

Safety Program

Arena Fire Protection, Inc. Client Number **C59360**

Title 29 Code of Federal Regulations (CFR)

Part 1926, Subpart C, Section 21, Subsection (b), Paragraph (2), States:

"The Employer shall instruct each employee in the recognition and avoidance of unsafe conditions and the regulations applicable to his work environment to control or eliminate any hazards or other exposure to illness or injury."

1. Post the General Safety Rules at each location and job site as well as your main facility.
2. Provide a copy of the Safety Program for all job sites.
3. Add map of facility and evacuation route to the Emergency Response Program.
4. Post the Request for Training at the job sites or conspicuous location.
5. Note Accident Investigation Forms are included.
6. Note OSHA Log 300 included.
7. Bloodborne Pathogen section is included (annual training needs to be done for employees).
8. CPR & First Aid section included (this information is general in nature; no individual should ever exceed their level of first aid training).
9. Sample Material Safety Data Sheet included. Be sure to compile MSDSs for any chemicals the Company uses and make available to all employees in the office and on the job-site. Your Company is responsible for maintaining a current chemical inventory list.
10. Orientation Checklist - Initial Orientation must be conducted for all employees. (English/Spanish Orientation included). These forms are to be included and signed by all new hires. (Make copies for employees to sign at the orientation meeting.)
11. Safety Meeting Minutes. After any Safety Training, have employees sign the training roster and 3-hole punch the form and file it in the manual.

DISCLAIMER

OSHA's "Safety and Health Regulations" are continuously being reinterpreted. Therefore, Safety Services Company is unable to completely guarantee the exactness of the information conveyed in this publication. Safety Services Company assumes no responsibility and shall be held harmless for any inaccuracies or omissions contained within this manual and shall not be held liable to any extent or form for any injury or loss resulting from the manner in which this information is interpreted and/or applied.

Careful effort has been dedicated in order to provide a simplified, understandable explanation of OSHA regulations based on currently available information. This "Safety and Health Manual" is distributed with the agreement that Safety Services Company is not employed in providing legal or other specialized business services. Should expert assistance be required, retain the services of a competent professional.

SAFETY SERVICES COMPANY

P.O. Box 6408 Yuma, Arizona 85366-6408

Toll Free (866) 204-4786 Toll Free FAX (866) 556-0004

Toll Free Customer Service (866) 644-9630

e-Mail: ssc@safetyservicescompany.com www.safety2U.com

Arena Fire Protection, Inc.

Company Safety & Health Program Manual

Table of Contents

Workers' Compensation Premium Cost Containment & Forms

CHAPTER

- 1. Corporate Safety Policies and Procedures**
- 2. Safety Committees**
- 3. General Safety Rules/Codes of Safe Practice**
- 4. Machine/Equipment Safety**
- 5. Accident Investigation Plan**
- 6. Log 300 & OSHA**
- 7. Emergency Response Plan & Fire Prevention**
- 8. CPR & First Aid**
- 9. Hazard Assessment Plan**
- 10. Bloodborne Pathogens**
- 11. Workplace Violence & Harassment Policy**
- 12. Lockout & Tagout – Controlling Hazardous Energy**
- 13. Hazard Communication Program**
- 14. Personal Protective Equipment**
 - a. Respiratory Protection**
- 15. Posting Requirements**
- 16. Stairway & Ladder Safety Plan**
- 17. Fall Protection Plan in Construction**
- 18. Scaffolding for Construction**
- 19. Excavation Procedures**
- 20. Driver Safety Policy**
- 21. Contracts (New Hire Orientation Form
& Checklist – English/Spanish)**
- 22. Safety Meeting Minutes**
- 23. Appendix:**
 - 1- Asbestos**
 - 2- Electrical Safety**
 - 3- Hearing Conservation**
 - 4- Lead Exposure**

Program Notes:

Chapter 1 Corporate Safety Procedures

Arena Fire Protection, Inc.

Arena Fire Protection, Inc.

21312 State Line Rd.

Moss Point, MS. 39561-

The designated safety coordinator for *Arena Fire Protection, Inc.* is:

Allen Davidson

SAFETY & HEALTH POLICY STATEMENT

The Occupational Safety and Health Act of 1970 clearly defines the requirement to provide safe and healthful working conditions for all employees. Therefore, the safety and health of our employees is the first consideration in operating this business.

Safety and health in our business must be part of every operation. Without question, it is every employee's responsibility at all levels.

It is the intent of this company to comply with all laws. To do this, we must constantly be aware of conditions in all work areas that can produce injuries. No employee is required to work at a job they know is not safe or healthful. Your cooperation in detecting hazards and, in turn, controlling them, is a condition of your employment. Inform your supervisor immediately of any situation beyond your ability or authority to correct.

The personal safety and health of each employee of this company is of primary importance. Prevention of occupationally-induced injuries and illnesses is of such consequence that it will be given precedence over operating productivity, whenever necessary. To the greatest degree possible, management will provide all mechanical and physical activities required for personal safety and health, in keeping with the highest standards.

We will maintain an occupational safety and health program conforming to the best practices of organizations of this type. To be successful, such a program must embody proper attitudes towards injury and illness prevention on the part of supervisors and employees. It also requires cooperation in all safety and health matters, not only between supervisor and employee, but also between each employee and their co-workers. Only through such a cooperative effort can a safety and health program, in the best interest of all, be established and preserved.

Our objective is a safety and health program that will reduce the number of injuries and illnesses to an absolute minimum, not merely in keeping with, but surpassing, the best experience of operations similar to ours. Our goal is zero accidents and injuries.



Our safety and health program includes:

- ▣ Providing mechanical and physical safeguards to the maximum extent possible.
- ▣ Conducting a program of safety and health inspections to find and eliminate unsafe working conditions or practices, to control health hazards, and to fully comply with OSHA safety and health standards for every job.
- ▣ Training all employees in good safety and health practices.
- ▣ Providing necessary personal protective equipment, and instructions for proper use and care.
- ▣ Developing and enforcing safety and health rules, and requiring that employees cooperate with these rules as a condition of employment.
- ▣ Investigating, promptly and thoroughly, every accident to find out what caused it, and correct the problem so it will not happen again.

We recognize that the responsibilities for occupational safety and health are shared:

- ▣ This employer accepts responsibility for leadership of the safety and health program, for its effectiveness and improvement, and for providing the safeguards required to ensure safe work conditions.
- ▣ Supervisors are responsible for developing proper attitudes toward safety and health in themselves and in those they supervise, and for ensuring that all operations are performed with the utmost regard for the safety and health of all personnel involved, including themselves.
- ▣ Employees are responsible for wholehearted, genuine operations of all aspects of the safety and health program – including compliance with the rules and regulations – and for continuously practicing safety and health while performing their duties.



Arena Fire Protection, Inc. shall see that all employees are properly instructed and supervised in the safe operation of any machinery, tools, equipment, process, or practice which they are authorized to use or apply while at work.

Production is never so urgent that we can not take the time to do our work safely.

Note: A “*Safety & Health Policy Statement*” form to be signed by your *Company Owner* and distributed to all employees is provided for your use at the end of this section. It is your ***COPY MASTER.***

Program Goals

Why have a workplace "Safety and Health Plan"? Taking risks is part of running a business, particularly for small business owners. You take risks in product development, marketing, and advertising in order to stay competitive. But there are some risks that should never be taken. One of these is risking the **safety** and **health** of workers. Safety begins at the top and goes downward throughout the company. The primary goal of **Arena Fire Protection, Inc.** is to continue operating a profitable business while protecting employees from injuries or illness. This can be achieved by delegating responsibility and accountability to all involved in this COMPANY's operation.

★ **Responsibility:** Having to answer for activities and results.

★ **Accountability:** The actions taken by management to insure the performance of responsibilities.

In other words, to reach our goal of a safe workplace everyone needs to take responsibility and be held accountable.

Benefits of achieving our goals are:

- ▣ Minimizing of injuries and accidents
- ▣ Minimizing the loss of property and equipment
- ▣ Elimination of potential fatalities
- ▣ Elimination of potential permanent disabilities
- ▣ Elimination of potential OSHA fines
- ▣ Reductions in Workers' Compensation costs
- ▣ Reductions in operating costs
- ▣ Having the best "Safety and Health" conditions possible in the workplace



Management Commitment

This COMPANY is committed to building an effective **injury** and **illness** prevention plan, putting it in **writing**, and **integrating** it into the entire operation.

The management of **Arena Fire Protection, Inc.** is committed to the company's safety policy, and to provide direction and motivation by:

- ▣ Appointing Safety Coordinator(s) and/or Safety Committee Chairmen.
- ▣ Establishing company safety goals and objectives.
- ▣ Developing and implementing this written Safety and Health program.
- ▣ Ensuring total commitment to the Safety and Health program.
- ▣ Facilitating employees' safety training.
- ▣ Establishing responsibilities for management and employees to follow.
- ▣ Ensuring that management and employees are held accountable for performance of their safety responsibilities.
- ▣ Establishing and enforcing disciplinary procedures for employees.
- ▣ Reviewing the Safety and Health program annually, and revising or updating as needed.

Labor & Management Accountability

All employees, both *labor* and *management*, need to understand their responsibilities under OSHA rules and be held accountable for complying with the rules as well as the company's related policies.

Remember, it is the employer's responsibility to provide a safe and healthful work environment for their employees. However, holding everyone accountable for their part in workplace safety and health is critical for a successful injury and illness prevention plan.

Assignment of Responsibility

The Safety Coordinator(s) and/or Safety Committee Members

Arena Fire Protection, Inc. has designated:

| | |
|--|------------------------------|
| <i>Safety Coordinator</i> | <i>Allen Davidson</i> |
| <i>Safety Coordinator</i> | |
| <i>Safety Coordinator</i> | |
| <i>Safety Coordinator</i> | |
| <i>Safety Committee Chair</i> | |
| <i>Safety Committee Vice-chairman</i> | |
| <i>Safety Committee Alternate Chair/Vice-chair</i> | |

Their cell phone and office phone numbers are:

| <i>Safety Person's Name</i> | <i>Office Phone #</i> | <i>Cell Phone #</i> |
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It shall be the duty of the Safety Coordinator to assist the Supervisor/Foreman and all other levels of Management in the initiation, education, and execution of an effective safety program including the following:

- Introducing the safety program to new employees.
- Following up on recommendations, suggestions, etc., made at the "Weekly" safety meetings. All topics of safety concerns must be documented accordingly.
- Assisting the personnel in the execution of standard policies.
- Conducting safety inspections on a periodic basis.
- Addressing all hazards or potential hazards as needed.
- Preparing monthly accident reports and investigations.

- ▣ Maintaining adequate stock of first aid supplies and other safety equipment to insure their immediate availability.
- ▣ Making sure there is adequate number of qualified "First Aid Certified" people on the work site.
- ▣ Becoming thoroughly familiar with OSHA regulations and local and state safety codes.
- ▣ Defining the responsibilities for safety and health of all subordinates and holding each person accountable for their results through the formal appraisal system and where necessary, disciplinary procedures.
- ▣ Emphasizing to employees that accidents create unnecessary personal and financial losses.

Safety Committee and Safety Meetings

Recognize and support the safety committee as an excellent vehicle for facilitating communication and involvement between labor and management on occupational safety and health issues.

The Committee shall consist of representatives from management and non-management employees with the scheduled person as the chairman. The committee is a forum, created for the purpose of fostering safety and health through communication.



The responsibilities of Safety Committee Members include:

- ▣ Discussing safety policies and procedures with management and making recommendations for improvements.
- ▣ Reviewing accident investigation reports on all accidents and "near-misses".
- ▣ Identifying unsafe conditions and work practices and making recommendations for corrections.

NOTE: Refer to the succeeding section for instructions on Safety Committee protocols.

All employees of **Arena Fire Protection, Inc.** shall attend and participate in the "Weekly" safety meetings. The safety meeting shall be conducted by the designated Safety Coordinator/Supervisor/Foreman. Problems that have arisen, or that are anticipated, shall be discussed along with any other safety and health topics. The meeting shall be kept a valuable educational experience by:

- ▣ Starting and stopping according to schedule.
- ▣ Keeping the meetings moving.
- ▣ Using illustrated material and demonstrations to make the point.
- ▣ Discussing each topic thoroughly, providing handouts if possible.
- ▣ Evaluating accidents, injuries, property losses, and "near misses" for trends and similar causes to initiate corrective actions.

The designated Safety Coordinator/Supervisor/Foreman must document all aspects of any safety and health training.

Employee Involvement

Employees are required to *work in compliance* with the safety rules, *report* all accidents and near misses, and report all *unsafe* conditions or unsafe *practices*. To demonstrate this employer's commitment to support the employees in these responsibilities, the employer will do the following:

Communication System:

- ☐ Encourage employees to inform the employer about workplace hazards without fear of reprisal.
- ☐ Establish and maintain a centrally located "Safety Bulletin Board" where current, relevant information may be easily reviewed by employees.
- ☐ Schedule general employee meetings at which time safety is freely and openly discussed by those present. These meetings will be regular, scheduled, and announced to all employees and managers to achieve maximum attendance. The purpose of these meetings is safety, and the concentration will be on:
 - ① Occupational accident and injury history at our work sites, with possible comparison to other locations in the COMPANY.
 - ② Feedback from the Safety Committee.
 - ③ Guest speakers concerned with workplace safety and health.
 - ④ When possible, brief audio-visual materials that relate to our business.
 - ★ Conduct training programs for communicating with employees.
 - ★ Provide a safety suggestion box so that employees, anonymously if desired, can communicate their concerns with management.
 - ★ Document all communication efforts to demonstrate that an effective communication system is in place.

Hazard Identification & Control

Periodic inspections and procedures for correction provide methods of identifying existing or potential hazards in the workplace, and eliminating or controlling them. Hazard control is essential to an effective injury and illness plan. We will be sure to look at safe work practices and ensure that they are being followed, and that unsafe conditions or procedures are identified and corrected properly and promptly.

Employees are encouraged to report possible hazardous situations, knowing their reports will be given prompt and serious attention.

Workplace equipment and personal protective equipment will be maintained in good, safe working condition.

Hazards, where possible, will be corrected as soon as they are identified. For those that can not be immediately corrected, a target date for correction will be set. The employer will provide interim protection for workers while hazards are being corrected. A written tracking system will be established to help monitor the progress of the hazard correction process.

Accident/Incident Investigation

Employers and safety committees are required to investigate or assign responsibility for investigating accidents. Accidents/incidents will be investigated by trained individuals, with the primary focus of understanding why the accident or incident occurred, and what actions can be taken to preclude recurrence. The focus will be on **solutions** and never on **blame**. They will be in writing, and adequately identify the causes of the accident or near-miss occurrence.

Worker Training

Training is another essential element of any injury and illness prevention plan. OSHA rules require each employer to train workers for any job or task they are assigned.

Our plan includes training and instruction:

- ▣ For all employees when they are first hired.
- ▣ For all new employees for each specific task.
- ▣ For all employees given new job assignments for which training has not already been received.
- ▣ Whenever new substances, processes, procedures, or equipment are introduced into the workplace and present a new hazard.
- ▣ Whenever new personal protective equipment or different work practices are used on existing hazards.
- ▣ Whenever the employer is made aware of a new or previously unrecognized hazard.
- ▣ For all supervisors to ensure they are familiar with the safety and health hazards to which employees under their immediate direction and control may be exposed.

An effective safety and health plan requires proper job performance by everyone in the workplace.

As the employer, we must ensure that all employees are knowledgeable about the *materials* and equipment with which they work, what known *hazards* are present, and how they are *controlled*.

Periodic Program Evaluation

A periodic review is scheduled to look at each critical component in our safety and health plan to determine what is working well and what changes, if any, are needed. All employees are encouraged to participate by keeping the employer informed of their concerns regarding the elements of this safety and health plan.

The success of this safety and health plan is dependant upon two things: First, the employer must provide a **safe** and **healthful** environment in which the employee has the opportunity to work safe, and second, the employee must **choose** to *work safe*.



Supervisor/Foreman

The Supervisors and/or Foremen will establish an operating atmosphere that insures that safety and health is managed in the same manner and with the same emphasis as production, cost, and quality control. This will be accomplished by:

- ▣ Regularly emphasizing that accident and health hazard exposure prevention are not only moral responsibilities, but also a condition of employment.
- ▣ Identifying operational oversights that could contribute to accidents which often result in injuries and property damage.
- ▣ Participating in safety and health related activities, including routinely attending safety meetings, reviews of the facility, and correcting employee behavior that can result in accidents and injuries.
- ▣ Spending time with each person hired explaining the safety policies and the hazards of his/her particular work.
- ▣ Ensuring that initial orientation of "new hires" is properly carried out.
- ▣ Making sure that if a "Competent Person" is required, that one is present to oversee, and instruct employees when necessary.
- ▣ Never short-cutting safety for expediency, nor allowing workers to do so.
- ▣ Enforcing safety rules consistently, and following COMPANY's discipline and enforcement procedures.
- ▣ Conducting daily job-site inspections and correcting noted safety violations.

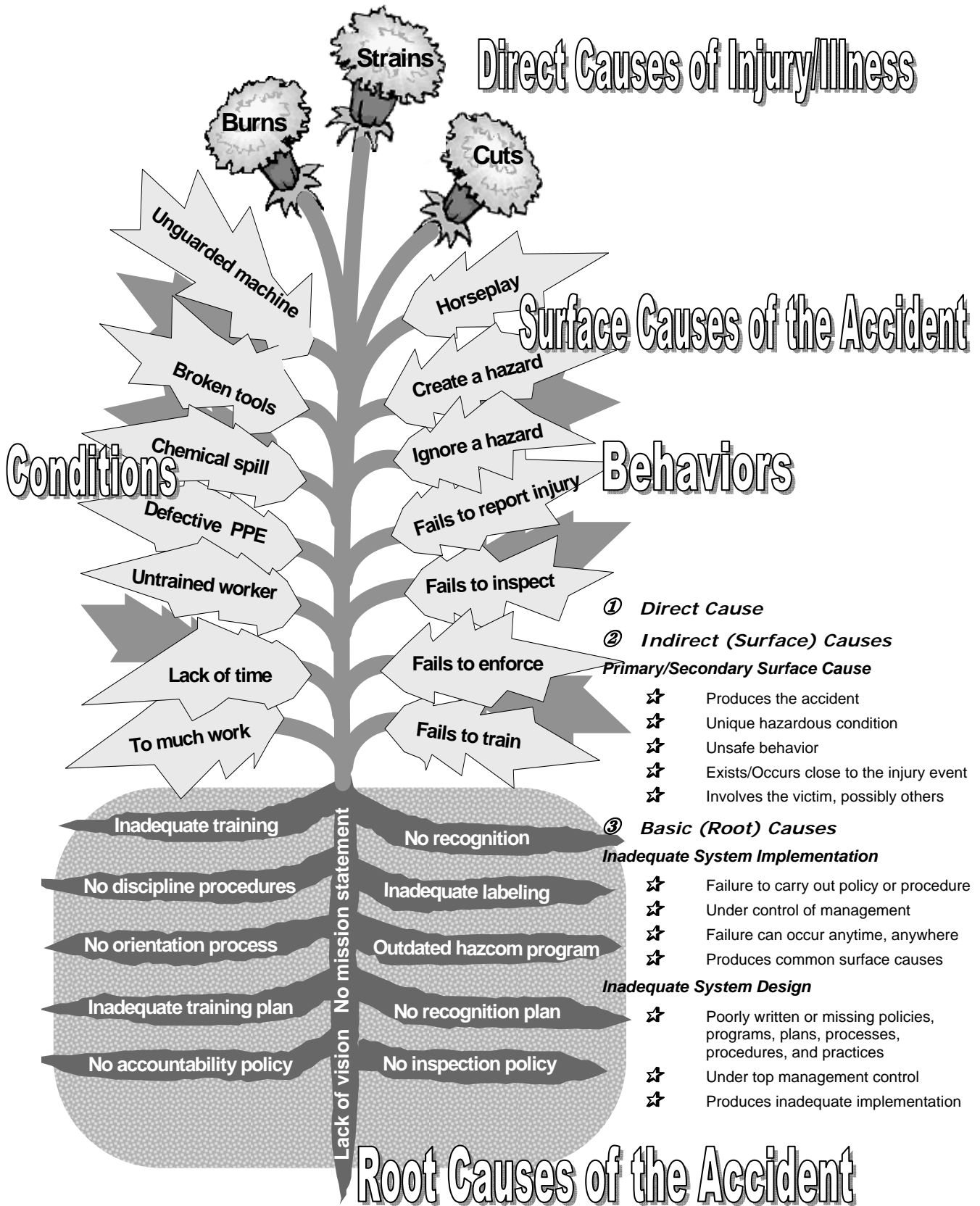
Employees

It is the duty of each and every employee to know the safety rules, and conduct his work in compliance with these rules. Disregard of the safety and health rules shall be grounds for disciplinary action up to and including termination. It is also the duty of each employee to make full use of the safeguards provided for their protection. Every employee will receive an orientation when hired and receive a copy of any COMPANY Safety and Health Programs. Employee responsibilities include the following:

- ▣ Reading, understanding and following safety and health rules and procedures.
- ▣ Signing the Code of Safe Practices and any other policy acknowledgements.
- ▣ Wearing Personal Protective Equipment (PPE) at all times when working in areas where there is a possible danger of injury.
- ▣ Wearing suitable work clothes as determined by the supervisor/foreman.
- ▣ Performing all tasks safely as directed by their supervisor/foreman.
- ▣ Reporting **ALL** injuries, no matter how slight, to their supervisor/foreman immediately and seeking treatment promptly.
- ▣ Knowing the location of first aid, fire fighting equipment, and safety devices.
- ▣ Attending any and all required safety and health meetings.
- ▣ Not performing potentially hazardous tasks, or using any hazardous material until properly trained, and following all safety procedures for those tasks.
- ▣ STOPPING AND ASKING QUESTIONS IF EVER IN DOUBT ABOUT THE SAFETY OF ANY OPERATION

THE SAFETY WEED

Weed Out the Causes of Injuries and Illnesses



Safety & Health Policy Statement

Arena Fire Protection, Inc.

The Occupational Safety and Health Act of 1970 clearly defines the requirement to provide safe and healthful working conditions for all employees. Therefore, the safety and health of our employees is the first consideration in operating this business.

Safety and health in our business must be part of every operation. Without question, it is every employee's responsibility at all levels.

It is the intent of this COMPANY to comply with all laws. To do this, we must constantly be aware of conditions in all work areas that can produce injuries. No employee is required to work at a job they know is not safe or healthful. Your cooperation in detecting hazards and, in turn, controlling them, is a condition of your employment. Inform your supervisor immediately of any situation beyond your ability or authority to correct.

The personal safety and health of each employee of this COMPANY is of primary importance. Prevention of occupationally-induced injuries and illnesses is of such consequence that it will be given precedence over operating productivity, whenever necessary. To the greatest degree possible, management will provide all mechanical and physical activities required for personal safety and health, in keeping with the highest standards.

We will maintain an occupational safety and health program conforming to the best practices of organizations of this type. To be successful, such a program must embody proper attitudes towards injury and illness prevention on the part of supervisors and employees. It also requires cooperation in all safety and health matters, not only between supervisor and employee, but also between each employee and their co-workers. Only through such a cooperative effort can a safety and health program, in the best interest of all, be established and preserved.

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- ▣ Conducting a program of safety and health inspections to find and eliminate unsafe working conditions or practices, to control health hazards, and to fully comply with OSHA safety and health standards for every job.
- ▣ Training all employees in good safety and health practices.
- ▣ Providing necessary personal protective equipment, and instructions for proper use and care.
- ▣ Developing and enforcing safety and health rules, and requiring that employees cooperate with these rules as a condition of employment.
- ▣ Investigating, promptly and thoroughly, every accident to find out what caused it, and correct the problem so it will not happen again.

We recognize that the responsibilities for occupational safety and health are shared:

- ▣ This employer accepts responsibility for leadership of the safety and health program, for its effectiveness and improvement, and for providing the safeguards required to ensure safe work conditions.
- ▣ Supervisors are responsible for developing proper attitudes toward safety and health in themselves and in those they supervise, and for ensuring that all operations are performed with the utmost regard for the safety and health of all personnel involved, including themselves.
- ▣ Employees are responsible for wholehearted, genuine operations of all aspects of the safety and health program – including compliance with the rules and regulations – and for continuously practicing safety and health while performing their duties.

Arena Fire Protection, Inc. shall see that workers are properly instructed and supervised in the safe operation of any machinery, tools, equipment, process, or practice which they are authorized to use or apply.

Production is never so urgent that we can not take the time to do our work safely.

Owner Name

Signature

Date

Section Notes:

Chapter 2 Safety Committees

Arena Fire Protection, Inc. Safety Committee members are:
Allen Davidson, Donald Davidson, Scott Davidson.

The Safety Committee will meet a minimum of **4** times per year.

Safety Committee Policy Statement

Introduction

Arena Fire Protection, Inc. is committed to accident prevention in order to protect the safety and health of all our employees. Injury and illness losses due to hazards are needless, costly and preventable. To prevent these losses, a joint management/worker safety committee will be established. Employee involvement in accident prevention and support of safety committee members and activities is necessary to ensure a safe and healthful workplace for all employees.

Purpose

The purpose of our safety committee is to bring workers and management together in a non-adversarial, cooperative effort to promote safety and health in the workplace. The safety committee will assist management and make recommendations for change.

Organization

There shall be, in most cases, an equal number of employee and employer representatives. However, there may be more employee representatives than employer representatives if both groups agree. Employee representatives shall be volunteers or elected by their peers. If no employees volunteer or are elected, they may be appointed by management. Employer representatives will be appointed. Safety committee members will serve a continuous term of at least one year. Committee membership terms will be staggered so that at least one experienced member is always on the committee.

Extent of Authority

It must be clearly understood that the safety committee advises management on issues that will promote safety and health in the workplace. Written recommendations are expected from the safety committee and they will be submitted to management. In turn, management will give serious consideration to the recommendations submitted and will respond in writing to the committee within a reasonable time.

Functions

- Committee meetings and employee involvement.
- Hazard assessment and control.
- Safety and health planning.
- Evaluation of accountability system.
- Evaluation of management commitment to workplace safety and health.
- Evaluation of accident and incident investigation program.
- Safety and health training.

Recommendations

All recommendations submitted to management must be written and should:

- ① Be clear and concise.
- ② Provide reasons for implementation.
- ③ Give recommended options.
- ④ Show implementation costs and recommended completion dates.
- ⑤ List benefits to be gained.

Procedures

The committee’s plan of action requires procedures by which the committee may successfully fulfill its role. Procedures developed should include but not be limited to:

- Meeting date, time, and location (Safety Committee Meeting Agenda)
- Election of chairperson and secretary
- Order of business
- Records (Safety Committee Meeting Minutes)

Duties of each member must include, but not be limited to:

- Reporting unsafe conditions and practices
- Attending all safety and health meetings
- Reviewing all accidents and near-misses
- Recommending ideas for improving safety and health
- Working in a safe and healthful manner
- Observing how safety and health is enforced in the workplace
- Completing assignments given to them by the chairperson
- Acting as a work area representative in matters of health and safety
- Others as determined by COMPANY safety and health needs

The Safety Coordinator(s) and/or Safety Committee Members

Arena Fire Protection, Inc. has designated:

| |
|--|
| <i>Safety Coordinator</i> |
| <i>Safety Coordinator</i> |
| <i>Safety Coordinator</i> |
| <i>Safety Committee Chair</i> |
| <i>Safety Committee Vice-chairman</i> |
| <i>Safety Committee Alternate Chair/Vice-chair</i> |

Their cell phone and office phone numbers are:

| <i>Safety Person’s Name</i> | <i>Office Phone #</i> | <i>Cell Phone #</i> |
|-----------------------------|-----------------------|---------------------|
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It shall be the duty of the Safety Coordinator to assist the Supervisor/Foreman and all other levels of Management in the initiation, education, and execution of an effective safety program.

Note: A "Safety Committee Policy Statement" form to be signed by your Company Owner and distributed to all employees is provided for your use at the end of this section. It is your COPY MASTER.

Safety Committee Operations

The purpose of a safety committee is to bring workers and managers together to achieve and maintain a safe, healthful workplace. It is easy to start a safety committee, but developing an effective one – one that achieves and maintains a safe, healthful workplace – requires workers and managers who are committed to achieving that goal. Effective safety committees find solutions to problems that cause workplace accidents, illnesses, and injuries. And fewer accidents, injuries, and illnesses mean lower Workers' Compensation claims costs and insurance rates.

Understand a Safety Committee's Seven Essential Activities

Anyone can start a safety committee, but, to make it effective, the committee must be built on a foundation of **management commitment** and must be **accountable** for achieving its goals. The committee must do the following:

- Involve employees in achieving the committee's goals
- Identify workplace hazards
- Review reports of accidents and near misses
- Keep accurate records of committee activities
- Evaluate its strengths and weaknesses

① Commitment

The committee will not survive without management support. Management demonstrates support by encouraging employees to get involved in achieving a safe, healthful workplace and by acting on the committee's recommendations.

Representatives demonstrate commitment by attending committee meetings, following through on their assigned tasks, and encouraging other employees to get involved in identifying hazards.

② Accountability

Representatives should understand that the committee expects them to contribute; each representative shares responsibility for accomplishing safety committee goals, which benefit everyone who works for the COMPANY.

The safety committee is also responsible for monitoring how management holds employees accountable for working safely and for recommending ways to strengthen accountability.

③ Employee Involvement

To become effective, a safety committee needs help from everyone in The COMPANY. The safety committee must have a method for employees to report hazards and to offer safety suggestions.

Ways the safety committee can encourage employees to get involved:

- ☐ Encourage employees to report hazards and unsafe work practices to a safety-committee representative.
- ☐ Act on employee suggestions and recognize their contributions to a safer workplace.
- ☐ Promote the committee's activities and accomplishments.

Make sure employees know that you are starting a safety committee. Tell them why you are starting the committee, describe its role in the COMPANY's safety-and-health program, and explain management's commitment to the committee.

You can inform employees in a memo or a newsletter, by e-mail, or – better yet – meet with them to promote the committee and to answer questions.

④ *Hazard Identification*

The safety committee plays an important role in keeping the workplace hazard-free:

- ☐ Ensure that representatives know how to recognize hazards and understand basic principles for controlling them.
- ☐ Focus on identifying hazards and unsafe work practices that are likely to cause serious injuries.
- ☐ Conduct thorough workplace inspections at least quarterly.
- ☐ Document hazards during quarterly inspections and discuss how to control them at regular safety-committee meetings.
- ☐ Include employer and employee representatives on the inspection team.

⑤ *Accident Investigation*

The committee must have a procedure for investigating all workplace accidents, illness, and deaths. It is not necessary for the committee to conduct accident investigations or to participate in investigations; however, the committee should ensure that management does so. The committee should also carefully review accident reports to help management identify accident causes and determine how to control them.

⑥ *Recordkeeping*

You may not think of record keeping as an essential activity, but accurate, well-organized records document the committee's accomplishments and can inform the committee what it needs to do to improve. The following documents are required for the safety committee's file:

- ☐ Accurate minutes of each safety committee meeting
- ☐ Committee reports, evaluations, and recommendations
- ☐ Management's response to committee recommendations
- ☐ Employee safety suggestions and hazard concerns

⑦ *Evaluation*

Evaluation answers the question "Are we effective?" Effective safety committees periodically evaluate their strengths and weaknesses, and the evaluation helps them set new goals.

At least once a year, schedule a half-day safety-committee meeting to accomplish the following: identify the committee's achievements over the past 12 months, review essential activities, and set goals for the next 12 months.

Start With Your Primary Place of Employment

If you are starting a safety committee, you should do so at your company's primary place of employment - the workplace where management controls the budget and can act on the safety committee's recommendations.

Do you have mobile or satellite sites?

If you have workplaces that aren't primary places of employment – construction sites or field offices, for example – you can have one central safety committee at your primary place of employment that represents all of the other workplaces.

Determine How Many Representatives will Serve on the Committee

The minimum number of representatives on your safety committee needs to be effective depends on the number of employees in your company, for example:

| <i>Number of Employees</i> | <i>Number of Representatives</i> |
|-----------------------------------|---|
| Up to 20 | At least 2 |
| More than 20 | At least 4 |

Your safety committee can have more than the minimum number of representatives.

Determine Who Will Serve on the Committee

Your safety committee should have an equal number of employee and employer representatives and must have a chairperson elected by the representatives.

Other matters to consider about who will serve on the committee:

- ❑ Employee representatives can volunteer to serve on the committee or their peers can elect them. If your collective bargaining agreement has procedures for selecting representatives, follow those procedures.
- ❑ Employer representatives represent the employer. You can have more employee representatives on the committee than employer representatives if no one objects – but not a majority of employer representatives. You can choose any employee to serve as an employer representative.
- ❑ Representatives' jobs should reflect the company's major job classifications.
- ❑ Representatives must be paid their regular wages for safety committee meetings and safety-related training sessions.
- ❑ Each representative must serve at least one year on the committee.

How to Determine Who Does What on the Committee

Your safety committee must have a chairperson and a recorder – someone to take minutes at each meeting. The committee does not have to have a vice-chair; however, someone should be available to prepare an agenda and conduct committee business in the chair's absence. The following table summarizes the duties of the chairperson, vice-chair, recorder, and other committee representatives.

Representatives' Duties and Responsibilities

Chairperson

- ❑ Schedules monthly meetings
- ❑ Develops agendas for meetings
- ❑ Conducts monthly meetings



Vice-chair

- ☐ Assumes chair's duties when the chair is absent
- ☐ Coordinates training for new representatives
- ☐ Performs other duties assigned by the chair

Recorder

- ☐ Takes minutes at each meeting
- ☐ Distributes copies of minutes to representatives
- ☐ Posts minutes for other employees to review
- ☐ Maintains the safety-committee file
- ☐ Keeps minutes and agendas on file for three years

Other Committee Representatives

- ☐ Report employees' safety and health concerns to the committee
- ☐ Report accidents, near miss incidents, and unsafe workplace conditions to the committee
- ☐ Suggest items to include in the monthly meeting agenda
- ☐ Encourage other employees to report workplace hazards and suggest how to control them
- ☐ Establish procedures for conducting quarterly workplace inspections and for making recommendations to management to eliminate or control hazards
- ☐ Help management evaluate the company's safety-and-health program and recommends how to improve it
- ☐ Establish procedures for investigating the causes of accidents and near-miss incidents

Set Practical Goals for the Committee

Purpose and goals: put them in writing

The purpose of your safety committee is to bring workers and managers together to achieve and maintain a safe, healthful workplace. But you will need to narrow the focus, set goals, and specify what the committee will do.

Train the Representatives

What representatives need to know:

Representatives must understand the purpose of the safety committee, how to apply OSHA's safety rules, and how to conduct safety-committee meetings. They must also have training in hazard identification and the principles of accident investigation.

Representatives should know whom to contact for information or for help on workplace safety-and-health matters. Two sources are your workers' compensation insurance carrier and OSHA.

Who can do the training? You can do the training if you are confident you can accomplish the objectives, or you can choose someone who has training experience and understands the objectives.

Hold Regular Meetings

Require Participation

Each representative must help the committee accomplish its goals. Make sure representatives understand that they will be committing to attending monthly meetings and to participating in committee activities.

Set a Repeating Meeting Schedule

Your committee should meet at least once a month. Setting a regular time, date, and place for meetings - for example, 10 a.m.-noon, the first Tuesday of each month - makes it easier for everyone to remember.

Establish Ground Rules

Ground rules keep meetings orderly and efficient. All representatives should understand them and the chairperson should enforce them. Important ground rules:

- ☐ Keep the discussion focused on agenda topics.
- ☐ Listen to others and let them finish before responding.
- ☐ Cooperate to achieve effective solutions.
- ☐ Finish the meeting on time.

Follow a Written Agenda

The agenda outlines the meeting's discussion topics. The chairperson should understand the agenda topics and keep the discussion focused on them. Send copies of the agenda to representatives a few days before the meeting so they can review it.

Take Accurate Minutes

Accurate meeting minutes are important because they document the committee's accomplishments. The representative who has this responsibility should be able to grasp the main points of a discussion and record them quickly.

Meeting minutes should include the following:

- ☐ A brief summary of the discussion of each topic
- ☐ A copy of committee reports, evaluations, and recommendations
- ☐ A copy of management's response to committee recommendations

Remember to send a copy of the minutes to each representative promptly after the meeting and to post a copy where other employees can see it. If your company has field offices, send a copy to each field office. Keep a copy of each meeting's minutes on file for three years.

Conducting the Meeting

Effective meetings start on time. Make sure the meeting room is ready; allow extra time if you need to set up tables, rearrange chairs, or clean up after others have met. Before getting down to business, start the meeting on the right track by doing the following:

- ☐ Distribute the agenda. Make sure everyone has a copy of the agenda and any other handouts.
- ☐ Review the ground rules. You may not need to review the ground rules at every meeting, but consider doing so for the benefit of guests and new representatives.
- ☐ Make introductions. No one likes to feel left out at a meeting. Welcome new representatives and guests.

- ❑ Review the minutes from the last meeting. Request additions or corrections to last month's minutes. Update the minutes to reflect the changes.
- ❑ Review the agenda topics. Give representatives and guests the opportunity to suggest changes or to add discussion topics to the agenda.

Unless the representatives agree to continue the meeting, end it at the scheduled time. You can discuss unfinished items during the next meeting or later with concerned representatives. Before you finish, thank guests for coming and schedule the next meeting.

How To Do It

How to accomplish four important activities that helps you take care of safety committee business.

- ① *How to Write Bylaws*
- ② *How to Prepare an Agenda*
- ③ *How to Record Minutes*
- ④ *How to Identify Workplace Hazards*

How to Write Bylaws

Bylaws state the committee's purpose, define its essential activities, and describe how it conducts its regular business. Your safety committee does not have to have bylaws, but they can give the committee stability as new representatives come on board and others leave.

Bylaws can be as simple or as complex as you want to make them. They are usually organized in sections; each section defines a specific committee function, as in the following example:

| What to Include In Your Safety Committee Bylaws | |
|--|---|
| Function | Information to Include |
| Name, Purpose, Goal, Objectives | State committee's purpose, its goals, and its objectives. Make them clear and keep them brief. |
| Membership | <ul style="list-style-type: none"> ★ State how many representatives will serve on the committee. ★ Describe how the representatives are selected to serve on the committee. ★ State how long representatives will serve on the committee. |
| Officers and Representatives: Duties and Responsibilities | Describe duties and responsibilities of each: <ul style="list-style-type: none"> ★ The chair ★ The recorder ★ The vice-chair ★ The other representatives |
| Training | State what the representatives need to know to fulfill their responsibilities and describe how they will receive their training. |
| Meetings | Define the following: <ul style="list-style-type: none"> ★ The schedule for regular committee meetings. ★ Who must attend the meetings. ★ The requirements for preparing and distributing the agenda and the minutes. ★ The procedures for voting on committee decisions. |
| Employee Involvement | State how the committee will involve employees in achieving a safe, healthful workplace. <ul style="list-style-type: none"> ★ Describe how employees should report hazards and unsafe practices to the committee. ★ Describe how employees can submit ideas for controlling or eliminating hazards. |
| Accident Investigation | State the committee's role in investigating near-misses and accidents. <ul style="list-style-type: none"> ★ Describe how representatives will review accidents and near-miss incidents. ★ Describe how the committee will report recommendations for controlling hazards. |
| Workplace Inspections | State how the committee will conduct regular workplace inspections. <ul style="list-style-type: none"> ★ Include the schedule for quarterly workplace inspections. ★ Identify who will conduct the inspections. ★ Describe how the committee will report hazard-control recommendations to management. |
| Evaluation | State how the committee will evaluate the safety-and-health program and assess its activities. |

Safety Committee Bylaws: An Example

Although your safety committee does not have to have Bylaws, they can give the committee stability by stating, in writing, how the committee conducts its business. Bylaws can be as simple or complex as you want to make them. This example shows the bylaws of the imaginary ***XYZ Construction Company's*** safety committee.

Name

The name of the committee is the XYZ Safety Committee.

Purpose

The purpose of the XYZ Safety Committee is to bring all XYZ Construction Company employees together to achieve and maintain a safe, healthful workplace.

Goal

The goal of the XYZ Safety Committee is to eliminate workplace injuries and illnesses by involving employees and managers in identifying hazards and suggesting how to prevent them.

Objectives

The XYZ Safety Committee has four objectives:

- ① Involve employees in achieving a safe, healthful workplace.
- ② Promptly review all safety-related incidents, injuries, accidents, illnesses, and deaths.
- ③ Conduct quarterly workplace inspections, identify hazards, and recommend methods for eliminating or controlling the hazards.
- ④ Annually evaluate the XYZ Construction Company's workplace safety-and-health program and recommend to management how to improve the program.

Representatives

The XYZ Safety Committee will have ten voting representatives. Five of the representatives will represent employees and five will represent management. Employee representatives can volunteer or their peers can elect them. Management representatives will be selected by management.

Each representative will serve a continuous term of at least one year. Terms will be staggered so that at least one experienced representative always serves on the committee.

Chair and Vice-chair

The XYZ Safety Committee will have two officers: chair and vice-chair. One officer will represent labor and one officer will represent management.

Terms of Service

Chair and vice-chair will each serve a one-year term.

Duties of the Chair

The duties of the chair:

- ✦ Schedule regular committee meetings.
- ✦ Approve committee correspondence and reports.
- ✦ Develop written agenda for conducting meeting.
- ✦ Supervise the preparation of meeting minutes.
- ✦ Conduct the committee meeting.

Duties of the Vice-chair

The duties of the vice-chair:

- ✦ In the absence of the chair, assume the duties of the chair.
- ✦ Perform other duties as directed by the chair.

Election of Chair and Vice-chair

The election of a new chair or vice-chair will be held during the monthly committee meeting before the month in which the incumbent's term expires.

If the chair or vice-chair leaves office before the term expires, an election will be held during the next scheduled safety-committee meeting; the elected officer will serve for the remainder of the term.

Training

New representatives will receive training in safety-committee functions, hazard identification, and accident-investigation procedures.

Meetings

Monthly schedule — The XYZ Safety Committee will meet the third Tuesday of each month, except when the committee conducts quarterly workplace safety inspections.

Example Page 1

Attendance and Alternates

Each representative will attend regularly scheduled safety committee meetings and participate in quarterly workplace inspections and other committee activities. Any representative unable to attend a meeting will appoint an alternate and inform the chair before the meeting. An alternate attending a meeting on behalf of a regular representative will be a voting representative for that meeting.

Agenda

The agenda will prescribe the order in which the XYZ Safety Committee conducts its business. The agenda will also include the following when applicable:

- ★ A review of new safety and health concerns
- ★ A status report of employee safety and health concerns under review
- ★ A review of all workplace near misses, accidents, illness, or deaths occurring since the last committee meeting.

