proper training can prevent this type of accident.

**CAUTION**

Never operate a power tool until you have been trained to use it. You can greatly reduce the chances of accidents by learning the safety rules for each task you perform.

### 3.2.5 Intentional Acts

When someone purposely causes an accident, it is called an intentional act. Sometimes an angry or dissatisfied employee may purposely create a situation that leads to property damage or personal injury. If someone you are working with threatens to get even or pay back someone, let your supervisor know at once.

### 3.2.6 Unsafe Acts

An unsafe act is a change from an accepted, normal, or correct procedure that usually causes an accident. It can be any conduct that causes unnecessary exposure to a job-site hazard or that makes an activity less safe than usual. Here are examples of unsafe acts:

- Failing to use **personal protective equipment (PPE)**
- Failing to warn co-workers of hazards
- Lifting improperly
- Loading or placing equipment or supplies improperly
- Making safety devices (such as saw guards) inoperable
- Operating equipment at improper speeds
- Operating equipment without authority
- Servicing equipment in motion
- Taking an improper working position
- Using defective equipment
- Using equipment improperly

### 3.2.7 Rationalizing Risk

Everybody takes risks every day. When you get in your car to drive to work, you know there is a risk of being involved in an accident. Yet when you drive using all the safety practices you have learned, you know that there is a good chance that you will arrive at your destination safely. Driving is an appropriate risk because you have some control over your own safety and that of others.

Some risks are not appropriate. On the job, you must never take risks that endanger yourself or others just because you can make an excuse for doing so. This is called rationalizing risk. Rationalizing risk means ignoring safety warnings and practices. For example, because you are late for work, you might decide to run a red light. By trying to save time, you could cause a serious accident.

The following are common examples of rationalized risks on the job:

- Crossing boundaries because no activity is in sight
- Not wearing gloves because it will take only a minute to make a cut
- Removing your hard hat because you are hot and you cannot see anyone working overhead
- Not tying off your fall protection because you only have to lean over by about a foot

Think about the job before you do it. If you think that it is unsafe, then it is unsafe. Stop working until the job can be done safely. Bring your concerns to the attention of your supervisor. Your health and safety, and that of your co-workers, make it worth taking extra care.

### 3.2.8 Unsafe Conditions

An unsafe condition is a physical state that is different from the acceptable, normal, or correct condition found on the job site. It usually causes an accident. It can be anything that reduces the degree of safety normally present. The following are some examples of unsafe conditions:

- Congested workplace
- Defective tools, equipment, or supplies
- Excessive noise
- Fire and explosive hazards
- Hazardous atmospheric conditions (such as gases, dusts, fumes, and vapors)
- Inadequate supports or guards
- Inadequate warning systems
- Poor housekeeping
- Poor lighting
- Poor ventilation
- Radiation exposure
- Unguarded moving parts such as pulleys, drive chains, and belts

**On-Site**

Most workers who die from falls were wearing harnesses but had failed to tie off properly. Always follow the manufacturer’s instructions when wearing a harness. Know and follow your company’s safety procedures when working on roofs, ladders, and other elevated locations.
3.2.9 Management System Failure

Sometimes the cause of an accident is failure of the management system. The management system should be designed to prevent or correct the acts and conditions that can cause accidents. If the management system did not do these things, that system failure may have caused the accident.

What traits could mean the difference between a management system that fails and one that succeeds? A company implementing a good management system will:

- Put safety policies and procedures in writing
- Distribute written safety policies and procedures to each employee
- Review safety policies and procedures periodically
- Enforce all safety policies and procedures fairly and consistently
- Evaluate supplies, equipment, and services to see whether they are safe
- Provide regular, periodic safety training for employees

3.3.0 Housekeeping

In construction, housekeeping means keeping your work area clean and free of scraps or spills. It also means being orderly and organized. You must store your materials and supplies safely and label them properly. Arranging your tools and equipment to permit safe, efficient work practices and easy cleaning is also important.

If the work site is indoors, make sure it is well-lit and ventilated. Don’t allow aisles and exits to be blocked by materials and equipment. Make sure that flammable liquids are stored in safety cans. Oily rags must be placed only in approved, self-closing metal containers.

Remember that the major goal of housekeeping is to prevent accidents. Good housekeeping reduces the chances for slips, fires, explosions, and falling objects. Here are some good housekeeping rules:

- Remove from work areas all scrap material and lumber with nails protruding.
- Clean up spills to prevent falls.
- Remove all combustible scrap materials regularly.
- Make sure you have containers for the collection and separation of refuse. Containers for flammable or harmful refuse must be covered.
- Dispose of wastes often.
- Store all tools and equipment when you’re finished using them.

Another term for good housekeeping is pride of workmanship. If you take pride in what you are doing, you won’t let trash build up around you. The saying “A place for everything and everything in its place” is the right idea on the job site.

3.4.0 Company Safety Policies and OSHA Regulations

The mission of the Occupational Safety and Health Administration (OSHA) is to save lives, prevent injuries, and protect the health of America’s workers. To accomplish this, federal and state governments work in partnership with the 111 million working men and women and their 7 million employers who are covered by the Occupational Safety and Health Act (OSH Act) of 1970. Nearly every worker in the nation comes under OSHA’s jurisdiction. There are some exceptions, such as miners, transportation workers, many public employees, and the self-employed.

3.4.1 The Code of Federal Regulations

The Code of Federal Regulations (CFR) Part 1910 covers the OSHA standards for general industry. CFR Part 1926 covers the OSHA standards for the construction industry. Either or both may apply to you, depending on where you are working and what you are doing. If a job-site condition is covered in the CFR book, then that standard must be used. However, if a more stringent requirement is listed in CFR 1910, it should also be met. Check with your supervisor to find out which standards apply to your job.

29 CFR 1926 is divided into 26 lettered subparts (A through Z). As you progress in task-specific training, you will learn about all the subparts applicable to your work. Subpart C of 29 CFR 1926 applies to all construction and maintenance work. It outlines the general safety and health provisions for the construction industry. It covers the following topics:

- Safety training and education
- Injury reporting and recording
- First aid and medical attention
- Housekeeping
- Illumination
- Sanitation
- PPE
- Standards incorporated by reference
- Definitions
- Access to employee exposure and medical records
- Means of egress
- Employee emergency action plans

See Figure 6 to identify parts, sections, paragraphs, and subparagraphs of an OSHA standard.
3.4.3 Employee Rights and Responsibilities

While it is the employer’s responsibility to keep workers safe by complying with the General Duty Clause and all other OSHA regulations, workers have certain rights and responsibilities on the job site as well. First and foremost, workers must follow their employers’ safety rules. While workers cannot be cited or fined by OSHA, they can be disciplined for violating their employer’s safety rules. Workers must also wear the provided personal protective equipment. Workers should also inform their foreman about health and safety concerns on the job.

Section 11(c) of the OSH Act prohibits employers from disciplining or discriminating against any worker for practicing their rights under OSHA, including filing a complaint. You have the right to file a complaint if you do not think that your employer is protecting your health and safety at work. You may submit a written request to OSHA asking for an inspection of your work site. Workers who file a complaint have the right to have their names withheld from their employers, and OSHA will not reveal this information.

Workers who would like an on-site inspection must submit a written request. You have the following rights when job site inspection is conducted:

- You must be informed of imminent dangers. An OSHA inspector must tell you if you are exposed to an imminent danger. An imminent danger is one that could cause death or serious injury now or in the near future. The inspector will also ask your employer to stop any dangerous activity.
- You have the right to accompany the OSHA inspector in the walk-around inspection. Walk-around activities include all opening and closing conferences related to the conduct of the inspection.
- You have the right to be told about citations issued at your workplace. Notices of OSHA citations must be posted in the workplace near the site where the violation occurred and must remain posted for three days or until the hazard is corrected, whichever is longer.