Minutes

Minutes will be recorded at each committee meeting and distributed via e-mail to all XYZ Construction Company employees.

The committee will submit a copy of the minutes to the XYZ Construction Company personnel office; the office will retain the copy for three years. All reports, evaluations, and recommendations of the committee will be included in the minutes. The minutes will also identify representatives who attended monthly meeting, and representatives who were absent.

Voting Quorum

Six voting representatives constitute a quorum. A majority vote of attending representatives is required to approve all safety-committee decisions. Issues not resolved by majority vote will be forwarded to management for resolution.

Employee Involvement

The XYZ Safety Committee will encourage employees to identify workplace-health-and-safety hazards. Concerns raised by employees will be presented to the committee in writing; the committee will review new concerns at the next regularly-scheduled monthly meeting.

Safety Log

The committee will maintain a log of all employee concerns, including the date received, recommendations to management, and the date the concern was resolved.

Response

The committee will respond to employee concerns in writing and work with management to resolve them. The committee will present written recommendations for resolving concerns to management. Within 60 days of receipt of the written recommendations, management will respond in writing to the committee indicating acceptance, rejection, or modification of the recommendations.

Incident and Accident Investigation

The XYZ Safety Committee will review new safety- or health-related incidents at its next regularly-scheduled meeting. Safety-related incidents include work-related near misses, injuries, illnesses, and deaths. When necessary, the committee will provide written recommendations to management for eliminating or controlling hazards.

Workplace Inspections

The XYZ Safety Committee will conduct quarterly workplace inspections of all company facilities in March, June, September, and December.

Written Report

The committee will prepare a written report for management that documents the location of all health or safety hazards found during inspection. The report will recommend options for eliminating or controlling the hazards.

Within 60 days of receipt of the written report, management will respond in writing to the committee, indicating acceptance, rejection, or proposed modification of the recommendations.

Evaluation

The XYZ Safety Committee will evaluate the company's workplace-safety-and-health program annually and provide a written evaluation of the program to management. The committee will also evaluate its own activities each December and use the evaluation to develop an action plan for the next calendar year.

Example Page 2

SAFETY COMMITTEE BYLAWS

Arena Fire Protection, Inc.

Name

The name of the committee is the _____ Safety Committee.

Purpose

The purpose of the _____ Safety Committee is to bring all _____ employees together to achieve and maintain a safe, healthful workplace.

Goal

The goal of the _____ Safety Committee is to eliminate workplace injuries and illnesses by involving employees and managers in identifying hazards and suggesting how to prevent them.

Objectives

The Safety Committee has four objectives:

- ① Involve employees in achieving a safe, healthful workplace.
- ② Promptly review all safety-related incidents, injuries, accidents, illnesses, and deaths.
- ③ Conduct quarterly workplace inspections, identify hazards, and recommend methods for eliminating or controlling the hazards.
- ④ Annually evaluate the _____ workplace safety-and-health program and recommend to management how to improve the program.

Representatives

The _____ Safety Committee will have _____ voting representatives. _____ of the representatives will represent employees and _____ will represent management. Employee representatives can volunteer or their peers can elect them. Management representatives will be selected by management.

Each representative will serve a continuous term of at least one year. Terms will be staggered so that at least one experienced representative always serves on the committee.

Chair and Vice-chair

The _____ Safety Committee will have two officers: chair and vice-chair. One officer will represent labor and one officer will represent management.

Terms of Service

Chair and vice-chair will each serve a one-year term.

Duties of the Chair

The duties of the chair:

- ★ Schedule regular committee meetings. ★ Approve committee correspondence and reports.
- ★ Develop written agenda for conducting meeting. ★ Supervise the preparation of meeting minutes.
- ★ Conduct the committee meeting.

Duties of the Vice-chair

The duties of the vice-chair:

- ★ In the absence of the chair, assume the duties of the chair.
- ★ Perform other duties as directed by the chair.

Election of Chair and Vice-chair

The election of a new chair or vice-chair will be held during the monthly committee meeting before the month in which the incumbent's term expires.

If the chair or vice-chair leaves office before the term expires, an election will be held during the next scheduled safety-committee meeting; the elected officer will serve for the remainder of the term.

Training

New representatives will receive training in safety-committee functions, hazard identification, and accident-investigation procedures.

Meetings

Monthly schedule — The _____ Safety Committee will meet the _____ of each month, except when the committee conducts quarterly workplace safety inspections.

Attendance and Alternates

Each representative will attend regularly scheduled safety committee meetings and participate in quarterly workplace inspections and other committee activities. Any representative unable to attend a meeting will appoint an alternate and inform the chair before the meeting. An alternate attending a meeting on behalf of a regular representative will be a voting representative for that meeting.

Agenda

The agenda will prescribe the order in which the _____ Safety Committee conducts its business. The agenda will also include the following when applicable:

- ★ A review of new safety and health concerns
- ★ A status report of employee safety and health concerns under review
- ★ A review of all workplace near misses, accidents, illness, or deaths occurring since the last committee meeting.

Minutes

Minutes will be recorded at each committee meeting and posted & distributed to all employees.

The committee will submit a copy of the minutes to the _____ personnel office; the office will retain the copy for three years. All reports, evaluations, and recommendations of the committee will be included in the minutes. The minutes will also identify representatives who attended monthly meeting, and representatives who were absent.

Voting Quorum

_____ voting representatives constitute a quorum. A majority vote of attending representatives is required to approve all safety-committee decisions. Issues not resolved by majority vote will be forwarded to management for resolution.

Employee Involvement

The _____ Safety Committee will encourage employees to identify workplace-health-and-safety hazards. Concerns raised by employees will be presented to the committee in writing; the committee will review new concerns at the next regularly-scheduled monthly meeting.

Safety Log

The committee will maintain a log of all employee concerns, including the date received, recommendations to management, and the date the concern was resolved.

Response

The committee will respond to employee concerns in writing and work with management to resolve them. The committee will present written recommendations for resolving concerns to management. Within 60 days of receipt of the written recommendations, management will respond in writing to the committee indicating acceptance, rejection, or modification of the recommendations.

Incident and Accident Investigation

The _____ Safety Committee will review new safety- or health-related incidents at its next regularly-scheduled meeting. Safety-related incidents include work-related near misses, injuries, illnesses, and deaths. When necessary, the committee will provide written recommendations to management for eliminating or controlling hazards.

Workplace Inspections

The _____ Safety Committee will conduct quarterly workplace inspections of all company facilities in March, June, September, and December.

Written Report

The committee will prepare a written report for management that documents the location of all health or safety hazards found during inspection. The report will recommend options for eliminating or controlling the hazards.

Within 60 days of receipt of the written report, management will respond in writing to the committee, indicating acceptance, rejection, or proposed modification of the recommendations.

Evaluation

The _____ Safety Committee will evaluate the company's workplace-safety-and-health program annually and provide a written evaluation of the program to management. The committee will also evaluate its own activities each December and use the evaluation to develop an action plan for the next calendar year.

How to Prepare an Agenda

The Purpose of the Agenda

The agenda, usually prepared by the safety-committee chairperson, is an outline of topics the representatives will discuss during a monthly meeting. The agenda helps structure the meeting and reminds representatives of their responsibilities – for example, special reports or other assigned tasks.

Preparing the Agenda

Most meetings should follow an agenda that includes the following topics:

- ☐ Introductions of new representatives and guests.
- ☐ Review of last meeting's minutes for addition or corrections.
- ☐ Old business – discussion of items not covered or resolved during the last meeting.
- ☐ New business – discussion of new items the committee needs to address or resolve.
- ☐ Employee suggestions – review and discussion of suggestions.
- ☐ Recommendations to management – review and discussion of recommendations to eliminate or control a hazard or to improve the company's safety-and-health program.
- ☐ Next meeting – date, location, and time in preparing the agenda, ask committee representatives if they have items to include under new business, employee suggestions, or recommendations to management. Keep the agenda as brief as possible.

Note: An "Agenda" form is provided for your use at the end of this section. It is your COPY MASTER.

Distributing the Agenda

Give committee representatives and other employees a chance to review the agenda.

Three to five days before the meeting:

- ☐ Send copies of the agenda to committee representatives and management.
- ☐ Post the agenda where other employees can read it.

Using the Agenda

After representatives, management, and other employees have had a chance to comment on the agenda, prepare the final version and make enough copies for everyone attending.

Use the agenda to guide the meeting. If you can not cover every topic during the meeting, schedule them for the next meeting under old business.

How to Take Minutes

Why Minutes are Important

Minutes are the official record of the safety committee's activities, including recommendations to management and accomplishments. The content should be concise, clear, and well-organized.

Note: A "Minutes" form is provided for your use at the end of this section. It is your COPY MASTER.

Who is Responsible for Minutes

Your committee should have a recorder who takes minutes at each meeting and, after the meeting, does the following:

- ▣ Distributes the minutes to representatives and management.
- ▣ Posts the minutes where other employees can read them.
- ▣ Keeps a copy of the minutes on file for three years.
- ▣ Ensures that all employees have the opportunity to respond to the minutes.

What to Include in the Minutes

Organize the minutes so that they follow the meeting agenda. Information to include in the minutes:

- ▣ Date, time, and place of the meeting.
- ▣ Names of attending representatives, guests, and representatives unable to attend.
- ▣ A summary of each agenda item discussed.
- ▣ Employee suggestions and reports of hazards.
- ▣ The committee's recommendations to management.
- ▣ Management's response to committee recommendations.

If the committee discusses a workplace accident or a near-miss incident, include a summary of the discussion in the minutes.

After the meeting, review and edit the minutes. Type a clean copy and post it where employees are likely to see it, or distribute it to all employees.

- ▣ Send a copy of the minutes to employees at mobile worksites or field offices.
- ▣ Keep the minutes for at least three years. You can file them in a notebook or a computer.

How to Identify Workplace Hazards

What to Do and How to Do It

Effective safety committees prove their worth by helping management keep workplace hazards under control. But you can not control hazards until you identify them.

- ▣ Get training on how to identify workplace hazards.
- ▣ Conduct quarterly workplace inspections.
- ▣ Discuss the hazards at monthly safety-committee meetings, document them in the minutes, and report them to management.



Getting Trained

Work with a mentor. A safety-and-health specialist from your insurance carrier, for example, will attend a safety committee meeting, answer questions, and help representatives learn how to identify hazards.

Know the rules. Know what safety and health rules apply to your workplace. The rules can inform you about hazards and help you determine how to control them.

Conducting Quarterly Workplace Inspections

Successful inspections involve walking, talking, listening, and writing:

- Walk around the workplace. Look for hazards and unsafe work practices that are likely to cause serious injuries. Focus on hazards rather than rule violations.
- Talk to employees. Ask them about hazards and unsafe conditions; be concerned and listen carefully.
- Take notes. What is the hazard? Where is the hazard? How could the hazard cause an accident and what could be the result? Who could be affected by the hazard?
- Report your findings. Organize your notes and summarize the important information in a report to the safety committee.

Getting Other Employees Involved

Concerned employees help the committee learn about workplace hazards and unsafe practices. Encourage them to report hazards and suggest how to control them.

Discussing Hazards at Safety Committee Meetings

The safety committee receives information about workplace hazards from quarterly inspections, from concerned employees, and from management. But the committee also needs to discuss how that information will lead to a safer, healthier workplace and the discussion should take place during a safety-committee meeting.

Reporting Hazards to Management

By reporting a hazard to management and recommending how to control or eliminate it, the committee acknowledges the hazard threatens a worker's safety.

A Safety Committee Evaluation Checklist

After you get your safety committee started, use this checklist to determine if it is necessary to do any fine-tuning to make it more effective.

| <i>Done</i> | <i>To Do</i> | |
|--------------------------|--------------------------|---|
| <input type="checkbox"/> | <input type="checkbox"/> | Our safety committee is composed of an equal number of employer and employee representatives. |
| <input type="checkbox"/> | <input type="checkbox"/> | Employee representatives are volunteers or are elected by their peers. |
| <input type="checkbox"/> | <input type="checkbox"/> | There are at least four representatives on the committee if the workplace has more than 20 employees – at least two representatives if the workplace has 20 or fewer employees. |
| <input type="checkbox"/> | <input type="checkbox"/> | The representatives elect the committee chairperson. |
| <input type="checkbox"/> | <input type="checkbox"/> | Representatives are paid their regular wages during safety committee training and meetings. |
| <input type="checkbox"/> | <input type="checkbox"/> | Employee representatives serve on the committee for at least one year. |
| <input type="checkbox"/> | <input type="checkbox"/> | Representatives' terms of service are staggered so that at least one experienced representative is always on the committee. |
| <input type="checkbox"/> | <input type="checkbox"/> | Reasonable efforts are made to ensure that committee representatives represent the firm's major work activities. |
| <input type="checkbox"/> | <input type="checkbox"/> | The committee meets monthly except when representatives schedule quarterly workplace inspections. |
| <input type="checkbox"/> | <input type="checkbox"/> | Committee meetings follow a written agenda. |

| <i>Done</i> | <i>To Do</i> | |
|--------------------------|--------------------------|--|
| <input type="checkbox"/> | <input type="checkbox"/> | The minutes for each meeting are maintained for at least three years. |
| <input type="checkbox"/> | <input type="checkbox"/> | Minutes are available to all employees to read. |
| <input type="checkbox"/> | <input type="checkbox"/> | All reports, evaluations, and recommendations are included in the minutes. |
| <input type="checkbox"/> | <input type="checkbox"/> | Management has a reasonable time to respond, in writing, to the committee's recommendations. |
| <input type="checkbox"/> | <input type="checkbox"/> | The committee has a method for collecting and reviewing employees' safety-related suggestions and reports of hazards. |
| <input type="checkbox"/> | <input type="checkbox"/> | The committee assists management in evaluating and improving the workplace safety and health program. |
| <input type="checkbox"/> | <input type="checkbox"/> | The inspection team conducts workplace inspections at least quarterly. |
| <input type="checkbox"/> | <input type="checkbox"/> | The committee's quarterly inspection team follows a standard procedure for identifying safety-and-health hazards during its inspections. |
| <input type="checkbox"/> | <input type="checkbox"/> | The inspection team includes employer and employee representatives. |
| <input type="checkbox"/> | <input type="checkbox"/> | The inspection team documents, in writing, the location and identity of workplace hazards. |
| <input type="checkbox"/> | <input type="checkbox"/> | The inspection team – or other persons designated by the committee – does quarterly inspections of satellite locations. |
| <input type="checkbox"/> | <input type="checkbox"/> | The committee has a procedure for reviewing the team's quarterly inspection reports. |
| <input type="checkbox"/> | <input type="checkbox"/> | The committee recommends to management ways to control hazards and unsafe work practices. |
| <input type="checkbox"/> | <input type="checkbox"/> | The committee makes recommendations to ensure all employees are accountable for following safe work practices. |
| <input type="checkbox"/> | <input type="checkbox"/> | The committee has a procedure for investigating workplace accidents, illnesses, and deaths. |
| <input type="checkbox"/> | <input type="checkbox"/> | Representatives understand the purpose of their safety committee and know how it functions. |
| <input type="checkbox"/> | <input type="checkbox"/> | Representatives have access to applicable OSHA safety and health rules. |
| <input type="checkbox"/> | <input type="checkbox"/> | Representatives have received safety training for identifying workplace hazards and investigating accidents. |

Safety Committee Meeting Agenda

Date: _____

To: All committee members, alternates, bulletin board

Meeting Date and Time: _____

Place: _____

| Agenda Items | Person Responsible |
|---|--------------------|
| 1. Old business | |
| a. Review last month's recommendations | _____ |
| b. Follow-up on last quarterly inspection | _____ |
| 2. New business | |
| a. Hazard reports | All |
| b. Accident investigation reviews | _____ |
| c. Recommendations review | _____ |
| d. _____ | _____ |
| e. _____ | _____ |
| f. _____ | _____ |
| 3. Safety Committee Members Training | |
| a. _____ | _____ |
| b. _____ | _____ |

Notes:

Chair Person's Signature

Date

Safety Committee Meeting Minutes

Chairperson: _____ Date: _____

Department: _____ Time meeting started: _____

PRESENT

ABSENT

| | |
|--|--|
| | |
| | |
| | |
| | |
| | |
| | |

Previous meeting minutes from _____ were read.
Date

Old Business

Ⓐ Review of last months recommendations

| Recommendation Number | Description | Not Completed | Completed | Date |
|--------------------------|-------------|--------------------------|--------------------------|-------|
| R- _____ | _____ | <input type="checkbox"/> | <input type="checkbox"/> | _____ |
| R- _____ | _____ | <input type="checkbox"/> | <input type="checkbox"/> | _____ |
| R- _____ | _____ | <input type="checkbox"/> | <input type="checkbox"/> | _____ |
| R- _____ | _____ | <input type="checkbox"/> | <input type="checkbox"/> | _____ |
| R- _____ | _____ | <input type="checkbox"/> | <input type="checkbox"/> | _____ |
| R- _____ | _____ | <input type="checkbox"/> | <input type="checkbox"/> | _____ |
| R- _____ | _____ | <input type="checkbox"/> | <input type="checkbox"/> | _____ |

Ⓑ Follow-up on last quarterly inspection: _____

New Business

Ⓐ Hazard (inspection) reports reviewed: _____

| Hazard Number | Description | Recommendation Number |
|------------------|-------------|--------------------------|
| H- _____ | _____ | R- _____ |
| H- _____ | _____ | R- _____ |
| H- _____ | _____ | R- _____ |
| H- _____ | _____ | R- _____ |
| H- _____ | _____ | R- _____ |
| H- _____ | _____ | R- _____ |

ⓑ Accident/incident investigation reviews:

| Accident Number | Near Miss | Description | Recommendation Number |
|-----------------|--------------------------|-------------|-----------------------|
| A- _____ | <input type="checkbox"/> | _____ | R- _____ |
| A- _____ | <input type="checkbox"/> | _____ | R- _____ |
| A- _____ | <input type="checkbox"/> | _____ | R- _____ |
| A- _____ | <input type="checkbox"/> | _____ | R- _____ |
| A- _____ | <input type="checkbox"/> | _____ | R- _____ |
| A- _____ | <input type="checkbox"/> | _____ | R- _____ |
| A- _____ | <input type="checkbox"/> | _____ | R- _____ |

Safety Committee Members Training Report: _____

Miscellaneous New Business: _____

Activity/Assignment Report:

| Description | Person Assigned |
|-------------|-----------------|
| _____ | _____ |
| _____ | _____ |
| _____ | _____ |
| _____ | _____ |
| _____ | _____ |

Committee Remarks: _____

Meeting adjourned: _____ Time/date Next meeting: _____ Time/date

Chair Person Signature

Secretary Signature

Safety Committee Policy Statement

Introduction

Arena Fire Protection, Inc. is committed to accident prevention in order to protect the safety and health of all our employees. Injury and illness losses due to hazards are needless, costly and preventable. To prevent these losses, a joint management/worker safety committee will be established. Employee involvement in accident prevention and support of safety committee members and activities is necessary to ensure a safe and healthful workplace for all employees.

Purpose

The purpose of our safety committee is to bring workers and management together in a non-adversarial, cooperative effort to promote safety and health in the workplace. The safety committee will assist management and make recommendations for change.

Organization

There shall be, in most cases, an equal number of employee and employer representatives. However, there may be more employee representatives than employer representatives if both groups agree. Employee representatives shall be volunteers or elected by their peers. If no employees volunteer or are elected, they may be appointed by management. Employer representatives will be appointed. Safety committee members will serve a continuous term of at least one year. Committee membership terms will be staggered so that at least one experienced member is always on the committee.

Extent of Authority

It must be clearly understood that the safety committee advises management on issues that will promote safety and health in the workplace. Written recommendations are expected from the safety committee and they will be submitted to management. In turn, management will give serious consideration to the recommendations submitted and will respond in writing to the committee within a reasonable time.

Functions

- ☐ Committee meetings and employee involvement.
- ☐ Hazard assessment and control.
- ☐ Safety and health planning.
- ☐ Evaluation of accountability system.
- ☐ Evaluation of management commitment to workplace safety and health.
- ☐ Evaluation of accident and incident investigation program.
- ☐ Safety and health training.

Recommendations

All recommendations submitted to management must be written and should:

- ① Be clear and concise.
- ② Provide reasons for implementation.
- ③ Give recommended options.
- ④ Show implementation costs and recommended completion dates.
- ⑤ List benefits to be gained.

Section Notes:

Chapter 3 General Safety Rules & Code of Safe Practices

Allen Davidson is responsible for the implementation and enforcement of the following safety rules. Disciplinary procedures will be enforced.

Employee Safety Training & Disciplinary Procedures

OSHA requires that employees be trained in the safe methods of performing their job. **Arena Fire Protection, Inc.** is committed to instructing all employees in safe and healthful work practices. Awareness of potential hazards, as well as knowledge of how to control them, is critical to maintaining a safe and healthful work environment and preventing injuries. To achieve this goal, we will provide training to each employee on general safety issues and safety procedures specific to that employee's work assignment.



Every new employee will be given instruction by their foreman in the general safety requirements of their job. A copy of our Code of Safe Practices shall also be provided to each employee. Tailgate or toolbox safety meetings will be conducted at least every 10 working days. All training will be documented on the forms provided.

Managers, superintendents and foremen will be trained at least twice per year on various accident prevention topics.

Training provides the following benefits:

- Makes employees aware of job hazards
- Teaches employees to perform jobs safely
- Promotes two way communication
- Encourages safety suggestions
- Creates interest in the safety program
- Fulfills OSHA requirements



Employee training will be provided at the following times:

- ① All new employees will receive a safety orientation their first day on the job.
- ② All new employees will be given a copy of the Code of Safe Practices and required to read and sign for it.
- ③ All field employees will receive training at tailgate or toolbox safety meetings held at the job site.
- ④ All employees given a new job assignment for which training has not been previously provided will be trained before beginning the new assignment.
- ⑤ Whenever new substances, processes, procedures or equipment that represent a new hazard are introduced into the workplace.
- ⑥ Whenever The COMPANY is made aware of a new or previously unrecognized workplace hazard.
- ⑦ Whenever management believes that additional training is necessary.
- ⑧ After all serious accidents.
- ⑨ When employees are not following safe work rules or procedures.

Training topics will include, but not be limited to:

- Employee's safety responsibilities
- General safety rules
- Code of Safe Practices
- Safe job procedures
- Use of hazardous materials
- Use of equipment
- Emergency procedures
- Safe lifting and material handling practices
- Use of boom and scissor lifts
- Use of fall-protection
- Contents of safety program

Documentation of Training

All employee safety training will be documented on one of the following three forms:

- ① New Employee Safety Orientation
- ② Specialized, formal employee training plans (confined spaces, fall protection, lockout/tagout, first aid, etc.)
- ③ Tailgate/Toolbox Safety Meeting Report

The following informal training methods will be used. Actual demonstrations of the proper way to perform a task will be used in most cases, for example:

- Tell them how to do the job safely
- Show them how to do the job safely
- Have them tell you how to do the job safely
- Have them show you how to do the job safely
- Follow up to ensure they are still performing the job safely

Safety Communication

Employee safety communication procedures are designed to develop and maintain employee involvement and interest in the Safety and Health Program. These activities will also ensure effective communication between management and employees on safety related issues that is of prime importance to The COMPANY.

The following are some of the safety communication methods that may be used:

- Tailgate/Toolbox safety training with employees that encourage participation and open, two-way communication.
- New employee safety orientation and provision of the Code of Safe Practices.
- Provision and maintenance of employee bulletin boards discussing safety issues, accidents, and general safety suggestions.
- Written communications from management or the Safety Coordinator, including memos, postings, payroll stuffers, and newsletters.
- Anonymous safety suggestion program.

Employees will be kept advised of highlights and changes relating to the safety program. The Foremen shall relay changes and improvements regarding the safety program to employees, as appropriate. Employees will be involved in future developments and safety activities, by requesting their opinions and comments, as necessary.

All employee-initiated safety related suggestions shall be properly answered, either verbally or in writing, by the appropriate level of management. Unresolved issues shall be relayed to The Safety Coordinator.

All employees are encouraged to bring any safety concerns they may have to the attention of management. **Arena Fire Protection, Inc.** will not discriminate against any employee for raising safety issues or concerns.

The COMPANY also has a system of anonymous notification whereby employees who wish to inform the company of workplace hazards without identifying themselves may do so by phoning or sending written notification to the following address:

Enforcement of Safety Policies

The compliance of all employees with The COMPANY'S Safety and Health Program is mandatory and shall be considered a condition of employment.

The following programs will be utilized to ensure employee compliance with the safety program and all safety rules:

- | | |
|--|---|
| <input type="checkbox"/> Training programs | <input type="checkbox"/> Optional safety incentive programs |
| <input type="checkbox"/> Retraining | <input type="checkbox"/> Disciplinary action |

Training Programs

The importance of safe work practices and the consequences of failing to abide by safety rules will be covered in the New Employee Safety Orientation and at Tailgate/Toolbox Safety meetings. This will help ensure that all employees understand and abide by The Company's safety policies.

Retraining

Employees that are observed performing unsafe acts or not following proper procedures or rules will be retrained by their foreman or supervisor. A Safety Contact Report may be completed by the supervisor to document the training. If multiple employees are involved, additional safety meetings will be held.

Safety Incentive Programs

Although strict adherence to safety policies and procedures is required of all employees, the company may choose to periodically provide recognition of safety-conscious employees and jobsites without accidents through a safety incentive program.

Disciplinary Action

The failure of an employee to adhere to safety policies and procedures established by The COMPANY can have a serious impact on everyone concerned. An unsafe act can threaten not only the health and well being of the employee committing the unsafe act but can also affect the safety of his/her coworkers and/or customers. Accordingly, any employee who violates any of the company's safety policies will be subject to disciplinary action.

Note: Failure to promptly report any on-the-job accident or injury, on the same day as occurrence, is considered a serious violation of The COMPANY'S Code of Safe Practices. Any employee who fails to immediately report a work-related accident or injury, no matter how minor shall be subject to disciplinary action.

Employees will be disciplined for infractions of safety rules and unsafe work practices that are observed, not just those that result in an injury. Often, when an injury occurs, the accident investigation will reveal that the injury was caused because the employee violated an established safety rule and/or safe work practice(s).

In any disciplinary action, the foreman should be cautious that discipline is given to the employee for safety violations, and not simply because the employee was injured on the job or filed a Workers' Compensation claim.

Violations of safety rules and the Code of Safe Practices are to be considered equal to violations of other company policy. Discipline for safety violations will be administered in a manner that is consistent with The COMPANY'S system of progressive discipline. If, after training, violations occur, disciplinary action will be taken as follows:

- ① Oral warning. Document it, including date and facts on the "Safety Warning Report" form. Add any pertinent witness statements. Restate the policy and correct practice(s).
- ② Written warning. Retrain as to correct procedure/practice.
- ③ Written warning with suspension.
- ④ Termination

As in all disciplinary actions, each situation is to be carefully evaluated and investigated. The particular step taken in the disciplinary process will depend on the severity of the violation, employee history, and regard to safety. Foremen and superintendents should consult with the office if there is any question about whether or not disciplinary action is justified. Employees may be terminated immediately for willful or extremely serious violations. Union employees are entitled to the grievance process specified by their contract.

Note: Consistency in the enforcement of safety rules shall be exercised at all times.

Employee Safety Warning Report

| | | | |
|---|----------------|--|----------------|
| Employee's Name | | Position | |
| Date of Warning | Violation Time | <input type="checkbox"/> am <input type="checkbox"/> pm | Violation Date |
| Supervisor | | Department | |
| Type of warning <input type="checkbox"/> Verbal <input type="checkbox"/> Written <input type="checkbox"/> Serious <input type="checkbox"/> Other: | | | |
| Type of Violation <input type="checkbox"/> Unsafe Act <input type="checkbox"/> Improper Safety Attire <input type="checkbox"/> Unsafe condition <input type="checkbox"/> Other | | | |
| Supervisor's Statement | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| Employee's Statement (Check Proper Box) | | | |
| <input type="checkbox"/> I agree with the Supervisor's statement <input type="checkbox"/> I disagree with the Supervisor's statement because: | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| List all previous warnings and retraining below | | | |
| When warned and <u>by whom</u> | | I have read and understand this warning decision | |
| First Warning (Describe reason) | | | |
| | | Employee's Signature | Date |
| | | | |
| | | | |
| Date | Date retrained | Supervisor's Signature | Date |
| Second Warning (Describe reason) | | | |
| | | | |
| | | | |
| Date | Date retrained | Copy Distribution | |
| Third Warning (Describe reason) | | | |
| | | <input type="checkbox"/> Employee | |
| | | <input type="checkbox"/> Employee's Supervisor | |
| | | <input type="checkbox"/> Personnel Department | |
| Date | Date retrained | <input type="checkbox"/> Safety Committee | |
| The Supervisor must complete this form immediately after the employee has been interviewed. A decision must be made on the following to ensure violators <u>will not</u> participate in the current safety incentive program. | | | |
| <input type="checkbox"/> No further action <input type="checkbox"/> Suspension <input type="checkbox"/> Other: | | | |
| <input type="checkbox"/> Suspension from current safety incentive program <input type="checkbox"/> Dismissal | | | |
| Submit this form for review at the next Safety Committee meeting | | | |
| Safety Committee Notes | | | |
| | | | |
| | | | |

CODE OF SAFE PRACTICES

Arena Fire Protection, Inc. will maintain a "Safety and Health Program" conforming to the best practices of organizations of this type. To be successful, such a program must embody the proper attitudes toward injury and illness prevention on the part of supervisors and employees. It also requires cooperation in all safety and health matters, not only between supervisor and employee, but also between each employee and his or her co-workers. Only through such a cooperative effort can a safety program in the best interest of all be established and preserved. Safety and health in our business must be a part of every operation.

THE COMPANY'S Safety and Health Program includes:

- ❑ ***Providing*** mechanical and physical safeguards to the maximum extent possible.
- ❑ ***Conducting*** a program of safety and health inspections to find and eliminate unsafe working conditions or practices, to control health hazards, and to comply fully with the safety and health standards for every job.
- ❑ ***Training*** all employees in good safety and health practices.
- ❑ ***Providing*** necessary personal protective equipment and instructions for its use and care.
- ❑ ***Developing and enforcing*** safety and health rules and requiring that employees cooperate with these rules as a condition of employment.
- ❑ ***Investigating***, promptly and thoroughly, every accident to find out what caused it and to correct the problem so that it will not happen again.
- ❑ ***Setting up*** a system of recognition and awards for outstanding safety service or performance.

We recognize that the responsibilities for safety and health are shared:

- ❑ ***THE COMPANY*** accepts the responsibility for leadership of the safety and health program, for its effectiveness and improvement, and for providing the safeguards required to ensure safe conditions.
- ❑ ***Supervisors*** are responsible for developing the proper attitudes toward safety and health in themselves and in those they supervise, and for ensuring that all operations are performed with the utmost regard for the safety and health of all personnel involved, including themselves.
- ❑ ***Employees*** are responsible for wholehearted, genuine operation with all aspects of the Safety and Health Program including compliance with all rules and regulations—and for continuously practicing safety while performing their duties.

GENERAL SAFETY RULES

- ❑ **Arena Fire Protection, Inc.** employees shall follow these safe practice rules, render every possible aid to safe operations, and report all unsafe conditions or practices to their supervisor.
- ❑ **Failure to abide** by the Code of Safe Practices may result in disciplinary action up to and including termination.
- ❑ **Supervisors shall** insist that employees observe and obey every rule, regulation, and order necessary to the safe conduct of the work, and shall take such action necessary to obtain compliance.
- ❑ **If you are unsure** of the safe method to do your job, STOP and ask your supervisor. Ignorance is no excuse for a safety violation.
- ❑ **All employees shall** be given frequent accident prevention instructions. Instructions, practice drills and articles concerning workplace safety and health shall be given at least once every _____ working days.
- ❑ **No one shall knowingly** be permitted to work while the employee's ability or alertness is impaired by fatigue, illness, and prescription or over the counter drugs. Employees who are suspected of being under the influence of illegal or intoxicating substances, impaired by fatigue or an illness, shall be prohibited from working.
- ❑ **Anyone known** to be under the influence of alcohol and/or drugs shall not be allowed on the job while in that condition. Persons with symptoms of alcohol and/or drug abuse are encouraged to discuss personal or work-related problems with the supervisor/employer.
- ❑ **Employees should** be alert to see that all guards and other protective devices are in proper places and adjusted, and shall report deficiencies. Approved protective equipment shall be worn in specified work areas.
- ❑ **Horseplay, scuffling, fighting** and other acts that tend to have an adverse influence on the safety or well being of the employees are prohibited. Do not run on the job site or in the shop or office area.
- ❑ **Work shall be** well-planned and supervised to prevent injuries when working with equipment and handling heavy materials. When lifting heavy objects, employees should bend their knees and use the large muscles of the leg instead of the smaller muscles of the back. Back injuries are the most frequent and often the most persistent and painful type of workplace injury.
- ❑ **Workers shall not** handle or tamper with any electrical equipment, machinery or air or water lines in a manner not within the scope of their duties, unless they have received instructions from their supervisor. Do not operate equipment that you are not familiar with. Do not attempt to use such equipment until you are fully trained and authorized.
- ❑ **Keep your work area clean**, free of debris, electrical cords and other hazards. Immediately clean up spilled liquids.
- ❑ **Always notify** all other individuals in your area who might be endangered by the work you are doing.
- ❑ **A red tag system** identifies equipment that is NOT to be operated, energized or used. All lock-out/tag-out notices and procedures must be observed and obeyed.

- ❑ **Do not block exits**, fire doors, aisles, fire extinguishers, first aid kits, emergency equipment, electrical panels, or traffic lanes.
- ❑ **Do not leave tools**, materials, or other objects on the floor that might cause others to trip and fall.
- ❑ **Do not distract others** while working. If conversation is necessary, make sure eye contact is made prior to communicating.
- ❑ **Employees shall not** enter manholes, underground vaults, chambers, tanks, silos, or other similar places that receive little ventilation, unless it has been determined that it is safe to enter.
- ❑ **Materials, tools, or other objects** shall not be thrown from buildings or structures until proper precautions are taken to protect others from the falling objects.
- ❑ **Employees shall cleanse thoroughly** after handling hazardous substances, and follow special instructions from authorized sources.
- ❑ **Gasoline or other flammable liquids** shall not be used for cleaning purposes.
- ❑ **No burning, welding, or other source** of ignition shall be applied to any enclosed tank or vessel, even if there are some openings, until it has first been determined that no possibility of explosion exists, and authority for the work is obtained from the foreman or superintendent.
- ❑ **Any damage to scaffolds**, falsework, or other supporting structures shall be immediately reported to the foreman and repaired before use.
- ❑ **Possession of firearms**, weapons, illegal drugs or alcoholic beverages on company or customer property or the job site is strictly prohibited.
- ❑ **All injuries shall** be reported promptly to your supervisor so that arrangements can be made for medical and/or first-aid treatment.

SPECIFIC SAFETY RULES

Electrical Safety

- ❑ **Only trained, qualified, and authorized employees** are allowed to make electrical repairs or work on electrical equipment or installations.
- ❑ **All electrical equipment** and systems shall be treated as energized until tested or otherwise proven to be de-energized.
- ❑ **All energized equipment** and installations will be de-energized prior to the commencement of any work. If the equipment or installation must be energized for test or other purposes, special precautions will be taken to protect against the hazards of electric shock.
- ❑ **All equipment shall be locked out** to protect against accidental or inadvertent operation when such operation could cause injury to personnel. Do not attempt to operate any switch, valve, or other energy-isolating device bearing a lock.
- ❑ **Safety grounds** shall always be used where there is a danger of shock from back feeding or other hazards.

- ❑ ***Polyester clothing or other flammable types*** of clothing shall not be worn near electrical circuits. Cotton clothing is much less likely to ignite from arc blast. Employees working on live circuits shall be provided Nomex or equivalent fire resistant clothing.
- ❑ **Suitable eye protection** must be worn at all times while working on electrical equipment.
- ❑ ***Always exercise caution*** when energizing electrical equipment or installations. Take steps to protect yourself and other employees from arc blast and exploding equipment in the event of a fault.
- ❑ ***All power tools*** will be grounded or double insulated. Tools with defective cords or wiring shall not be used.
- ❑ ***Metal jewelry*** should not be worn around energized circuits.
- ❑ ***Extension and temporary power cords*** must be heavy duty and grounded. Frayed or defective cords shall not be used.
- ❑ ***Suitable temporary barriers*** or barricades shall be installed when access to opened enclosures containing exposed energized equipment is not under the control of an authorized person.
- ❑ ***Electrical installations*** must be protected from accidental contact by enclosures or tight fitting covers.
- ❑ ***GFCI's are required*** on all power outlets.
- ❑ ***Circuits shall not*** be overloaded with equipment or extension cords.
- ❑ ***Metal measuring tapes, fish tapes, ropes or other metal devices*** are prohibited where they may contact energized parts of equipment or circuits.

Personal Protective Equipment (PPE)

- ❑ ***Use the correct PPE*** for each job assignment. If you do not know, ask.
- ❑ ***PPE shall be maintained*** in good condition and cleaned regularly.
- ❑ ***PPE shall be stored properly*** when not in use to protect it from damage.
- ❑ ***Damaged or broken PPE*** must be returned to your foreman for replacement.
- ❑ ***Hard hats must be worn*** on job sites at all times.
- ❑ ***ANSI approved*** safety glasses must be worn when working with power tools, compressed air or gasses, chemicals or any other item that creates an eye injury hazard.
- ❑ ***Face shields*** with safety glasses are recommended when grinding or working with hazardous chemicals.
- ❑ ***Employees must wear*** industrial work shoes in the shop and on the job site. The shoes must have complete leather uppers and skid resistant soles and be in good condition. Steel toe protection is recommended.
- ❑ ***Athletic style shoes, tennis shoes, open toe shoes, plastic or vinyl shoes or shoes with decorative accessories*** are not allowed.
- ❑ ***Hearing protectors must be worn*** when working with loud equipment such as cut off saws, chain saws, air hammers or grinders.
- ❑ ***Back support belts*** should be worn for heavy lifting tasks. They do not help you lift more, but may provide some protection from back injuries.

- ☐ **Be sure the protective clothing you wear** will not hamper or restrict freedom of movement due to improper fit.
- ☐ **Long pants** of heavy-duty material must be worn. No shorts or sweat pants are allowed.
- ☐ **Do not wear loose, torn or frayed clothing**, dangling ties, finger rings, dangling earrings, jewelry items, or long hair unless contained in a hair net, while operating any machine that could cause entanglement.
- ☐ **If required, wear NIOSH approved respirators** when applying adhesives, paint, welding, grinding or working with chemicals. Read the MSDS to find out which types of respirators are required. Facial hair may not be permitted in certain circumstances.

Hazardous Materials and Chemicals

- ☐ **Read all warning labels** and Material Safety Data Sheets (MSDS) before using any chemicals. MSDS contain personal protective equipment and safety information and are available from your foreman.
- ☐ **Hazardous materials shall be handled** in accordance with the MSDS and label. If protective equipment is required, use it.
- ☐ **Eye protection must be worn** when working with hazardous materials or chemicals.
- ☐ **Mixing of chemicals is prohibited** at all times unless required by the label. Before you mix - review all MSDS.
- ☐ **Always wash your hands thoroughly** after handling chemicals and before eating or smoking, even if you were wearing protective gloves.
- ☐ **Never use solvents** for hand cleaning. Use the non-toxic hand cleaners provided.
- ☐ **Store all hazardous materials properly** in suitable containers that are properly labeled.
- ☐ **Use chemicals** only in well-ventilated areas.
- ☐ **When using secondary containers**, ensure that they are labeled as to their contents and hazards.
- ☐ **Do not disturb any asbestos**. STOP work and tell your foreman. If you are not sure, STOP and ask.
- ☐ **Do not cut or weld** stainless steel or galvanized metal without respiratory protection. These items create toxic fumes.
- ☐ **Work with lead, asbestos, cadmium** and other toxic compounds require special precautions. Do not attempt to perform this work without special equipment and training.

Fire Prevention and Housekeeping

- ☐ **Always take precautions** to prevent fires which may be started, particularly from oily waste, rags, gasoline, flammable liquids, acetylene torches, improperly installed electrical equipment and trash.

- ☐ **Fire fighting equipment is** to be inspected on a regular basis. All discharged, damaged or missing equipment is to be immediately reported to a supervisor. Tampering with fire equipment is prohibited.
- ☐ **Access to fire extinguishers** must be kept clear at all times. Make note of the location of fire fighting equipment in your work area.
- ☐ **Never use gasoline** or flammable solvents for cleaning purposes.
- ☐ **Smoking is prohibited** within 20 feet of where flammable substances are present.
- ☐ **In case of fire**, employees shall consider the safety of themselves and other individuals before saving property.
- ☐ **Keep your work areas** free of debris. Remove useless material from the work area as fast as required to help reduce tripping hazards.
- ☐ **Maintain awareness** of potential hazards when walking about the job site.
- ☐ **Keep tools**, materials and equipment out of walkways and stairways at all times.
- ☐ **Sharp wires** or protruding nails must be kept bent.
- ☐ **Place tools** and equipment so they will not slide off the roof.
- ☐ **Tie material down** at day's end so the wind will not blow it off the roof.

Fall Protection

- ☐ **Fall protection, such as standard railings** or a safety harness and lanyard, shall be used at all times, when working 7 ½ feet or more above the level below.
- ☐ **Floor and wall openings**, unfinished balconies, elevator shafts and similar areas must be railed, covered or barricade to prevent falls.
- ☐ **Never remove fall protection rails**, covers, or barricades without permission from your foreman and special precautions. Always replace these items when finished with your task.
- ☐ **All safety harnesses** shall be the full body type with a shock-absorbing lanyard attached to a substantial anchorage capable of supporting twice the maximum load. Lanyards shall be attached at the wearer's upper back. Body belts are not to be worn as fall protection.
- ☐ **Read and obey all** manufacturers' instructions relating to your fall arrest system (safety harness and lanyard).
- ☐ **Inspect all components** of your harness and lanyard prior to each use and after a fall. Defective equipment is not to be used. Lanyards must be destroyed after a fall and never reused.
- ☐ **Safety harnesses and lanyards** should limit free fall distance to less than 4 feet and prevent contact with any level or objects below you.
- ☐ **Never use any part** of a fall arrest system, such as a harness or lanyard, to hoist materials or for any other purpose.
- ☐ **Safety harnesses** and shock absorbing lanyards are required to be worn at all times while in boom lifts.

Ladder Safety

- ❑ **Inspect the ladder before using it.** If it is broken, throw it out. Never repair a broken ladder, get a new one. Keep portable stairways, ladders and step stools in good condition and use them only in a safe manner.
- ❑ **Use the proper ladder for the job.** Do not use "A" frame ladders as straight ladders. Make sure the ladder is tall enough to reach the work area. Do not use metal ladders for electrical work.
- ❑ **Do not place ladders** in passageways, doorways, or any location where they might be hit or jarred, unless protected by barricades or guards.
- ❑ **Ladders should only be placed** on hard level surfaces. Make sure the ladder feet are not placed on sandy, slippery, or sloping surfaces. Clean or sweep the area where the ladder feet will be and make sure the rubber feet are in good shape.
- ❑ **Ladder rungs and steps** must be kept free of grease, oil, mud, or other slippery substances.
- ❑ **Arrange your work** so you are able to face the ladder and use both hands while climbing. Do not carry tools or equipment while climbing a ladder. Climb the ladder, and then hoist the tools or equipment with a line or a hoisting device.
- ❑ **Avoid temporary ladders.** Always use a commercially made, construction grade ladder of the proper length for the work being performed.
- ❑ **Secure portable ladders** in place and at a pitch so the leveling indicator is in alignment or the distance from the wall to the base of the ladder is at least 1' for every 4' of height.
- ❑ **Straight ladders shall** be tied off the top of the ladder to prevent slipping.
- ❑ **Be aware of objects** below you, move or cover sharp objects in case you fall. Cap or bend all rebar.
- ❑ **Do not stand** on or work from the 2nd rung from the top or above. Also do not reach too far from the ladder. Keep your belt buckle between the side rails.
- ❑ **Extension ladders shall** extend at least 36" above the level being accessed.
- ❑ **On all ladders,** do not step on cross bracing that is not intended to be used for climbing.

Scaffolds

- ❑ **Scaffolds are to be erected,** dismantled, altered or repaired by the scaffold contractor ONLY.
- ❑ **Inspect scaffolds prior** to use and report any damage immediately to your foreman. Do not use damaged scaffolds.
- ❑ **You are not permitted** to ride on rolling scaffolds being moved.
- ❑ **At least 2 people are required** to move rolling towers. Secure or remove all tools and materials before moving.
- ❑ **Always use guard railings** on all scaffolds regardless of height.
- ❑ **Use only high quality planking** on scaffolds and be sure the planks are secure to prevent shifting.
- ❑ **Always apply caster brakes** and use outriggers when scaffolds are stationary.

- ❑ **Do not use planks** or guard rails as a temporary means of obtaining greater height.
- ❑ **Be aware of the objects below you;** move or cover sharp objects in case you fall. Cap or bend all rebar.

Lockout/Tagout

- ❑ **All machinery** and electrical equipment shall be locked out and tagged prior to repair, cleaning, or adjustment unless power is necessary to perform the work. If so, other precautions, specified by your foreman, will be taken.
- ❑ **Use your own lock** and key. No one else should have a key for your lock. Destroy all duplicate keys.
- ❑ **Maintain control** of your key at all times to prevent unauthorized use.
- ❑ **Never remove another** employee's lock or energize tagged equipment.
- ❑ **If multiple employees** are working on the same equipment, each employee should install their own lock.
- ❑ **Notify all affected employees** that lockout/tagout is required and reasoning.
- ❑ **If the equipment is operating,** shut it down by the normal stopping procedure (depress stop button, open toggle switch, etc.).
- ❑ **Operate the switch,** valve or other energy isolating devices so that the energy source(s) (electrical, mechanical, hydraulic, etc.) is disconnected or isolated from the equipment.
- ❑ **Stored energy,** such as that in capacitors, springs, elevated machine members, rotating flywheels, hydraulic systems, and air, gas or water pressure, etc. must also be dissipated or restrained by methods such as grounding, repositioning, blocking, bleeding down, etc.
- ❑ **Lock-out all** energy isolation devices with an individual lock.
- ❑ **After ensuring** that no employees are exposed and as a check of having disconnected the energy sources, operate the push button or other normal operating controls to make certain the equipment will not operate. Caution: Return operating controls to neutral position after the test. The equipment is now locked-out. Install red lock-out tag on operating controls.
- ❑ **After repair is complete** and the equipment is ready for testing or normal operation, check the equipment to see that all cover plates and safety devices have been reinstalled.
- ❑ **When the equipment is clear,** remove all locks and tags. The energy isolating devices may be operated to restore energy to the equipment.

Boom and Scissor Lifts

- ❑ **Only trained and authorized employees** are allowed to use boom or scissor lifts. If you are not trained, stay off.
- ❑ **Read and obey all** manufacturers' instructions and safety precautions.
- ❑ **Inspect all lifts** prior to use. Defective equipment shall not be used.
- ❑ **A safety harness** with shock absorbing lanyard must be worn while using boom lifts. Harnesses are not required for scissor lifts, provided guardrails are adequate and you do not leave the work platform.

- ❑ **Always stay inside** the platform railing. Do not use planks or ladders to extend your reach.
- ❑ **Always lower** the lift before moving.
- ❑ **Never use scissor lifts** on uneven ground. They are designed for use primarily on concrete floors.

Hand and Power Tools

- ❑ **Proper eye protection** must be worn when using hand and power tools.
- ❑ **Know your** hand and power tool applications and limitations. Always use the proper tool for the job.
- ❑ **Inspect cords** and tools prior to use. Do not use tools that are faulty in any way. Exchange them for safe tools immediately.
- ❑ **Power tools must** be grounded or double insulated. All power tools are to be plugged into a grounded GFCI outlet.
- ❑ **Do not use** power tools in damp, wet or explosive atmospheres.
- ❑ **Do not lift,** lower or carry portable electrical tools by the power cord.
- ❑ **Keep all safety guards** in place and in proper working order.
- ❑ **Use clamps** or vises to secure work pieces.
- ❑ **Do not force** hand power tools. Apply only enough pressure to keep the unit operating smoothly.
- ❑ **Return all tools** and other equipment to their proper place after use.
- ❑ **Unplug all** power tools before changing bits and/or grinding disks.
- ❑ **Never leave** chuck keys in the tool during operation.
- ❑ **Do not use** a screwdriver as a chisel.
- ❑ **Before using sledges,** axes or hammers, be sure the handles are securely fastened with a wedge made of sound material.
- ❑ **Do not use a handle extension** or "cheater" on any wrench.
- ❑ **Files should be equipped** with handles and should not be used as a punch or pry.

Trenching and Excavation

- ❑ **All excavations and trenches 5 feet deep** or greater must be shored, sloped, or benched to protect workers from the hazards of moving earth. All trenching must be done in accordance with OSHA regulations.
- ❑ **Always locate underground utilities** before digging. Also contact regional notification centers in advance.
- ❑ **Do not work under loads** handled by lifting or digging equipment.
- ❑ **Ladders shall be provided** for access to trenches and excavations 4' deep or greater. Use them.
- ❑ **Keep all spoil piles** a minimum of 2 feet from the edge of the trench.
- ❑ **Barricade trenches** or use caution tape to warn others of their presence.
- ❑ **Inspect all trenches** and excavations daily, before work, to look for signs of shifting earth.

Cranes and Rigging

- ❑ ***No employee is permitted*** to ride on loads, hooks, or slings of any crane, hoist or derrick.
- ❑ ***Do not work or stand under*** any suspended load. Crane operators shall avoid swinging loads over people.
- ❑ ***Inspect all slings*** and chains prior to use. Do not use defective slings, chains, or rigging.

Welding and Cutting

- ❑ ***Make sure*** your welding equipment is installed properly and grounded and in good working condition.
- ❑ ***Always wear*** protective clothing suitable for the welding or cutting to be done.
- ❑ ***Always wear proper eye protection*** when welding, brazing, soldering or flame cutting. Once you remove your welding helmet, put on safety glasses.
- ❑ ***Keep your work area*** clean and free of hazards. Make sure that no flammable, volatile or explosive materials are in or near the work area.
- ❑ ***Handle all compressed gas cylinders*** with extreme care. Keep caps on when not in use. Make sure that all compressed gas cylinders are secured to the equipment carriage, wall or other structural supports. When compressed gas cylinders are empty close the valve, install the cap and return to correct bottle storage area.
- ❑ ***Store compressed gas cylinders*** in a safe place with good ventilation. Acetylene cylinders and oxygen cylinders should be kept at least 20 feet apart.
- ❑ ***Do not weld or cut*** in confined spaces without special precautions and your foreman's authorization.
- ❑ ***Do not weld on containers*** that have held combustibles or flammable materials.
- ❑ ***Use mechanical exhaust ventilation*** at the point of welding when welding lead, cadmium, chromium, manganese, brass, bronze, zinc or galvanized metals. These metals are highly toxic and their fumes should not be breathed.
- ❑ ***Make sure all electrical connections*** are tight and insulated. Do not use cables with frayed, cracked or bare spots in the insulation.
- ❑ ***When the electrode holder*** or cutting torch is not in use, hang it on the brackets provided. Never let it touch a compressed gas cylinder.
- ❑ ***Dispose of electrode*** and wire stubs in proper containers since stubs and rods on the floor are a safety hazard.
- ❑ ***Use weld curtains*** to shield others from the light rays produced by your welding.
- ❑ ***Make sure all compressed gas connections*** are tight and check for leaks. Do not use hoses with frayed or cracked spots.
- ❑ ***Keep your leads*** orderly and out of walkways. Suspend them whenever possible.
- ❑ ***DO NOT WELD*** if leads or machine are in or near water.
- ❑ ***Make sure*** a portable fire extinguisher is nearby.

- ❑ **Keep your work area clean** and free of hazards. When flame cutting, sparks can travel 30-40 feet. Do not allow flame cut sparks to hit hoses, regulators or cylinders.
- ❑ **Use oxygen and acetylene** or other fuel gases with the appropriate torches and tips only for the purpose intended.
- ❑ **Never use acetylene** at a pressure in excess of 15 pounds per square inch. Higher pressure can cause an explosion.
- ❑ **Never use oil, grease or any other** material on any apparatus or thread fitting in the oxyacetylene or oxyfuel gas system. Oil and grease in contact with oxygen will cause spontaneous combustion.
- ❑ **Always use the correct** sequence and technique for assembling and lighting the torch. Always use the correct sequence and technique for shutting off a torch.
- ❑ **Check valves must be used** on all compressed gas cylinders to prevent back flow of the gas.

Company Vehicles

- ❑ **Only authorized employees** are permitted to operate company vehicles. Do not let anyone else drive your company vehicle.
- ❑ **Company vehicles** are to be used for company business only. Personal, off duty and family use is prohibited.
- ❑ **Drive defensively** and obey all traffic and highway laws.
- ❑ **Always wear** your seat belt, whether the driver or a passenger.
- ❑ **Report all accidents** as soon as possible to your supervisor and obtain a police report.
- ❑ **Keys must be removed** from all unattended vehicles and the vehicles must be locked, unless parking inside the facility.
- ❑ **Do not jump** from the cab or bed of company vehicles. Always use the stairs or a ladder.
- ❑ **Inspect your vehicle** and report any defects or operating problems to your supervisor so that repairs can be made.
- ❑ **No smoking** while refueling.
- ❑ **If your driver's license** is revoked or expired, immediately notify your supervisor and do not drive.

Traffic Safety

- ❑ **All employees exposed** to traffic hazards are required to wear orange flagging garments (shirts, vests, jackets) at all times.
- ❑ **When possible**, construction vehicles are to be placed between the employees and traffic to prevent vehicles from entering the work area and hitting members of the crew.
- ❑ **All traffic controls** will be established in accordance with the Manual of Traffic Controls for Construction and Maintenance Work Zones.
- ❑ **Traffic controls** are to be properly maintained throughout the workday. Signs and cones must be kept upright, visible and in their proper position at all times.

CODE OF SAFE PRACTICES RECEIPT

Arena Fire Protection, Inc.

This is to certify that I have received a copy of THE COMPANY Code of Safe Practices.

I have read these instructions, understand them, and will comply with them while working for the company.

I understand that failure to abide by these rules may result in disciplinary action and possible termination of my employment with this COMPANY.

I also understand that I am to report any injury to my foreman or superintendent immediately and report all safety hazards.

I further understand that I have the following "Safety" rights:

- I am not required to work in any area I feel is not safe.
- I am entitled to information on any hazardous material or chemical I am exposed to while working.
- I am entitled to see a copy of THE COMPANY Safety and Health Manual.
- I will not be discriminated against for reporting safety concerns.

Employee Name Signature Date

Supervisor Name Signature Date

cc: Employee File

Section Notes:

Chapter 4 Machine & Equipment Safety

Allen Davidson is responsible for the implementation and enforcement of the following safety rules for machine guarding and equipment safety. Disciplinary procedures will be enforced.

If an employee notices equipment in need of repair or out of compliance he/she shall notify **Allen Davidson**.

Basics of Machine Safeguarding

Crushed hands and arms, severed fingers, blindness – the list of possible machinery-related injuries is as long as it is horrifying. There seem to be as many hazards created by moving machine parts as there are types of machines. Safeguards are essential for protecting workers from needless and preventable injuries.

A good rule to remember is: Any machine part, function, or process which may cause injury must be safeguarded. When the operation of a machine or accidental contact with it can injure the operator or others in the vicinity, the hazards must be either controlled or eliminated.



This information describes the various hazards of mechanical motion and describes some techniques for protecting workers from these hazards. General information includes where mechanical hazards occur, the hazards created by different kinds of motions and the requirements for effective safeguards, as well as a brief discussion of non-mechanical hazards.

Principles

The purpose of machine guarding is to protect against and prevent injury from:

- Point of operation
- Rotating parts
- Sparks
- In-running nip points
- Flying chips

Where Mechanical Hazards Occur

Dangerous moving parts in three basic areas require safeguarding:

① Point of Operation

That point where work is actually performed on material, such as:

- Cutting
- Boring
- Turning
- Bending
- Shaping
- Forming
- Shearing
- Drilling
- Grinding
- Punching

② Power Transmission Apparatus

All components of the mechanical system which transmit energy to the part of the machine performing the work:

- Flywheels
- Couplings
- Chains
- Sprockets
- Pulleys
- Cams
- Cranks
- Shafts
- Belts
- Spindles
- Gears
- Rods

③ Other Moving Parts

All parts of the machine which moves while the machine is working:

▣ Reciprocating

▣ Transverse

▣ Auxiliary parts

▣ Rotating

▣ Feed mechanisms

Hazardous Mechanical Motions

A wide variety of mechanical *motions* and actions may present hazards to the worker. These can include the movement of rotating members (*belts, sprockets, fan blades, etc.*), reciprocating arms (*shaker screens, tables, etc.*), moving belts (*transverse motion conveyors, transfer chains/belts, etc.*), meshing gears, cutting teeth, and any parts that impact or shear.

There are three basic categories of hazardous machine and equipment motions:

① Rotating

② Reciprocating

③ Transverse

Rotating motion can be dangerous; even smooth, slowly rotating shafts can grip clothing, and through mere skin contact force an arm or hand into a dangerous position. Injuries due to contact with rotating parts can be severe.

Collars, couplings, cams, clutches, flywheels, shaft ends, spindles, meshing gears, and horizontal or vertical shafting are some examples of common rotating mechanisms which may be hazardous. The danger increases when projections such as set screws, bolts, nocks, abrasions, and projecting keys or set screws are exposed on rotating parts.

In-running nip point hazards are caused by the rotating parts on machinery. There are three main types of in-running nips.

Parts can rotate in opposite directions while their axes are parallel to each other. These parts may be in contact (producing a nip point) or in close proximity. In the latter case the stock fed between the rolls produces the nip points. This danger is common on machines with intermeshing gears, rolling mills, and calendars.

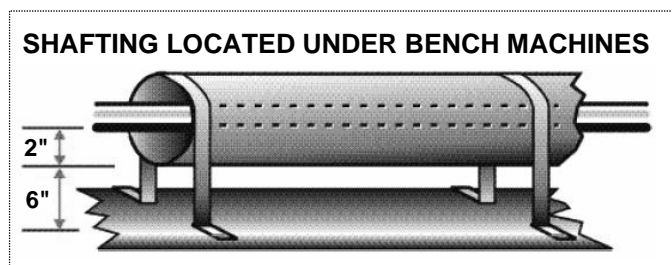
Nip points are also created between rotating and tangentially moving parts. Some examples would be: The point of contact between a power transmission belt and its pulley, a chain and a sprocket, and a rack and pinion.

Nip points can occur between rotating and fixed parts which create a shearing, crushing, or abrading action. Examples are: Spoked handwheels or flywheels, screw conveyors, or the periphery of an abrasive wheel and an incorrectly adjusted work rest.

Reciprocating motions may be hazardous because, during the back-and-forth or up-and-down motion, a worker may be struck by or caught between a moving and a stationary part.

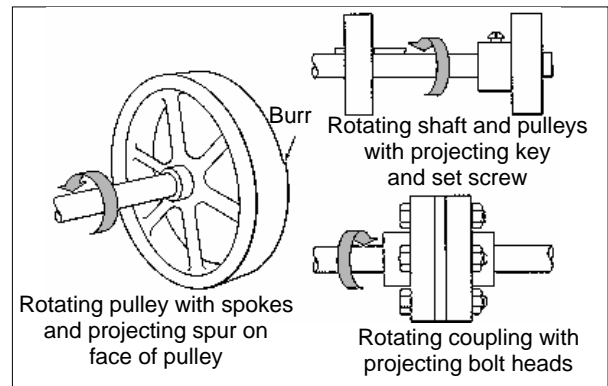
Transverse motion (movement in a straight, continuous line) creates a hazard because a worker may be struck or caught in a pinch or shear point by the moving part.

These different types of hazardous mechanical *motions* and actions are basic in varying combinations to nearly all machines, and recognizing them is the first step toward protecting workers from the danger they present.



① All "Rotating" motion including:

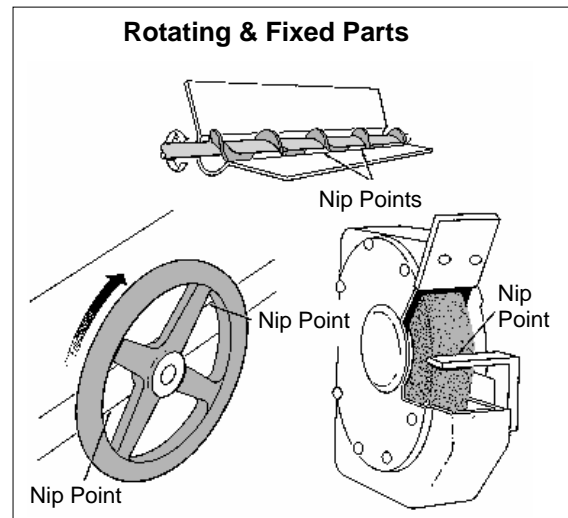
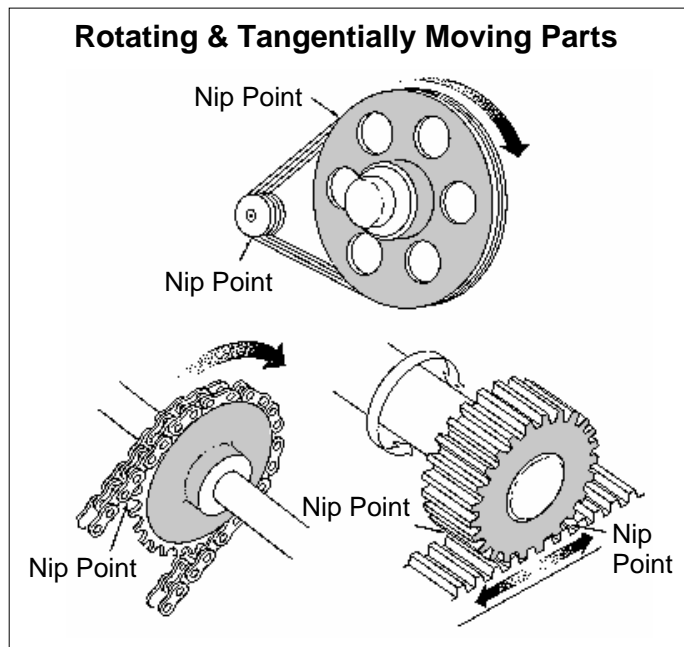
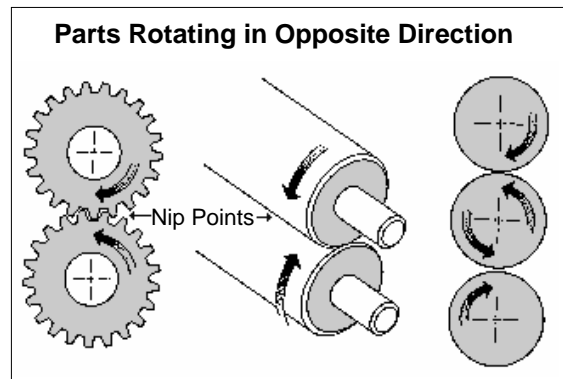
- ☐ Cams
- ☐ Sprockets
- ☐ Couplings
- ☐ Clutches
- ☐ Flywheels
- ☐ Shafts
- ☐ Pulleys
- ☐ Meshing Gears
- ☐ Fans



In-Running Nip Point Hazards

There are three main types of in-running nips:

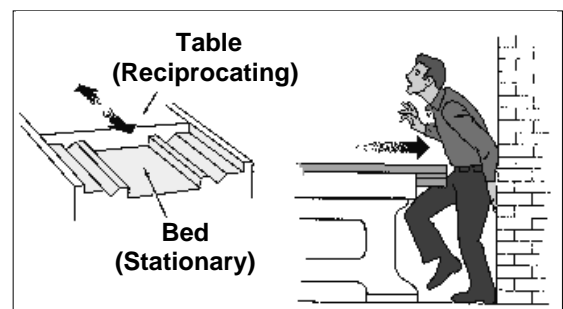
- ① Parts rotating in opposite direction
- ② Rotating and tangentially moving parts
- ③ Rotating and fixed parts



② **Reciprocating Motion**

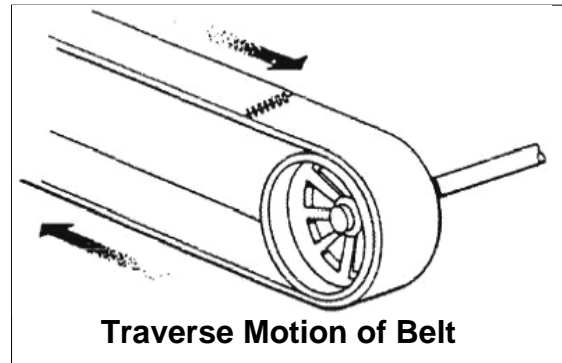
- ☐ Back & forth; Up & down
- ☐ May be struck by or caught between a moving and stationary part

Do you have reciprocating motion in your facility?
e.g. Scissor lifts, shaker screens, feed tables, slicers, feeding/ejection parts, etc.



③ **Transverse Motion**

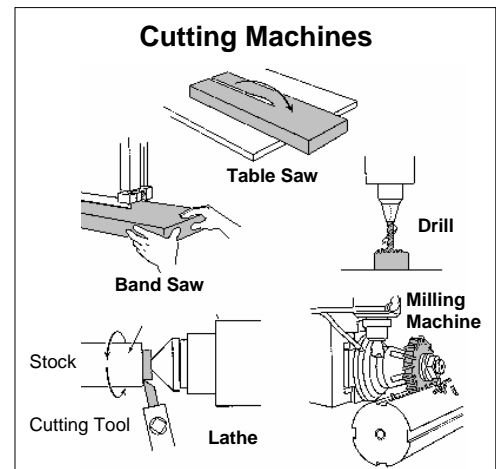
- ☐ Straight & continuous line
 - ★ Conveyor lines
 - ★ Lengthy belts
- ☐ May be struck or caught in a pinch or shear point by the moving part.



Hazardous Mechanical Actions

A wide variety of mechanical **actions** may present hazards to the worker. These can include:

- ☐ Stamping/Punching (impact) action
- ☐ Cutting teeth
- ☐ Shearing blades
- ☐ Meshing gears
- ☐ Movement of rotating members
- ☐ Reciprocating arms
- ☐ Moving belts
- ☐ Rollers and brakes



There are four basic categories of hazardous machine and equipment actions:

- ① **Cutting** ② **Shearing** ③ **Bending** ④ **Punching**

Cutting action may involve rotating, reciprocating, or transverse motion. The danger of cutting action exists at the point of operation where finger, arm, and body injuries can occur and where flying chips or scrap material can strike the head, particularly in the area of the eyes or face. Such hazards are present at the point of operation in cutting work, metal, or other materials.

Examples of mechanisms involving cutting hazards include band saws, circular saws, boring or drilling machines, turning machines (lathes), or milling machines.

A punching action results when power is applied to a slide (ram) for the purpose of blanking, drawing, or stamping metal and other materials. The danger of this type of action occurs at the point of operation where stock is inserted, held, and withdrawn by hand. Typical machines used for punching operations are power presses and iron workers.

Shearing action involves applying power to a slide or knife in order to trim or shear metal or other materials. A hazard occurs at the point of operation where stock is actually inserted, held, and withdrawn. Examples of machines used for shearing operations are mechanically, hydraulically, or pneumatically powered shears.

Bending action results when power is applied to a slide in order to draw or stamp metal or other materials. A hazard occurs at the point of operation where stock is inserted, held, and withdrawn. Equipment that uses bending action includes power presses, press brakes, and tubing benders.

These different types of hazardous mechanical *actions* are basic in varying combinations to nearly all machines, and recognizing them is the first step toward protecting workers from the danger they present.

Requirements for Safeguards

What must a safeguard do to protect workers against mechanical hazards?

Safeguards must meet these minimum general requirements:

Prevent contact: The safeguard must prevent hands, arms, and any other part of a worker's body from making contact with dangerous moving parts. A good safeguarding system eliminates the possibility of the operator or another worker placing parts of their bodies near hazardous moving parts.

Secure: Workers should not be able to easily remove or tamper with the safeguard, because a safeguard that can easily be made ineffective is no safeguard at all. Guards and safety devices should be made of durable material that will withstand the conditions of normal use. They must be firmly secured to the machine.

Protect from falling objects: The safeguard should ensure that no objects can fall into moving parts. A small tool which is dropped into a cycling machine could easily become a projectile that could strike and injure someone.

Create no new hazards: A safeguard defeats its own purpose if it creates a hazard of its own such as a shear point, a jagged edge, or an unfinished surface which can cause a laceration. The edges of guards, for instance, should be rolled or bolted in such a way that they eliminate sharp edges.

Create no interference: Any safeguard which impedes a worker from performing the job quickly and comfortably might soon be overridden or disregarded. Proper safeguarding can actually enhance efficiency since it can relieve the worker's apprehensions about injury.

Allow safe lubrication: If possible, one should be able to lubricate the machine without removing the safeguards. Locating oil reservoirs outside the guard, with a line leading to the lubrication point, will reduce the need for the operator or maintenance worker to enter the hazardous area.

Non-Mechanical Hazards

While this chapter concentrates attention on concepts and techniques for safeguarding mechanical motion, machines obviously present a variety of other hazards which cannot be ignored. Remember that things other than safeguarding moving parts can affect the safe operation of machines.

All power sources for machines are potential sources of danger. When using electrically powered or controlled machines, or instance, the equipment as well as the electrical system itself must be properly grounded. Replacing frayed, exposed, or old wiring will also help to protect the operator and others from electrical shocks or electrocution. High pressure systems also need careful inspection and maintenance to prevent possible failure from pulsation, vibration, or leaks. Such a failure could cause, among other things, explosions or flying objects.

Machines often produce noise (unwanted sound) which can result in a number of hazards to workers. Noise can startle and disrupt concentration, and can interfere with communications, thus hindering the worker's safe job performance. Research has linked noise to a whole range of harmful health effects, from hearing loss and aural pain to nausea, fatigue, reduced muscle control, and emotional disturbance.

Engineering controls such as the use of sound-dampening materials, and personal protective equipment, such as ear plugs and muffs, can help control the harmful effects of noise. Also, administrative controls that involve removing the worker from the noise source can be an effective measure when feasible.

Because some machines require the use of cutting fluids, coolant, and other potentially harmful substances, operators, maintenance workers, and others in the vicinity may need protection. These substances can cause ailments ranging from dermatitis to serious illnesses and disease. Specially constructed safeguards, ventilation, and protective equipment and clothing are possible temporary solutions to the problem of machinery-related chemical hazards until these hazards can be better controlled or eliminated from the workplace.

Training

Even the most elaborate safeguarding system cannot offer effective protection unless the worker knows how to use it and why. Specific and detailed training is therefore a crucial part of any effort to provide safeguarding against machine-related hazards. Thorough operator training should involve instruction or hands-on training in the following:

- ① A description and identification of the hazards associated with particular machines.
- ② The safeguards themselves, how they provide protection, and the hazards for which they are intended.
- ③ How to use the safeguards and why.
- ④ How and under what circumstances safeguards can be removed, and by whom (in most cases, repair or maintenance personnel only).
- ⑤ What to do (e.g., contact the supervisor) if a safeguard is damaged, missing, or unable to provide adequate protection.

This kind of safety training is necessary for new operators and maintenance or setup personnel, when any new or altered safeguards are put in service, or when workers are assigned to a new machine or operation.

Protective Clothing and Personal Protective Equipment

Engineering controls, which eliminate the hazard at the source and do not rely on the worker's behavior for their effectiveness, offer the best and most reliable means of machine safeguarding. Therefore, engineering controls must be the employer's first choice for eliminating machine hazards. But whenever engineering controls are not available or are not fully capable of protecting the employee (and extra measure of protection is necessary), operators must wear protective clothing or personal protective equipment.

If it is to provide adequate protection, the protective clothing and equipment selected must always be:

- ① Appropriate for the particular hazards.
- ② Maintained in good condition.
- ③ Properly stored when not in use, to prevent damage or loss.
- ④ Kept clean, fully functional, and sanitary.

Protective clothing is, of course, available for different parts of the body.

Hard hats can protect the head from the impact of bumps and falling objects when the worker is handling stock, caps and hair nets can help keep the worker's hair from being caught in machinery.

If machine coolants could splash, or particles could fly into the operator's eyes or face, then face shields, safety goggles, glasses, or similar kinds of protection might be necessary. Hearing protection may be needed when workers operate noisy machines. To guard the trunk of the body from cuts or impacts from heavy or rough-edged stock, there are certain protective coveralls, jackets, vests, aprons, and full-body suits. Workers can protect their hands and arms from the same kinds of injury with special sleeves and gloves. Safety shoes and boots, or other acceptable foot guards, can shield the feet against injury in case the worker needs to handle heavy stock which might drop.

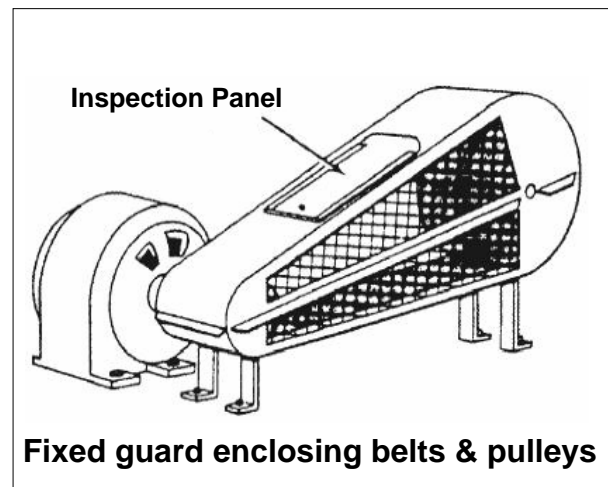
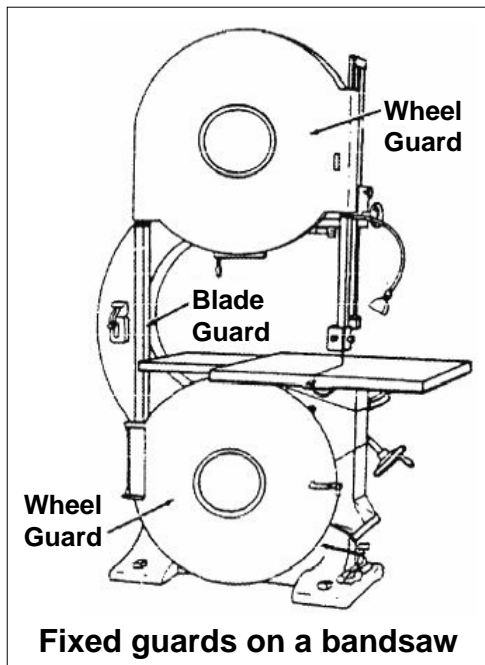
It is important to note that protective clothing and equipment can create hazards. A protective glove which can become caught between rotating parts, or a respirator face-piece which hinders the wearer's vision, for example, require alertness and continued attentiveness whenever they are used.

Other parts of the worker's clothing may present additional safety hazards. For example, loose-fitting shirts might possibly become entangled in rotating spindles or other kinds of moving machinery. Jewelry, such as bracelets and rings, can catch on machine parts or stock and lead to serious injury by pulling a hand into the danger area.

Methods of Machine Safeguarding

There are many ways to safeguard machines. The type of operation, the size or shape of stock, the method of handling, the physical layout of the work area, the type of material, and production requirements or limitations will help to determine the appropriate safeguarding method for the individual machine.

As a general rule, power transmission apparatus is best protected by fixed guards that enclose the danger areas. For hazards at the point of operation, where moving parts actually perform work on stock, several kinds of safeguarding may be possible. One must always choose the most effective and practical means available.



Machine safeguards can be grouped under five general classifications:

① Guards

- Fixed
- Interlocked
- Adjustable
- Self-adjusting

② Devices

- Presence Sensing
 - ★ Photoelectrical (optical)
 - ★ Radiofrequency (capacitance)
 - ★ Electromechanical
- Pullback
- Restraint
- Safety Controls
 - ★ Safety trip control
 - Pressure-sensitive body bar
 - Safety triprod
 - Safety tripwire cable
 - ★ Two-hand control
 - ★ Two-hand trip
- Gates
 - ★ Interlocked
 - ★ Other

③ Location/Distance

④ Potential Feeding and Ejection Methods to Improve Safety for the Operator

- Automatic feed
- Semi-automatic feed
- Automatic ejection
- Semi-automatic ejection
- Robot

⑤ Miscellaneous Aids

- Awareness barriers
- Miscellaneous protective shields
- Hand-feeding tools and holding fixtures

Guards

Guards are barriers which prevent access to danger areas. There are four general types of guards:

Fixed: As its name implies, a fixed guard is a permanent part of the machine. It is not dependent upon moving parts to perform its intended function. It may be constructed of sheet metal, screen, wire cloth, bars, plastic, or any other material that is substantial enough to withstand whatever impact it may receive and to endure prolonged use. This guard is usually preferable to all other types because of its relative simplicity and permanence.

| Types of Machine Guards | | | |
|--------------------------------|---|--|---|
| Method | Safeguarding Action | Advantages | Limitations |
| Fixed | Provides a barrier | Can be constructed to suit many specific applications. In-plant construction is often possible. Can provide maximum protection. Usually requires minimum maintenance. Can be suitable to high production, repetitive operations. | May interfere with visibility. Can be limited to specific operations. Machine adjustment and repair often require its removal, thereby necessitating other means of protection for maintenance personnel. |
| Interlocked | Shuts off or disengages power and prevents starting of machine when guard is open; should require the machine to be stopped before the worker can reach into the danger area. | Can provide maximum protection. Allows access to machine for removing jams without time consuming removal of fixed guards. | Requires careful adjustment and maintenance. May be easy to disengage jams. |
| Adjustable | Provides a barrier that may be adjusted to facilitate a variety of production operations. | Can be constructed to suit many specific applications. Can be adjusted to admit varying sizes of stock. | Hands may enter danger area – protection may not be complete at all times. May require frequent maintenance and/or adjustment. The guard may be made ineffective by the operator. May interfere with visibility. |
| Self-Adjusting | Provides a barrier that moves according to the size of the stock entering the danger area. | Off-the-shelf guards are often commercially available. | Does not always provide maximum protection. May interfere with visibility. May require frequent maintenance and adjustment. |

Interlocked: When this type of guard is opened or removed, the tripping mechanism and/or power automatically shuts off or disengages, and the machine cannot cycle or be started until the guard is back in place.

An interlocked guard may use electrical, mechanical, hydraulic, or pneumatic power or any combination of these. Interlocks should not prevent "inching" by remote control if required. Replacing the guard should not automatically restart the machine. To be effective, all movable guards should be interlocked to prevent occupational hazards.

Adjustable: Adjustable guards are useful because they allow flexibility in accommodating various sizes of stock.

Self-Adjusting: The openings of these barriers are determined by the movement of the stock. As the operator moves the stock into the danger area, the guard is pushed away, providing an opening which is only large enough to admit the stock. After the stock is removed, the guard returns to the rest position. This guard protects the operator by placing a barrier between the danger area and the operator. The guards may be constructed of plastic, metal, or other substantial material. Self-adjusting guards offer different degrees of protection.

Devices

A safety device may perform one of several functions. It may stop the machine if a hand or any part of the body is inadvertently placed in the danger area; restrain or withdraw the operator's hands from the danger area during operation; require the operator to use both hands on machine controls, thus keeping both hands and body out of danger; or provide a barrier which is synchronized with the operating cycle of the machine in order to prevent entry to the danger area during the hazardous part of the cycle.

Presence-Sensing

The photoelectric (optical) presence-sensing device uses a system of light sources and controls which can interrupt the machine's operating cycle. If the light field is broken, the machine stops and will not cycle. This device must be used only on machines which can be stopped before the worker can reach the danger area. The design and placement of the guard depends upon the time it takes to stop the mechanism and the speed at which the employee's hand can reach across the distance from the guard to the danger zone.

The radiofrequency (capacitance) presence-sensing device uses a radio beam that is part of the machine control circuit. When the capacitance field is broken, the machine will stop or will not activate. Like the photoelectric device, this device shall only be used on machines which can be stopped before the worker can reach the danger area. This requires the machine to have a friction clutch or other reliable means for stopping.

The electromechanical sensing device has a probe or contact bar which descends to a predetermined distance when the operator initiates the machine cycle. If there is an obstruction preventing it from descending its full predetermined distance, the control circuit does not actuate the machine cycle.

Pullback devices utilize a series of cables attached to the operator's hands, wrists, and/or arms. This type of device is primarily used on machines with stroking action. When the slide/ram is up between cycles, the operator is allowed access to the point of operation. When the slide/ram begins to cycle by starting its descent, a mechanical linkage automatically assures withdrawal of the hands from the point of operation.

Restraint

The restraint (holdout) device generally utilizes cables or straps that are attached to the operator's hands and a fixed point. The cables or straps must be adjusted to let the operator's hands travel within a predetermined safe area. There is no extending or retracting action involved. Consequently, hand-feeding tools are often necessary if the operation involves placing material into the danger area.

Safety Trip Controls

Safety trip controls provide a quick means for deactivating the machine in an emergency situation. A pressure-sensitive body bar, when depressed, will deactivate the machine. If the operator or anyone trips, loses balance, or is drawn toward the machine, applying pressure to the bar will stop the operation.

The positioning of the bar, therefore, is critical. It must stop the machine before a part of the employee's body reaches the danger area.

When pressed by hand, the safety deactivates the machine. Because the triprod has to be actuated by the operator during an emergency situation, its proper position is also critical.

Safety tripwire cables are located around the perimeter of or near the danger area. The operator must be able to reach the cable with either hand to stop the machine.

| Types of Devices | | | |
|--------------------------------------|---|--|---|
| Method | Safeguarding Action | Advantages | Limitations |
| Photoelectric | Machine will not start cycling when the light field is interrupted. When the light field is broken by any part of the operator's body during the cycling process, immediate machine braking is activated. | Can allow freer movement for operator. Simplicity of use. Used by multiple operators. Provide passerby protection. No adjustment required. | Does not protect against mechanical failure. Limited to machines that can be stopped. |
| Radiofrequency (optical) | Machine cycling will not start when the capacitance field is interrupted. When the capacitance field is disturbed by any part of the operator's body during the cycling process, immediate machine braking is activated. | Can allow freer movement for operator. | Does not protect against mechanical failure. Antennae sensitivity must be properly adjusted; this adjustment must be maintained properly. Limited to machines that can be stopped. |
| Electromechanical | Contact bar or probe travels a predetermined distance between the operator and the danger area. Interruption of this movement prevents the starting of machine cycle. | Can allow access at the point of operation. | Contact bar or probe must be properly adjusted for each application; this adjustment must be maintained properly. |
| Pullback Restraint (holdback) | As the machine begins to cycle, the operator's hands are pulled out of the danger area. Prevents the operator from reaching into the danger area. | Eliminates the need for auxiliary barriers or other interference at the danger area. Little risk of mechanical failure. | Limits movement of operator. May obstruct work space around operator. Adjustments must be made for specific operations and for each individual. Requires frequent inspections and regular maintenance. Requires close supervision of the operator's use of the equipment. |

Two-Hand Control

The two-hand control requires constant, concurrent pressure by the operator to activate the machine. This kind of control requires a part-revolution clutch, brake, and a brake monitor if used on a power press. With this type of device, the operator's hands are required to be at a safe location (on control buttons) and at a safe distance from the danger area while the machine completes its closing cycle.

Types of Devices

| Method | Safeguarding Action | Advantages | Limitations |
|---|--|---|---|
| Safety trip controls: Pressure-sensitive body bar Safety triprod Safety tripwire | Stops the machine when tripped. | Simplicity of use. | All controls must be manually activated. May be difficult to activate controls because of their location. Only protects the operator. May require special fixtures to hold work. May require a machine brake. |
| Two-hand Control | Concurrent use of both hands is required, preventing the operator from entering the danger area. | Operator's hands are at a pre-determined location. Operator's hands are free to pick up a new after first half of cycle is completed. | Requires a partial cycle machine with a brake. Some two-hand controls can be rendered unsafe by holding with arm or blocking, thereby permitting one-hand operation. Protects only the operator. |
| Two-hand Trip | Concurrent use of two hands on separate controls prevents hands from being in danger area when machine cycle starts. | Operator's hands are away from danger area. Can be adapted to multiple operations. No obstruction to hand feeding. Does not require adjustment for each operation. | Operator may try to reach into danger area after tripping machine. Some trips can be rendered unsafe by holding with arm or blocking, thereby permitting one-hand operation. Protects only the operator. May require special fixtures. |
| Gate | Provides a barrier between danger area and operator or other personnel | Can prevent reaching into or walking into the danger area. | May require frequent inspection and regular maintenance. May interfere with operator's ability to see the work. |

Two-Hand Trip

The two-hand trip requires concurrent application of both the operator's control buttons to activate the machine cycle, after which the hands are free. This device is usually used with machines equipped with full-revolution clutches. The trips must be placed far enough from the point of operation to make it impossible for the operator to move his or her hands from the trip buttons or handles into the point of operation before the first half of the cycle is completed. The distance from the trip button depends upon the speed of the cycle and the band speed constant.