After an inspection has been performed, OSHA will give the employer a date by which any hazards cited must be fixed. Employers can appeal these dates, and appeals must be filed within 15 days of the citation. Workers have the right to meet privately with the OSHA inspector to discuss the results of the inspection.

If you have been discriminated against for asserting your OSHA rights, you have the right to file a complaint with the OSHA area office within 30 days of the incident. Make sure you file your

3.4.2 The General Duty Clause

If a standard does not specifically address a hazard, the general duty clause must be invoked. Failing to adhere to the general duty clause can result in heavy fines for your employer. The general duty clause reads as follows:

In practice, OSHA, court precedent, and the review commission have established that if the following elements are present, a general duty clause citation may be issued:

- The employers failed to keep the workplace free of a hazard to which employees of that employer were exposed.
- The hazard was recognized. (Examples might include: through your safety personnel, employees, organization, trade organization, or industry customs.)
- The hazard was causing or was likely to cause death or serious physical harm.
- There was a feasible and useful method to correct the hazard.
complaint as soon as possible, as the time limit is strictly enforced.

You also have the right to see and copy any medical records about you that the employer has obtained. Your employer is required by OSHA 29 CFR 1926.33 and OSHA 29 CFR 1910.1020 to maintain your medical records for 30 years after you leave employment. If you are employed for less than one year, the employer can maintain your records or give them to you when you leave the job.

3.4.4 Inspections

OSHA conducts six types of inspections to determine if employers are in compliance with standards:

- **Imminent danger inspections** – OSHA’s top priority for inspection, conducted when workers face an immediate risk of death or serious physical harm.
- **Catastrophe inspections** – Performed after an accident that requires hospitalization of three or more workers. Employers are required to report fatalities and catastrophes to OSHA within eight hours.
- **Worker complaint and referral inspections** – Conducted due to complaints by workers or a worker representative, or a referral from a recognized professional.
- **Programmed inspection** – Aimed at high-risk areas based on OSHA’s targeting and priority methods.
- **Follow-up inspection** – Completed after citations to assure employer has corrected violations.
- **Monitoring inspection** – Used for long-term abatement follow-up or to assure compliance with variances.

Before beginning an inspection, OSHA staff must be able to determine from the complaint that there are reasonable grounds to believe that a violation of an OSHA standard or a safety or health hazard exists. If OSHA has information indicating the employer is aware of the hazard and is correcting it, the agency may not conduct an inspection after obtaining the necessary documentation from the employer.

Complaint inspections are typically limited to the hazards listed in the complaint, although other violations in plain sight may be cited as well. The inspector may decide to expand the inspection based on professional judgment or conversations with workers.

Complaints are not necessarily inspected in first-come, first-served order. OSHA ranks complaints based on the severity of the alleged hazard and the number of workers exposed. That is why lower-priority complaints can often be handled more quickly using the phone/fax method than through on-site inspections.

Inspections are typically performed by conducting a walk-around. During a walk-around inspection, the inspector typically does the following:

- Observes conditions of the job site.
- Talks to workers.
- Inspects records.
- Examines posted hazard warnings and signs.
- Points out hazards and suggests ways to reduce or eliminate them.

After the walk-around inspection, there is typically a closing conference held between the inspector and the site contractor or company managers. During this conference, inspectors discuss their findings, citing specific violations and suggested abatement methods. Inspectors may also conduct interviews with the employers, workers, and representatives at this point.

3.4.5 Violations

Employers who violate OSHA regulations can be fined. The fines are not always high, but they can harm a company’s reputation for safety. Fines for serious safety violations can cost up to $7,000. Fines for each violation that was done willfully can cost up to $70,000. In 2002, more than 78,000 fines were levied at a cost of $70,000 per violation.

3.4.6 Compliance

Just as employers are responsible to OSHA for compliance, employees must comply with their company’s safety policies and rules. Employers are required to identify hazards and potential hazards within the workplace and eliminate them, control them, or provide protection from them. This can only be done through the combined efforts of the employer and employees. Employers must provide written programs and training on hazards, and employees must follow the procedures. You, as the employee, must read and understand the OSHA poster at your job site explaining your rights and responsibilities. If you are unsure where the OSHA poster is, ask your supervisor.