Thus the operator's hands are kept far enough away to prevent them from being placed in the danger area prior to the slide/ram or blade reaching the full "down" position.

To be effective, both two-hand controls and trips must be located so that the operator cannot use two hands or one hand and another part of his/her body to trip the machine.

Gate

A gate is a moveable barrier that protects the operator at the point of operation before the machine cycle can be started. Gates are, in many instances, designed to be operated with each machine cycle.

To be effective, the gate must be interlocked so that the machine will not begin a cycle unless the gate guard is in place. It must be in the closed position before the machine can function.

Another potential application of this type of guard is where the gate is a component of a perimeter safeguarding system. Here the gate may provide protection not only to the operator but to pedestrian traffic as well.

Safeguarding by Location/Distance

The examples mentioned are a few of the numerous applications of the principle of safeguarding by location/distance. A thorough hazard analysis of each machine and particular situation is absolutely essential before attempting this safeguarding technique.

To consider a part of a machine to be safeguarded by location, the dangerous moving part of a machine must be so positioned that those areas are not accessible or do not present a hazard to a worker during the normal operation of the machine. This may be accomplished by locating a machine so that the hazardous parts of the machine are located away from operator work stations or other areas where employees walk or work. This can be accomplished by positioning a machine with its power transmission apparatus against a wall and leaving all routine operations conducted on the other side of the machine. Additionally, enclosure walls or fences can restrict access to machines. Another possible solution is to have dangerous parts located high enough to be out of the normal reach of any worker.

The feeding process can be safeguarded by location if a safe distance can be maintained to protect the worker's hands. The dimensions of the stock being worked on may provide adequate safety.

For instance, if the stock is several feet long and only one end of the stock is being worked on, the operator may be able to hold the opposite end while the work is being performed. An example would be a single-end punching machine. However, depending upon the machine, protection might still be required for other personnel.

The positioning of the operator's control station provides another potential approach to safeguarding by location. Operator controls may be located at a safe distance from the machine if there is not reason for the operator to tend it.

Feeding and Ejection Methods to Improve Operator Safety:

Many feeding and ejection methods do not require the operator to place his or her hands in the danger area. In some cases, not operator involvement is necessary after the machine is set up. In other situations, operators can manually feed the stock with the assistance of a feeding mechanism. Properly designed ejection methods do not require any operator involvement after the machine starts to function.

Some feeding and ejection methods may even create hazards themselves. For instance, a robot may eliminate the need for an operator to be near the machine but may create a new hazard itself by the movement of its arm.

Using these feeding and ejection methods does not eliminate the need for guards and devices. Guards and devices must be used wherever they are necessary and possible in order to provide protection from exposure to hazards.

Types of feeding and ejection methods:

Automatic feeds reduce the exposure of the operator during the work process, and sometimes do not require any effort by the operator after the machine is set up and running.

With semiautomatic feeding, as in the case of a power press, the operator uses a mechanism to place the piece being processed under the ram at each stroke. The operator does not need to reach into the danger area, and the danger area is completely enclosed.

| Types of Feeding and Ejection Methods | | | |
|--|--|--|--|
| Method | Safeguarding Action | Advantages | Limitations |
| Automatic Feed | Stock is fed from rolls, indexed by machine mechanism, etc. | Eliminates the need for operator involvement in the danger area. | Other guards are also required for operator protection – usually fixed barrier guards. Requires frequent maintenance. May not be adaptable to stock variation. |
| Semi-Automatic Feed | Stock is fed by chutes, movable dies, dial feed, plungers, or sliding bolster. | | |
| Automatic Ejection | Work pieces are ejected by air or mechanical means. | Operator does not have to enter danger area to remove finished work. | May create a hazard of blowing chips or debris. Size of stock limits the use of this method. Air ejection may present a noise hazard. |
| Semi-Automatic Ejection | Work pieces are ejected by mechanical means which are initiated by the operator. | | |
| Robots | They perform work usually done by operator. | Operator does not have to enter danger area. Are suitable for operations where high stress factors are present, such as heat and noise. | Can create hazards themselves. Require maximum maintenance. Are suitable only to specific operations. |

Miscellaneous Aids

While these aids do not give complete protection from machine hazards, they may provide the operator with an extra margin of safety. Sound judgment is needed in their application and usage. Following are several examples of possible applications.

An awareness barrier does not provide physical protection, but serves only to remind a person that he or she is approaching the danger area. Generally, awareness barriers are not considered adequate when continual exposure to the hazard exists.

Although the barrier does not physically prevent a person from entering the danger area, it calls attention to it. For an employee to enter the danger area, an overt act must take place, that is, the employee must either reach or step over, under or through the barrier.

Shields, another aid, may be used to provide protection from flying particles, splashing cutting oils, or coolants.

Special hand tools may be used to place or remove stock, particularly from or into the point of operation of a machine. A typical use would be for reaching into the danger area of a press or press brake.

Holding tools should not be used instead of other machine safeguards; they are merely a supplement to the protection that other guards provide.

A push stick or block may be used when feeding stock into a saw blade. When it becomes necessary for hands to be in close proximity to the blade, the push stick or block may provide a few inches of safety and prevent a severe injury.

Guard Construction

Today, many builders of single-purpose machines provide point-of-operation and power transmission safeguards as standard equipment. However, not all machines in use have built-in safeguards provided by the manufacturer.

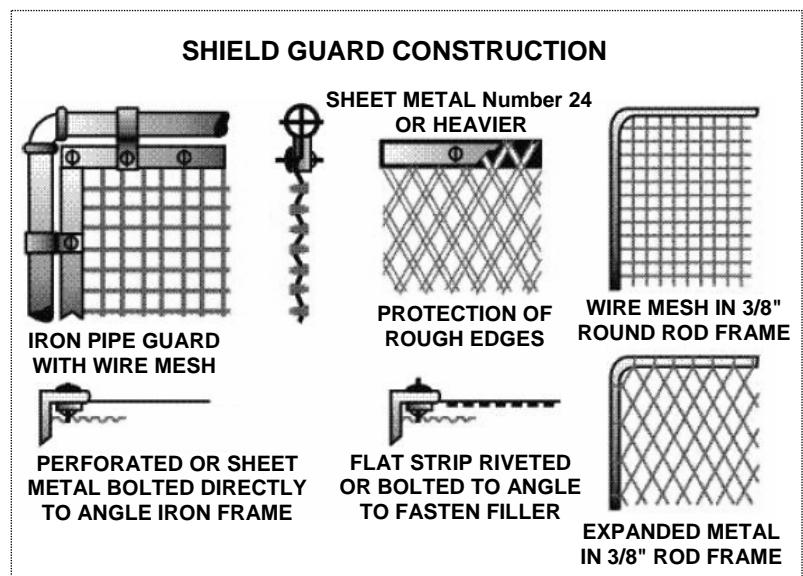
Guards designed and installed by the builder offer two main advantages:

- ① They usually conform to the design and function of the machine.
- ② They can be designed to strengthen the machine in some way or to serve some additional functional purposes.

User-built guards are sometimes necessary for a variety of reasons.

They have these advantages:

- ☐ Often, with older machinery, they are the only practical safeguarding solution.
- ☐ They may be the only choice for mechanical power transmission apparatus in older plants, where machinery is not powered by individual motor drives.
- ☐ They permit options for point-of-operation safeguards when skilled personnel design and make them.
- ☐ They can be designed and built to fit unique and even changing situations.
- ☐ They can be installed on individual dies and feeding mechanisms.
- ☐ Design and installation of machine safeguards by plant personnel can help to promote safety consciousness in the workplace.



However, they also have disadvantages:

- ☐ User-built guards may not conform well to the configuration and function of the machine.
- ☐ There is a risk that user-built guards may be poorly designed or built.

Point-of-Operation Guards

Point-of-operation safeguarding is complicated by the number and complexity of machines and also by the different uses for individual machines. For these reasons, not all machine builders provide point-of-operation guards on their products.

In many cases, a point-of-operation guard can only be made and installed by the user after a thorough hazard analysis of the work requirements. Poorly designed, built, or installed guards may create a hazard rather than eliminate one. To be effective, they must safeguard the employee while allowing the work to continue with minimum disruption to the production process.

Mechanical Power Transmission Apparatus Guarding

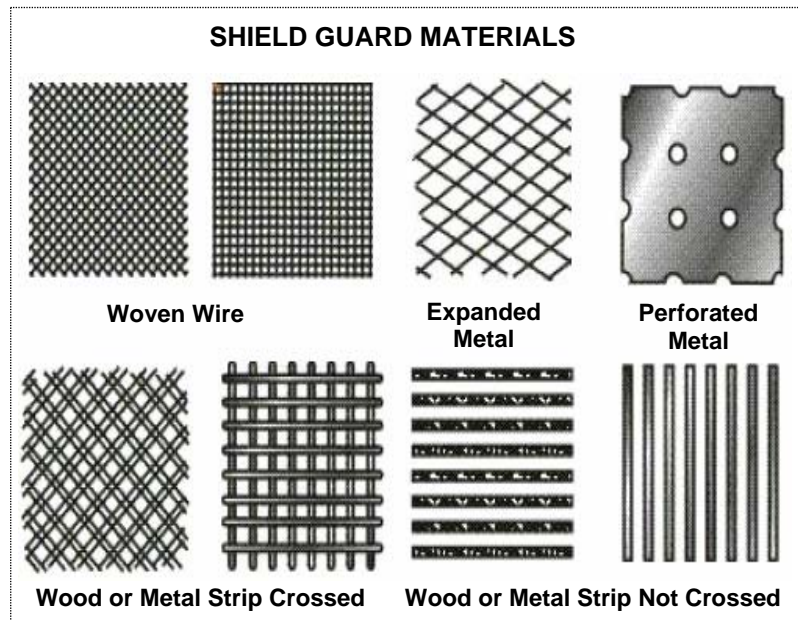
A significant difference between power transmission guards and point-of-operation guards is that the former type needs no opening for feeding stock. The only openings necessary for power transmission guards are those for lubrication, adjustment, repair, and inspection. These openings should be provided with interlocked covers that cannot be removed except by using tools for service or adjustment.

To be effective, power transmission guards should cover all moving parts in such a manner that no part of the operator's body can come in contact with them.

Guard Material

Under many circumstances, metal is the best material for guards. Guard framework is usually made from structural shapes, pipe, bar, or rod stock. Filler material generally is expanded or perforated or solid sheet metal or wire mesh. It may be feasible to use plastic or safety glass where visibility is required.

Guards made of wood generally are not recommended because of their flammability and lack of durability and strength. However, in areas where corrosive materials are present, wooden guards may be the better choice.



Machinery Maintenance and Repair

Good maintenance and repair procedures contribute significantly to the safety of the maintenance crew as well as that of machine operators. The variety and complexity of machines to be serviced, the hazards associated with their power sources, the special dangers that may be present during machine breakdown, and the severe time constraints often placed on maintenance personnel all make safe maintenance and repair work difficult.

Training and aptitude of people assigned to these jobs should make them alert for the intermittent electrical failure, the worn part, the inappropriate noise, the cracks or other signs that warn of impending breakage or that a safeguard has been damaged, altered, or removed. By observing machine operators at their tasks and listening to their comment, maintenance personnel may learn where potential trouble spots are and give them early attention before they develop into sources of accidents and injury. Sometimes, all that is needed to keep things running smoothly and safely is machine lubrication or adjustment.

Any damage observed or suspected should be reported to the supervisor; if the condition impairs safe operation, the machine should be taken out of service for repair. Safeguards that are missing, altered, or damaged also should be reported so appropriate action can be taken to insure against worker injury.

If possible, machine design should permit routine lubrication and adjustment without removal of safeguards. But when safeguards must be removed, and the machine serviced, the OSHA lockout procedure must be adhered to. The maintenance and repair crew must never fail to replace the guards before the job is considered finished and the machine released from lockout.

Is it necessary to oil machine parts while a machine is running? If so, special safeguarding equipment may be needed solely to protect the oiler from exposure to hazardous moving parts. Maintenance personnel must know which machines can be serviced while running and which cannot.

"If in doubt, lock it out." Obviously, the danger of accident or injury is reduced by shutting off and locking out all sources of energy.

In situations where the maintenance or repair worker would necessarily be exposed to electrical elements or hazardous moving machine parts in the performance of the job, there is no question that all power sources must be shut off and locked out before work begins. Warning signs or tags are inadequate insurance against the untimely energizing of mechanical equipment.

Thus, one of the first procedures for the maintenance person is to disconnect and lock out the machine from all of its power sources, whether the source is electrical, mechanical, pneumatic, hydraulic, or a combination of these. Energy accumulation devices must be "bled down."

Electrical: Unexpected energizing of any electrical equipment that can be started by automatic or manual remote control may cause electric shock or other serious injuries to the machine operator, the maintenance worker, or others operating adjacent machines controlled by the same circuit. For this reason, when maintenance personnel must repair electrically powered equipment, they should open the circuit at the switch box and padlock the switch (lock it out) in the "OFF" position. This switch should be tagged with a description of the work being done, the name of the maintenance person, and the department involved. When more than one worker is to be engaged in the servicing/maintenance function, a typical lockout hasp to which each may affix a personal lock must be used.



Mechanical: Safety blocks should be used as an additional safeguard on equipment such as a mechanical power press, even though the machine has been locked out. The safety blocks prevent the ram from coming down under its own weight.

Pneumatic and hydraulic: Valves used during repair or shutdown to keep a pneumatic-powered machine or its components from operating can be locked open or shut. Before the valve can be opened, everyone working on the machine must use his or her own key to release the lockout. A sliding-sleeve valve exhausts line pressure at the same time it cuts off the air supply. Valves used to lock out pneumatic or hydraulic-powered machines should be designed to accept locks or lockout adapters and should be capable of "bleeding off" pressure residues that could cause any part of the machine to move.

In shops where several maintenance persons might be working on the same machine, multiple lockout devices accommodating several padlocks are used. The machine cannot be reactivated until each person removes his or her lock. As a matter of general policy, lockout control is gained by the procedure of issuing personal padlocks to each maintenance or repair person; no one but that person can remove the padlock, thereby each worker controls the power systems.

Whenever machines or equipment are serviced, there are hazards encountered by the employees performing the servicing or maintenance which are unique to the repair or maintenance procedures being conducted. These hazards may exist due to the failure of the employees doing the servicing or maintenance to stop the machine being worked on. Even if the machine has been stopped, the machine can still be hazardous due to the possibility of the machine becoming re-energized or restarting.

In order to prevent these hazards, each machine or piece of equipment should be safeguarded during the conduct of servicing or maintenance by:

- ① Notifying all affected employees (usually machine or equipment operators or users) that the machine or equipment must be shut down to perform some maintenance or servicing.
- ② Stopping the machine.
- ③ Isolating the machine or piece of equipment from its energy source.
- ④ Locking out or tagging out the energy source.
- ⑤ Relieving any stored or residual energy.
- ⑥ Verifying that the machine or equipment is isolated from the energy source.

Although this is the general rule, there are exceptions when the servicing or maintenance is not hazardous for an employee, when the servicing which is conducted is minor in nature, done as an integral part of production, and the employer utilizes alternative safeguards which provide effective protection as is required by specific OSHA standards.

When the servicing or maintenance is completed, there are specific steps which must be taken to return the machine or piece of equipment to service. These steps include:

- ① Inspection of the machine or equipment to ensure that all guards and other safety devices are in place and functional.
- ② Checking the area to ensure that energization and start up of the machine or equipment will not endanger employees.
- ③ Removal of the lockout devices.
- ④ Re-energization of the machine or equipment.
- ⑤ Notification of affected employees that the machine or equipment may be returned to service.

The steps to lockout described here are only a part of the total energy control program which must exist in the workplace. In addition, the employee should have written procedures for all machines and equipment, employees must be trained in their duties and responsibilities under the energy control program, and periodic inspections must be conducted to maintain the effectiveness of the program.

The maintenance and repair facility in the company deserves consideration here. Are all the right tools on hand and in good repair? Are lubricating oils and other common supplies readily available and safely stored?

Are commonly used machine parts and hardware kept in stock so that the crews are not encouraged (even obliged) to improvise, at the risk of doing an unsafe repair, or to postpone a repair job? And do not overlook the possibility that maintenance equipment itself may need guarding of some sort. The same precaution applies to tools and machines used in the repair shop. Certainly, the maintenance and repair crew are entitled to the same protection that their service provides to the machine operators in the company.

The Utilization of Industry Consensus Standards

OSHA uses industry consensus standards, related to the safe operation of equipment, as guidance of the industry accepted practice for safe operations. Industry consensus standards which describe equipment configuration or design, but which do not describe safe and/or healthful use and operation of the equipment are of limited assistance with regard to OSHA standards.

In any event, even when an industry consensus standard addresses safety/health considerations, OSHA may determine that the safety/health practices described by that industry consensus standard are deficient when related to the requirement(s) set forth by the pertinent OSHA regulation(s). However, many of the various ANSI safety standards devoted to the safe use of equipment and machines are pertinent and provide valuable guidance as they relate to the multitude of safe operating procedures regularly discussed in ANSI safety standards.

All of the requirements of 29 CFR 1910.212 (or your state equivalents) are applicable to machines found in industry. Paragraph (a) (1) requires that employees be protected from the hazards created by the point of operation, ingoing nip points, and rotating parts. Paragraph (a) (2) describes the manner in which guards shall be affixed. The proper applications of devices are not described; therefore, other similar OSHA or pertinent industry standards must be referred to for guidance. Paragraph (a) (3) describes, with particularity, the requirements for safeguarding the point of operation.

The OSHA standard specifically requires that at the point of operation, "the guarding device shall be in conformity with any appropriate standards therefore, or in the absence of applicable specific standards, shall be so designed and constructed as to prevent the operator from having any part of his body in the danger zone during the operating cycle." Applicable standards include any similar OSHA standard or any OSHA adopted industry consensus standard(s) which provide for the safety of the operator during the operating cycle. However, any specific industry consensus standard, such as an ANSI standard for the particular machine or equipment, should be used for guidance relative to the accepted procedures for safeguarding workers and operators from the recognized hazards of the equipment.

Ergonomic Considerations of Machine Safeguarding

The ergonomic considerations of machine safeguarding are as significant to the safety and health of the worker as are the multitude of techniques to accomplish safety and health in the workplace. Worker stress and fatigue can be averted by creditable work setups and well integrated safeguarding. The various industry consensus standards are only now beginning to address this issue. Future evaluations of safeguarding are likely to devote more attention to this aspect.

Cooperation and Assistance

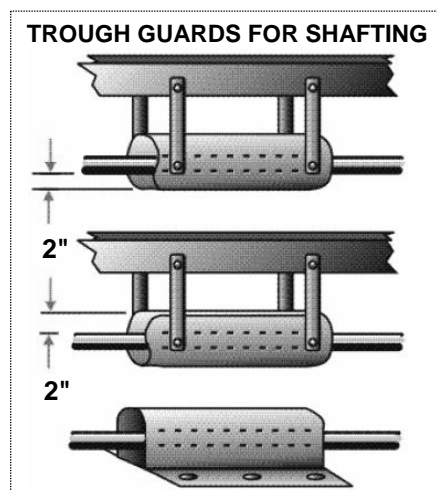
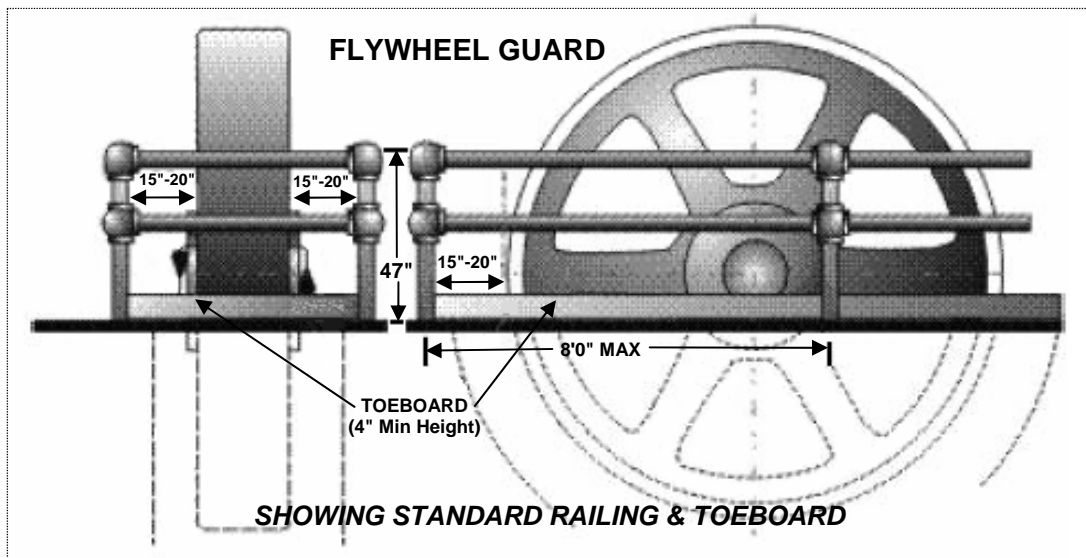
Safety in the workplace demands cooperation and alertness on everyone's part. Supervisors, operators and other workers who notice hazards in need of safeguarding, or existing systems that need repair or improvement, should notify the proper authority immediately.

Supervisors have these additional, special responsibilities with regard to safety in the workplace; explaining to the worker all the potential hazards associated with the machines and processes in the work area; and being responsive to employer requests for action or information regarding machine hazards.

The first-line supervisor plays a pivotal role in communicating the safety needs of the worker to management and the employer's safety rules and policies to the worker.

Sometimes, the solution to a machine safeguarding problem may require expertise that is not available in a given establishment. Employers are encouraged to find out where help is available and, when necessary, to request it.

The machine's manufacturer is often a good place to start when looking for assistance with a safeguarding problem. Manufacturers can often supply the necessary literature or advice, insurance carriers, too, will often make their safety specialists available to the establishments whose assets they insure. Union safety specialists can also lend significant assistance.



Machine Guarding Checklist

Answers to the following questions will help determine the safeguarding needs of the workplace by drawing attention to hazardous conditions or practices requiring correction.

Requirements for All Safeguards

Yes No

- 1. Do the safeguards provided meet the minimum OSHA requirements?
- 2. Do the safeguards prevent workers' hands, arms, and other body parts from making contact with dangerous moving parts?
- 3. Are the safeguards firmly secured and not easily removable?
- 4. Do the safeguards ensure that no objects will fall into the moving parts?
- 5. Do the safeguards permit safe, comfortable, and relatively easy operation of the machine?
- 6. Can the machine be oiled without removing the safeguard?
- 7. Is there a system for shutting down the machinery before safeguards are removed?
- 8. Can the existing safeguards be improved?

Mechanical Hazards

The point of operation:

- 1. Is there a point-of-operation safeguard provided for the machine?
- 2. Does it keep the operator's hands, fingers, and body out of the danger area?
- 3. Is there evidence that the safeguards have been tampered with or removed?
- 4. Could you suggest a more practical, effective safeguard?
- 5. Could changes be made on the machine to eliminate the point-of-hazard entirely?

Power transmission apparatus:

- 1. Are there any unguarded gears, sprockets, pulleys, or flywheels on the apparatus?
- 2. Are there any exposed belts or chain drives?
- 3. Are there any exposed set screws, key ways, collars, etc.?
- 4. Are starting and stopping controls within easy reach of the operator?
- 5. If there is more than one operator, are separate controls provided?

Other moving parts:

- 1. Are safeguards provided for all hazardous moving parts of the machine, including auxiliary parts?

Nonmechanical Hazards

- 1. Have appropriate measures been taken to safeguard workers against noise hazards?
- 2. Have special guards, enclosures, or personal protective equipment been provided, where necessary, to protect workers from exposure to harmful substances used in machine operation?

Electrical Hazards

Yes No

- 1. Is the machine installed in accordance with National Fire Protection Association and National Electrical Code requirements?
- 2. Are there loose conduit fittings?
- 3. Is the machine properly grounded?
- 4. Is the power supply correctly fused and protected?
- 5. Do workers occasionally receive minor shocks while operating any of the machines?

Training

- 1. Do operators and maintenance workers have the necessary training in how to use the safeguards and why?
- 2. Have operators and maintenance workers been trained in where the safeguards are located, how they provide protection, and what hazards they protect against?
- 3. Have operators and maintenance workers been trained in how and under what circumstances guards can be removed?
- 4. Have workers been trained in the procedures to follow if they notice guards that are damaged, missing, or inadequate?

Protective Equipment and Proper Clothing

- 1. Is protective equipment required?
- 2. If protective equipment is required, is it appropriate for the job, in good condition, kept clean and sanitary, and stored carefully when not in use?
- 3. Is the operator dressed safely for the job (i.e., no loose-fitting clothing or jewelry)?

Machinery Maintenance and Repair

- 1. Have maintenance workers received up-to-date instruction on the machines they service?
- 2. Do maintenance workers lock out the machine from its power sources before beginning repairs?
- 3. Where several maintenance persons work on the same machine, are multiple lockout devices used?
- 4. Do maintenance persons use appropriate and safe equipment in their repair work?
- 5. Is the maintenance equipment itself properly guarded?
- 6. Are maintenance and servicing workers trained in the requirements of 29 CFR 1910.147 (or your state equivalent), lockout/tagout hazard, and do the procedures for lockout/tagout exist before they attempt their tasks?

Evaluator's Name

Signature

Date

Chapter 5 Accident Investigation Plan

Arena Fire Protection, Inc. is committed to investigating all accidents/incidents. These investigations demonstrate the company's commitment to providing a safe and healthful work environment.

Introduction

Accidents occur when hazards escape detection during preventive measures, such as a job or process safety analysis, when hazards are not obvious, or as the result of combinations of circumstances that were difficult to foresee. A thorough accident investigation may identify previously overlooked physical, environmental, or process hazards, the need for new or more extensive safety training, or unsafe work practices. The primary focus of any accident investigation should be the determination of the facts surrounding the incident and the lessons that can be learned to prevent future similar occurrences. The focus of the investigation should NEVER be to place blame. The process should be positive and thought of as an opportunity for improvement.



Most accidents in the workplace result from unsafe work behaviors. According to the latest research, they represent the direct cause of about 95% of all workplace accidents. Hazardous conditions represent the direct cause for only about 3% of workplace accidents. "Acts of God" account for the remaining 2%. All these statistics imply that management system weaknesses account for fully 98% of all workplace accidents. Effective accident investigation identifies these root causes and recommends strategies to eliminate management system weaknesses.

When Do You Conduct an Investigation?

As a general rule, investigations should be conducted for:

- ☐ All injuries (even the very minor ones)
- ☐ All accidents with potential for injury
- ☐ Property and/or product damage situations
- ☐ All "Near Misses" where there was potential for serious injury

Near miss and incident reporting and investigation allow you to identify and control hazards before they cause a more serious incident. Accident/incident investigations are a tool for uncovering hazards that either were missed earlier or hazards where controls were defeated. However, it is important to remember that the investigation is only useful when its objective is to identify root causes. In other words, every contributing factor to the incident must be uncovered and recommendations made to prevent recurrence.

Have a Plan!

When a serious accident occurs in the workplace, everyone will be too busy dealing with the emergency at hand to worry about putting together an investigation plan, so the best time to develop effective accident investigation procedures is before the accident occurs.

The plan should include procedures that determine:

- ☐ Who should be notified of accident?
- ☐ Who is authorized to notify outside agencies? (fire, police, etc.)
- ☐ Who is assigned to conduct investigations?
- ☐ Training required for accident investigators:
- ☐ Who receives and acts on investigation reports?
- ☐ Timetables for conducting hazard correction.

Secure the Accident Scene

For a serious accident, the first action the accident team needs to take is to secure the accident scene so material evidence is not moved or removed. Material evidence has a tendency to walk off after an accident. If the accident is quite serious, OSHA may inspect and require that all material evidence be marked and remain at the scene of the accident.

Gather Information

The next step is to gather useful information about what directly and indirectly contributed to the accident. The following tools should be used to gather as much information as possible:

- ☐ Interview eye witnesses as soon as possible after the accident. Interview witnesses separately, never as a group.
- ☐ Interview other interested persons such as supervisors, co-workers, etc.
- ☐ Review related records such as:
 - ★ Training records
 - ★ Disciplinary records
 - ★ Medical records (as allowed)
 - ★ Maintenance records
 - ★ OSHA 300 Log (past similar injuries)
 - ★ Safety Committee records
- ☐ Document the scene with photographs, videotape, or sketches AND appropriate measurements.

Develop a Sequence of Events

Use the information gathered to develop a detailed step by step description of the accident. Make sure the accident is documented in enough detail to enable an individual unfamiliar with the situation to envision the sequence of events. Do not just describe the accident itself; include a description of events that led up to the accident.

Analyze the Accident

The next step is to determine the cause(s) of the accident. This is the most difficult step because first the events must be analyzed to discover surface cause(s) for the accident, and then, by asking "why" a number of times, the related root causes are uncovered. Remember, surface causes are usually pretty obvious and not too difficult to determine. However, it may take a great deal more time to accurately determine the weaknesses in the management system, or root causes, that contributed to the conditions and practices associated with the accident.

More on surface causes:

The surface causes of accidents are those hazardous conditions and individual unsafe employee/manager behaviors that have directly caused or contributed in some way to the accident.

Hazardous conditions may exist in any of the following categories:

- | | | | |
|-------------|-------------|----------------|------------|
| ★ Materials | ★ Tools | ★ Environment | ★ People |
| ★ Machinery | ★ Chemicals | ★ Workstations | ★ Workload |
| ★ Equipment | | ★ Facilities | |

It is important to know that most hazardous conditions in the workplace are the result of unsafe behaviors that produced them. Individual unsafe behaviors may occur at any level of the organization.

Some example of unsafe employee/manager behaviors include:

- | | |
|--------------------------------|-----------------------------|
| ★ Failing to comply with rules | ★ Allowing unsafe behaviors |
| ★ Using unsafe methods | ★ Failing to train |
| ★ Taking shortcuts | ★ Failing to supervise |
| ★ Horseplay | ★ Failing to correct |
| ★ Failing to report injuries | ★ Scheduling too much work |
| ★ Failing to report hazards | ★ Ignoring worker stress |

More on root causes:

The root causes for accidents are the underlying system weaknesses that have somehow contributed to the existence of hazardous conditions and unsafe behaviors that represent surfaces causes of accidents. Root causes always pre-exist surface causes. Inadequately designed system components have the potential to feed and nurture hazardous conditions and unsafe behaviors. If root causes are left unchecked, surface causes will flourish!

Root causes may be separated into two categories:

- ☐ **System design weaknesses** — Missing or inadequately designed policies, programs, plans, processes, and procedures will affect conditions and practices generally throughout the workplace. Defects in system design represent hazardous system conditions.
- ☐ **System implementation weaknesses** — Failures to initiate, carry out, or accomplish safety policies, programs, plans, processes, and procedures. Defects in implementation represent ineffective management behavior.

System Design Weaknesses

- ★ Missing or inadequate safety policies/rules
- ★ Training program not in place
- ★ Poorly written plans
- ★ Inadequate process
- ★ No procedures in place

System Implementation Weaknesses

- ★ Safety policies/rules are not being enforced
- ★ Safety training is not being conducted
- ★ Adequate supervision is not conducted
- ★ Incident/Accident analysis is inconsistent
- ★ Lockout/Tagout procedures are not reviewed annually

Develop Preventive Actions

This is the most important piece of any investigation. All of the work done to this point culminates with recommendations to prevent similar accidents from happening in the future. Recommendations should relate directly to the surface and root causes of the accident. These recommendations should include recommended actions such as:

- ▣ Engineering controls (for example, local exhaust ventilation or use of a lift assisting device)
- ▣ Work practice controls (for example, pre-plan work, and remove jewelry and loose fitting clothing before operating machinery)
- ▣ Administrative controls (e.g., standard operating procedures or worker rotation)
- ▣ Personal protective equipment (for example, safety glasses or respirators)

It is crucial that, after making recommendations to eliminate or reduce the surface causes, that the same procedure is used to recommend actions to correct the root causes. If root causes are not corrected, it is only a matter of time before a similar accident occurs.

Summary

A successful accident investigation determines not only what happened, but also finds how and why the accident occurred. Investigations are crucial as an effort to prevent a similar or perhaps more disastrous sequence of events. Research has shown that a typical accident is the result of many related and unrelated factors that somehow all come together at the same time. It is estimated that there are usually more than ten factors that contribute to a serious accident. Although, this combination of factors normally makes an investigation very time consuming and resource intensive, the good news is that the accident can normally be prevented by removing only a few of the contributing factors.

Attached is a typical accident/incident investigation form to assist you in determining surface and root causes as well as track progress on preventative actions. Should you have additional questions on this subject, please feel free to call us.

ACCIDENT / INCIDENT REPORT

Company:

| | | | | |
|------------------|------|---|---|------------|
| Date of Accident | Time | Day of Week <input type="checkbox"/> S <input type="checkbox"/> M <input type="checkbox"/> T <input type="checkbox"/> W <input type="checkbox"/> T <input type="checkbox"/> F <input type="checkbox"/> S | Shift <input type="checkbox"/> 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 | Department |
|------------------|------|---|---|------------|

INJURED PERSON

| | | | | |
|---|--|--|--|---------------------|
| Name: | | Address: | | |
| Age: | Phone: | | | |
| Job Title: | | Supervisor Name: | | |
| Length of Employment at Company: | | Length of Employment at Job: | | |
| Employee Classification: <input type="checkbox"/> Full Time <input type="checkbox"/> Part Time <input type="checkbox"/> Contract <input type="checkbox"/> Temporary | | | | |
| Nature of Injury | <input type="checkbox"/> Bruising | <input type="checkbox"/> Dislocation | <input type="checkbox"/> Other (specify) | Injured Body Part : |
| <input type="checkbox"/> Strain/Sprain | <input type="checkbox"/> Scratch/Abrasion | <input type="checkbox"/> Internal | | |
| <input type="checkbox"/> Fracture | <input type="checkbox"/> Amputation | <input type="checkbox"/> Foreign Body | Remarks: | |
| <input type="checkbox"/> Laceration/Cut | <input type="checkbox"/> Burn/Scald | <input type="checkbox"/> Chemical Reaction | | |
| Treatment | Name and Address of Treating Physician or Facility: | | | |
| <input type="checkbox"/> First Aid | | | | |
| <input type="checkbox"/> Emergency Room | | | | |
| <input type="checkbox"/> Dr.'s Office | | | | |
| <input type="checkbox"/> Hospitalization | | | | |

DAMAGED PROPERTY

| Property, Equipment, or Material Damaged | Describe Damage |
|---|-----------------|
| | |
| | |
| Object or Substance Inflicting Damage: | |
| | |
| | |

INCIDENT DESCRIPTION

Describe what happened (attach photographs or diagrams if necessary)

ROOT CAUSE ANALYSIS (Check All that Apply)

| Unsafe Acts | Unsafe Conditions | Management Deficiencies |
|--|---|--|
| <input type="checkbox"/> Improper work technique | <input type="checkbox"/> Poor workstation design/layout | <input type="checkbox"/> Lack of written policies & procedures |
| <input type="checkbox"/> Safety rule violation | <input type="checkbox"/> Congested work area | <input type="checkbox"/> Safety rules not enforced |
| <input type="checkbox"/> Improper PPE or PPE not used | <input type="checkbox"/> Hazardous substances | <input type="checkbox"/> Hazards not identified |
| <input type="checkbox"/> Operating without authority | <input type="checkbox"/> Fire or explosion hazard | <input type="checkbox"/> PPE unavailable |
| <input type="checkbox"/> Failure to warn or secure | <input type="checkbox"/> Inadequate ventilation | <input type="checkbox"/> Insufficient worker training |
| <input type="checkbox"/> Operating at improper speeds | <input type="checkbox"/> Improper material storage | <input type="checkbox"/> Insufficient supervisor training |
| <input type="checkbox"/> By-passing safety devices | <input type="checkbox"/> Improper tool or equipment | <input type="checkbox"/> Improper maintenance |
| <input type="checkbox"/> Guards not used | <input type="checkbox"/> Insufficient knowledge of job | <input type="checkbox"/> Inadequate supervision |
| <input type="checkbox"/> Improper loading or placement | <input type="checkbox"/> Slippery conditions | <input type="checkbox"/> Inadequate job planning |
| <input type="checkbox"/> Improper lifting | <input type="checkbox"/> Poor housekeeping | <input type="checkbox"/> Inadequate hiring practices |
| <input type="checkbox"/> Servicing machinery in motion | <input type="checkbox"/> Excessive noise | <input type="checkbox"/> Inadequate workplace inspection |
| <input type="checkbox"/> Horseplay | <input type="checkbox"/> Inadequate hazards guarding | <input type="checkbox"/> Inadequate equipment |
| <input type="checkbox"/> Drug or alcohol use | <input type="checkbox"/> Defective tools/equipment | <input type="checkbox"/> Unsafe design or construction |
| <input type="checkbox"/> Unnecessary haste | <input type="checkbox"/> Insufficient lighting | <input type="checkbox"/> Unrealistic scheduling |
| <input type="checkbox"/> Unsafe act of others | <input type="checkbox"/> Inadequate fall protection | <input type="checkbox"/> Poor process design |
| <input type="checkbox"/> Other: | <input type="checkbox"/> Other: | <input type="checkbox"/> Other: |

All About OSHA

Recordkeeping Requirements & Inspection Procedures



CONTENTS



| | |
|--|-----------|
| <i>Introduction — Who is OSHA?</i> | <i>2</i> |
| <i>The “OSH Act” — OSHA Coverage</i> | <i>4</i> |
| <i>Rights & Responsibilities under the “OSH Act”</i> | <i>5</i> |
| <i>Legal Protections</i> | <i>8</i> |
| <i>Public-Sector Employees</i> | <i>10</i> |
| <i>Advisory Groups</i> | <i>10</i> |
| <i>State Plans & Programs</i> | <i>11</i> |
| <i>Standards & Guidance</i> | <i>12</i> |
| <i>The Standards-Setting Process</i> | <i>12</i> |
| <i>Variances</i> | <i>14</i> |
| <i>Reporting & Recordkeeping Requirements</i> | <i>15</i> |
| <i>OSHA Enforcement</i> | <i>19</i> |
| <i>The Inspection Process — Off-Site Investigations</i> | <i>20</i> |
| <i>The Inspection Process — On-Site Investigations</i> | <i>21</i> |
| <i>Violations and Penalties</i> | <i>24</i> |
| <i>Contesting Inspection Results</i> | <i>25</i> |
| <i>OSHA Recordkeeping Forms</i> | <i>27</i> |

INTRODUCTON — Who is OSHA?

More than three decades ago, the Occupational Safety and Health Act of 1970 created the Occupational Safety and Health Administration to help employers and employees reduce injuries, illnesses, and deaths on the job in America. Since then, workplace fatalities have been cut by 62 percent and occupational injury and illness rates have declined 40 percent. At the same time, U.S. employment has doubled and now includes nearly 115 million workers at 7 million sites. OSHA provides national leadership in occupational safety and health. The agency seeks to find and share the most effective ways to get results—to save lives and prevent injuries and illnesses. The message is simple—Safety and health add value: To your business. To your workplace. To your life.

For business, protecting workers' safety and health is the right thing to do. It saves money and adds value to the organization. When workers stay whole and healthy, businesses experience lower Workers' Compensation insurance costs, reduced medical expenditures, decreased payout for return-to-work programs, fewer faulty products, and lower costs for job accommodations for injured workers. There are also indirect benefits such as increased productivity, lower costs for training replacement workers, and decreased costs for overtime.

Every workplace is a community. Safety and health add value to workplaces by increasing morale, improving productivity, and reducing turnover. The best companies build a reputation that is synonymous not only with an excellent product, but also an outstanding work environment where safety and health is a core value.

Every employee benefits when safety and health is a priority at the workplace. Every worker wants to make a contribution through his or her job, yet the primary purpose of work is to make a living. Safety and health add value to the lives of workers by enabling them to maintain their incomes and provide for their families. Getting hurt or sick is not just physically painful. On-the-job injuries and illnesses can significantly reduce income, increase stress, and hinder a full family life.

Establishing a safe and healthful working environment requires every employer and every worker to make safety and health a top priority. The entire workforce – from the CEO to recent hires – must recognize the value of safety and health and acknowledge that this is central to the mission and key to the corporate vision and identity.

OSHA provides leadership and encouragement to employers and workers to help them recognize and realize the value of safety and health on the job. The agency's ultimate goal will always be to reduce injuries, illnesses, and deaths to zero.

OSHA's Establishment — Purpose & History

OSHA stands for the Occupational Safety and Health Administration, an agency of the U.S. Department of Labor. The U.S. Congress, led by U.S. Senator Harrison A. Williams Jr. and U.S. Representative William A. Steiger, passed the Occupational Safety and Health Act of 1970 (the OSH Act)¹ "...to assure so far as possible every working man and woman in the nation safe and healthful working conditions and to preserve our human resources."

The legislation, signed into law by President Richard M. Nixon on Dec. 29, 1970, established OSHA and its sole responsibility to provide worker safety and health protection.

¹ Public Law 91-596, Dec. 29, 1970; as amended by P.L. 101-552, Nov. 5, 1990; as amended by P.L. 105-198, July 16, 1998; as amended by P.L. 105-241, Sept. 29, 1998.

Who OSHA Affects

Nearly everyone in America works or has someone in the immediate family who does. Whether you are an employer, employee, or have a family member who works, you need to know about OSHA. The more you know about OSHA, the better you can protect yourself, your coworkers, or your employees and contribute to safe and healthful working conditions for all Americans.

Why OSHA is Necessary

Until 1970, no uniform or comprehensive provisions existed to protect against workplace safety and health hazards. At that time:

- ❑ Job-related accidents accounted for more than 14,000 worker deaths,
- ❑ Nearly 2.5 million workers were disabled by workplace accidents and injuries,
- ❑ Ten times as many workdays were lost from job-related disabilities as from labor strikes
- ❑ The estimated new cases of occupational diseases totaled 300,000.

In terms of lost productivity and wages, medical expenses, and disability compensation, the burden on the nation's commerce was staggering. The human cost was beyond calculation. Today, OSHA helps to safeguard the right to a safe and healthful work environment for nearly 115 million workers—America's most valuable national resource.

OSHA's Impact

Since OSHA's creation in 1970, the nation has made substantial progress in occupational safety and health. OSHA and its many partners in the public and private sectors have:

- ❑ Cut the work-related fatality rate by 62 percent.
- ❑ Reduced overall injury and illness rates by 42 percent.
- ❑ Virtually eliminated brown lung disease in the textile industry.
- ❑ Reduced trenching and excavation fatalities by 35 percent.