To help employers provide a safe workplace, OSHA requires companies to provide a **competent person** to ensure the safety of the employees. In OSHA 29 CFR 1926, OSHA defines a competent person as follows:

- Competent person means one who is capable of identifying existing and predictable hazards in the surroundings or working conditions which
are unsanitary, hazardous, or dangerous to employees, and who has authorization to take prompt corrective measures to eliminate them.

In comparison, OSHA 29 CFR 1926 defines a qualified person as follows:

Someone who, by possession of a recognized degree, certificate, or professional standing, or who by extensive knowledge, training, and experience, has successfully demonstrated his ability to solve or resolve problems relating to the subject matter, work, or the project.

In other words, a competent person is experienced and knowledgeable about the specific operation and has the authority from the employer to correct the problem or shut down the operation until it is safe. A qualified person has the knowledge and experience to handle problems. A competent person is not necessarily a qualified person.

These terms will be an important part of your career. It is important for you to know who the competent person is on your job site. OSHA requires a competent person for many of the tasks you may be assigned to perform, such as confined space entry, ladder use, and trenching. Different individuals may be assigned as a competent person for different tasks, according to their expertise. To ensure safety for you and your co-workers, work closely with your competent person and supervisor.

3.4.7 Record Keeping

Accurate record keeping is a particularly important part of OSHA compliance. OSHA 29 CFR 1904 outlines the recording and reporting information for all occupational injuries and illnesses. Its purpose is to set the guidelines so that employers know when and how to report and record all workplace fatalities, injuries, and illnesses. The rules vary between companies, so it’s important to revisit CFR 1904 frequently when you participate in any record keeping or reporting activities.

On-Site

For more information on OSHA, visit the OSHA website at www.osha.gov. To report an emergency, fatality, or imminent life-threatening situation, call OSHA’s toll free line immediately:

1-800-321-OSHA (6742) or TTY – 1-877-889-5627

To file a complaint online, go to http://www.osha.gov/pls/oshawa/complaints.html.

3.5.0 Reporting Injuries, Accidents, and Incidents

There are three categories of on-the-job events: injuries, accidents, and incidents. An injury is anything that requires treatment, even minor first aid. An accident is anything that causes an injury or property damage. An incident is anything that could have caused an injury or damage but, because it was caught in time, did not.

You must report all on-the-job injuries, accidents, or incidents, no matter how minor, to your supervisor (Figure 7). Some workers think they will get in trouble if they report minor injuries. That’s not true. Small injuries, like cuts and scrapes, can later become big problems because of infection and other complications.

Many employers are required to maintain a log of significant work-related injuries and illnesses using OSHA Form 300. Employee names can be kept confidential in certain circumstances. A summary of these injuries must be posted at certain intervals, although employers do not need to submit it to OSHA unless requested. Employers can calculate the total number of injuries and illnesses and compare it with the average national rates for similar companies.
By analyzing accidents, companies and OSHA can improve safety policies and procedures. By reporting an accident, you can help keep similar accidents from happening in the future.

### 3.6.0 The Four High-Hazard Areas

Construction has four leading causes of death. These are often referred to as the four high-hazard areas, and include falls, struck-by hazards, caught-in or caught-between hazards, and electrical hazards. Of all construction fatalities, 82% fall into one of these four categories (Figure 8).

Here are explanations of the four leading hazard groups:

- Falls from elevation are accidents involving failure of, failure to provide, or failure to use appropriate fall protection.
- Struck-by accidents involve unsafe operation of equipment, machinery, and vehicles, as well as improper handling of materials, such as through unsafe rigging operations.
- Caught-in or caught-between accidents involve unsafe operation of equipment, machinery, and vehicles, as well as improper safety procedures at trench sites and in other confined spaces.
- Electrical shock accidents involve contact with overhead wires, use of defective tools, failure to disconnect power source before repairs, or improper environment fault protection.