OSHA's Role

Despite these important successes, significant hazards and unsafe conditions still exist in U.S. workplaces. Each year:

- ❑ Almost 6,000 Americans die from workplace injuries.
- ❑ Perhaps as many as 50,000 workers die from illnesses in which workplace exposures were a contributing factor.
- ❑ Nearly 6 million people suffer non-fatal workplace injuries.
- ❑ The cost of occupational injuries and illnesses totals more than \$170 billion.

What OSHA Does

OSHA uses three basic strategies, authorized by the *Occupational Safety and Health Act*, to help employers and employees reduce injuries, illnesses, and deaths on the job:

- ❑ Strong, fair, and effective enforcement.
- ❑ Outreach, education, and compliance assistance.
- ❑ Partnerships and other cooperative programs.

Based on these strategies, OSHA conducts a wide range of programs and activities to promote workplace safety and health. The agency:

- ▣ Encourages employers and employees to reduce workplace hazards and to implement new safety and health management systems or improve existing programs.
- ▣ Develops mandatory job safety and health standards and enforces them through worksite inspections, employer assistance, and, sometimes, by imposing citations, penalties, or both.
- ▣ Promotes safe and healthful work environments through cooperative programs, partnerships, and alliances.
- ▣ Establishes responsibilities and rights for employers and employees to achieve better safety and health conditions.
- ▣ Supports the development of innovative ways of dealing with workplace hazards.
- ▣ Maintains a reporting and recordkeeping system to monitor job-related injuries and illnesses.
- ▣ Establishes training programs to increase the competence of occupational safety and health personnel.
- ▣ Provides technical and compliance assistance and training and education to help employers reduce worker accidents and injuries.
- ▣ Works in partnership with states that operate their own occupational safety and health programs.
- ▣ Supports the Consultation Service.

The “OSH Act” — OSHA Coverage

Who the OSH Act Covers

The *OSH Act* covers all private-sector employers and their employees in the 50 states and all territories and jurisdictions under federal authority. Those jurisdictions include the District of Columbia, Puerto Rico, the Virgin Islands, American Samoa, Johnston Island, and the Outer Continental Shelf Lands as defined in the *Outer Continental Shelf Lands Act*.

OSHA coverage includes:

- ▣ Employers and employees in varied fields that include but are not limited to manufacturing, construction, long-shoring, shipbuilding, ship breaking, ship repair, agriculture, law, medicine, charity and disaster relief, organized labor, and private education.
- ▣ Religious groups to the extent that they employ workers for secular purposes. The *OSH Act* covers employers and employees either directly through federal OSHA or through an OSHA-approved state program.

Who is Not Covered

The *OSH Act* does not cover:

- ▣ The self-employed.
- ▣ Immediate members of farming families on farms that do not employ outside workers.

- ▣ Employees whose working conditions are regulated by other federal agencies under other federal statutes. These include mine workers, certain truckers and transportation workers, and atomic energy workers.
- ▣ Public employees in state and local governments; some states have their own occupational safety and health plans that cover these workers.

Rights and Responsibilities under the “OSH Act”

Employer Responsibilities

If you are an employer, you **must**:

- ★ Meet your general duty/responsibility to provide a workplace free from recognized hazards.
- ★ Keep workers informed about OSHA and safety and health matters with which they are involved.
- ★ Comply, in a responsible manner, with standards, rules, and regulations issued under the *OSH Act*.
- ★ Be familiar with mandatory OSHA standards.
- ★ Make copies of standards available to employees for review upon request.
- ★ Evaluate workplace conditions.
- ★ Minimize or eliminate potential hazards.
- ★ Provide employees safe, properly maintained tools and equipment, including appropriate personal protective equipment, and ensure that they use it.
- ★ Warn employees of potential hazards.
- ★ Establish or update operating procedures and communicate them to employees.
- ★ Provide medical examinations when required.
- ★ Provide training required by OSHA standards.
- ★ Report within eight hours any accident that results in a fatality or the hospitalization of three or more employees.
- ★ Keep OSHA-required records of work-related injuries and illnesses.
- ★ Post a copy of OSHA 300A, Summary of Work-Related Injuries and Illnesses, for the previous year from February 1 to April 30.
- ★ Post, at a prominent location within the workplace, the OSHA “It’s The Law” poster (OSHA 3165) informing employees of their rights and responsibilities.
- ★ Provide employees, former employees, and their representatives' access to the Log of Work-Related Occupational Injuries and Illnesses (OSHA 300) at a reasonable time and in a reasonable manner.
- ★ Provide access to employee medical records and exposure records to the employee and others as required by law.
- ★ Cooperate with OSHA compliance officers.
- ★ Not discriminate against employees who properly exercise their rights under the *OSH Act*.
- ★ Post OSHA citations and abatement verification notices at or near the worksite involved.
- ★ Abate cited violations within the prescribed period.

Employer Rights

If you are an employer, you have the right to:

- ★ Seek free advice and on-site consultation from OSHA.
- ★ Be involved in job safety and health through your industry association.
- ★ Request and receive proper identification of OSHA compliance officers.
- ★ Be advised by the compliance officer of the reason for an inspection.
- ★ Have an opening and closing conference with the compliance officer.
- ★ Accompany the compliance officer on the inspection.
- ★ File a notice of contest to dispute inspection results.
- ★ Request an informal settlement agreement process after an inspection.
- ★ Apply for a variance from a standard's requirements when technical expertise and materials are unavailable and other means have been provided to protect employees.
- ★ Take an active role in developing safety and health programs.
- ★ Be assured of the confidentiality of any trade secrets.
- ★ Submit a written request to the National Institute for Occupational Safety and Health (NIOSH) for information on whether any substance in your workplace has potentially toxic effects in the concentrations being used.
- ★ Submit information or comments to OSHA on the issuance, modification, or revocation of OSHA standards and request a public hearing.

Employee Responsibilities

Employees are expected to comply with all applicable standards, rules, regulations, and orders issued under the *OSH Act*.

If you are an employee, you **should**:

- ★ Read the OSHA "It's The Law" poster (OSHA 3165) at the jobsite.
- ★ Comply with all applicable OSHA standards.
- ★ Follow all employer safety and health rules and regulations, and wear or use prescribed protective equipment while engaged in work.
- ★ Report hazardous conditions to the supervisor.
- ★ Report any job-related injury or illness to the employer, and promptly seek medical treatment.
- ★ Cooperate with the OSHA compliance officer conducting an inspection.
- ★ Exercise your rights under the *OSH Act* in a responsible manner.

Employee Rights

If you are an employee, you have the right to:

- ★ Review copies of appropriate OSHA standards, rules, regulations, and requirements that the employer should have available at the workplace.
- ★ Request information from your employer on safety and health hazards, precautions, and emergency procedures.
- ★ Receive adequate training and information.

- ★ Request that OSHA investigate if you believe hazardous conditions or violations of standards exist in your workplace.
- ★ Have your name withheld from your employer if you file a complaint.
- ★ Be advised of OSHA actions regarding your complaint and have an informal review of any decision not to inspect or to issue a citation.
- ★ Have your authorized employee representative accompany the OSHA compliance officer during an inspection.
- ★ Respond to questions from the OSHA compliance officer.
- ★ Observe any monitoring or measuring of hazardous materials and see any related monitoring or medical records.
- ★ Review the Log and Summary of Work-Related Injuries and Illnesses (OSHA 300 and 300A) at a reasonable time and in a reasonable manner.
- ★ Request a closing discussion following an inspection.
- ★ Submit a written request to the National Institute for Occupational Safety and Health for information on whether any substance in your workplace has potentially toxic effects in the concentrations being used and have your name withheld from your employer.
- ★ Object to the abatement period set in a citation issued to your employer.
- ★ Participate in hearings conducted by the Occupational Safety and Health Review Commission.
- ★ Be notified by your employer if he or she applies for a variance, and testify at a variance hearing and appeal the final decision.
- ★ Submit information or comments to OSHA on the issuance, modification, or revocation of OSHA standards and request a public hearing.

If Employees feel their Workplace is Unsafe or Unhealthy...

To File a Complaint...

If employees feel their workplace has unsafe or unhealthy working conditions, often the best and fastest way to get it corrected is to notify a supervisor or employer. Employees also may file a complaint by phone, mail, email, or fax with the nearest OSHA office and request an inspection. Employees may request that OSHA not reveal their name. To file a complaint, call (800) 321-OSHA (6742) or contact the nearest OSHA regional, area, state plan, or consultation office listed at www.osha.gov. The teletypewriter (TTY) number is (877) 889-5627. Employees can also file a complaint online. Most online complaints are addressed by OSHA's phone/fax system. That means they may be resolved informally over the phone with the employer. Written, signed complaints submitted to OSHA area or state-plan offices are more likely to result in on-site OSHA inspections. Complaints from workers in OSHA-approved state-plan states will be forwarded to the appropriate state plan for response. If employees are concerned about confidentiality, they may prefer to file a complaint from their home computer or a computer in the local library. Download the OSHA complaint form, complete it and then fax or mail it to the local OSHA office or they may simply contact the local OSHA office to receive a copy of the complaint form. Be sure to include name, address, and telephone number so that OSHA is able to get in touch.

To Refuse Unsafe Work...

Refusing to do a job because of potentially unsafe workplace conditions is not ordinarily an employee right under the law and may result in disciplinary action by an employer. However, if employees have reasonable grounds to believe that they are exposed to an imminent danger on the job, they do have the right to refuse to do a job. Employees should remain at the jobsite until the problem can be resolved because OSHA will not be able to protect them if they walk off the job.

Legal Protections

Additional Employee Protections

A number of different laws provide employees legal protections for getting involved in safety and health matters. The *OSH Act*, for example, provides employees the right to seek safe and healthful conditions on the job without fear of punishment. Under Section 11(c) of the act, employees may exercise such rights as:

- ☐ Voicing concerns to an employer, union, OSHA, any other government agency, or others about job safety or health hazards.
- ☐ Filing safety or health grievances
- ☐ Participating in a workplace safety and health committee or in union activities concerning job safety and health.
- ☐ Participating in OSHA inspections, conferences, or hearings.
- ☐ Refusing to work when a dangerous situation threatens death or serious injury where there is insufficient time to contact OSHA and where the employee has sought from his or her employer and been unable to obtain a correction of the dangerous conditions.

Protections against Employer Retaliation

An employer may not retaliate if an employee exercises these or any other rights under the *OSH Act*. This means that an employer may not take these actions against any worker who expresses concern or files a complaint about safety and health conditions or participates in job safety-related activities:

- ★ Termination of employment
- ★ Demote
- ★ Take away seniority or other earned benefits
- ★ Transfer to an undesirable job or shift
- ★ Threaten or harass the worker

Whistleblower Protections

Since passage of the *OSH Act* in 1970, Congress has expanded OSHA's whistleblower protection authority to protect workers from discrimination under 14 federal statutes. These statutes, and the number of days employees have to file a complaint, are:

☐ Occupational Safety and Health Act of 1970 (30 days)

Provides discrimination protection for employees who exercise rights guaranteed under the act, such as filing a safety and health complaint with OSHA and participating in an inspection.

☐ Surface Transportation Assistance Act (180 days)

Provides discrimination protections for truck drivers and other employees relating to the safety of commercial motor vehicles. Coverage includes all buses for hire and freight trucks with a gross vehicle weight greater than 10,001 pounds.

☐ Asbestos Hazard Emergency Response Act (90 days)

Provides discrimination protection for individuals who report violations of environmental laws relating to asbestos in elementary and secondary school systems.

☐ International Safety Container Act (60 days)

Provides discrimination protection for employees who report violations of the act, which regulates shipping containers.

☐ Energy Reorganization Act (180 days)

Provides discrimination protection for employees of operators and subcontractors of nuclear power plants licensed by the Nuclear Regulatory Commission and for employees of contractors working under contract with the Department of Energy.

☐ Clean Air Act (30 days)

Provides discrimination protection for employees who report violations of the act, which provides for the development and enforcement of standards regarding air quality and air pollution.

☐ Safe Drinking Water Act (30 days)

Provides discrimination protection for employees who report violations of the act, which requires that all drinking water systems in public buildings and in new construction be lead free.

☐ Federal Water Pollution Control Act (30 days)

Provides discrimination protection for employees who report hazardous pollution of waters that provide a natural habitat for living things. Also called the Clean Water Act.

☐ Toxic Substances Control Act (30 days)

Provides discrimination protection for employees who report violations of regulations involving the manufacture, distribution, and use of certain toxic substances

☐ Solid Waste Disposal Act (30 days)

Provides discrimination protection for employees who exercise certain rights under the act, which provides assistance for the development of facilities for the recovery of energy and other resources from discarded materials and regulates hazardous waste management. Also called the Resource Conservation and Recovery Act.

☐ Comprehensive Environmental Response, Compensation, and Liability Act (30 days)

Provides discrimination protection for employees who exercise rights under the act, which provides liability, compensation, cleanup, and emergency response for hazardous substances released into the environment and for the cleanup of inactive hazardous waste disposal sites.

☐ Wendell H. Ford Aviation Investment and Reform Act for the 21st Century (90 days)

Provides discrimination protection for employees of air carriers, contractors, or subcontractors of air carriers who raise safety concerns.

☐ Corporate and Criminal Fraud Accountability Act of 2002 (90 days)

Provides discrimination protection for employees or contractors of publicly traded companies or brokerage firms who report mail, wire, bank, or securities fraud or violations of laws related to stockholder fraud. Also called the Sarbanes-Oxley Act.

☐ Pipeline Safety Improvement Act of 2002 (180 days)

Provides discrimination protection for employees who report violations of the federal law regarding pipeline safety and security or who refuse to violate such provisions.

Public-Sector Employees

Federal Worker Coverage

Section 19 of the *OSH Act* makes federal agency heads responsible for providing safe and healthful working conditions for their employees. OSHA conducts federal workplace inspections in response to employee reports of hazards. The *OSH Act* also requires agencies to comply with standards consistent with those for private-sector employers. Under a 1998 amendment to the act, it covers the U.S. Postal Service the same as any private-sector employer.

OSHA's Federal Sector Authority

In its federal sector authority, OSHA:

- ☐ Can not propose monetary penalties against another federal agency for failure to comply with OSHA standards.
- ☐ Does not have authority to protect federal employee "whistleblowers." The *Whistleblower Protection Act of 1989* allows present and former federal employees (except for corporations and certain intelligence agencies) to file their reports of reprisal with the Office of Special Counsel – U.S. Merit Systems Protection Board.

State and Local Government Worker Coverage

OSHA provisions cover the private sector only. However, some states have their own OSHA-approved occupational safety and health programs. These state programs must cover state and local workers and must be at least as effective as federal OSHA requirements.

Advisory Groups

OSHA has several standing or ad hoc advisory committees that advise the agency on safety and health issues. These committees include representatives of management, labor, and state agencies as well as one or more designees of the Secretary of Health and Human Services (HHS). Members also may include representatives of occupational safety and health professions and the general public.

The two standing (or statutory) advisory committees are:

- ☐ The National Advisory Committee on Occupational Safety and Health (NACOSH), which advises, consults with, and makes recommendations to the Secretaries of Labor and HHS on matters regarding administration of the *OSH Act*.
- ☐ The Advisory Committee on Construction Safety and Health (ACCSH), which advises the Secretary of Labor on construction safety and health standards and other regulations.

Other continuing advisory committees include:

- ☐ The Federal Safety and Health Advisory Committee (FACOSH), which advises the Secretary of Labor on all aspects of federal agency safety and health.
- ☐ The Maritime Advisory Committee for Occupational Safety and Health (MACOSH), which advises the Secretary of Labor on workplace safety and health programs, policies, and standards in the maritime industry.
- ☐ The National Advisory Committee on Ergonomics, which advises OSHA on initiatives to reduce ergonomic-related injuries and illnesses in the workplace. OSHA may occasionally form short-term advisory committees to advise the agency on specific issues.

State Plans — State Safety & Health Programs

State plans are OSHA-approved job safety and health programs operated by individual states instead of federal OSHA. The *OSH Act* encourages states to develop and operate their own job safety and health plans and precludes state enforcement of OSHA standards unless the state has an approved plan. OSHA approves and monitors all state plans.

Once a state plan is approved under Section 18(b) of the *OSH Act*, OSHA funds up to 50 percent of the program's operating costs. State plans must provide standards and enforcement programs as well as voluntary compliance activities that are at least as effective as the federal program.

State plans covering the private sector also must cover state and local government employees. OSHA rules also permit states to develop plans that cover only public sector (state and local government) employees. In these cases, private sector employment remains under federal OSHA jurisdiction.

Twenty-three states operate complete plans and three cover only the public sector. These states are listed on the OSHA website at www.osha.gov.

State Program Coverage

States with approved plans cover most private sector employees as well as state and local government workers in the state. Federal OSHA continues to cover federal employees and certain other employees specifically excluded by a state plan—for example, those who work in maritime industries and on military bases.

State Workplace Inspections

States with approved state plans respond to accidents and workplace complaints and conduct random unannounced inspections, just like federal OSHA. The states issue citations and proposed penalties under state law and adjudicate disputes through a state review board or other procedure.

Federal Monitoring of State Plans

Federal OSHA closely monitors state programs. Anyone finding inadequacies or other problems in the administration of a state program may file a Complaint About State Program Administration (CASPA) with the appropriate OSHA regional administrator. OSHA investigates all these complaints and, where they are found to be valid, requires appropriate corrective action.

Employer Rights and Responsibilities

State plans must guarantee the same employer and employee rights as OSHA. Employer and employee responsibilities in states with their own occupational safety and health programs are generally the same as in states under federal OSHA.

State Safety and Health Standards

State safety and health standards under approved plans must be identical to or at least as effective as federal OSHA standards and must keep pace with federal standards. State plans must adopt standards comparable to federal standards within six months after a federal standard takes effect. Most state plan standards are very similar to federal standards, but states with approved plans may have different and independent standards.

Standards and Guidance

Requirements

In general, standards require that employers:

- ▣ Maintain conditions or adopt practices reasonably necessary and appropriate to protect workers on the job.
- ▣ Be familiar with and comply with standards applicable to their establishments.
- ▣ Ensure that employees have and use personal protective equipment when required for safety and health.

Hazards Addressed

OSHA issues standards for a wide variety of workplace hazards, including:

- | | |
|---------------------------|------------------------------|
| ★ Toxic substances | ★ Hazardous waste |
| ★ Harmful physical agents | ★ Infectious diseases |
| ★ Electrical hazards | ★ Fire and explosion hazards |
| ★ Fall hazards | ★ Dangerous atmospheres |
| ★ Trenching hazards | ★ Machine hazards |

In addition, where there are no specific OSHA standards, employers must comply with the *OSH Act's* "General Duty Clause". The general duty clause, Section 5(a)(1) requires that each employer "furnish ... a place of employment which is free from recognized hazards that are causing or are likely to cause death or serious physical harm to employees."

The Standards-Setting Process

Deciding to Develop a Standard

OSHA can begin standards-setting procedures on its own initiative or in response to petitions from other parties, including:

- ▣ The Secretary of Health and Human Services (HHS).
- ▣ The National Institute for Occupational Safety and Health (NIOSH).
- ▣ State and local governments.
- ▣ Nationally recognized standards producing organizations and employer or labor representatives.
- ▣ Any other interested parties.

How OSHA Develops Standards

OSHA publishes its intention to propose, amend, or revoke a standard in the *Federal Register*, either as:

- ▣ A Request for Information or an Advance Notice of Proposed Rulemaking or announcement of a meeting to solicit information to be used in drafting a proposal.
- ▣ A Notice of Proposed Rulemaking, which sets out the proposed new rule's requirements and provides a specific time for the public to respond.

Interested parties may submit written information and evidence. OSHA also may schedule a public hearing to consider various points of view. After reviewing public comments, evidence, and testimony, OSHA publishes:

- ☐ The full text of any standard amended or adopted and the date it becomes effective, along with an explanation of the standard and the reasons for implementing it.
- ☐ A determination that no standard or amendment is necessary.

Input from Other Government Agencies

Other government agencies, such as NIOSH, can recommend standards to OSHA. The *OSH Act* established the National Institute for Occupational Safety and Health under the Department of HHS as the research agency for occupational safety and health. NIOSH conducts research on various safety and health problems, provides technical assistance to OSHA, and recommends standards for OSHA's adoption. (For more information, call (800) 35-NIOSH or visit the agency's website at www.cdc.gov/niosh.)

Emergency Temporary Standards

Under certain limited conditions, OSHA can set emergency temporary standards that take effect immediately and remain in effect until superseded by a permanent standard.

To take such an action, OSHA must determine that:

- ☐ Workers are in grave danger due to exposure to substances or agents determined to be toxic or physically harmful or to new hazards.
- ☐ An emergency standard is necessary to protect them.

OSHA then publishes the emergency temporary standard in the *Federal Register*, where it also serves as a proposed permanent standard. The usual procedures for adopting a permanent standard apply, except that a final ruling should be made within six months.

Congressional Jurisdiction over OSHA Standards

OSHA submits all final rules to Congress and the General Accounting Office for review. Congress has the authority to repeal a standard by passing a joint resolution under an expedited procedure established by the *Small Business Regulatory Enforcement and Fairness Act*, or *SBREFA*, but has done so only once. For the repeal to take effect, the joint resolution must be signed by the President.

Employer Recourse

An employer who is unable to comply with new requirements or anyone who disagrees with a new standard can:

- ☐ Petition a court for judicial review.
- ☐ Request a permanent, temporary, or experimental variance from a standard or regulation.
- ☐ Apply for an interim order to continue working under existing conditions while OSHA considers a variance request.

Petitions to Modify or Withdraw Standards or Requirements

Employers or employees may petition OSHA to modify or revoke standards just as they may petition the agency to develop standards. OSHA continually reviews its standards to keep pace with developing and changing industrial technology.

Filing a Petition for Judicial Review

Anyone who may be adversely affected by a final or emergency standard may file a petition for judicial review. The objecting party must file the petition within 60 days of the rule's publication with the U.S. Court of Appeals for the circuit in which the petitioner lives or has his or her primary place of business. Filing an appeals petition will not delay enforcement of a standard, unless the Court of Appeals specifically orders it.

OSHA issues permanent standards only after careful consideration of the arguments and data received from the public in written submissions and at hearings.

Guidelines versus Standards

A guideline is a tool to assist employers in recognizing and controlling hazards. It is voluntary and not enforceable under the *OSH Act*. Failure to implement a guideline is not itself a violation of the *OSH Act's* general duty clause. Guidelines are more flexible than standards. They can be developed quickly and can be changed easily as new information becomes available with scientific advances. Guidelines make it easier for employers to adopt innovative programs to suit their workplaces, rather than inflexible, one-size-fits-all solutions to issues that may be unique to an industry or facility.

Variations

A variance grants an employer formal permission to deviate from a standard's requirements or time frame.

Employer Requests for Variations

Employers may ask OSHA for a variance from:

- ▣ A newly promulgated standard or regulation if they cannot fully comply by the effective date due to shortage of materials, equipment, or professional or technical personnel.
- ▣ Requirements of a standard or regulation if they can demonstrate that their alternative or alternatives provide employees with protection as effective as that provided by the standard or regulation.

Types of Variations

An employer applies for a ***temporary variance*** if he or she cannot comply with a standard or regulation by its effective date because professional or technical personnel, material, or equipment are not available, or because the necessary construction or alteration of facilities cannot be completed in time. While operating under a temporary variance, an employer generally must meet specific conditions specified by OSHA.

An employer who can prove that working conditions, practices, means, methods, operations, or processes at his or her worksite are as safe and healthful as they would be if the employer complied with the standard may apply for a ***permanent variance***. Pending OSHA approval to grant a permanent variance, an employer must comply with the OSHA standard.

An employer may apply for an ***experimental variance*** if he or she is participating in an effort to demonstrate or validate new job safety and health techniques, and either the Secretary of Labor or the Secretary of HHS has approved that experiment.

Impact of Variance Applications on Citations

Variations are not retroactive. An employer who has been cited for violating a standard may not seek relief from that citation by applying for a variance. The fact that a citation is outstanding does not prevent an employer from filing a variance application.

However, if the citation is being contested by the employer, the OSHA Administrator has the option to decline to accept the variance application for the provision(s) under contest.

For more Information about Variances

For further information and help in applying for a variance, contact the nearest OSHA office listed on the agency website at www.osha.gov or by calling (800) 321-OSHA (6742).

OSHA's Reporting & Recordkeeping Requirements

All employers must report to OSHA within eight hours of learning about:

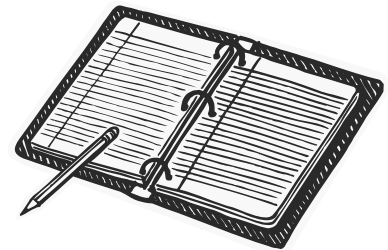
- The death of any employee from a work-related incident, and
- The in-patient hospitalization of three or more employees as a result of a work-related incident.

In addition, employers must report all fatal heart attacks. Deaths from motor vehicle accidents on public streets (except those in a construction work zone) and in accidents on commercial airplanes, trains, subways or buses do not need to be reported. These reports may be made by telephone or in person to the nearest OSHA area office listed at www.osha.gov or by calling OSHA's toll-free number, (800) 321-OSHA (6742).

Employers may be subject to other requirements in other OSHA standards as well.

Recordkeeping Benefits

OSHA's recordkeeping requirements, as set out in the *OSH Act*, established an effective, centralized, nationwide system for monitoring occupational safety and health problems—a vital requirement for gauging problems and solving them. Keeping records allows OSHA to compile survey material, helps identify high-hazard industries, and informs employees about their employers' workplace safety record. These records also help employers identify potential sources of injuries and illnesses at their worksites.



Employer Requirements

OSHA's reporting and recordkeeping regulations require employers to:

- Maintain records in each establishment of occupational injuries and illnesses as they occur and make those records accessible to employees.
- Keep injury and illness records and post from February 1 through April 30 an annual summary of occupational injuries and illnesses for each establishment. A company executive must certify the accuracy of the summary.
- Record any fatality regardless of the length of time between the injury and death.
- Provide, upon request, pertinent injury and illness records for inspection and copying by any representative of the Secretaries of Labor or HHS, or the state during any investigation, research, or statistical compilation.
- Comply with any additional recordkeeping and reporting requirements in specific OSHA standards.

Exempt Employers

Employers with 10 or fewer employees are exempt from maintaining the OSHA log of injuries and illnesses unless the Bureau of Labor Statistics (BLS) or OSHA notifies them that they have been selected to participate in a mandatory data collection.

OSHA also exempts employers in certain low-hazard industries such as real estate agencies and clothing stores, as defined in the recordkeeping standard. Exempt employers must still comply with requirements to display an OSHA "It's The Law" poster (OSHA 3165) and report to OSHA within eight hours any accident that results in one or more fatalities or the hospitalization of three or more employees. A few exempt employers will have to maintain records if OSHA or BLS selects them to participate in a mandatory data collection. The agency will notify those employers in advance and supply them the necessary forms and instructions.

Exceptions to the Recording Requirements

To be considered work-related, there must be a significant degree of aggravation to a preexisting injury or illness. In addition, cases arising from eating food and drinking beverages, blood donations, and exercise programs do not need to be recorded. Common cold and flu cases also do not need to be recorded. There are specific criteria for determining when mental illnesses are considered work-related and when cases should be recorded if employees are traveling or working at home.

Maintaining Recordkeeping Forms

Employers must log injuries and illnesses on recordkeeping forms, keep the logs current and retain them for five years at each establishment. Logs must be available for inspection by representatives of OSHA, HHS, BLS, or the designated state agency within four hours of the request. Employers are required to update logs to reflect any changes that occur.

DO NOT send any recordkeeping forms to OSHA or any other agency. The employer maintains forms and posts the annual summary in the workplace. If OSHA inspects the workplace, the employer will be required to produce the forms.

Summary for Reporting and Recordkeeping Requirements

OSHA recordkeeping regulations require most employers to maintain records of workplace injuries, illness, and deaths. Employers must:

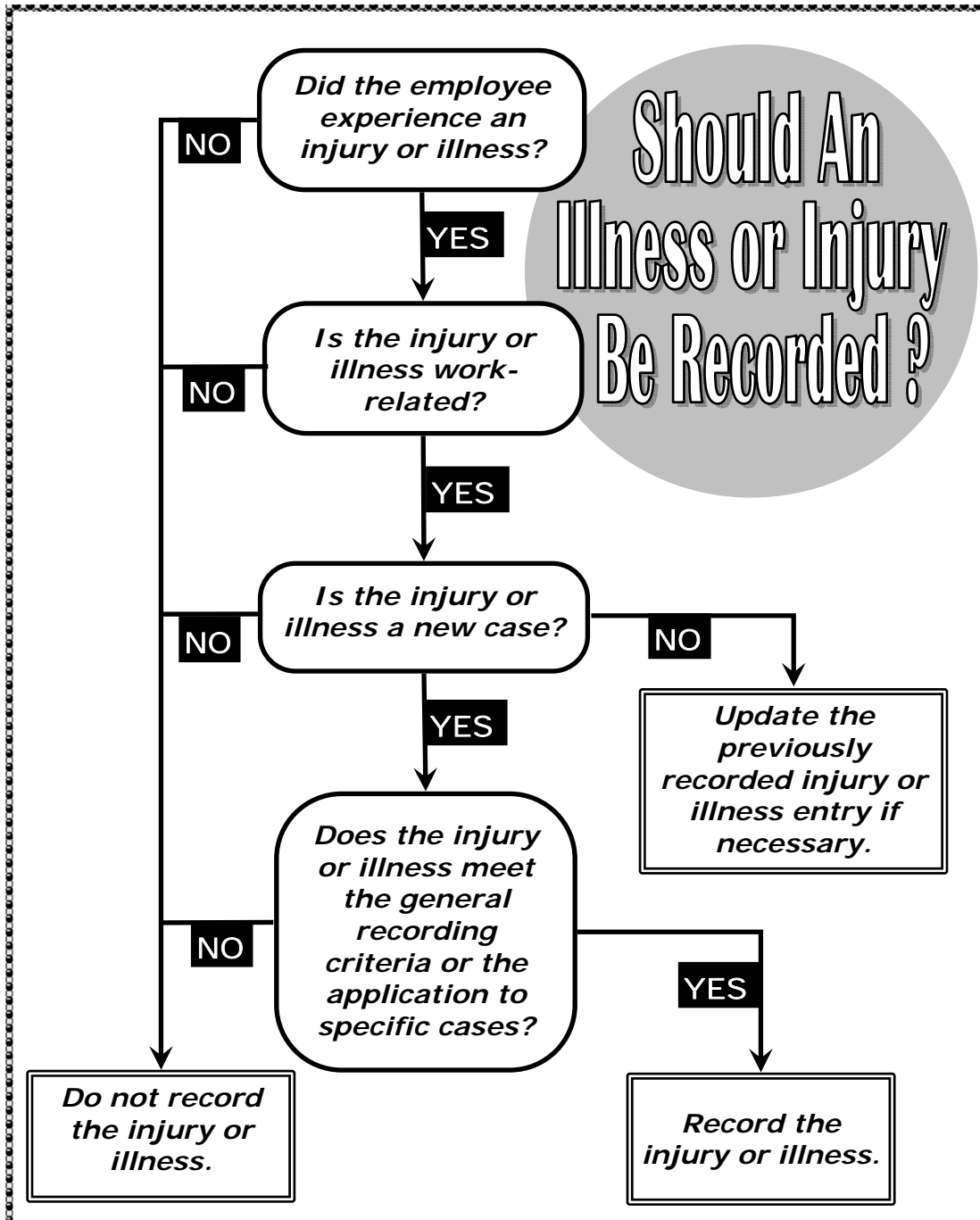
- ★ *Maintain injury and illness records.*
- ★ *Report all fatalities.*
- ★ *Report each accident that hospitalizes three or more employees.*
- ★ *Make records accessible to employees.*
- ★ *Allow OSHA access to records.*
- ★ *Post an annual summary of injuries and illnesses.*

Determining if an Injury or Illness is Work-Related

An employer must consider an injury or illness to be work-related if an event or exposure in the work environment either caused or contributed to the resulting condition or significantly aggravated a preexisting injury or illness. Most injuries and illnesses resulting from events or exposures in the work environment are presumed to be work-related.

What Cases to Record

To determine which work-related injuries and illnesses must be recorded, consult the following chart.



Employers with Multiple Worksites

Employers must keep injury and illness records for each establishment. OSHA defines an establishment as a “single physical location where business is conducted or where services are performed.” An employer whose employees work in dispersed locations must keep records at the place where the employees report for work. In some situations, employees do not report to work at the same place each day. In that case, records must be kept at the place from which they are paid or at the base from which they operate.

Recordkeeping Forms

Three forms are needed for recordkeeping:

☐ OSHA 300 — Log of Work-Related Injuries and Illnesses.

Employers must log each recordable occupational injury and illness on this form within six working days from the time the employer learns of it. A complete copy current to within 45 calendar days must be present at all times in the establishment if the employer prepares the log at a central location using automatic data processing equipment. A substitute for the OSHA 300 is acceptable if it is as detailed, readable, and understandable as the OSHA 300.

☐ OSHA 301 — Injury and Illness Incident Report.

Each employer must complete the OSHA 301 form within seven calendar days from the time the employer learns of the work-related injury or illness. This form includes more data about how the injury or illness occurred. Employees and former employees are guaranteed access to their individual OSHA 301 forms. Employee representatives will be provided access to the “information about the case” section of the OSHA 301 form in establishments where they represent employees.

☐ OSHA Form 300A — Summary of Work-Related Injuries and Illnesses.

This form was created to make it easier to post and calculate incident rates. Employers must post copies of the previous year’s records no later than February 1 and keep them in place through April 30.

Recording Zero Injuries or Illnesses

If there were no injuries or illnesses during the year, employers must enter “zero” on the totals line of the form and post it. The form must be signed and certified by a company executive.

Employee Privacy

Employers must withhold the names of individuals with sensitive injuries such as sexual assaults, HIV infections, and mental illness.

OSHA’s Annual Survey

Each year, OSHA collects injury and illness information from employers through the OSHA Data Initiative to better direct agency resources and improve worker protections. All employers in construction and manufacturing with 40 or more employees are eligible to be included in the initiative. In addition, employers from 67 other industries in other industrial sectors are selected, generally if they are in industries rated as “high hazard” or with high injury and illness rates. Establishments are selected for inclusion in the annual survey based on previous reported injury and illness rates, an OSHA intervention, or the periodic revisiting of former participants in the annual survey.

OSHA asks employers selected for participation to send information already collected on the 300A summary form, required by the OSHA occupational injury and illness recordkeeping regulation.

Summary of Information Employers must Post

Employers must display at each establishment, wherever they normally post notices to employees, the following:

- ★ *A copy of the totals from the previous year's summary of occupational injuries and illnesses, OSHA 300A (February through April).*
- ★ *OSHA "It's The Law" poster (OSHA 3156), or the state equivalent, informing employees of their rights and responsibilities under the OSH Act.*
- ★ *Summaries of petitions for variances from standards of recordkeeping procedures.*
- ★ *Copies of all OSHA citations for violations of standards. These must remain posted at or near the location of alleged violations for three days, or until the violations are corrected, whichever is longer.*

OSHA Enforcement

Compliance Officer Authority

The *OSH Act* authorizes OSHA compliance officers—at reasonable times, in a reasonable manner, and within reasonable time limits—to:

- ▣ Enter any factory, plant, establishment, construction site, or other areas of the workplace or environment where work is being performed.
- ▣ Inspect and investigate during regular working hours any such place of employment and all pertinent conditions, structures, machines, apparatus, devices, equipment, and materials.
- ▣ Inspect and investigate at other times any such place of employment and all pertinent conditions, structures, machines, apparatus, devices, equipment, and materials.
- ▣ Question privately any employer, owner, operator, agent or employee during an inspection or investigation.



Compliance Officer Qualifications

OSHA compliance officers have specialized knowledge and experience in the occupational safety and health field, including industrial hygiene, safety engineering, toxicology, and occupational medicine. They receive vigorous training on OSHA standards and how to recognize safety and health hazards. Many OSHA staff members have specialized credentials such as certified industrial hygienist (CIH) or certified safety professional (CSP) certifications.

Advance Notice of Inspections

OSHA generally conducts inspections without advance notice. In fact, anyone who alerts an employer in advance of an OSHA inspection can receive a criminal fine of up to \$1,000 or a six-month jail term or both.

However, under special circumstances, OSHA may give the employer advance notice of an inspection—but no more than 24 hours. These special circumstances include:

- ▣ Imminent danger situations, which require correction immediately.
- ▣ Inspections that must take place after regular business hours or require special preparation.
- ▣ Cases where OSHA must provide advance notice to assure that the employer and employee representative or other personnel will be present.
- ▣ Situations in which OSHA determines that advance notice would produce a more thorough or effective inspection.

Employers receiving advance notice of an inspection must inform their employees' representative or arrange for OSHA to do so.

Search Warrants

An employer has the right to require the compliance officer to obtain an inspection warrant before entering the worksite. OSHA may inspect after acquiring a judicially authorized search warrant based on administrative probable cause or evidence of a violation.

OSHA may take appropriate steps, including legal action, if an employer still refuses to admit a compliance officer, or if an employer attempts to interfere with an inspection.

Inspection Priorities

OSHA cannot inspect all 7 million workplaces covered by the *OSH Act* each year. The most hazardous workplaces need primary attention. OSHA, therefore, has established a system of inspection priorities in order to make the most positive impact on occupational safety and health. The agency inspects under the following conditions:

- ★ ***Imminent danger*** — or any condition where there is reasonable certainty that a danger exists that can be expected to cause death or serious physical harm immediately or before the danger can be eliminated through normal enforcement procedures. OSHA gives top priority to imminent danger.
- ★ ***Catastrophes and fatal accidents*** — resulting in the death of any employee or the hospitalization of three or more employees.
- ★ ***Employee complaints*** — involving imminent danger or an employer violation that threatens death or serious physical harm.
- ★ ***Referrals*** — from other individuals, agencies, organizations, or the media.
- ★ ***Planned or programmed*** — inspections in industries with a high number of hazards and associated injuries.
- ★ ***Follow-ups*** — to previous inspections.

The Inspection Process – Off-site Investigations

“Phone/FAX” Investigations

There are two ways that OSHA can respond to a complaint. OSHA can either perform an on-site inspection or an off-site investigation, also known as a “phone/fax investigation.” Although every worker has a right to receive an on-site inspection if certain conditions are met, there are times when a phone/fax (or letter) investigation may be a better alternative. OSHA responds more quickly to lower-priority hazards using a phone/fax approach. This enables the agency to concentrate resources on the most serious workplace hazards.

Employees who request a phone/fax investigation do not give up the right to request an on-site inspection of potential violations and hazards if they are not satisfied with the investigation. Workers should call their nearest OSHA area office to discuss their options. If an off-site investigation is appropriate, the agency telephones the employer, describes the alleged hazards, and then follows up with a fax or letter. The employer must respond in writing within five days, identifying any problems found and noting corrective actions taken or planned. If the response is adequate, OSHA generally will not conduct an inspection. The employee or employee representative who filed the original complaint will receive a copy of the employer's response and, if still not satisfied, may then request an on-site inspection.

The OSH Act authorizes OSHA to conduct workplace inspections to enforce its standards. Every establishment covered by the OSH Act is subject to inspection by OSHA compliance safety and health officers.

If the employee or employee representative files a written complaint that meets certain conditions, then OSHA may conduct an on-site inspection. Those conditions include claims of serious physical harm that have already resulted in disabling injuries or illnesses or claims of imminent danger situations; written, signed complaints requesting inspections; and situations where the employer provided an inadequate response to a phone/fax investigation.

The Inspection Process – On-site Inspections

What to Expect

A typical OSHA inspection includes four stages:

- ① Presentation of inspector credentials
- ② Opening conference
- ③ Inspection walkaround
- ④ Closing conference

How an Inspection Begins

When arriving at a worksite, the OSHA compliance officer displays official credentials and asks to meet an appropriate employer representative. Employers should always insist on seeing the compliance officer's credentials.

An OSHA compliance officer carries U.S. Department of Labor credentials bearing his or her photograph and a serial number that an employer can verify by phoning the nearest OSHA office. Posing as a compliance officer is a violation of law; suspected imposters should be promptly reported to local law enforcement agencies.

Opening Conference

In the opening conference, the compliance officer:

- ▢ Explains why OSHA selected the establishment for inspection.
- ▢ Obtains information about the establishment.
- ▢ Explains the purpose of the visit, the scope of the inspection, walk-around procedures, employee representation, employee interviews, and the closing conference.
- ▢ Determines whether an OSHA funded consultation is in progress or whether the facility has received an inspection exemption.

If so, the compliance officer usually terminates the inspection. The compliance officer asks the employer to select an employer representative to accompany him or her during the inspection. OSHA welcomes, but does not require, an employee representative to accompany the inspector.

Under no circumstances may the employer select the employee representative for the walkaround. OSHA encourages employers and employees to meet together.

Selecting Employee Representatives

If ...

The employees are represented by a recognized bargaining representative,

There is a plant safety committee and no recognized bargaining representative,

There is neither a recognized bargaining representative nor a plant safety committee,

There is no authorized employee representative.

Then ...

The union usually will designate the employee rep to accompany the compliance officer.

The employee members of that committee or the employees at large will designate the employee rep.

The employees themselves may select the employee rep, or the compliance officer will determine if any other employees would suitably represent the interests of employees.

The compliance officer must consult with a reasonable number of employees concerning safety and health matters in the workplace.

Such consultations may be held privately.

Inspection Walkaround

After the opening conference, the compliance officer and accompanying representatives proceed through the establishment, inspecting work areas for potentially hazardous working conditions. The compliance officer will discuss possible corrective actions with the employer. OSHA may consult, at times privately, with employees during the inspection walkaround. An inspection walkaround may cover only part of an establishment, particularly if the inspection resulted from a specific complaint, fatality, or catastrophe or is part of a local or national emphasis program. Other inspections may cover the entire facility, "wall to wall."

Trade secrets observed by the compliance officers are kept confidential. Federal employees who release confidential information without authorization are subject to a \$1,000 fine, one year in jail, or both, and removal from office or employment.

Records Reviews

The compliance officer checks posting and recordkeeping practices, including whether the employer has:

- Maintained records of deaths, injuries, and illnesses.
- Posted OSHA's Summary of Work-Related Injuries and Illnesses (OSHA 300A) from February 1 to April 30.
- Prominently displayed the OSHA "It's The Law" poster (OSHA 3165).