### 3.7.0 Evacuation Procedures

In many work environments, specific evacuation procedures are needed. These procedures go into effect when dangerous situations arise, such as fires, chemical spills, and gas leaks. In an emergency, you must know the evacuation procedures. You must also know the signal (usually a horn or siren) that tells workers to evacuate.

When you hear the evacuation signal, follow the evacuation procedures exactly. That usually means taking a certain route to a designated assembly area and telling the person in charge that you are there. If hazardous materials are released into the air, you may have to look at the wind sock to see which way the wind is blowing. Different evacuation routes are planned for different wind directions. Taking the right route will keep you from being exposed to the hazardous material.

### 4.0.0 Hazard Recognition, Evaluation, and Control

The process of hazard recognition, evaluation, and control is the foundation of an effective safety program. When hazards are identified and assessed, they can be addressed quickly, reducing the hazard potential. Simply put, the more aware you are of your surroundings and the dangers in them, the less likely you are to be involved in an accident.

#### 4.1.0 Hazard Recognition

Accident/incident types and energy sources are considered potential hazard indicators. The best approach in determining if a situation or equipment is potentially hazardous is to ask yourself these questions:

- How can this situation or equipment cause harm?
- What types of energy sources are present that can cause an accident?
- What is the magnitude of the energy?
- What could go wrong to release the energy?
- How can the energy be eliminated or controlled?
- Will I be exposed to any hazardous materials?

Before you can fully answer these questions, you need to know the different types of accidents that can happen and the energy sources behind the accidents. Some of the different types of accidents that can cause injuries include the following:

- Falls on the same elevations or falls from elevations
- Being caught in, on, or between equipment
- Being struck by falling objects
- Contact with acid, electricity, heat, cold, radiation, pressurized liquid, gas, or toxic substances
- Being cut by tools or equipment
- Exposure to high noise levels
- Repetitive motion or excessive vibration

Figure 8 The four high-hazard areas.
Did you spot the four high-hazard areas in this list? Remember, these four types of accidents cause 82% of all construction fatalities: falls, struck-by, caught-in, and electrical.

When equipment is the cause of an accident, it is usually because there was an uncontrolled release of energy. The different types of energy sources that can be released include the following:

- Mechanical
- Pneumatic
- Hydraulic
- Electrical
- Chemical
- Thermal
- Radioactive
- Gravitational
- Stored energy

There are a number of ways to recognize hazards and potential hazards on a job site. Some techniques are more complicated than others. In order to be effective, they all must answer this question: What could go wrong with this situation or operation? No matter what hazard recognition technique you use, answering that question in advance will save lives and prevent equipment damage.

4.2.0 Job Safety Analysis (JSA) and Task Safety Analysis (TSA)

Performing a job safety analysis (JSA), also known as job hazard analysis (JHA), is one approach to hazard recognition. Another common technique is performing a task safety analysis (TSA), also called a task hazard analysis (THA).

In a JSA, the task at hand is broken down into its individual parts or steps and then each step is analyzed for its potential hazards. Once a hazard is identified, certain actions or procedures are recommended that will correct that hazard. For example, during a JSA, it is determined that using a come-along to install a pump motor in a tight space would be safer than having a worker do it manually. By using the come-along, the chance that the worker’s hand would get crushed during installation is reduced. Using the job safety analysis saved the worker from injury. Figure 9 shows an example of a form used to conduct a job safety analysis.

<table>
<thead>
<tr>
<th>JOB SAFETY ANALYSIS FORM</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Job Title:</strong></td>
</tr>
<tr>
<td><strong>Job Location:</strong></td>
</tr>
<tr>
<td><strong>PPE:</strong></td>
</tr>
<tr>
<td><strong>Tools, Materials and Equipment:</strong></td>
</tr>
<tr>
<td><strong>Date of Analysis:</strong></td>
</tr>
<tr>
<td><strong>Conducted by:</strong></td>
</tr>
<tr>
<td><strong>Staffing:</strong></td>
</tr>
<tr>
<td><strong>Duration:</strong></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Step</th>
<th>Hazards</th>
<th>Quality Concern</th>
<th>Environmental Concern</th>
<th>New Procedure or Protection</th>
</tr>
</thead>
</table>

*Figure 9  Job safety analysis form.*
JSAs can also be used as pre-planning tools. This helps to ensure that safety is planned into the job. You may be asked to take part in a JSA during job planning. When JSAs are used as pre-planning tools, they contain the following information:

- Tools, materials, and equipment needs
- Staffing or manpower requirements
- Duration of the job
- Quality concerns

Task safety analysis is similar to job safety analysis in that both require workers to identify potential hazards and needed safeguards associated with a job they are about to do. The difference is the form used to report the hazards. During a TSA, a pre-printed, fill-in-the-blank checklist, like the one shown in Figure 10, is often used to document any hazard found during analysis. Before work begins, the first-line supervisor or team leader should discuss the conclusions found during the TSA with the crew. Some companies require workers to sign the completed TSA forms or checklists before they start work. This helps companies document and ensure that workers have been told of potential hazards and safety procedures.

4.3.0 Risk Assessment

Whether an action is considered safe is often a matter of evaluating risk. Risk is a measure of the probability, consequences, and exposure related to an event. Probability is the chance that a given event will occur. Consequences are the results of an action, condition, or event. Exposure is the amount of time and/or the degree to which someone or something is exposed to an unsafe condition, material, or environment.

A safe operation is one in which there is an acceptable level of risk. This means there is a low probability of an accident and that the consequences and exposure risk are all acceptable. For example, climbing a ladder has risk that is considered to be acceptable if the proper ladder is being used as intended, if it is set up correctly, and if it is in good condition. The probability of an accident, exposure to danger, and potential consequences are all low. If any one of these conditions were different, climbing the ladder would have an unacceptable level of risk.
## TASK SAFETY ANALYSIS CHECKLIST

<table>
<thead>
<tr>
<th>Number</th>
<th>Question</th>
<th>Yes</th>
<th>No</th>
<th>N/A</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Have underground utilities been located prior to excavation?</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2.</td>
<td>In areas where there are known or suspected unexploded ordnances, has the area been cleared by qualified explosive ordnance disposal (EOD) personnel?</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3.</td>
<td>Are excavations, the adjacent areas, and protective systems inspected and documented daily?</td>
<td></td>
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</tr>
<tr>
<td>4.</td>
<td>Are excavations over 5 feet in depth adequately protected by shoring, trench box or sloping?</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5.</td>
<td>When excavations are undercut, is the overhanging material safely supported?</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6.</td>
<td>Have methods been taken to control the accumulation of water in excavations?</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7.</td>
<td>Are employees protected from falling materials (loose rock or soil)?</td>
<td></td>
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<td></td>
</tr>
<tr>
<td>8.</td>
<td>Are substantial stop logs or barricades installed where vehicles or equipment are used or allowed adjacent to an excavation?</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>9.</td>
<td>Have steps been taken to prevent the public, workers or equipment from falling into excavations?</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10.</td>
<td>Are all wells, calyx holes, pits, shafts, etc. barricaded or covered?</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>11.</td>
<td>Are walkways provided where employees or equipment are required or permitted to cross over excavations?</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>12.</td>
<td>Where employees are required to enter excavations, is access/egress provided every 25 feet laterally?</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>13.</td>
<td>For excavations less than 20 feet, is the maximum slope 1½ horizontal to 1 vertical?</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>14.</td>
<td>Are support systems drawn from manufacturer's tabulated data in accordance with all manufacturer's specifications?</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>15.</td>
<td>Are copies of the tabulated data maintained at the job site?</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>16.</td>
<td>Are members of support systems securely connected together?</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>17.</td>
<td>Are shields installed in a manner to restrict lateral or other hazardous movement?</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Comments:**

*Figure 10  TSA checklist.*