The compliance officer also examines records, where required, of employee exposure to toxic substances and harmful physical agents.

On-the-Spot Corrections

Some apparent violations detected by the compliance officer can be corrected immediately. The compliance officer records such corrections to help evaluate the employer's good faith for compliance. Apparent violations that have been corrected may still serve as the basis for a citation or notice of proposed penalty or both.

After the Walkaround

After the inspection walkaround, the compliance officer holds a closing conference with the employer and the employee representatives, either jointly or separately.

During the closing conference, the compliance officer:

- ▣ Discusses with the employer all unsafe or unhealthful conditions observed on the inspection and indicates all apparent violations for which a citation may be recommended.
- ▣ Tells the employer of his or her appeal rights, anti-discrimination rights under 11(c) of the *OSH Act*, and procedures for contesting citations within 15 working days after receiving the citation.
- ▣ Informs the employer of his or her obligations regarding any citations that may be issued.

The compliance officer will hold a separate closing conference with the employees or their representative, if requested, to discuss matters of direct interest to employees and to inform them of their rights after an inspection.

Information in an OSHA Citation

Citations inform the employer and employees of:

- ▣ Regulations and standards the employer allegedly violated.
- ▣ Any hazardous working conditions covered by the *OSH Act's* general duty clause.
- ▣ The proposed length of time set for abatement of hazards.
- ▣ Any proposed penalties.

Additional Information Provided

The compliance officer:

- ▣ Informs employers of their rights under the *Small Business Regulatory Enforcement Fairness Act of 1996 (SBREFA)*. *SBREFA* requires that all federal agencies have in place a policy to reduce or, under appropriate circumstances, waive penalties for violations of standards by small businesses.
- ▣ Informs employers that Regional Small Business Regulatory Fairness Boards created under *SBREFA* exist to hear cases if employers are not satisfied with agency resolutions of enforcement matters.
- ▣ Explains that OSHA area offices offer assistance and can answer questions about programs and activities.

Disclosures of Penalties

Only the OSHA area director has the authority to tell the employer what penalties the agency will propose.

OSHA has up to six months following an inspection to issue a final report. After reviewing the full inspection report, the OSHA area director will:

- ▣ Issue citations without penalties.
- ▣ Issue citations with proposed penalties.
- ▣ Determine that neither is warranted.

Violations and Penalties

Types of Penalties

Under the *OSH Act*, OSHA may cite the following violations and propose the following penalties:

Other-than-Serious: A violation that has a direct relationship to job safety and health, but probably would not cause death or serious physical harm. OSHA may propose a penalty of up to \$7,000 for each other-than-serious violation.

Serious: A violation where there is substantial probability that death or serious physical harm could result and that the employer knew, or should have known, of the hazard. OSHA may propose a mandatory penalty of up to \$7,000 for each serious violation.

Willful: A violation that the employer intentionally and knowingly commits or a violation that the employer commits with plain indifference to the law. The employer either knows that what he or she is doing constitutes a violation, or is aware that a hazardous condition existed and made no reasonable effort to eliminate it. OSHA may propose penalties of up to \$70,000 for each willful violation, with a minimum penalty of \$5,000 for each willful violation.

In addition to OSHA citations and penalties, the U.S. Department of Justice may bring a criminal action against an employer whose willful violation of a standard results in the death of an employee.

If a court convicts such an employer, the offense is punishable by a court-imposed fine or by imprisonment for up to six months, or both. The court may impose a fine for a criminal conviction of up to \$250,000 for an individual or \$500,000 for a corporation.

Repeated: A violation of any standard, regulation, rule, or order where OSHA finds a substantially similar violation during a re-inspection. OSHA may propose penalties of up to \$70,000 for each repeated violation. To be the basis of a repeat citation, the original citation must be final. A citation under contest may not serve as the basis for a subsequent repeat citation.

Violation Categories & Possible Penalties

| <i>Type of Violation</i> | <i>Minimum Penalty Per Violation</i> | <i>Maximum Penalty Per Violation</i> |
|--|--------------------------------------|---|
| Other-than-serious | | \$7,000 |
| Serious | \$100* | \$7,000 |
| Posting | | \$7,000 |
| Willful | \$5,000 | \$70,000 |
| Willful, with fatality, first conviction | | \$250,000/\$500,000 or six months in prison or both ** |
| Willful, with fatality, second conviction | | \$250,000/\$500,000 or one year in prison or both ** |
| Repeated | \$5,000 | \$70,000 |
| Failure to abate | | \$7,000 per day |

* Set as OSHA policy in the *Field Inspection Reference Manual (FIRM)*.

** The monetary criminal fine is set by Title 18 of the U.S. Code (*Crimes and Criminal Procedure*), Section 3571, which states that individuals found guilty of an offense may not be fined more than \$250,000, and organizations not more than \$500,000.

Failure to Abate: OSHA may propose an additional penalty of up to \$7,000 for *each day* an employer fails to correct a previously cited violation beyond the prescribed abatement date.

Penalties for Other Violations

Employers may be assessed penalties for:

- ☐ Violating posting requirements can bring a civil penalty of up to \$7,000. (OSHA does not fine for failing to post the "It's The Law" poster (OSHA 3165).)
- ☐ Falsifying records, reports, or applications, upon conviction in a court, can bring a criminal fine of \$10,000 or up to six months in jail, or both.
- ☐ Assaulting a compliance officer or otherwise resisting, opposing, intimidating or interfering with a compliance officer in the performance of his or her duties is a criminal offense. Anyone convicted of such an action is subject to a criminal fine of not more than \$5,000 and imprisonment for not more than three years.

Adjustments to Proposed Penalty Amounts

The agency may adjust a penalty downward depending on the employer's good faith (demonstrated efforts to comply with the *OSH Act*), history of previous violations, and size of business. When the adjusted penalty amounts to less than \$100, OSHA does not propose any penalty. For serious violations, OSHA may also reduce the proposed penalty based on the gravity of the alleged violation. No good faith adjustment will be made for alleged willful violations.

Criminal Penalties

An employer who is convicted in a criminal proceeding of a willful violation of a standard that has resulted in the death of an employee may be fined up to \$250,000 (or \$500,000 if the employer is a corporation) or imprisoned up to six months, or both. A second conviction doubles the possible term of imprisonment.

Contesting Inspection Results

Employee Questions Regarding Inspection Results

Employees may request an informal conference with OSHA to discuss any issues raised by an inspection, citation, notice of proposed penalty, or employer's notice of intent to contest.

OSHA must conduct an informal conference within the 15 working day contest period. In addition, if OSHA initiated an inspection due to an employee complaint, the employee or authorized employee representative may request an informal review of any decision not to issue a citation.

Employees may contest:

- ☐ The time specified in the citation for abatement of a hazardous condition.
- ☐ An employer's petition for modification of abatement (PMA) requesting an extension of the abatement period. Employees must contest the PMA within 10 working days of its posting or within 10 working days after an authorized employee representative has received a copy.

Employees, however, may not contest citations, penalties, or lack of penalties.

Employer Appeals of Inspection Results

When issued a citation or notice of a proposed penalty, an employer may request an informal conference with OSHA's area director to discuss the case. OSHA authorizes its area directors to reach settlement agreements with employers that adjust citations and penalties to avoid prolonged legal disputes. As with informal conferences requested by employees, OSHA must conduct an informal conference requested by an employer within the 15-working-day contest period.

Petitions for Modification of Abatement

If an employer who has been cited for violations cannot meet the abatement dates as issued or amended at the informal conference, the employer must submit a request for an extension of time. This is called a "Petition for Modification of Abatement", or PMA. A PMA must be filed in writing with the area director who issued the citation no later than the close of the next working day following the date the director originally set for abatement.

Notices of Contest

If an employer decides to contest the citation, the time set for abatement, and/or the proposed penalty, he or she has 15 working days after receiving the citation and notice of proposed penalty to notify the OSHA area director in writing. An oral disagreement is not sufficient. This written notification is called a notice of contest.

Any employer, employee, or employee representative also may request an informal conference within the 15 working day contest period to discuss inspection results. Based on information and evidence presented at the informal conference, OSHA may enter into an informal settlement agreement with the employer, which could involve changes to citations, penalties, or abatement dates.

There is no specific format for the notice of contest. It must, however, clearly identify the employer's basis for filing a contest of the citation, notice of proposed penalty, abatement period, or notification of failure to correct the violation.

Reviews of Notices of Contest

If the written notice of contest has been filed within the required 15 working days, the OSHA area director forwards it to the Occupational Safety and Health Review Commission (OSHRC).

The commission is an independent federal agency created by the *OSH Act* to decide contested OSHA citations and penalties. It is not associated with OSHA or the Department of Labor.

The commission will assign an administrative law judge to hear the case. The administrative law judge may:

- ▣ Find the contest legally invalid and disallow it.
- ▣ Set a hearing for a public place near the employer's workplace.

The employer and the employees have the right to participate in the hearing.

Employer Appeals of Administrative Judge Rulings

Once the administrative law judge has ruled, any party to the case may request a further review by the commission.

Any of the three OSHRC commissioners also may, at his or her own motion, bring a case before the commission for review. Employers and OSHA may appeal commission rulings to the appropriate U.S. Court of Appeals.

Recordkeeping Forms

Following are the three forms are needed for recordkeeping:

- ★ ***OSHA Form 300 — Log of Work-Related Injuries and Illnesses.***
- ★ ***OSHA Form 301 — Injury and Illness Incident Report.***
- ★ ***OSHA Form 300A — Summary of Work-Related Injuries and Illnesses.***

These are official Federal OSHA forms with accompanying instructions and worksheets. Make copies of the blank forms for future use.

Section Notes:

Chapter 7 Emergency Response Plan & Fire Prevention Procedures

For: *Arena Fire Protection, Inc.*



Contents

| | |
|---|-----------|
| <i>Why Plan for Workplace Emergencies?</i> | 2 |
| Managing Workplace Emergencies | 2 |
| The Incident-Management System | 2 |
| An Incident-Management System for Your Workplace..... | 2 |
| <i>Developing an Emergency Plan</i> | 4 |
| Involve Employees in the Planning Process | 4 |
| Identify Emergencies that Could Affect Your Workplace | 4 |
| Establish a Chain of Command | 4 |
| Develop a Policy and Procedures for Responding to Emergencies | 7 |
| <i>Planning Considerations</i> | 9 |
| Accounting for Employees | 9 |
| Alerting Employees to an Emergency | 9 |
| Conducting Employee Rescues | 9 |
| Coordinating with Multi-Employer Workplaces | 9 |
| Developing Quick-Response Teams | 9 |
| Educating Employees about Emergencies and Evacuations | 9 |
| Establishing Evacuation Exits | 10 |
| Providing Medical Assistance and First Aid | 12 |
| Recording Critical Employee Information | 12 |
| Reporting Fires and Other Emergencies | 12 |
| Selecting and Using Personal Protective Equipment | 12 |
| <i>Types of Emergencies</i> | 13 |
| Earthquake | 13 |
| Explosion | 13 |
| Fire | 13 |
| Hazardous-Substance Release | 14 |
| Medical | 14 |
| Weather-Related Event | 15 |
| Threats of Violence | 15 |
| Terrorism | 15 |
| <i>OSHA's Emergency-Planning Rules</i> | 16 |
| Do You Need an Emergency Plan? | 16 |
| OSHA Fire Protection & Means of Egress Standards | 16 |
| Fire Extinguishers | 23 |
| Rule-by-rule summary | 27 |
| Emergency Action Plan Form | 28 |
| Training Drills & Exercises Chart | 30 |

Emergency Action/Response Plans

Why Plan for Workplace Emergencies?

When we think about workplace emergencies, if we think about them at all, it is usually after we learn about them through the news. Workplace emergencies can happen at any time; to be prudent, we should prepare for them. Because it is hard to think clearly during an emergency, it is essential to plan your response.

Emergency planning is the first step, and it can be challenging even if your workplace has few employees. You will need to determine what emergencies could affect your workplace, who will lead and make decisions during an emergency, and what procedures will ensure that employees respond appropriately. These elements are the foundation of a workplace emergency plan.

Emergency planning may not prevent emergencies, but it can protect lives, equipment, and property over the long term. This guide will help you plan for workplace emergencies so that you and your coworkers respond appropriately when an unlikely event happens.

Does OSHA Require Employers to Have Emergency Plans?

OSHA requires most employers to have emergency plans. Those that have more than 10 employees must have written plans. Those that have 10 or fewer employees do not have to put their plans in writing; however, they must ensure that their employees know what procedures to follow to protect themselves in an emergency. [See Page 19](#) for more information on the compliance requirements.

Managing Workplace Emergencies

The Incident-Management System

You can learn much about planning for workplace emergencies from professional emergency responders. When someone calls 911 to report an emergency, he or she connects with a local network of fire, police, and other emergency service professionals who will respond as efficiently as possible. This network is part of a larger incident-management system that can respond to an emergency and accomplish the following:

- ▣ Identify, locate, and determine the extent of the emergency.
- ▣ Determine the resources necessary to manage and control the emergency.
- ▣ Coordinate command-and-control responsibilities between police and fire departments, hospitals and other medical service providers, government agencies, and on-site responders.
- ▣ Establish and maintain communication between on-scene emergency responders and other emergency service providers.
- ▣ Provide for the safety of victims.

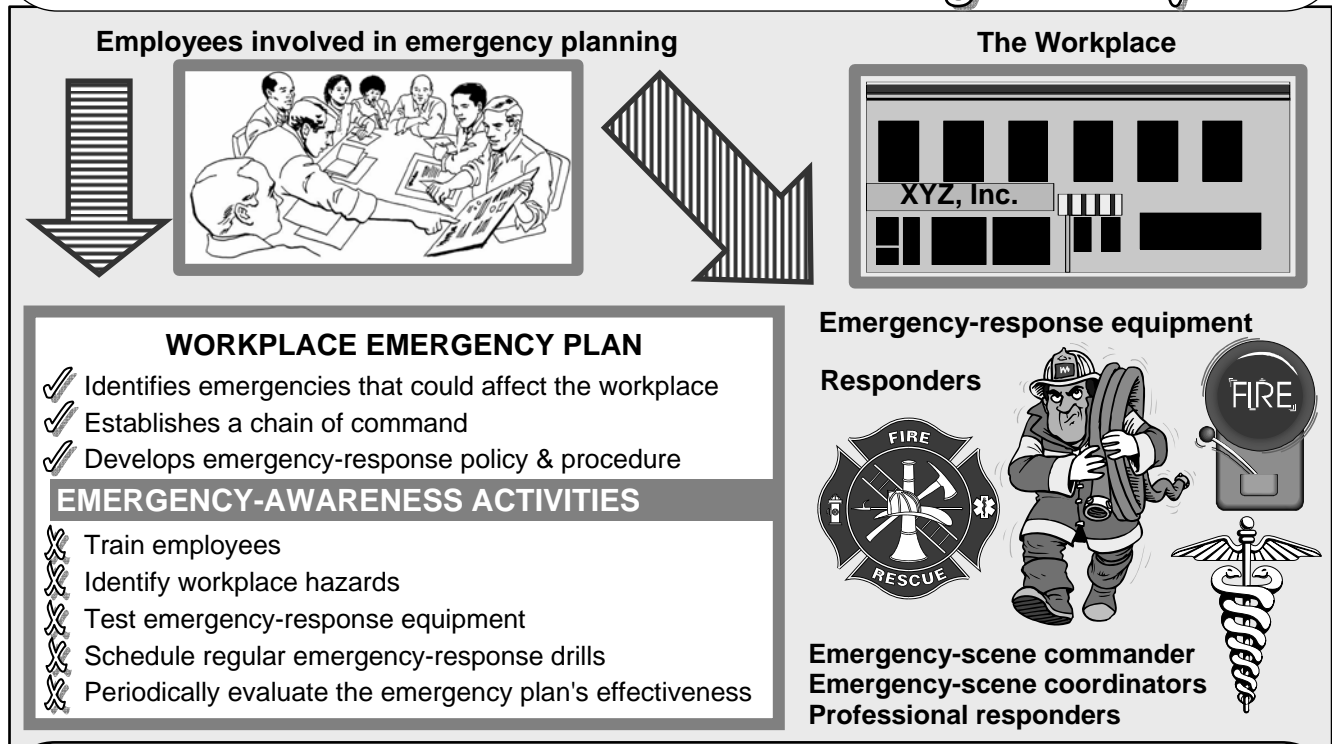
An Incident-Management System for Your Workplace

With thoughtful planning, you can create a small-scale version of the incident management system used by professional responders. Your workplace will be ready to respond to any emergency – from a heart attack to an earthquake – and manage it in the most effective, efficient way possible. The essential parts of this system are your employees, your emergency plan, communication and emergency-response equipment, and your workplace.

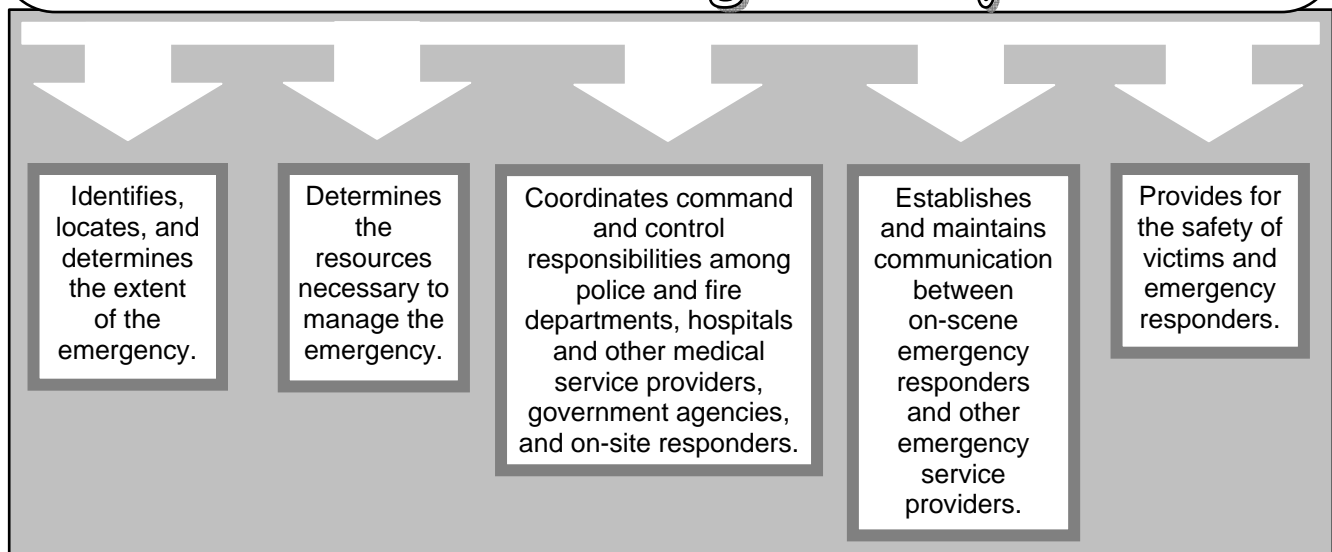
Here is how a workplace-incident management system should work during an emergency:

Trained employees, operating under a chain of command and following procedures in the emergency plan, determine the nature and extent of the emergency. They determine whether an evacuation is necessary, carry out critical emergency-scene activities to ensure the safety of others at their workplace, and communicate with professional responders, sharing critical information about the nature of the emergency.

Critical Elements of the Incident-Management System



What the Incident-Management System Does



Developing an Emergency Plan

Your goal is to create an emergency plan that ensures the well-being of everyone at your workplace in the most effective, efficient manner possible. But if you have never had to respond to a workplace emergency, how do you begin?

You begin by involving employees in the planning process, identifying emergencies that could affect your workplace, establishing an emergency chain of command, and developing emergency-response policy and procedures.

Involve Employees in the Planning Process

Perhaps the most important element of emergency planning is getting employees involved in the planning process; when employees participate, they will take the plan seriously and be more likely to respond appropriately during an emergency. From the start, they should be aware that the purpose of the plan is to ensure their safety.

- ▣ Form a team to help you develop the plan; ask for volunteers to join the team.
- ▣ Review the plan with your employees to ensure that they know the procedures to follow to respond safely in an emergency. Each employee should have a copy of the plan or know where to obtain one.
- ▣ Encourage employees to report workplace hazards and unsafe work practices that could contribute to an emergency.

Identify Emergencies that Could Affect Your Workplace

Identify any external incident (outside your workplace) that could threaten employees or the public and any incident within your workplace that could cause an emergency.

Examples include the following:

- ▣ Earthquake: *external*
- ▣ Explosion: *external or internal*
- ▣ Fire: *external or internal*
- ▣ Hazardous-substance release: *external or internal*
- ▣ Medical: *internal*
- ▣ Weather-related event (hurricane, tornado, blizzard, etc.): *external*
- ▣ Threat of violence: *external or internal*

Keep in mind... Electrical, heating and cooling, and telecommunication-system failures can disrupt workplace activities and contribute to emergencies. What effect would each have on your workplace? Human error also contributes to many workplace emergencies; are your employees trained to do their jobs safely?

Establish a Chain of Command

A chain of command links one person with overall responsibility for managing an emergency to others responsible for carrying out specific emergency-response tasks. A chain of command establishes who is in charge and ensures that everyone in the chain responds to emergencies in an organized way.

At the top of the chain is the emergency scene commander, a trained employee who has overall responsibility for managing emergencies.

Just below the emergency scene commander are the volunteer emergency scene coordinators.

In an organization that has multiple buildings or workplaces, the chain of command might also include a facility manager, an emergency director, and other management units, as shown in illustration 1a.

At many small- to medium-sized workplaces, the chain of command consists of an emergency scene commander and one or two volunteer emergency scene coordinators as shown in illustration 1b.

The Responsibilities of the Emergency Scene Commander

The emergency scene commander has overall command of a workplace emergency, including the following responsibilities:

- ▣ Assessing incidents to determine if it is necessary to order emergency response.
- ▣ Supervising emergency scene coordinators’ activities during an emergency.
- ▣ Coordinating the activities of professional responders such as ambulance, police, and fire departments.
- ▣ Directing shutdown of critical workplace equipment or operations.
- ▣ Determining if an evacuation is necessary and managing an evacuation.

Keep in mind... The emergency scene commander should be an employee who has experience managing others, assessing complex events, and making effective decisions under difficult circumstances.

The Role of the Emergency Scene Coordinators

Emergency scene coordinators are responsible for coordinating other employees’ activities during an emergency (guiding them to appropriate exits and safe areas during an evacuation, for example) and for other emergency-response tasks for which they have volunteered and been properly trained.

Illustration 1a

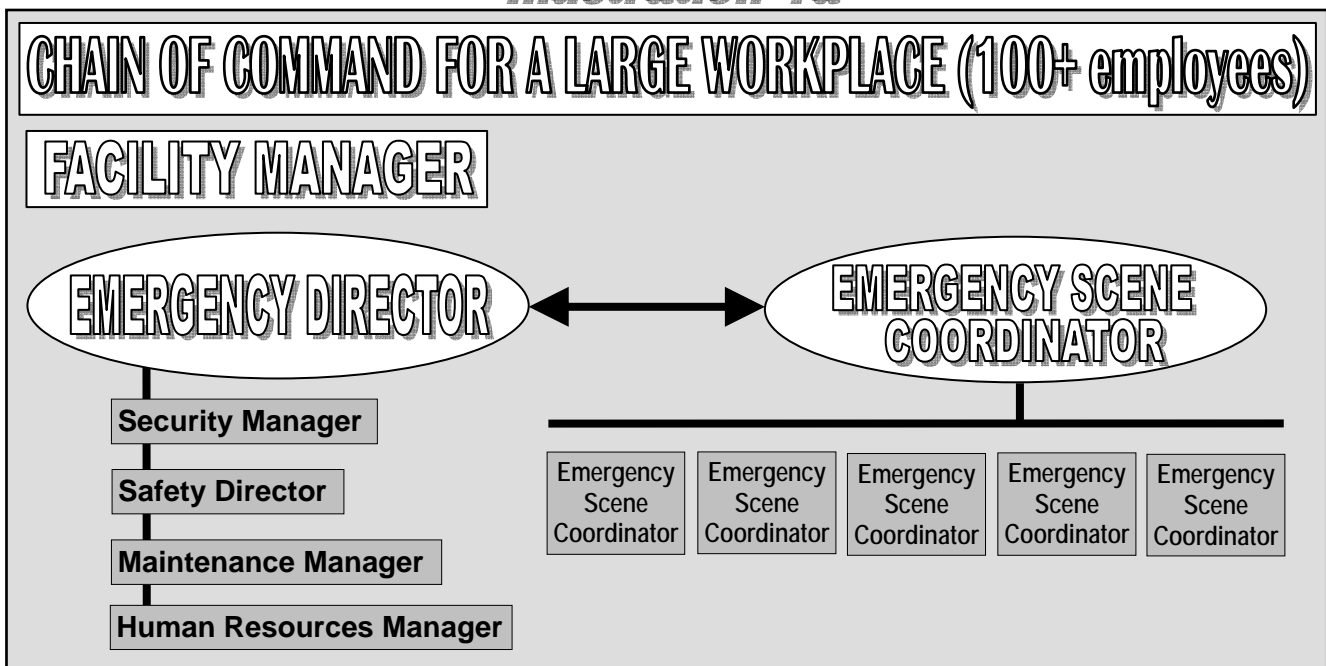


Illustration 1b

CHAIN OF COMMAND FOR A SMALL WORKPLACE (20 or fewer employees)

EMERGENCY SCENE COMMANDER

Emergency
Scene
Coordinator

Emergency
Scene
Coordinator

At small workplaces, the chain of command may consist of an Emergency Scene Commander and only one or two Emergency Coordinators.

Generally, each coordinator should be responsible for about 20 employees within a designated work area, as shown in the following table.

Number of Emergency-Scene Responders for Typical Workplaces

| <i>Total Employees in Workplace</i> | <i>Emergency Scene Commander</i> | <i>Emergency Scene Coordinator</i> |
|-------------------------------------|----------------------------------|------------------------------------|
| <i>11-19</i> | <i>1</i> | <i>1</i> |
| <i>20-49</i> | <i>1</i> | <i>1-2</i> |
| <i>50-99</i> | <i>1</i> | <i>2-5</i> |
| <i>100-249</i> | <i>1</i> | <i>5-12</i> |
| <i>250+</i> | <i>1</i> | <i>12+</i> |

Emergency scene coordinators must know how to respond to all emergencies identified in your emergency plan, the evacuation procedures for your workplace, and how to use emergency communication equipment. They should also know CPR, first aid, and how to respond to threats of violence. Their primary responsibilities include the following:

- ▣ Checking rooms and other enclosed spaces for employees who may be trapped or unable to evacuate during an emergency.
- ▣ Knowing who may need assistance during an evacuation and how to assist them.
- ▣ Coordinating the emergency activities of employees.
- ▣ Ensuring that employees understand how to respond to workplace emergencies.
- ▣ Knowing the workplace layout, appropriate escape routes, and areas that employees must not enter during an evacuation.
- ▣ Verifying that employees are in designated safe areas after an evacuation.

Keep in mind... Establishing a chain of command minimizes confusion during an emergency. An effective chain of command helps ensure that responders manage an emergency in the most efficient way possible.

Develop a Policy and Procedure for Responding to Emergencies

The Policy

Create a short written policy that states the purpose of the plan and emphasizes that you are committed to ensuring the safety of employees and others at your workplace during an emergency. The following is an example:

"It is the policy of this organization to protect employees from physical harm, harassment, and intimidation. To provide a safe working environment for all employees, this organization is committed to establishing an effective emergency plan. The plan is based on an "Incident Management System" (IMS) that consists of volunteer employees trained to respond to any workplace emergency. The system is modeled on the IMS system used by fire, police, and emergency medical-service responders. It provides for overall command and control of any emergency incident. It improves communication between IMS personnel and the fire, police, and medical personnel who respond to a call for help. And it provides appropriate emergency assistance during the first few minutes it takes for emergency responders to arrive."

The Procedures

Procedures are instructions for accomplishing specific tasks. Emergency procedures are important because they tell employees exactly what to do to ensure their safety during an emergency. If your workplace has more than 10 employees, your emergency plan must describe in writing how you will accomplish each of the following tasks:

- ☐ Report emergencies to local fire and police departments.
- ☐ Inform the emergency chain of command of an emergency.
- ☐ Warn employees about an emergency.
- ☐ Conduct an orderly, efficient workplace evacuation.
- ☐ Assist employees, with disabilities or limited English-speaking skills during an evacuation.
- ☐ Shut down critical equipment, operate fire extinguishers, and perform other essential services during an evacuation.
- ☐ Account for employees at a designated safe area after an evacuation.
- ☐ Perform rescue and first aid that may be necessary during an emergency.

Keep in mind... If your workplace has 10 or fewer employees, you do not have to put these procedures in writing; however, you must ensure that employees know what procedures they must follow to protect themselves.

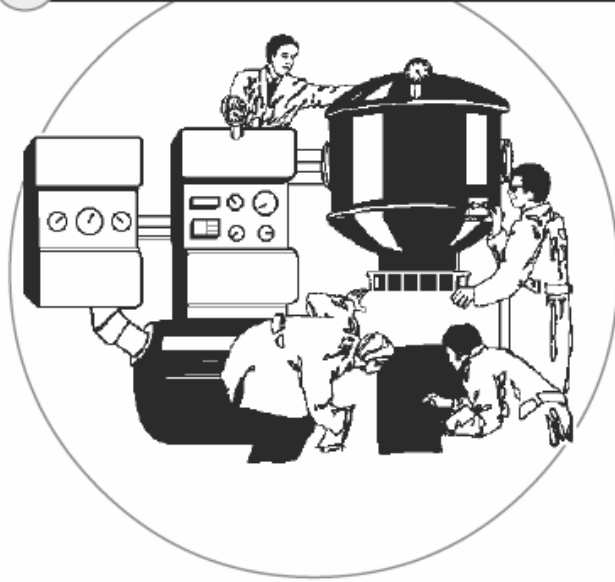
Other Critical Information

Include the following in your procedures:

- ☐ The names of the emergency scene commander, the emergency scene coordinators,
- ☐ and others responsible for carrying out the plan, and how to contact them during an emergency.
- ☐ The name of the person who has the authority to order a workplace evacuation (typically, the emergency scene commander).
- ☐ The names and phone numbers of those who understand the emergency plan and will inform others about it (typically the emergency scene commander and the emergency scene coordinators).

The Emergency Planning Process

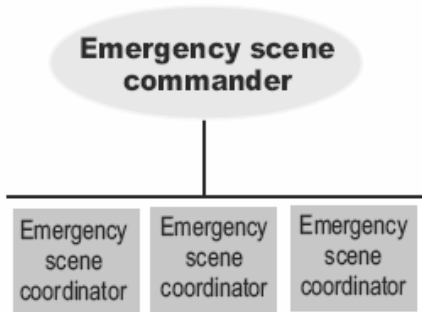
1 Involve employees



2 Identify possible incidents



3 Establish a chain of command



4 Develop procedures



5 Your workplace emergency plan



Planning Considerations

Accounting for Employees after an Evacuation

Designate a meeting area a safe distance away from the emergency site and ensure that employees know they must meet there after they evacuate the workplace. An emergency scene coordinator should take a "Roll-Call" to identify employees not present.

Keep in mind... You will need to determine what information or assistance employees may need if they can not return to the workplace after an evacuation.

Alerting Employees to an Emergency

You can use a public address system, portable radio, an alarm, an air-horn, or any other means that you know will reach and warn all employees. Alarms must be distinctive, be recognizable by all employees, and have a back-up power supply in case the primary power fails.

Keep in mind... You may need alarms that employees can hear and see.

Conducting Employee Rescues

It takes more than good intentions to save lives. Would-be rescuers can endanger themselves and those they are trying to rescue. During most emergencies, leave rescue work to professional responders who are appropriately trained and equipped. The exceptions? A catastrophe, such as a severe earthquake, may delay professional emergency responders for hours or days. Also, jobs such as handling hazardous substances or working in confined spaces could result in emergencies for which fire or police departments are not trained.

Find out what kind of emergencies local responders are trained and equipped to respond to. If they are unable to respond to emergencies unique to your workplace, your employees must be trained and able to respond promptly.

Coordinating with Multi-Employer Workplaces

If you share a building or worksite with other employers, consider working with them to develop a building-wide emergency plan. If a building-wide plan is not feasible, you should ensure that your plan does not conflict with the plans of the other employers in the building.

Developing Quick-Response Teams

A quick-response team consists of volunteer employees trained to handle workplace incidents that require immediate action, such as medical emergencies, threatening or violent people, and hazardous-substance releases. Consider the following in developing quick response teams:

- ☐ Types of incidents that require immediate action
- ☐ Roles and responsibilities of team members
- ☐ Communication and response procedures for the team

Educating Employees about Emergencies and Evacuations

To protect themselves during an emergency, all employees must understand the following elements of their emergency plan:

- ☐ The roles of the emergency scene commander and coordinators.
- ☐ How to respond to threats and intimidation.

- ▣ The method(s) for warning employees of emergencies.
- ▣ The method for contacting employees' next of kin after an emergency.
- ▣ The procedure for summoning emergency responders.
- ▣ The location of safe meeting areas.
- ▣ How to respond to an emergency and to an order to evacuate.

Educate new employees about the emergency plan when you hire them and keep all employees informed about any changes to the plan.

Train emergency scene coordinators in first aid and CPR, bloodborne-pathogen protection, and how to use rescue equipment.

Schedule regular drills so that employees can practice. Include outside fire and police departments in the drills when possible. Evaluate the effectiveness of each drill and identify activities that need strengthening. Share the results with all employees.

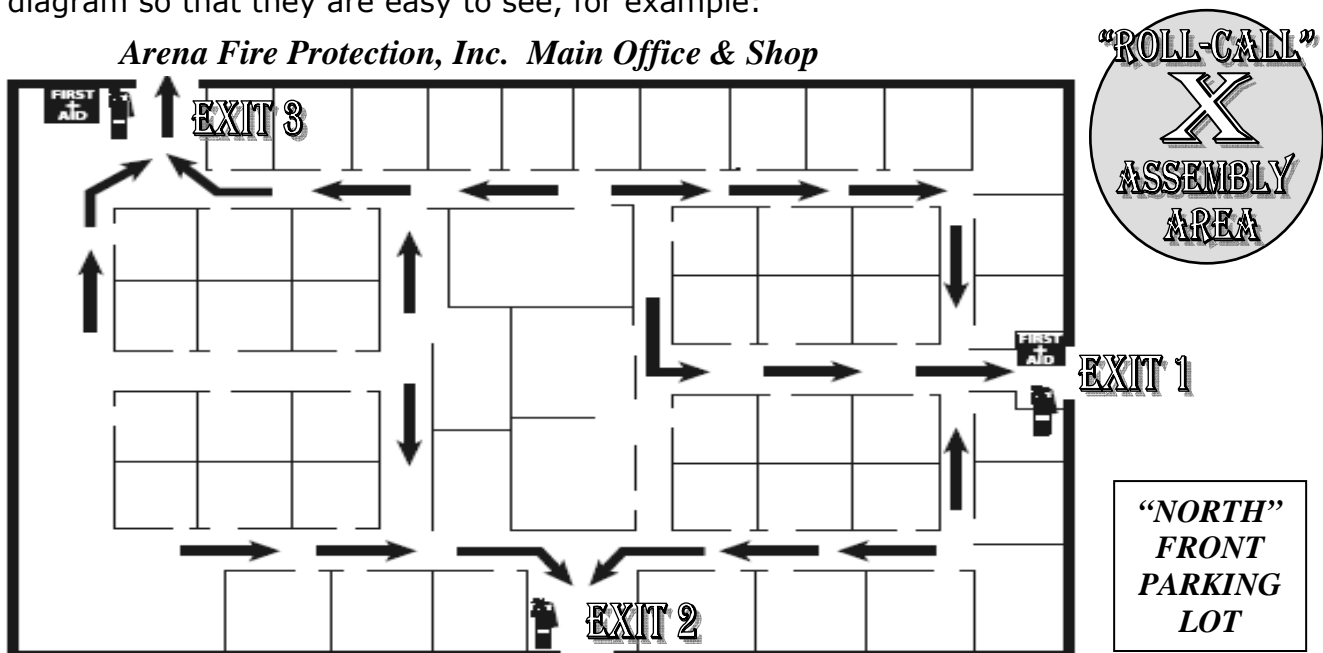
When a workplace emergency requires an evacuation, all employees must know to leave, what emergency exits to take, and where to meet. Employees may also need to know how to shut down critical equipment during an evacuation.

Establishing Evacuation Exits

Your workplace should have a primary evacuation exit and an alternate exit. Post diagrams that show the evacuation routes and the exits where all employees will see them. Identify the exits and the exit routes in your plan. Characteristics of exits:

- ▣ They are clearly marked, well lit, and visible under emergency conditions.
- ▣ They are wide enough to accommodate employees during an evacuation.
- ▣ They are unobstructed and clear of debris at all times.
- ▣ They are unlikely to expose employees to other hazards.

Keep in mind... An essential part of your emergency plan is an evacuation diagram – a floor plan of your building that shows evacuation exits and describes the emergency evacuation procedure. Mark the exit routes and the “Roll-Call” assembly area on the diagram so that they are easy to see, for example:



Exit Routes

How would you escape from your workplace in an emergency? Do you know where all the exits are in case your first choice is too crowded? Are you sure the doors will be unlocked and that the exit access behind them will not be blocked during a fire, explosion, or other crisis? Knowing the answers to these questions could keep you safe during an emergency.

Workplace Exit Routes

Usually, a workplace must have at least two exit routes for prompt evacuation. But more than two exits are required if the number of employees, size of the building, or arrangement of the workplace will not allow a safe evacuation. Exit routes must be located as far away as practical from each other in case one is blocked by fire or smoke.

Requirements for Exits

- ❑ Exits must be separated from the workplace by fire-resistant materials – that is, a one-hour fire-resistance rating if the exit connects three or fewer stories, and a two-hour fire-resistance rating if the exit connects more than three floors.
- ❑ Exits can have only those openings necessary to allow access to the exit from occupied areas of the workplace or to the exit discharge. Openings must be protected by a self-closing, approved fire door that remains closed or automatically closes in an emergency.
- ❑ Keep the line-of-sight to exit signs clearly visible always.
- ❑ Install “EXIT” signs using plainly legible letters.

Safety Features for Exit Routes

- ❑ Keep exit routes free of explosives or highly flammable furnishings and other decorations.
- ❑ Arrange exit routes so employees will not have to travel toward a high-hazard area unless the path of travel is effectively shielded from the high-hazard area.
- ❑ Ensure that exit routes are free and unobstructed by materials, equipment, locked doors, or dead-end corridors.
- ❑ Provide lighting for exit routes adequate for employees with normal vision.
- ❑ Keep exit route doors free of decorations or signs that obscure their visibility of exit route doors.
- ❑ Post signs along the exit access indicating the direction of travel to the nearest exit and exit discharge if that direction is not immediately apparent.
- ❑ Mark doors or passages along an exit access that could be mistaken for an exit “Not an Exit” or with a sign identifying its use (such as “Closet”).
- ❑ Renew fire-retardant paints or solutions when needed.
- ❑ Maintain exit routes during construction, repairs, or alterations.

Design and Construction Requirements

- ❑ Exit routes must be permanent parts of the workplace.
- ❑ Exit discharges must lead directly outside or to a street, walkway, refuge area, public way, or open space with access to the outside.

- ▣ Exit discharge areas must be large enough to accommodate people likely to use the exit route.
- ▣ Exit route doors must unlock from the inside. They must be free of devices or alarms that could restrict use of the exit route if the device or alarm fails.
- ▣ Exit routes can be connected to rooms only by side-hinged doors, which must swing out in the direction of travel if the room may be occupied by more than 50 people.
- ▣ Exit routes must support the maximum permitted occupant load for each floor served, and the capacity of an exit route may not decrease in the direction of exit route travel to the exit discharge.
- ▣ Exit routes must have ceilings at least 7 ft., 6 in. high.
- ▣ An exit access must be at least 28 inches wide at all points. Objects that project into the exit must not reduce its width.

Providing Medical Assistance and First Aid

Is there a nearby emergency clinic or hospital that will admit victims of emergencies from your workplace? If not, make sure that emergency scene coordinators have appropriate first-aid training and supplies. The American Red Cross, insurance companies, and fire departments usually offer such training.

Recording Critical Employee Information

After a medical emergency, an employee may be unable to contact next of kin or other relatives. You should have access to employees' home telephone numbers, the names and telephone numbers of family members they want you to contact, physician names and phone numbers, and information employees give you about their medical conditions or medications. Many employers keep this information with employees' permanent employment records and update it yearly.

Reporting Fire and Other Emergencies

Your emergency plan must have a procedure for reporting fires and other emergencies to professional responders. Report all fires by calling 911. Fires are generally not reported to fire departments by fire alarms; most fire alarms warn only building occupants.

Keep in mind... The emergency scene commander should stay in a safe location to relay relevant information to professional emergency responders.

Selecting and Using Personal Protective Equipment

Personal protective equipment includes clothing and equipment that protects emergency responders against specific hazards. Examples include work gloves, goggles, hard hats, and respirators.

Properly used, personal protective equipment offers protection against a hazard but does not eliminate the hazard. If it fails or is not appropriate for a particular task, the user risks exposure. Appropriate, effective protection depends on selecting, wearing, and using the equipment properly – which can be challenging. The following steps highlight the procedures for selecting personal protective equipment:

Step

Action

- ① Identify emergency-related hazards for which personal protective equipment may be necessary; for example, those responding to medical emergencies need protection from bloodborne pathogens.
- ② Determine which personal protective equipment will protect users from the hazards; for example, latex gloves and face shields may be necessary to protect responders from bloodborne pathogens.
- ③ Determine who will use the equipment; it is critical that the equipment fit the user and not cause allergic reactions or other health problems.
- ④ Determine the conditions under which responders will use the equipment; the equipment must not fail under those conditions.
- ⑤ Ensure that emergency responders know how to use the equipment. Whether they are wearing hard hats or atmosphere-supplying respirators, responders must know how the equipment will protect them and when it will not protect them. Responders must know how to wear, use, and maintain the equipment, and how to discard contaminated equipment.

Types of Emergencies

This section highlights emergencies that could affect workplaces and summarizes what to do when responding to them. Consider factors such as workplace size and location, number of employees, and the nature of their work in determining how to respond.

Earthquake

During an earthquake, people in most workplaces are at greatest risk from collapsing ceilings, windows, light fixtures, and other falling objects. If you are indoors, the safest response is to take cover under sturdy furniture or to brace yourself against an inside wall. Stay away from windows, skylights, bookcases, and other heavy objects. Protect your head and neck.

What to do:

- ☐ If indoors, stay there. Take cover under sturdy furniture or against inside walls.
- ☐ Do not use elevators.
- ☐ Stay away from windows, skylights, and other objects that could fall.
- ☐ Use stairways to leave the workplace if the order is given to evacuate.
- ☐ Be ready to rescue victims; professional responders may not be able to respond; remove victims to a triage area if possible.

Explosion

Any workplace that handles, stores, or processes flammable gasses, liquids, and solids is vulnerable. Explosions offer no warnings, causing disorganization and panic.

What to do:

- ☐ Try to establish communication with emergency scene coordinators.
- ☐ Assess damage to the workplace and estimate human casualties.
- ☐ Administer first aid if it is safe to do so.
- ☐ Do not use elevators.
- ☐ Evacuate following an established procedure.

Fire

Invite a local fire department representative to your workplace to help you identify fire hazards and to discuss how your workplace should respond to a fire. It is the byproducts of fire – smoke and fire gasses – that kill. A quick, orderly evacuation is the most effective response to an out-of-control fire.

What to do:

- ☐ Pull the fire alarm (or set off the predetermined signal).
- ☐ Call 911; tell the dispatcher the location and the nature of the emergency.
- ☐ Inform an emergency scene coordinator.
- ☐ Do not use elevators.
- ☐ Permit only trained responders to use fire extinguishers.

Keep in mind... If you permit emergency scene coordinators or other employees to use fire extinguishers, train them or ensure that they are properly trained in their use.

Hazardous-Substance Release

Hazardous substances include solvents, pesticides, paints, petroleum products, and heavy metals – any substance hazardous to health. Even if your workplace does not use hazardous substances, could it be affected by a nearby release or an accident on a local freeway? If so, make sure your emergency plan describes how the scene commander and coordinators will respond and notify fire and police departments.

What to do:

- ☐ Inform the emergency scene commander.
- ☐ Evacuate the area surrounding the release.
- ☐ Call 911; tell the dispatcher the location and the nature of the emergency.

If your workplace uses hazardous chemicals, OSHA's hazard communication rule requires you to inventory them, keep the manufacturer-supplied material safety data sheets, label the chemical containers, and train employees to protect themselves from the chemicals' hazards.

If your workplace is involved in hazardous-waste operations or responds to emergencies involving hazardous substances, you must have a written plan that describes how you will respond to hazardous-substance emergencies.

If employees must wear personal protective equipment during an emergency – chemical suits, gloves, hoods, boots, or respirators, for example – make sure that equipment will be available when they need it, that it fits them, and that they know how to use it.

Medical

The most likely workplace emergency is a medical emergency. A serious medical emergency such as cardiac arrest requires immediate attention – response time is critical. It is essential that medical first responders know how to perform first aid/CPR.

What to do:

- ☐ Call 911. Tell the dispatcher the location and the nature of the emergency.
- ☐ Do not move the victim.
- ☐ Notify an emergency scene coordinator for CPR or other first-aid tasks.
- ☐ Inform the emergency scene commander.

- ▣ Assist professional medical responders when they arrive.
- ▣ Inform the victim's supervisor.

Consider purchasing an automatic external defibrillator (AED) to treat victims in cardiac arrest. Until recently, AEDs were used primarily in hospitals and ambulances. Now they are portable, more affordable, and can be used by just about anyone after a short training session.

Weather-Related Event

Hurricanes, tornadoes, blizzards, and floods are likely to be the cause of weather-related workplace emergencies. Many communities experience floods following warm spring rain. Winter storms often bring strong winds, freezing rain, and snow that can cause structural damage and power outages.

What to do:

- ▣ Wait for instructions from the emergency scene commander; a power failure will slow communication.
- ▣ Tune a battery-powered radio to a station that broadcasts local news.
- ▣ Do not evacuate the workplace unless ordered to do so.

Threats of Violence

Threats of violence may be delivered in any form: face-to-face, by fax, e-mail, phone, or in writing. Threats can be directed toward the workplace or toward a specific person. Police departments, mental health professionals, and employee-assistance program counselors offer prevention information, security inspections, and employee training that help reduce the risk of workplace violence.

What to do:

- ▣ Inform an emergency scene coordinator.
- ▣ Activate a silent alarm if your workplace has one.
- ▣ Isolate the threatening person if it is possible to do so safely.
- ▣ Inform the emergency scene commander.

Bomb Threats

Take threats seriously. Do not use fire alarms or phones in the building – they generate radio waves that could trigger a bomb. If someone finds a package that may contain or that may be a bomb, he or she should note its size, shape, and whether it emits a sound, then notify the emergency scene commander. Call 911 from outside the building to report the emergency and determine if an evacuation is necessary. Use a communication method that does not generate radio waves to order the evacuation.

Consider offering threat-management training to one or more emergency scene coordinators and creating a threat quick-response team.

Terrorism

Although terrorist acts pose minimal risks to most workplaces, the devastating effects of recent acts have changed the perception of a "secure workplace" and added a new dimension to emergency planning. What distinguishes terrorist acts is the use of threats and violence to intimidate or coerce. Factors to consider in emergency planning include the following:

How do others perceive the mission of your organization in the following contexts?

- | | |
|---|--|
| <input type="checkbox"/> Political activities | <input type="checkbox"/> Economic activities |
| <input type="checkbox"/> Business activities | <input type="checkbox"/> Social responsibilities |

How vulnerable are your critical resources from terrorist attack?

- Production machinery and equipment
- Mail and HVAC systems
- Electronic communication, power, data, and systems hardware
- Real estate and other physical property
- Finance and administrative transactions
- Employees at the workplace or at other locations

Do You Need an Emergency Plan?

Keep in mind... If your workplace has more than 10 employees, the plan must be in writing. If your workplace has 10 or fewer employees, the plan does not have to be written; however, you must ensure that employees know what procedures they must follow to protect themselves in an emergency.

OSHA Fire Protection and Means of Egress Standards

FIRE PREVENTION PLAN

(1) Development of a Fire Prevention Plan

- (a) When another OSHA standard requires an employer to develop a fire prevention plan, the plan must comply with this section and cover each part of the workplace.
- (b) The plan must be in writing, in the work area and available to employees on request; except that an employer with 10 or fewer employees in a workplace may use a verbal plan.

(2) Minimum Elements of a Fire Prevention Plan – A fire prevention plan must include:

- (a) a list of all major fire hazards, including proper handling and storage procedures for hazardous materials, potential ignition sources and their control, and the type of fire protection equipment necessary to control each major hazard;
- (b) procedures to control accumulations of flammable and combustible waste materials;
- (c) procedures for regular maintenance of safeguards on heat producing equipment to prevent accidental ignition of combustible materials;
- (d) names or job titles of employees responsible for maintaining equipment to prevent or control sources of ignition or fires; and,
- (e) names or job titles of those responsible for control of fuel source hazards.

(3) Employee Information – The employer must:

- (a) inform employees of the fire hazards in their work area; and
- (b) review with each employee, when first assigned to a job, those parts of the fire prevention plan necessary for self-protection.

EMERGENCY ACTION PLAN

(1) Development of an Emergency Action Plan

- (a) When another OSHA standard requires an employer to develop an emergency action plan, the plan must comply with this section and cover each part of the workplace.
- (b) The plan must be in writing, in the work area and available to employees on request, except that an employer with 10 or fewer employees in a workplace may use a verbal plan.

(2) Minimum Elements of an Emergency Action Plan – An emergency action plan must include:

- (a) procedures for emergency evacuation, including type of evacuation and exit route assignments;
- (b) procedures to account for all employees after evacuation;
- (c) procedures for reporting a fire or other emergency;
- (d) procedures to follow for emergency operation or shut down of critical equipment before evacuation;
- (e) procedures to follow for rescue and medical duties; and,
- (f) names or job titles of employees to contact for more information about the duties of employees under the plan.

(3) Employee Alarm System – There must be a properly working employee alarm system. The alarm system must use a distinctive signal for each purpose and comply with 29 CFR 1910.165.

(4) Training – An employer must designate employees to assist in the safe emergency evacuation of other employees. These designated employees must receive training in emergency evacuation procedures.

(5) Employee Review – An employer must review the emergency action plan with each employee covered by it:

- (a) when the plan is new or the employee is new to the job;
- (b) when the employee's responsibilities under the plan change; and,
- (c) when the plan changes.

EXITS AND EXIT ROUTES

(1) Application – This subpart does not apply to mobile workplaces, such as vehicles or vessels.

(2) Definitions

- (a) **Exit.** The part of the exit route that is a way out of the workplace (Like a door, stairwell or vestibule).
- (b) **Exit Route.** A continuous, unobstructed path from anywhere in a work area to the exit.

(3) General

- (a) There must be permanent, unobstructed exit routes to get out of work areas safely during emergencies.
- (b) There must be two or more exit routes depending on the size and layout of the work area and the number of people involved. A single exit route is acceptable only if all workers can get out through it safely during an emergency. Locate multiple exit routes apart from each other.

(4) Design

- (a) An exit must have enough openings to permit access to, or exit from, occupied areas. An interior opening into an exit must have a self-closing fire door that remains closed. Each fire door, its frame, and its hardware must be listed or approved by a nationally recognized testing laboratory.

Note to paragraph (a): 29 CFR 1910.155(c)(3)(iv)(A) defines "listed," 29 CFR 1910.7 defines a "nationally recognized testing laboratory," and 29 CFR 1910.155 (c)(3) defines "approved."

- (b) Walls or partitions that separate an exit from other areas must have at least a 1-hour fire resistance rating if the exit connects three stories or less. Materials that separate an exit must have at least a 2-hour fire resistance rating if the exit connects four stories or more.
- (c) Exits must open from the inside without keys, tools or special knowledge. Devices that lock only from the outside are acceptable. There must be nothing on an exit door that could hinder its use during an emergency.

Note: You may lock or block an exit door from the inside in a mental, penal, or correctional institution, if supervisory personnel are continuously on duty and a plan exists to remove occupants during an emergency.

- (d) An exit must lead directly outside or to a street, walkway, refuge area, or to an open space with access to the outside.
- (e) Exit stairs that continue beyond the floor of exit discharge must have doors, partitions, or other effective means at the floor of exit discharge to assure that the direction of exit travel is clear to employees.
- (f) Use only a side-hinged exit door to connect any room to an exit route. The door must swing out if the room can hold more than 50 persons or has highly flammable or explosive materials in it.
- (g) Each exit route must be able to handle the maximum-permitted occupant load for each floor served by it. The capacity of a path to the exit must not decrease as people move toward the exit.
- (h) The exit route must be at least 6 feet, 8 inches high at all points.
- (i) An exit route must be at least 28 inches wide at all points between handrails and wider if needed to handle the occupant load.
- (j) Objects that project into the exit route must not reduce the minimum height and width of the exit route.
- (k) Repair or replace damaged or altered fire retardant coatings to keep their original retardant effectiveness.

(5) Access

- (a) There must be unobstructed access to exit routes.
- (b) Exit routes must not pass through or into lockable rooms or dead ends.
- (c) Exit routes must be mostly level or have stairs or ramps.

(6) Outside and Refuge Areas

- (a) The street, walkway, refuge area, or open space to which an exit leads must be large enough to accommodate all building occupants likely to use that exit.
- (b) A refuge area must be:
 - (A) a space along an exit route protected from the effects of fire either by separation from other spaces within the building or by its location; or
 - (B) a floor with at least two spaces separated by smoke-resistant partitions, in a building where each floor is protected by an automatic sprinkler system. Automatic sprinkler systems must comply with 29 CFR 1910.159.

(7) Outside Exit Routes

- (a) Outdoor exit routes must meet the requirements for indoor exit routes and these additional requirements:
 - (A) The exit route must have guardrails to protect unenclosed sides elevated above a lower surface;
 - (B) There must be a cover if accumulation of snow or ice is likely;
 - (C) The exit route must be reasonably straight, smooth, solid, level; and
 - (D) The exit route must have no dead ends longer than 20 feet.

(8) Condition of Exit Routes and Exits

- (a) Exit routes must minimize danger to employees during emergencies.
- (b) Exit routes must be free of highly flammable furnishings and decorations.
- (c) An exit route must not require employees to travel toward materials that burn very quickly, emit poisonous fumes, or are explosive, unless those materials are effectively shielded from the exit route.
- (d) Exit routes must have adequate lighting.
- (e) Each exit must be clearly visible and must have a distinctive sign reading "Exit." Install additional directional signs to exits where necessary.
- (f) Exit doors must have no signs or decorations that obscure their visibility.
- (g) The line-of-sight to an exit sign must be clear.

- (h) If workers could mistake a “non-exit” for an exit, mark the non-exit, “Not an Exit” or mark it to indicate its real use.
- (i) There must be enough reliable light on or from exit signs to allow them to be effective during emergencies.
- (j) All safeguards to protect employees during an emergency (e.g., sprinkler systems, alarm systems, fire doors, exit lighting) must work properly.

(9) Exits during Construction and Repair

- (a) Employees must not occupy an area under construction until an adequate number of exit routes that comply with these rules are available.
- (b) Employees must not occupy an area during repair or alteration unless all exits and existing fire protection remain as effective as before the work. Alternate fire protection must provide an equivalent level of safety.
- (c) Flammable or explosive materials used during construction or repair must not expose employees to hazards not otherwise present or impede emergency escape.

(10) Alarm System – There must be an operable employee alarm system with a distinctive signal to warn employees of fire or other emergencies, unless employees can see or smell a fire or other hazard so that it would provide adequate warning to them. The employee alarm system must comply with the requirements of 29 CFR 1910.165.

(11) Special Circumstances - Counterweights and Cold Storage Facilities

- (a) There must be an enclosure or guard around counterweights that are near enough to passageways or work areas to cause a hazard. The guard or enclosure need only be sufficient to protect workers from contact with the counterweight when it moves.
- (b) The doors on walk-in refrigerators, coolers and freezers must have latches or closer devices that open from the inside without a key or special knowledge or effort.

PORTABLE FIRE SUPPRESSION EQUIPMENT

§1910.157 PORTABLE FIRE EXTINGUISHERS

(a) Scope and Application – The requirements of this section apply to the placement, use, maintenance, and testing of portable fire extinguishers provided for the use of employees. Paragraph (d) of this section does not apply to extinguishers provided for employee use on the outside of workplace buildings or structures. Where extinguishers are provided but are not intended for employee use and the employer has an emergency action plan and a fire prevention plan which meet the requirements of §1910.38, then only the requirements of paragraphs (e) and (f) of this section apply.

(b) Exemptions

- (1) Where the employer has established and implemented a written fire safety policy which requires the immediate and total evacuation of employees from the workplace upon the sounding of a fire alarm signal and which includes an emergency action plan and a fire prevention plan which meet the requirements of §1910.38, and when extinguishers are not available in the workplace, the employer is exempt from all requirements of this section unless a specific standard in Part 1910 requires that a portable fire extinguisher be provided.
- (2) Where the employer has an emergency action plan meeting the requirements of §1910.38 which designates certain employees to be the only employees authorized to use the available portable fire extinguishers, and which requires all other employees in the fire area to immediately evacuate the affected work area upon the sounding of the fire alarm, the employer is exempt from the distribution requirements in paragraph (d) of this section.

(c) General Requirements

- (1) The employer shall provide portable fire extinguishers and shall mount, locate and identify them so that they are readily accessible to employees without subjecting the employees to possible injury.

- (2) Only approved portable fire extinguishers shall be used to meet the requirements of this section.
- (3) The employer shall not provide or make available in the workplace portable fire extinguishers using carbon tetrachloride or chlorobromomethane extinguishing agents.
- (4) The employer shall assure that portable fire extinguishers are maintained in a fully charged and operable condition and kept in their designated places at all times except during use.
- (5) The employer shall remove from service all soldered or riveted shell self-generating soda acid or self-generating foam or gas cartridge water type portable fire extinguishers which are operated by inverting the extinguisher to rupture the cartridge or to initiate an uncontrollable pressure generating chemical reaction to expel the agent.

(d) Selection and Distribution

- (1) Portable fire extinguishers shall be provided for employee use and selected and distributed based on the classes of anticipated workplace fires and on the size and degree of hazard which would affect their use.
- (2) The employer shall distribute portable fire extinguishers for use by employees on Class A fires so that the travel distance for employees to any extinguisher is 75 feet (22.9 m) or less.
- (3) The employer may use uniformly spaced standpipe systems or hose stations connected to a sprinkler system installed for emergency use by employees instead of Class A portable fire extinguishers, provided that such systems meet the respective requirements of §1910.158 or §1910.159, that they provide total coverage of the area to be protected, and that employees are trained at least annually in their use.
- (4) The employer shall distribute portable fire extinguishers for use by employees on Class B fires so that the travel distance from the Class B hazard area to any extinguisher is 50 feet (15.2 m) or less.
- (5) The employer shall distribute portable fire extinguishers used for Class C hazards on the basis of the appropriate pattern for the existing Class A or Class B hazards.
- (6) The employer shall distribute portable fire extinguishers or other containers of Class D extinguishing agent for use by employees so that the travel distance from the combustible metal working area to any extinguishing agent is 75 feet (22.9 m) or less. Portable fire extinguishers for Class D hazards are required in those combustible metal working areas where combustible metal powders, flakes, shavings, or similarly sized products are generated at least once every two weeks.

(e) Inspection, Maintenance and Testing

- (1) The employer shall be responsible for the inspection, maintenance and testing of all portable fire extinguishers in the workplace.
- (2) Portable extinguishers or hose used in lieu thereof under paragraph (d)(3) of this section shall be visually inspected monthly.
- (3) The employer shall assure that portable fire extinguishers are subjected to an annual maintenance check. Stored pressure extinguishers do not require an internal examination. The employer shall record the annual maintenance date and retain this record for one year after the last entry or the life of the shell, whichever is less. The record shall be available to the Assistant Secretary upon request.
- (4) The employer shall assure that stored pressure dry chemical extinguishers that require a 12-year hydrostatic test are emptied and subjected to applicable maintenance procedures every 6 years. Dry chemical extinguishers having non-refillable disposable containers are exempt from this requirement. When recharging or hydrostatic testing is performed, the 6-year requirement begins from that date.
- (5) The employer shall assure that alternate equivalent protection is provided when portable fire extinguishers are removed from service for maintenance and recharging.

(f) Hydrostatic Testing

- (1) The employer shall assure that hydrostatic testing is performed by trained persons with suitable testing equipment and facilities.

- (2)** The employer shall assure that portable extinguishers are hydrostatically tested at the intervals listed in Table L-1 of this section, except under any of the following conditions:
- (i)** When the unit has been repaired by soldering, welding, brazing, or use of patching compounds;
 - (ii)** When the cylinder or shell threads are damaged;
 - (iii)** When there is corrosion that has caused pitting, including corrosion under removable name plate assemblies;
 - (iv)** When the extinguisher has been burned in a fire; or
 - (v)** When a calcium chloride extinguishing agent has been used in a stainless steel shell.
- (3)** In addition to an external visual examination, the employer shall assure that an internal examination of cylinders and shells to be tested is made prior to the hydrostatic tests.
- (4)** The employer shall assure that portable fire extinguishers are hydrostatically tested whenever they show new evidence of corrosion or mechanical injury, except under the conditions listed in paragraphs (f)(2)(i)-(v) of this section.
- (5)** The employer shall assure that hydrostatic tests are performed on extinguisher hose assemblies which are equipped with a shut-off nozzle at the discharge end of the hose. The test interval shall be the same as specified for the extinguisher on which the hose is installed.
- (6)** The employer shall assure that carbon dioxide hose assemblies with a shut-off nozzle are hydrostatically tested at 1,250 psi (8,620 kPa).
- (7)** The employer shall assure that dry chemical and dry powder hose assemblies with a shut-off nozzle are hydrostatically tested at 300 psi (2,070 kPa).
- (8)** Hose assemblies passing a hydrostatic test do not require any type of recording or stamping.
- (9)** The employer shall assure that hose assemblies for carbon dioxide extinguishers that require a hydrostatic test are tested within a protective cage device.
- (10)** The employer shall assure that carbon dioxide extinguishers and nitrogen or carbon dioxide cylinders used with wheeled extinguishers are tested every 5 years at 5/3 of the service pressure as stamped into the cylinder. Nitrogen cylinders which comply with 49 CFR 173.34(e)(15) may be hydrostatically tested every 10 years.
- (11)** The employer shall assure that all stored pressure and Halon 1211 types of extinguishers are hydrostatically tested at the factory test pressure not to exceed two times the service pressure.
- (12)** The employer shall assure that acceptable self-generating type soda acid and foam extinguishers are tested at 350 psi (2,410 kPa).
- (13)** Air or gas pressure may not be used for hydrostatic testing.
- (14)** Extinguisher shells, cylinders, or cartridges which fail a hydrostatic pressure test, or which are not fit for testing shall be removed from service and from the workplace.
- (15)** **(i)** The equipment for testing compressed gas type cylinders shall be of the water jacket type. The equipment shall be provided with an expansion indicator which operates with an accuracy within one percent of the total expansion or .1 cc (.1 ml) of liquid.
- (ii)** The equipment for testing non-compressed gas type cylinders shall consist of the following:
- (A)** A hydrostatic test pump, hand or power operated, capable of producing not less than 150 percent of the test pressure, which shall include appropriate check valves and fittings;
 - (B)** A flexible connection for attachment to fittings to test through the extinguisher nozzle, test bonnet, or hose outlet, as is applicable; and
 - (C)** A protective cage or barrier for personal protection of the tester, designed to provide visual observation of the extinguisher under test.
- (16)** The employer shall maintain and provide upon request to the Assistant Secretary evidence that the required hydrostatic testing of fire extinguishers has been performed at the time intervals shown in Table L-1.

Such evidence shall be in the form of a certification record which includes the date of the test, the signature of the person who performed the test and the serial number, or other identifier, of the fire extinguisher that was tested. Such records shall be kept until the extinguisher is hydrostatically retested at the time interval specified in Table L-1 or until the extinguisher is taken out of service, whichever comes first.

(g) Training and Education

(1) Where the employer has provided portable fire extinguishers for employee use in the workplace, the employer shall also provide an educational program to familiarize employees with the general principles of fire extinguisher use and the hazards involved with incipient stage fire fighting.

(2) The employer shall provide the education required in paragraph (g)(1) of this section upon initial employment and at least annually thereafter.

(3) The employer shall provide employees who have been designated to use fire fighting equipment as part of an emergency action plan with training in the use of the appropriate equipment.

(4) The employer shall provide the training required in paragraph (g)(3) of this section upon initial assignment to the designated group of employees and at least annually thereafter.

Appendices to §1910.157 – PORTABLE FIRE EXTINGUISHERS

1. Scope and Application – The scope and application of this section is written to apply to three basic types of workplaces.

First, there are those workplaces where the employer has chosen to evacuate all employees from the workplace at the time of a fire emergency.

Second, there are those workplaces where the employer has chosen to permit certain employees to fight fires and to evacuate all other non-essential employees at the time of a fire emergency.

Third, there are those workplaces where the employer has chosen to permit all employees in the workplace to use portable fire extinguishers to fight fires.

The section also addresses two kinds of work areas. The entire workplace can be divided into outside (exterior) work areas and inside (interior) work areas. This division of the workplace into two areas is done in recognition of the different types of hazards employees may be exposed to during fire fighting operations.

Fires in interior work-places pose a greater hazard to employees; they can produce greater exposure to quantities of smoke, toxic gases, and heat because of the capability of a building or structure to contain or entrap these products of combustion until the building can be ventilated.

Exterior work areas, normally open to the environment, are somewhat less hazardous, because the products of combustion are generally carried away by the thermal column of the fire. Employees also have a greater selection of evacuation routes if it is necessary to abandon fire fighting efforts. In recognition of the degree of hazard present in the two types of work areas, the standards for exterior work areas are somewhat less restrictive in regards to extinguisher distribution. Paragraph (a) explains this by specifying which paragraphs in the section apply.

2. Portable Fire Extinguisher Exemptions – In recognition of the three options given to employers in regard to the amount of employee evacuation to be carried out, the standards permit certain exemptions based on the number of employees expected to use fire extinguishers.

Where the employer has chosen to totally evacuate the workplace at the time of a fire emergency and when fire extinguishers are not provided, the requirements of this section do not apply to that workplace.

Where the employer has chosen to partially evacuate the workplace or the effected area at the time of a fire emergency and has permitted certain designated employees to remain behind to operate critical plant operations or to fight fires with extinguishers, then the employer is exempt from the distribution requirements of this section.

Employees who will be remaining behind to perform incipient fire fighting or members of a fire brigade must be trained in their duties. The training must result in the employees becoming familiar with the locations of fire extinguishers. Therefore, the employer must locate the extinguishers in convenient locations where the employees know they can be found. For example, they could be mounted in the fire truck or cart that the fire brigade uses when it responds to a fire emergency.

They can also be distributed as set forth in the National Fire Protection Association's Standard No. 10, "Portable Fire Extinguishers." When the employer has decided to permit all employees in the workforce to use fire extinguishers, then the entire OSHA section applies.

3. Portable Fire Extinguisher Mounting – Previous standards for mounting fire extinguishers have been criticized for requiring specific mounting locations. In recognition of this criticism, the standard has been rewritten to permit as much flexibility in extinguisher mounting as is acceptable to assure that fire extinguishers are available when needed and that employees are not subjected to injury hazards when they try to obtain an extinguisher.

It is the intent of OSHA to permit the mounting of extinguishers in any location that is accessible to employees without the use of portable devices such as a ladder. This limitation is necessary because portable devices can be moved or taken from the place where they are needed and, therefore, might not be available at the time of an emergency.

Employers are given as much flexibility as possible to assure that employees can obtain extinguishers as fast as possible. For example, an acceptable method of mounting extinguishers in areas where fork lift trucks or tow-motors are used is to mount the units on retractable boards which, by means of counter-weighting, can be raised above the level where they could be struck by vehicular traffic. When needed, they can be lowered quickly for use. This method of mounting can also reduce vandalism and unauthorized use of extinguishers.

The extinguishers may also be mounted as outlined in the National Fire Protection Association's Standard No. 10, "Portable Fire Extinguishers."

4. Selection and Distribution – The employer is responsible for the proper selection and distribution of fire extinguishers and the determination of the necessary degree of protection. The selection and distribution of fire extinguishers must reflect the type and class of fire hazards associated with a particular workplace.

Extinguishers for protecting Class A hazards – may be selected from the following types: water, foam, loaded stream, or multipurpose dry chemical.

Extinguishers for protecting Class B hazards – may be selected from the following types: Halon 1301, Halon 1211, carbon dioxide, dry chemicals, foam, or loaded stream.

Extinguishers for Class C hazards – may be selected from the following types: Halon 1301, Halon 1211, carbon dioxide, or dry chemical.

Combustible metal (Class D hazards) – fires pose a different type of fire problem in the workplace.

Extinguishers using water, gas, or certain dry chemicals cannot extinguish or control this type of fire. Therefore, certain metals have specific dry powder extinguishing agents which can extinguish or control this type of fire. Those agents which have been specifically approved for use on certain metal fires provide the best protection; however, there are also some "universal" type agents which can be used effectively on a variety of combustible metal fires if necessary.

The "universal" type agents include: Foundry flux, Lith-X powder, TMB liquid, pyromet powder, TEC powder, dry talc, dry graphite powder, dry sand, dry sodium chloride, dry soda ash, lithium chloride, zirconium silicate, and dry dolomite.

Water is not generally accepted as an effective extinguishing agent for metal fires. When applied to hot burning metal, water will break down into its basic atoms of oxygen and hydrogen. This chemical breakdown contributes to the combustion of the metal.

However, water is also a good universal coolant and can be used on some combustible metals, but only under proper conditions and application, to reduce the temperature of the burning metal below the ignition point. For example, automatic deluge systems in magnesium plants can discharge such large quantities of water on burning magnesium that the fire will be extinguished.

The National Fire Protection Association has specific standards for this type of automatic sprinkler system. Further information on the control of metal fires with water can be found in the National Fire Protection Association's Fire Protection Handbook. An excellent source of selection and distribution criteria is found in the National Fire Protection Association's Standard No. 10. Other sources of information include the National Safety Council and the employer's fire insurance carrier.

5. Substitution of Standpipe Systems for Portable Fire Extinguishers – The employer is permitted to substitute acceptable standpipe systems for portable fire extinguishers under certain circumstances. It is necessary to assure that any substitution will provide the same coverage that portable units provide. This means that fire hoses, because of their limited portability, must be spaced throughout the protected area so that they can reach around obstructions such as columns, machinery, etc. and so that they can reach into closets and other enclosed areas.

6. Inspection, Maintenance and Testing – The ultimate responsibility for the inspection, maintenance and testing of portable fire extinguishers lies with the employer. The actual inspection, maintenance, and testing may, however, be conducted by outside contractors with whom the employer has arranged to do the work. When contracting for such work, the employer should assure that the contractor is capable of performing the work that is needed to comply with this standard.

If the employer should elect to perform the inspection, maintenance, and testing requirements of this section in-house, then the employer must make sure that those persons doing the work have been appropriately trained and to recognize problem areas which could cause an extinguisher to fail.

The employer may also check with the manufacturer of the unit that has been purchased and obtain guidelines on inspection, maintenance, and testing. Hydrostatic testing is a process that should be left to contractors or individuals using suitable facilities and having the necessary training.

Anytime the employer has removed an extinguisher from service to be checked or repaired, alternate equivalent protection must be provided. Alternate equivalent protection could include replacing the extinguisher with one or more units having equivalent or equal ratings, posting a fire watch, restricting the unprotected area from employee exposure, or providing a hose system ready to operate.

7. Hydrostatic Testing – As stated before, the employer may contract for hydrostatic testing. However, if the employer wishes to provide the testing service, certain equipment and facilities must be available. Employees should be made aware of the hazards associated with hydrostatic testing and the importance of using proper guards and water pressures.

Severe injury can result if extinguisher shells fail violently under hydrostatic pressure. Employers are encouraged to use contractors who can perform adequate and reliable service. Firms which have been certified by the Materials Transportation Board (MTB) of the U.S. Department of Transportation (DOT) or State licensed extinguisher servicing firms or recognized by the National Association of Fire Equipment Distributors in Chicago, Illinois, are generally acceptable for performing this service.

8. Training and education. This part of the standard is of the utmost importance to employers and employees if the risk of injury or death due to extinguisher use is to be reduced.

If an employer is going to permit an employee to fight a workplace fire of any size, the employer must make sure that the employee knows everything necessary to assure the employee's safety. Training and education can be obtained through many channels. Often, local fire departments in larger cities have fire prevention bureaus or similar organizations which can provide basic fire prevention training programs. Fire insurance companies will have data and information available. The National Fire Protection Association and the National Safety Council will provide, at a small cost, publications that can be used in a fire prevention program.

Actual fire fighting training can be obtained from various sources in the country. Some manufacturers of extinguishers conduct fire schools for customers in the proper use of extinguishers.

In meeting the requirements of this section, the employer may also provide educational materials, without classroom instruction, through the use of employee notice campaigns using instruction sheets or flyers or similar types of informal programs. The employer must make sure that employees are trained and educated to recognize not only what type of fire is being fought and how to fight it, but also when it is time to get away from it and leave fire suppression to more experienced fire fighters.

A Rule-by-Rule Summary

The following rules include OSHA's requirements for planning and responding to workplace emergencies. Rules in bold include specific requirements for emergency and fire prevention plans.

| RULE | WHAT IT COVERS |
|---|---|
| Exits and Exit Routes | Requirements for exits that employees use during an emergency. |
| Employee Action Plan | All emergency action plans required by other OSHA rules. Requires a written plan for workplaces that have more than 10 employees; covers the written requirements, requirements for alarms, evacuations, and training. |
| Fire Prevention Plan | All fire prevention plans required by OSHA rules. Requires a written plan for workplaces that have more than 10 employees; covers the written requirements, requirements for housekeeping, training, and preventive maintenance. |
| Fire Brigades | Organizational, training, and personal protective equipment requirements for fire brigades established by an employer. |
| Portable Fire Suppression Equipment | Requirements for placing, using, maintaining, and testing portable fire extinguishers for employee use. Requirements for standpipe and hose systems. |
| Fixed Fire Suppression Equipment | Requirements for automatic sprinkler systems. Requirements for fixed extinguishing systems Requirements for dry chemical fixed extinguishing systems. Requirements for gaseous agent fixed extinguishing systems. Requirements for water, spray, and foam fixed extinguishing systems. |
| Other Fire Protective Systems | Requirements for fire detectors and fire detection systems. Requirements for employee alarm systems. |
| Process Safety Management | Requirements for controlling the of highly hazardous chemicals release of toxic, reactive, flammable, or explosive chemicals. Requires an emergency plan. |
| Hazardous Waste Operations and Emergency Response. | Requires an emergency plan for employers engaged in cleanup operations, operations at TSD facilities, and employers who respond to releases of hazardous substances. |
| Personal Protective Equipment | Requirements for eye and face protection Requirements for respiratory protection Requirements for head protection Requirements for foot protection Requirements for hand protection |
| Permit-Required Confined Spaces | Requirements for entry procedures, rescue and emergency services. |
| Toxic and Hazardous Substances (This section includes an extensive list chemicals) | Requirements for controlling employee exposure to hazardous substances. Requires an emergency plan, including appropriate personal protective equipment, for airborne releases. Training requirements on the appropriate actions employees must take if they may be involved in emergencies involving blood or other potentially infectious materials |
| Hazard Communication | Requirements for protecting employees who may be exposed to hazardous chemicals, including information on container warning labels, material safety data sheets, and training. |
| Medical Services & First Aid | Requirements for workplace first aid and emergency medical services. |

Where to Find More Information

- ▣ Emergency management guide for business and industry; Federal Emergency Management Agency (FEMA), www.fema.gov/library/bizindex.htm
- ▣ How to Plan for Workplace Emergencies and Evacuations; U.S. Department of Labor Occupational Safety and Health Administration, www.osha.gov

EMERGENCY ACTION PLAN

To be posted at all Company facilities and workplaces

Page 1

| | | | |
|--|--|----------------------------|------------------|
| Company Name: | | Job Location: | |
| Street Address: | | | |
| City: | | State: | ZIP Code: |
| Prepared By: (Print Name of Preparer) | | | |
| Title: | | Phone Number: | |
| Signature: | | Date: | |
| PURPOSE | | | |
| This plan is for the safety and well-being of the employees of: (Name of Company) | | | |
| It identifies necessary management and employee actions during fires and other emergencies. Education and training are provided so that all employees know and understand the Emergency Action Plan. | | | |
| LOCATON OF PLAN | | | |
| The Emergency Action Plan can be found at the station or office of each: (Foreman, Supervisor, etc.) | | | |
| A copy is also maintained in THE COMPANY general offices. | | | |
| Upon request, an OSHA representative may obtain a copy of the plan from: (Name and Title) | | | |
| EXIT ROUTES | | | |
| Draw a diagram of jobsite or facility exit routes in space below: | | | |
| Locate meeting place or "Roll-Call" area on above diagram: | | | |
| ACCOUNTING FOR EMPLOYEES | | | |
| After exiting jobsite or facility, all employees are to assemble for "Roll-Call" at this location: | | | |
| Note location on above diagram | | | |
| The following persons are responsible for ensuring that employees comply with this requirement: | | | |
| Name and Title: | | | |
| Name and Title: | | | |
| CRITICAL OPERATIONS | | | |
| To minimize damage from the emergency, the following personnel are responsible for shutting down the listed critical operations: | | | |
| Personnel Names | | Critical Operations | |
| | | | |
| | | | |
| | | | |
| As soon as shutdowns are completed, the employees who performed critical operations must take the nearest exit route in accordance with general emergency procedures. | | | |

EMERGENCY ACTION PLAN

RESCUE AND MEDICAL DUTIES

The following personnel are certified and trained in both CPR and general first aid. These persons are to be contacted as specified in the "General Emergency Training":

| Name and Title | Phone Number |
|----------------|--------------|
| | |
| | |
| | |

REPORTING EMERGENCIES

The following personnel have the duty of contacting public responders to come to the emergency scene. The personnel are listed in descending order of availability:

| Name and Title | Phone Number |
|----------------|--------------|
| | |
| | |
| | |

ALARM SYSTEMS AND NOTIFICATION OF EMERGENCIES

In the event of a workplace or facility emergency, employees will be notified as follows:

Identify method(s) of notification:

| |
|--|
| |
| |
| |

TYPES OF EVACUATION

OSHA requires this Company to have an established system of types of evacuation to follow for different emergency circumstances. The following listing represents company policy for various emergency situations:

PARTIAL EVACUATION: Code Yellow – 3 rings or horn blasts: RESPONDERS (trained extinguisher personnel and trained rescue and medical personnel)

FULL EVACUATION: Code Red – 4 rings or horn blasts: RESPONDERS (n/a)

NOTE: If there is more than one evacuation type, the alarm signal for each must be distinctive.

OTHER: (describe)

OTHER: (describe)

PUBLIC EMERGENCY RESPONSE INFORMATION

Ensure that 911 emergency services cover the area this Emergency Action Plan covers.

Local Police Department:

Local Fire Department:

Local Ambulance/EMS:

Local Hospital:

FURTHER INFORMATION

For further information or explanation about any duties under this Plan, contact:

| |
|-----------------|
| Name and Title: |
| |
| Name and Title: |
| |

This Emergency Action Plan is authorized and approved by:
(Name and Title)

Signature

Training Drills & Exercises Scheduling Chart

| | JANUARY | FEBRUARY | MARCH | APRIL | MAY | JUNE | JULY | AUGUST | SEPTEMBER | OCTOBER | NOVEMBER | DECEMBER |
|--|---------|----------|-------|-------|-----|------|------|--------|-----------|---------|----------|----------|
| Management Orientation/ Review | | | | | | | | | | | | |
| Employee Orientation/ Review | | | | | | | | | | | | |
| Contractor Orientation/ Review | | | | | | | | | | | | |
| Community/ Media Orientation/ Review | | | | | | | | | | | | |
| Management Tabletop Exercise | | | | | | | | | | | | |
| Response Team Tabletop Exercise | | | | | | | | | | | | |
| Walk-Through Drill | | | | | | | | | | | | |
| Functional Drills | | | | | | | | | | | | |
| Evacuation Drill | | | | | | | | | | | | |
| Full-Scale Exercise | | | | | | | | | | | | |
| Emergency & Rescue Equipment Inspections | | | | | | | | | | | | |

Chapter 8 CPR & First Aid

Arena Fire Protection, Inc. is committed to the safety and health of our employees and ensures that first aid kits are stocked and available to all employees.

First aid kits are located in/at: **the jobsite.**

An Employer's First Aid Responsibility

- ① You must make sure that first-aid trained personnel are available to provide quick and effective first aid.
- ② Make sure first-aid training contains required subjects.
- ③ Keep current and document your first-aid training.
- ④ Make sure appropriate first-aid supplies are readily available.
- ⑤ Provide a first-aid station when required.
- ⑥ Make sure emergency washing facilities are functional and readily accessible.
- ⑦ Inspect and activate your emergency washing facilities.
- ⑧ Make sure supplemental flushing equipment provides sufficient water.

Your workplace may be covered by separate first-aid rules. If you do any of the types of work listed below, you must follow separate, industry specific rules:

- | | |
|---|--|
| <input type="checkbox"/> Agricultural | <input type="checkbox"/> Logging |
| <input type="checkbox"/> Compressed air | <input type="checkbox"/> Sawmill |
| <input type="checkbox"/> Construction | <input type="checkbox"/> Ship building and repairing |

① ***Ensure that First Aid Trained Personnel are Available to Provide Quick and Effective First Aid***

You must choose one of the following 2 options to make sure that your employees have access to personnel who are trained in first aid.

Option 1:

Make sure first-aid trained employees are in your workplace to help your employees if they become hurt or ill on the job by doing the following:

Make sure that:

- Each person in charge of employees has first-aid training; OR
 - Another person with first-aid training is present or available to your employees, whenever you have 2 or more employees present.
- ★ Adequately post emergency telephone numbers in your workplace.

Option 2:

Develop and maintain a written first-aid response plan for your workplace. If you choose this option, you must do all of the following:

- Determine how many, if any, employees should be trained in first-aid, based on the following factors:
 - ★ What type(s) of occupational hazards are present in your workplace?
 - ★ How likely is it that a workplace injury or illness will occur?

- ☆ How serious are the occupational hazards in your workplace?
- ☆ How remote is your workplace?
- ☆ How complex is your worksite in terms of size, design, etc.?
- ☆ What medical emergencies have occurred at your workplace in the past?
- ☆ How far away and how long does it take to get to emergency medical services?

☐ Make sure your first-aid response plan:

- ☆ Fits your work location, type of work, and environmental conditions.
- ☆ Identifies the available emergency medical services and access numbers and where they are posted.
- ☆ Describes the type of first-aid training employees receive, if applicable.
- ☆ Identifies the location(s) of first-aid supplies and/or first-aid stations.
- ☆ Identifies the contents of first-aid kits.
- ☆ Describes how first-aid supplies or kits will be inspected and maintained.
- ☆ Describes how injured or ill employees will have access to first-aid trained employees.

Note: Employers who require their employees to provide first aid must comply with OSHA requirements for "Occupational Exposure to Bloodborne Pathogens".

② ***Ensure First Aid Training Contains Required Subjects***

You must make sure that every 2 years, employees are trained in and able to demonstrate their skill and knowledge of the following subject areas:

- ☐ Role and responsibilities of the first-aid provider
- ☐ Assessing a scene
- ☐ Performing an initial and ongoing assessment of an injured or ill person
- ☐ Scene safety
- ☐ Body substance isolation/bloodborne pathogens
- ☐ Performing an emergency move
- ☐ Placing an ill person in the recovery position
- ☐ Opening and maintaining an airway
- ☐ Providing rescue breathing
- ☐ Managing an obstructed airway
- ☐ Performing adult/one-rescuer CPR
- ☐ Recognizing the warning signs and symptoms of medical problems
- ☐ Recognizing and caring for an injured or ill person with decreased levels of responsiveness
- ☐ Controlling external bleeding and recognizing internal bleeding
- ☐ Recognizing and caring for victims of shock
- ☐ Recognizing and stabilizing spinal injury
- ☐ Recognizing and manually stabilizing suspected skeletal injuries
- ☐ Knowledge of voluntary provisions of first aid, consent and confidentiality

Note: Assess your workplace to determine if there are certain job hazards and/or if the time and distance from emergency medical services indicate a need for training beyond the items listed above.

③ Keep Current and Document Your First Aid Training

You must keep a written record of your employees' first-aid training by keeping rosters, first-aid cards, or certificates. You may store your documentation on a computer, as long as the information is readily available when requested by OSHA personnel.

④ Ensure Appropriate First Aid Supplies are Readily Available

You must:

- ☐ Make sure first-aid supplies are readily available.
- ☐ Make sure first-aid supplies at your workplace are appropriate to:
 - ★ Your occupational setting.
 - ★ The response time of your emergency medical services.

Note: First-aid kits from your local retailer or safety supplier should be adequate for most non-industrial employers.

- ☐ Make sure that first-aid supplies are:
 - ★ Easily accessible to all your employees.
 - ★ Stored in containers that protect them from damage, deterioration, or contamination. Containers must be clearly marked, not locked, and may be sealed.
 - ★ Able to be moved to the location of an injured or acutely ill employee.

⑤ Provide a First Aid Station when Required

You must:

- ☐ Provide a first-aid station with at least one first-aid trained employee available if there are 50 or more employees per shift at one location.
- ☐ Make sure the first-aid station:
 - ★ Is well marked.
 - ★ Is available to employees during all working hours.
 - ★ Is equipped with first-aid supplies that are appropriate for your number of employees, occupational setting, and working conditions.
 - ★ Has at least one portable first-aid kit.

⑥ Ensure Emergency Washing Facilities are Functional and Accessible

You must:

- ☐ Provide an emergency shower:
 - ★ When there is potential for major portions of an employee's body to contact corrosives, strong irritants, or toxic chemicals.
 - ★ That delivers water to cascade over the user's entire body at a minimum rate of 20 gallons (75 liters) per minute for fifteen minutes or more.

- ▣ Provide an emergency eyewash:
 - ★ When there is potential for an employee's eyes to be exposed to corrosives, strong irritants, or toxic chemicals.
 - ★ That irrigates and flushes both eyes simultaneously while the user holds their eyes open.
 - ★ With an on-off valve that activates in one second or less and remains on without user assistance until intentionally turned off.
 - ★ That delivers at least 0.4 gallons (1.5 liters) of water per minute for 15 minutes or more.

Note: You can determine whether chemicals in your workplace require emergency washing facilities by looking at the material safety data sheet (MSDS) or similar documents. The MSDS contains information about first-aid requirements and emergency flushing of skin or eyes.

- ▣ Make sure emergency washing facilities:
 - ★ Are located so that it takes no more than ten seconds to reach.
 - ★ Are kept free of obstacles blocking their use.
 - ★ Function correctly.
 - ★ Provide the quality and quantity of water that is satisfactory for emergency washing purposes.
- ▣ If water in emergency washing facilities is allowed to freeze, they won't function correctly. Precautions need to be taken to prevent this from happening.
- ▣ The travel distance to an emergency washing facility should be no more than 50 feet (15.25 meters).
- ▣ Training in the location and use of your emergency washing facilities is required under the employer chemical hazard communication rule.
- ▣ All emergency washing facilities using "not fit for drinking" (non-potable) water must have signs stating the water is "not fit for drinking."
- ▣ For further information on the design, installation, and maintenance of emergency washing facilities, see American National Standards Institute (ANSI) publication Z358.1 - 1998, Emergency Eyewash and Shower Equipment.

⑦ *Inspect and Activate Your Emergency Washing Facilities*

You must:

- ▣ Make sure all plumbed emergency washing facilities are inspected once a year to make sure they function correctly. Inspections should include:
 - ★ Examination of the piping.
 - ★ Make sure that water is available at the appropriate temperature and quality.
 - ★ Activation to check that the valves and other hardware work properly.
 - ★ Checking the water flow rate.
- ▣ Make sure plumbed emergency eyewashes and hand-held drench hoses are activated weekly to check the proper functioning of the valves, hardware, and availability of water.

- ☐ Make sure all self-contained eyewash equipment and personal eyewash units are inspected and maintained according to manufacturer instructions.
 - ★ Inspections to check proper operation must be done once a year
 - ★ Sealed personal eyewashes must be replaced after the manufacturer's expiration date.

Note: Most manufacturers recommend replacing fluid in open self-contained eyewashes every 6 months. The period for sealed containers is typically 2 years.

⑧ **Ensure Supplemental Flushing Equipment Provides Enough Water**

Supplemental flushing equipment can not be used in place of required emergency showers or eyewashes.

You must

- ☐ Make sure hand-held drench hoses deliver at least 3.0 gallons (11.4 liters) of water per minute for 15 minutes or more.

Note: Why use a drench hose? A drench hose is useful when:

- ★ The spill is small and doesn't require an emergency shower
 - ★ Used with a shower for local rinsing, particularly on the lower extremities.
- ☐ Make sure personal eyewash equipment delivers only clean water or other medically approved eye flushing solutions.

Fit your First Aid Response Plan to your Company

Note: If you have a small business and there are other employers in the same location or building, or there are other employers located close to your work site, you may want to coordinate with them and develop a joint First-aid Response Plan.

The following tips are provided to help determine specific first aid requirements for any particular location of your Company's operations.

Employees at work site locations — This includes your maintenance and janitorial staff, and mobile crews that may go to other locations for service calls, installations, etc.

Source of potential injury, most likely injury, and treatment required — If you use powered cutting equipment, an accident could result in a severe cut or even possible amputation. In this situation, immediate first aid is required to keep the injured person from bleeding to death.

Types of injuries that have occurred in the past — What situations ("near misses" or "close calls") could have resulted in injury but did not and what would have been the most likely injury? This information may be found in sources such as OSHA 300 forms, worker compensation claims, and safety committee minutes. Talking to supervisors and employees should be an important source of information, particularly for things that almost happened, but did not.

Determine the type and quantity of first aid supplies necessary to treat injured workers and where these supplies should be located for easy accessibility. Be sure to have an appropriate number of kits available and do not hesitate to call your local emergency response team.

Availability of emergency medical services — Would your employees dial 911 or is there some other way to summon help?

Response time of emergency medical services — From the time an accident happened, how many minutes would it take trained medical people to get to an injured worker? Things to consider include:

- ▣ How long would it take your employees to reach a phone to call 911? Are phones conveniently located in the work area or would they have to go to an office to call?
- ▣ How far are the emergency medical services (hospital, fire station, etc.) from your work site?
- ▣ How would emergency medical services get to your work site? They may only be 100 feet away, but if it is across a limited access road they may have go 5 miles in one direction to turn around and come back.
- ▣ How bad is traffic? Are back-ups common at certain times?
- ▣ How available are emergency medical services? If there is only one ambulance and one medical team, they may be out on another emergency. It could take a long time for someone to respond to your call.
- ▣ How large and complex is your work site? How difficult would it be for emergency services to find the place where the injured worker is? You may want the emergency service to go to a central location (such as a reception area) and receive directions from there.
- ▣ Contact your local emergency medical service and get their answers to these questions. You may find their responses are different from what you would expect.

Develop your First Aid Response Plan and put it in Writing

When developing and writing your first aid response plan, consider the following:

- ▣ Include the site and who is responsible for managing the plan. This includes updating the written plan as needed and making sure an adequate number of first aid trained employees available.
- ▣ Make sure a method is developed for summoning emergency medical services.
- ▣ Post a list of employees who are first aid trained.
- ▣ Describe the procedures employees should use to request first aid.
- ▣ Identify who is responsible for inspecting, stocking & maintaining first aid kits.

Train Your Employees

The First Aid Response Plan will not be effective if your employees do not know about it. You need to make sure your employees are informed of the First Aid Response Plan and what it says. Remember to train new or temporary employees as part of their safety orientation before they start work.

Your Responsibility

- ★ Fit the First Aid Response Plan to your Business.
- ★ Develop and Write your First Aid Response Plan.
- ★ Train your Employees.

First Aid Kit Contents

During any serious injury situation, the first aid kit becomes the most vitally important toolbox on the jobsite. Even if your people have had the finest first aid skills training available, these talents are mostly negated by the lack of emergency medical supplies to use when most needed.

The OSHA rule states: "First aid supplies shall be easily accessible when required. The contents of a first aid kit shall be placed in a weather proof container with sterile, individually sealed packages for each type of item and shall be checked by the employer before being sent out on each job and at least weekly on each job to ensure that the expended items are replaced." In the event of an emergency medical situation caused by a serious injury accident, proper and prompt treatment can greatly reduce the severity of the injury and possibly prevent the death of a co-worker.

The suggested contents of an excellent first aid kit include:

- ☐ Decent quality first aid handbook with illustrations. This is your important quick reference guide.
- ☐ PPE: 3-Pair latex gloves; surgical masks, dust masks, or other needed face protection; clear eye protection or face shield.
- ☐ Large, sterile gauze pads (6 each: 2X2's, 3X3's, and 4X4's), compress dressings (4X8), 3 each.
- ☐ Rolled gauze bandages: 2" and 3" wide, 3 each; large box assorted "band-aids".
- ☐ Two elastic wrap bandages (ace wrap).
- ☐ 6 burn treatment single-use packages, 0.5 g. application.
- ☐ 1 eye covering bandages (for two eyes)
- ☐ Alcohol, peroxide, alcohol swabs, antiseptic spray and ointment, burn gel or cream, pain relief tabs, cotton balls and Q-tips.
- ☐ Surgical or athletic tape; 1" and 2" wide, 2 rolls each.
- ☐ Self-activating cold packs, 4x5 inches
- ☐ Good quality eye-wash solution, with eye cup. Liquid antiseptic hand soap.
- ☐ Mouth-to-mouth barrier for CPR
- ☐ Blunt-nose surgical scissors, tweezers, safety pins, and a snake-bite kit.

Although no official inventory list exists, thoughtful consideration should be given to the specific working conditions the people will be directed to and adjustments to your Company's first aid supplies should be made. Knowing what to do in a medical emergency is important, but so is knowing what not to do. Be sure you always know where your first aid kit is.

NOTE: All personnel using CPR & First Aid techniques should be certified in an appropriate training format before using these skills. Never exceed the level of your first aid training.

FIRST AID RESPONSE PLAN

| | | |
|---|------------|-------|
| Company: | Date: | |
| This plan was written for: (site or location this plan covers) | | |
| The following person/position is responsible for managing our first aid response plan: | | |
| The emergency medical service to be called: | | |
| Summon the emergency medical service by doing the following: (In most cases it will be to call 911 or some other phone number, but a direct alarm or some other method may be the preferred way.) | | |
| Emergency phone numbers are posted at the following location(s): | | |
| Other means to summon aid are at the following location: | | |
| When employees need first aid they must do the following: | | |
| Employees on site who are first aid trained: | | |
| First-aid kits (or a first aid station) are located at: | | |
| The following person/position is responsible for inspecting the first aid kits: | | |
| The Company's Designated Medical Provider is: | | |
| Person Preparing Plan: | Signature: | Date: |
| Supervisor's Name: | Signature: | Date: |

Chapter 9 Hazard Assessment Plan



Arena Fire Protection, Inc. is committed to providing a safe and hazard free workplace.

The foreman will inspect all job-sites and facilities for hazards.

Hazard Assessment Plan

This company performs inspections of the job-site and or facility at least **daily**. Hazard evaluations include inspection of the area as well as work practices.

During the course of inspection if a hazard is identified it is immediately corrected. If the hazard is not immediately correctable, all appropriate personnel are notified and the hazard is clearly identified by signs, barricades, or other warnings.

Hazard evaluations are to be appropriately documented using the following forms or any means necessary.

Hazard Assessment Checklist

The following checklists contain safety and health hazard assessment items commonly found in the workplace. It is the employer's responsibility to identify, evaluate and control job-specific safety and health hazards in the workplace, and to meet all applicable OSHA requirements.

Submission of this completed form is a prerequisite for issuance of the Start Work Notice.

Instructions: Complete this form for all construction work. Identify all hazards that could be present in the job to be performed. If a box is checked "Yes", then state the hazard and *describe your hazard control method*. If a hazard is not listed below and is present in the job, then check the box for item 41 "Other" and *describe hazard and hazard control method*.

EXAMPLE

- Yes** **No** **2. Ladders/Scaffolds/Stairways** – for example: Body Harness, Lanyards, Safety Net, Aerial Lifts, Guardrails, Training, other

Hazard/Hazard Control Ladder Use - Our employees are only using 6 foot ladders. If a greater height needs to be reached, a scissors lift will be used.

HAZARD ASSESSMENT CHECKLIST

Contractor _____ Date Prepared _____

Prepared by (Foreman if possible) _____ Phone _____ Cell _____ Pager _____

Foreman/Supervisor for the job _____ Phone _____ Cell _____ Pager _____

Subcontractor or Employee Responsible for Safety Inspections _____ Phone _____ Pager _____

List The Work Crews That Will Be Briefed About This Analysis: _____

_____ Date of Briefing _____

Job Description: _____

Job Number: _____ Job Location (Bldg. No./Site) _____

YES NO

1. **Fall Protection** – for example: Fall Protection Plan, Body Harness, Lanyards, Guardrails, Handrails, Training, other

Hazard/Hazard Control _____

2. **Ladders / Scaffolds / Stairways** – for example: Body Harness, Lanyards, Safety Net, Aerial Lifts, Guardrails, Training, other

Hazard/Hazard Control _____

3. **Excavation / Trenching / Shoring** – for example: Excavation Permit, Selection of Protective Systems, Shoring, Slope Detail, Spoils Pile, Soil Classification, Sloping and Benching, Hydraulic Shoring, Access Ladders, Traffic Plates, other

Hazard/Hazard Control _____

YES NO

4. **Lockout and Tagout Control of Hazardous Energy** – for example: Locks and Tags, Blinds, Safety Meetings, Training, other

Hazard/Hazard Control _____

5. **Electrical Hot Work Permit Required** – for example: Energized Electrical Permit, Rubber Mat, Sleeves, PPE, other

Hazard/Hazard Control _____

6. **Electrical / Power Transmission** – for example: Wiring Design, Wiring Protection, Hazardous Location Installation, other

Hazard/Hazard Control _____

7. **Hoisting / Rigging** – for example: Operator Permits, Equipment Inspections and Tags, Training, other

Hazard/Hazard Control _____

8. **Confined Space** – for example: ESH Entry Approval/Permit, Training, Air Monitoring, Rescue Plan and Equipment, other

Hazard/Hazard Control _____

9. **Demolition** – for example: Preparatory Operations, Work Practices, Chutes, Mechanical Demolition, Barricades, other

Hazard/Hazard Control _____

10. **Signs/Signals/Barricades** – for example: Caution Tape, Barriers, Barricades, Signs, Traffic Cones, Tags, Traffic Vests, other

Hazard/Hazard Control _____

11. **Head Protection and Rollover Protective Structure** – for example: Hard Hats, Bump Caps, Equipment Inspection, other

Hazard/Hazard Control _____

YES NO

12. **Eye Protection** – for example: Safety Glasses, Safety Goggles, Face Shields, Portable Eye Wash Unit, other

Hazard/Hazard Control _____

13. **Ear Protection** – for example: Ear Plugs, Ear Muffs, other

Hazard/Hazard Control _____

14. **Breathing Protection** – for example: Engineering Controls, Respirators, Air filters, Dust Masks, HEPA Filters, other

Hazard/Hazard Control _____

15. **Hand Protection** – for example: Gloves, Gauntlets, Sleeves, Barrier Cream, other

Hazard/Hazard Control _____

16. **Torso Protection** – for example: Flame Resistant Clothing, Coveralls, Aprons, Bib Overalls, other

Hazard/Hazard Control _____

17. **Foot Protection** – for example: Steel Toed Shoes, Metatarsal Guards, Boots, other

Hazard/Hazard Control _____

18. **Site Exits / Means of Egress** – for example: Emergency Action Plans, Marked and Clear, Outdoors Job, other

Hazard/Hazard Control _____

19. **Fire Protection/Prevention** – for example: Extinguishers, Fire Watch, 2-Way Radio, Pull Box, Alarms, and other Alarms, other

Hazard/Hazard Control _____

YES NO

20. **Welding/Cutting/Brazing** – for example: Welding/Burn Permit, Fire Watch, Fire Blanket, Site Screen, Gas Bottle Safety, other

Hazard/Hazard Control _____

21. **Hot Work Permit Required** – for example: Welding, Brazing, Torch Cutting, Temporary Heating, Pressured Air Line, other

Hazard/Hazard Control _____

22. **Material Handling, Storage, Use, and Disposal** – for example: Flammables, Combustibles, Labeling, Gas Bottle Storage, LP-Gas Safety, Safety Containers/Cans, Waste Materials, Disposal Process, other

Hazard/Hazard Control _____

23. **Concrete / Masonry** – for example: Debris Pile, Chutes, Wet Cuts, other

Hazard/Hazard Control _____

24. **Crane / Derrick / Hoist / Helicopter / Conveyors** – for example: Drum Hoists, Elevators, Cable Inspections, other

Hazard/Hazard Control _____

25. **Tunnel / Shaft / Caissons / Compressed Air** – for example: Underground Construction, Cofferdams, Blasting Safety, other

Hazard/Hazard Control _____

26. **Steel Erection** – for example: Falling Object Protection, Site-Specific Erection Plan, Construction Sequence, other

Hazard/Hazard Control _____

27. **Vehicle Safety / Mechanized Equipment** – for example: Operator Permits, Equipment Inspection, Hydraulic Inspection, other

Hazard/Hazard Control _____

YES NO

28. **Construction Power** – for example: Extension Cords, GFCI, Generators, Battery Charging, Air Receivers, other

Hazard/Hazard Control _____

29. **Blasting and Use of Explosives** – for example: Blaster Qualifications, Transportation, Storage, Loading, Inspection, other

Hazard/Hazard Control _____

30. **Powder Actuated Tool Safety** – for example: (HILTI) Operator Training, Valid License, other

Hazard/Hazard Control _____

31. **Power & Hand Tool Safety** – for example: Guards, Cords, Ground Prong, GFCI, Jacks, Abrasive Wheels, other

Hazard/Hazard Control _____

32. **Area Lighting** – for example: Flood Lights, Traffic Control Lights, Drop Lights, Flashlights, other

Hazard/Hazard Control _____

33. **Housekeeping** – for example: Debris Pile, Hazardous Waste Disposal Containers, Clear Work Area, other

Hazard/Hazard Control _____

34. **Traffic Control** – for example: Flagman, Signboard, Caution Lights, Traffic Vests, Whistle, other

Hazard/Hazard Control _____

35. **Hazard Communication / Toxic Substances** – for example: Material Safety Data Sheets, Asbestos, Benzene, other

Hazard/Hazard Control _____

YES NO

36. **Ionizing & Non-ionizing Radiation** – for example: Radiation Badges, Training, Distance, Shielding, Time, other

Hazard/Hazard Control _____

37. **Environmental** – for example: Excavation Permit, Segregated Debris Pile, Asbestos, Run-off Prevention, other

Hazard/Hazard Control _____

38. **Medical Protection** – for example: First Aid Kit, C.P.R. Trained Personnel, 2-Way Radio, Telephone 911, other

Hazard/Hazard Control _____

39. **General Health & Safety Provisions** – for example: Recordkeeping, Work Practices, Equipment Maintenance, Training, other

Hazard/Hazard Control _____

40. **Sanitation** – for example: Drinking Water, Toilets, Eating Areas, Washing Areas, other

Hazard/Hazard Control _____

41. **Other** – Identify any other hazard control associated with this job

Hazard/Hazard Control _____

Self-Inspection for OSHA Compliance

The most widely accepted way to identify hazards is to conduct safety and health inspections. The only way you can be certain of the actual situation is for you to look at it from time to time. Begin a program of self-inspection in your own facility/workplace. Self-inspection is a must if you are to know where probable hazards exist and whether they are under control. These checklists are designed to assist you in this fact-finding. It will give you some indication of where you should begin action to make your business safer and more healthful for all of your employees. Use any checklists relevant to your business operations and disregard those which do not apply.

When you have completed the checklist, add this material to your injury information, your employee information, and your process and equipment information. You will now possess many facts that will help you determine what problems exist. Then, if you use the OSHA standards in your problem-solving process, it will be much easier for you to determine the action needed to solve these problems.

The scope of your self-inspections should include the following:

- ★ ***Processing, Receiving, Shipping and Storage*** — equipment, job planning, layout, heights, floor loads, projection of materials, materials-handling and storage methods, and training for material handling equipment.
- ★ ***Building and Grounds Conditions*** — floors, walls, ceilings, exits, stairs, walkways, ramps, platforms, driveways, and aisles.
- ★ ***Housekeeping Program*** — waste disposal, tools, objects, materials, leakage and spillage, cleaning methods, schedules, work areas, remote areas, and storage areas.
- ★ ***Electricity*** — equipment, switches, breakers, fuses, switch-boxes, junctions, special fixtures, circuits, insulation, extensions, tools, motors, grounding, and national electric code compliance.
- ★ ***Lighting*** — type, intensity, controls, conditions, diffusion, location, and glare and shadow control.
- ★ ***Heating and Ventilation*** — type, effectiveness, temperature, humidity, controls, and natural and artificial ventilation and exhaust.
- ★ ***Machinery*** — points of operation, flywheels, gears, shafts, pulleys, key ways, belts, couplings, sprockets, chains, frames, controls, lighting for tools and equipment, brakes, exhausting, feeding, oiling, adjusting, maintenance, lockout/tagout, grounding, work space, location, and purchasing standards.
- ★ ***Personnel*** — experience training, including hazard identification training; methods of checking machines before use; type of clothing; personal protective equipment; use of guards; tool storage; work practices; and methods of cleaning, oiling, or adjusting machinery.
- ★ ***Hand and Power Tools*** — purchasing standards, inspection, storage, repair, types, maintenance, grounding, use, and handling.
- ★ ***Chemicals*** — storage, handling, transportation, spills, disposals, amounts used, labeling, toxicity or other harmful effects, warning signs, supervision, training, protective clothing and equipment, and hazard communication requirements.
- ★ ***Fire Prevention*** — extinguishers, alarms, sprinklers, smoking rules, exits, personnel assigned, separation of flammable materials and dangerous operations, explosive-proof fixtures in hazardous locations, and waste disposal.
- ★ ***Maintenance, including tracking and abatement of preventive & regular maintenance*** — regularity, effectiveness, training of personnel, materials and equipment used, records maintained, method of locking out machinery, and general methods.
- ★ ***Personal Protective Equipment*** — type, size, maintenance, repair, storage, assignment of responsibility, purchasing methods, standards observed, training in care and use, rules of use, and method of assignment.
- ★ ***Transportation*** — motor vehicle safety, seat belts, vehicle maintenance, and safe driver programs.
- ★ ***Review*** — evacuation routes, equipment, and personal protective equipment.

Company: _____ Location: _____

Inspector(s): _____ Date: _____

EMPLOYER POSTINGS

Y N

- Is the required OSHA workplace poster displayed in a prominent location where all employees are likely to see it?
- Are emergency telephone numbers posted where they can be readily found in case of emergency?
- Where employees may be exposed to any toxic substances or harmful physical agents, has appropriate information concerning employee access to medical and exposure records and "Material Safety Data Sheets" been posted or otherwise made readily available to affected employees?
- Are signs concerning "Exiting from buildings," room capacities, floor loading, biohazards, exposures to x-ray, microwave, or other harmful radiation or substances posted where appropriate?
- Is the Summary of Occupational Illnesses and Injuries (OSHA Form 300) posted from February 1st through April 30th?

RECORDKEEPING

Y N

- Are all occupational injury or illnesses, except minor injuries requiring only first aid, being recorded as required on the OSHA 300 log?
- Are employee medical records and records of employee exposure to hazardous substances or harmful physical agents up-to-date and in compliance with current OSHA standards?
- Are employee training records kept and accessible for review by employees, when required by OSHA standards?
- Have arrangements been made to maintain required records for the legal period of time for each specific type record? (Some records must be maintained for at least 40 years.)
- Are operating permits and records up-to-date for such items as elevators, air pressure tanks, and liquefied petroleum gas tanks?

SAFETY AND HEALTH PROGRAM

Y N

- Do you have an active safety and health program in operation that deals with general safety and health program elements as well as the management of hazards specific to your worksite?
- Is one person clearly responsible for the overall activities of the safety and health program?

- Do you have a safety committee or group made up of management and labor representatives that meets regularly and report in writing on its activities?
- Do you have a working procedure for handling in-house employee complaints regarding safety and health?
- Are you keeping your employees advised of the successful effort and accomplishments you and/or your safety committee have made in assuring they will have a workplace that is safe and healthful?
- Have you considered incentives for employees or workgroups who have excelled in reducing workplace injury/illnesses?

MEDICAL SERVICES AND FIRST AID

Y N

- Is there a hospital, clinic, or infirmary for medical care in proximity of your workplace?
- If medical and first-aid facilities are not in proximity of your workplace, is at least one employee on each shift currently qualified to render first aid?
- Have all employees who are expected to respond to medical emergencies as part of their work (1) received first-aid training; (2) had hepatitis B vaccination made available to them; (3) had appropriate training on procedures to protect them from bloodborne pathogens, including universal precautions; and (4) have available and understand how to use appropriate personal protective equipment to protect against exposure to bloodborne diseases?
- Where employees have had an exposure incident involving bloodborne pathogens, did you provide an immediate post-exposure medical evaluation and followup?
- Are medical personnel readily available for advice and consultation on matters of employees' health?
- Are emergency phone numbers posted?
- Are first-aid kits easily accessible to each work area, with necessary supplies available, periodically inspected and replenished as needed?
- Have first-aid kit supplies been approved by a physician, indicating that they are adequate for a particular area or operation?
- Are means provided for quick drenching or flushing of the eyes and body in areas where corrosive liquids or materials are handled?

FIRE PROTECTION

Y N

- Is your local fire department well acquainted with your facilities, its location and specific hazards?
- If you have a fire alarm system, is it certified as required?
- If you have a fire alarm system, is it tested at least annually?
- If you have interior stand pipes and valves, are they inspected regularly?
- If you have outside private fire hydrants, are they flushed at least once a year and on a routine preventive maintenance schedule?
- Are fire doors and shutters in good operating condition?
- Are fire doors and shutters unobstructed and protected against obstructions, including their counterweights?
- Are fire door and shutter fusible links in place?
- Are automatic sprinkler system water control valves, air and water pressure checked weekly/periodically as required?
- Is the maintenance of automatic sprinkler systems assigned to responsible persons or to a sprinkler contractor?
- Are sprinkler heads protected by metal guards, when exposed to physical damage?
- Is proper clearance maintained below sprinkler heads?
- Are portable fire extinguishers provided in adequate number and type?
- Are fire extinguishers mounted in readily accessible locations?
- Are fire extinguishers recharged regularly and noted on the inspection tag?
- Are employees periodically instructed in the use of extinguishers and fire protection procedures?

PERSONAL PROTECTIVE EQUIPMENT AND CLOTHING (PPE)

Y N

- Are employers assessing the workplace to determine if hazards that require the use of personal protective equipment (e.g. head, eye, face, hand, or foot protection) are present or are likely to be present?
- If hazards or the likelihood of hazards are found, are employers selecting and having affected employees use properly fitted personal protective equipment suitable for protection from these hazards?
- Has the employer been trained on PPE procedures, i.e. what PPE is necessary for a job tasks, when they need it, and how to properly adjust it?
- Are protective goggles or face shields provided and worn where there is any danger of flying particles or corrosive materials?

- Are approved safety glasses required to be worn at all times in areas where there is a risk of eye injuries such as punctures, abrasions, contusions or burns?
- Are employees who need corrective lenses (glasses or contacts) in working environments having harmful exposures, required to wear only approved safety glasses, protective goggles, or use other medically approved precautionary procedures?
- Are protective gloves, aprons, shields, or other means provided and required where employees could be cut or where there is reasonably anticipated exposure to corrosive liquids, chemicals, blood, or other potentially infectious materials?
- Are hard hats provided and worn where danger of falling objects exists?
- Are hard hats inspected periodically for damage to the shell and suspension system?
- Is appropriate foot protection required where there is the risk of foot injuries from hot, corrosive, poisonous substances, falling objects, crushing or penetrating actions?
- Are approved respirators provided for regular or emergency use where needed?
- Is all protective equipment maintained in a sanitary condition and ready for use?
- Do you have eye wash facilities and a quick Drench Shower within the work area where employees are exposed to injurious corrosive materials?
- Where special equipment is needed for electrical workers, is it available?
- Where food or beverages are consumed on the premises, are they consumed in areas where there is no exposure to toxic material, blood, or other potentially infectious materials?
- Is protection against the effects of occupational noise exposure provided when sound levels exceed those of the OSHA noise standard?
- Are adequate work procedures, protective clothing and equipment provided and used when cleaning up spilled toxic or otherwise hazardous materials or liquids?
- Are there appropriate procedures in place for disposing of or decontaminating personal protective equipment contaminated with, or reasonably anticipated to be contaminated with, blood or other potentially infectious materials?

GENERAL WORK ENVIRONMENT

Y N

- Are all worksites clean, sanitary, and orderly?
- Are work surfaces kept dry or appropriate means taken to assure the surfaces are slip-resistant?

- Are all spilled hazardous materials or liquids, including blood and other potentially infectious materials, cleaned up immediately and according to proper procedures?
- Is combustible scrap, debris and waste stored safely and removed from the worksite promptly?
- Is all regulated waste, as defined in the OSHA bloodborne pathogens standard (29 CFR 1910.1030), discarded according to federal, state, and local regulations?
- Are accumulations of combustible dust routinely removed from elevated surfaces including the overhead structure of buildings, etc.?
- Is combustible dust cleaned up with a vacuum system to prevent the dust going into suspension?
- Is metallic or conductive dust prevented from entering or accumulating on or around electrical enclosures or equipment?
- Are covered metal waste cans used for oily and paint-soaked waste?
- Are all oil and gas fired devices equipped with flame failure controls that will prevent flow of fuel if pilots or main burners are not working?
- Are paint spray booths, dip tanks, etc., cleaned regularly?
- Are the minimum number of toilets and washing facilities provided?
- Are all toilets and washing facilities clean and sanitary?
- Are all work areas adequately illuminated?
- Are pits and floor openings covered or otherwise guarded?
- Have all confined spaces been evaluated for compliance with 29 CFR 1910.146?

WALKWAYS

- | | | |
|--------------------------|--------------------------|--|
| Y | N | |
| <input type="checkbox"/> | <input type="checkbox"/> | Are aisles and passageways kept clear? |
| <input type="checkbox"/> | <input type="checkbox"/> | Are aisles and walkways marked as appropriate? |
| <input type="checkbox"/> | <input type="checkbox"/> | Are wet surfaces covered with non-slip materials? |
| <input type="checkbox"/> | <input type="checkbox"/> | Are holes in the floor, sidewalk or other walking surface repaired properly, covered or otherwise made safe? |
| <input type="checkbox"/> | <input type="checkbox"/> | Is there safe clearance for walking in aisles where motorized or mechanical handling equipment is operating? |
| <input type="checkbox"/> | <input type="checkbox"/> | Are materials or equipment stored in such a way that sharp projectives will not interfere with the walkway? |
| <input type="checkbox"/> | <input type="checkbox"/> | Are spilled materials cleaned up immediately? |
| <input type="checkbox"/> | <input type="checkbox"/> | Are changes of direction or elevations readily identifiable? |

- Are aisles or walkways that pass near moving or operating machinery, welding operations or similar operations arranged so employees will not be subjected to potential hazards?
- Is adequate headroom provided for the entire length of any aisle or walkway?
- Are standard guardrails provided wherever aisle or walkway surfaces are elevated more than 30 inches (76.20 centimeters) above any adjacent floor or the ground?
- Are bridges provided over conveyors and similar hazards?

FLOOR AND WALL OPENINGS

- | | | |
|--------------------------|--------------------------|--|
| Y | N | |
| <input type="checkbox"/> | <input type="checkbox"/> | Are floor openings guarded by a cover, a guardrail, or equivalent on all sides (except at entrance to stairways or ladders)? |
| <input type="checkbox"/> | <input type="checkbox"/> | Are toe-boards installed around the edges of permanent floor opening (where persons may pass below the opening)? |
| <input type="checkbox"/> | <input type="checkbox"/> | Are skylight screens of such construction and mounting that they will withstand a load of at least 200 pounds (90 kilograms)? |
| <input type="checkbox"/> | <input type="checkbox"/> | Is the glass in the windows, doors, glass walls, etc., which are subject to human impact, of sufficient thickness and type for the condition of use? |
| <input type="checkbox"/> | <input type="checkbox"/> | Are grates or similar type covers over floor openings such as floor drains of such design that foot traffic or rolling equipment will not be affected by the grate spacing? |
| <input type="checkbox"/> | <input type="checkbox"/> | Are unused portions of service pits and pits not actually in use either covered or protected by guardrails or equivalent? |
| <input type="checkbox"/> | <input type="checkbox"/> | Are manhole covers, trench covers and similar covers, plus their supports designed to carry a truck rear axle load of at least 20,000 pounds (9000 kilograms) when located in roadways and subject to vehicle traffic? |
| <input type="checkbox"/> | <input type="checkbox"/> | Are floor or wall openings in fire resistive construction provided with doors or covers compatible with the fire rating of the structure and provided with a self-closing feature when appropriate? |

STAIRS AND STAIRWAYS

- | | | |
|--------------------------|--------------------------|--|
| Y | N | |
| <input type="checkbox"/> | <input type="checkbox"/> | Are standard stair rails or handrails on all stairways having four or more risers? |
| <input type="checkbox"/> | <input type="checkbox"/> | Are all stairways at least 22 inches (55.88 centimeters) wide? |
| <input type="checkbox"/> | <input type="checkbox"/> | Do stairs have landing platforms not less than 30 inches (76.20 centimeters) in the direction of travel and extend 22 inches (55.88 centimeters) in width at every 12 feet (3.6576 meters) or less of vertical rise? |
| <input type="checkbox"/> | <input type="checkbox"/> | Do stairs angle no more than 50 and no less than 30 degrees? |

- Are stairs of hollow-pan type treads and landings filled to the top edge of the pan with solid material?
- Are step risers on stairs uniform from top to bottom?
- Are steps on stairs and stairways designed or provided with a surface that renders them slip resistant?
- Are stairway handrails located between 30 (76.20 centimeters) and 34 inches (86.36 centimeters) above the leading edge of stair treads?
- Do stairway handrails have at least 3 inches (7.62 centimeters) of clearance between the handrails and the wall or surface they are mounted on?
- Where doors or gates open directly on a stairway, is there a platform provided so the swing of the door does not reduce the width of the platform to less than 21 inches (53.34 centimeters)?
- Are stairway handrails capable of withstanding a load of 200 pounds (90 kilograms), applied within 2 inches (5.08 centimeters) of the top edge, in any downward or outward direction?
- Where stairs or stairways exit directly into any area where vehicles may be operated, are adequate barriers and warnings provided to prevent employees stepping into the path of traffic?
- Do stairway landings have a dimension measured in the direction of travel, at least equal to the width of the stairway?
- Is the vertical distance between stairway landings limited to 12 feet (3.6576 centimeters) or less?

ELEVATED SURFACES

- Are signs posted, when appropriate, showing the elevated surface load capacity?
- Are surfaces elevated more than 30 inches (76.20 centimeters) above the floor or ground provided with standard guardrails?
- Are all elevated surfaces (beneath which people or machinery could be exposed to falling objects) provided with standard 4-inch (10.16 centimeters) toe-boards?
- Is a permanent means of access and egress provided to elevated storage and work surfaces?
- Is required headroom provided where necessary?
- Is material on elevated surfaces piled, stacked or racked in a manner to prevent it from tipping, falling, collapsing, rolling or spreading?
- Are dock boards or bridge plates used when transferring materials between docks and trucks or rail cars?

EXITING OR EGRESS

- Are all exits marked with an exit sign and illuminated by a reliable light source?
- Are the directions to exits, when not immediately apparent, marked with visible signs?
- Are doors, passageways or stairways, that are neither exits nor access to exits, and which could be mistaken for exits, appropriately marked "NOT AN EXIT," "TO BASEMENT," "STOREROOM," etc.?
- Are exit signs provided with the word "EXIT" in lettering at least 5 inches (12.70 centimeters) high and the stroke of the lettering at least 1/2-inch (1.2700 centimeters) wide?
- Are exit doors side-hinged?
- Are all exits kept free of obstructions?
- Are at least two means of egress provided from elevated platforms, pits or rooms where the absence of a second exit would increase the risk of injury from hot, poisonous, corrosive, suffocating, flammable, or explosive substances?
- Are there sufficient exits to permit prompt escape in case of emergency?
- Are special precautions taken to protect employees during construction and repair operations?
- Is the number of exits from each floor of a building and the number of exits from the building itself, appropriate for the building occupancy load?
- Are exit stairways that are required to be separated from other parts of a building enclosed by at least 2-hour fire-resistive construction in buildings more than four stories in height, and not less than 1-hour fire-resistive constructive elsewhere?
- Where ramps are used as part of required exiting from a building, is the ramp slope limited to 1 foot (0.3048 meters) vertical and 12 feet (3.6576 meters) horizontal?
- Where exiting will be through frameless glass doors, glass exit doors, or storm doors are the doors fully tempered and meet the safety requirements for human impact?

EXIT DOORS

- Are doors that are required to serve as exits designed and constructed so that the way of exit travel is obvious and direct?
- Are windows that could be mistaken for exit doors, made inaccessible by means of barriers or railings?

- Are exit doors openable from the direction of exit travel without the use of a key or any special knowledge or effort when the building is occupied?
- Is a revolving, sliding or overhead door prohibited from serving as a required exit door?
- Where panic hardware is installed on a required exit door, will it allow the door to open by applying a force of 15 pounds (6.75 kilograms) or less in the direction of the exit traffic?
- Are doors on cold storage rooms provided with an inside release mechanism which will release the latch and open the door even if it's padlocked or otherwise locked on the outside?
- Where exit doors open directly onto any street, alley or other area where vehicles may be operated, are adequate barriers and warnings provided to prevent employees from stepping into the path of traffic?
- Are doors that swing in both directions and are located between rooms where there is frequent traffic, provided with viewing panels in each door?

PORTABLE LADDERS

- | | | | | | |
|---|--------------------------|----------|--------------------------|--------------------------|---|
| <table border="0"> <tr> <td style="padding-right: 5px;">Y</td> <td style="padding-right: 5px;">N</td> </tr> <tr> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> </tr> </table> | Y | N | <input type="checkbox"/> | <input type="checkbox"/> | <ul style="list-style-type: none"> Are all ladders maintained in good condition, joints between steps and side rails tight, all hardware and fittings securely attached and moveable parts operating freely without binding or undue play? <input type="checkbox"/> <input type="checkbox"/> Are non-slip safety feet provided on each ladder? <input type="checkbox"/> <input type="checkbox"/> Are non-slip safety feet provided on each metal or rung ladder? <input type="checkbox"/> <input type="checkbox"/> Are ladder rungs and steps free of grease and oil? <input type="checkbox"/> <input type="checkbox"/> Is it prohibited to place a ladder in front of doors opening toward the ladder except when the door is blocked open, locked or guarded? <input type="checkbox"/> <input type="checkbox"/> Is it prohibited to place ladders on boxes, barrels, or other unstable bases to obtain additional height? <input type="checkbox"/> <input type="checkbox"/> Are employees instructed to face the ladder when ascending or descending? <input type="checkbox"/> <input type="checkbox"/> Are employees prohibited from using ladders that are broken, missing steps, rungs, or cleats, broken side rails or other faulty equipment? <input type="checkbox"/> <input type="checkbox"/> Are employees instructed not to use the top step of ordinary stepladders as a step? <input type="checkbox"/> <input type="checkbox"/> When portable rung ladders are used to gain access to elevated platforms, roofs, etc., does the ladder always extend at least 3 feet (0.9144 meters) above the elevated surface? <input type="checkbox"/> <input type="checkbox"/> Is it required that when portable rung or cleat type ladders are used, the base is so placed that slipping will not occur, or it is lashed or otherwise held in place? |
| Y | N | | | | |
| <input type="checkbox"/> | <input type="checkbox"/> | | | | |

- Are portable metal ladders legibly marked with signs reading "CAUTION" - Do Not Use Around Electrical Equipment" or equivalent wording?
- Are employees prohibited from using ladders as guys, braces, skids, gin poles, or for other than their intended purposes?
- Are employees instructed to only adjust extension ladders while standing at a base (not while standing on the ladder or from a position above the ladder)?
- Are metal ladders inspected for damage?
- Are the rungs of ladders uniformly spaced at 12 inches, (30.48 centimeters) center to center?

HAND TOOLS AND EQUIPMENT

- | | | | | | |
|---|--------------------------|----------|--------------------------|--------------------------|---|
| <table border="0"> <tr> <td style="padding-right: 5px;">Y</td> <td style="padding-right: 5px;">N</td> </tr> <tr> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> </tr> </table> | Y | N | <input type="checkbox"/> | <input type="checkbox"/> | <ul style="list-style-type: none"> Are all tools and equipment (both company and employee owned) used by employees at their workplace in good condition? <input type="checkbox"/> <input type="checkbox"/> Are hand tools such as chisels and punches, which develop mushroomed heads during use, reconditioned or replaced as necessary? <input type="checkbox"/> <input type="checkbox"/> Are broken or fractured handles on hammers, axes and similar equipment replaced promptly? <input type="checkbox"/> <input type="checkbox"/> Are worn or bent wrenches replaced regularly? <input type="checkbox"/> <input type="checkbox"/> Are appropriate handles used on files and similar tools? <input type="checkbox"/> <input type="checkbox"/> Are employees made aware of the hazards caused by faulty or improperly used hand tools? <input type="checkbox"/> <input type="checkbox"/> Are appropriate safety glasses, face shields, etc. used while using hand tools or equipment which might produce flying materials or be subject to breakage? <input type="checkbox"/> <input type="checkbox"/> Are jacks checked periodically to ensure they are in good operating condition? <input type="checkbox"/> <input type="checkbox"/> Are tool handles wedged tightly in the head of all tools? <input type="checkbox"/> <input type="checkbox"/> Are tool cutting edges kept sharp so the tool will move smoothly without binding or skipping? <input type="checkbox"/> <input type="checkbox"/> Are tools stored in dry, secure location where they won't be tampered with? <input type="checkbox"/> <input type="checkbox"/> Is eye and face protection used when driving hardened or tempered spuds or nails? |
| Y | N | | | | |
| <input type="checkbox"/> | <input type="checkbox"/> | | | | |

PORTABLE (POWER OPERATED) TOOLS AND EQUIPMENT

- | | | | | | |
|---|--------------------------|----------|--------------------------|--------------------------|---|
| <table border="0"> <tr> <td style="padding-right: 5px;">Y</td> <td style="padding-right: 5px;">N</td> </tr> <tr> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> </tr> </table> | Y | N | <input type="checkbox"/> | <input type="checkbox"/> | <ul style="list-style-type: none"> Are grinders, saws and similar equipment provided with appropriate safety guards? <input type="checkbox"/> <input type="checkbox"/> Are power tools used with the correct shield, guard, or attachment, recommended by the manufacturer? <input type="checkbox"/> <input type="checkbox"/> Are portable circular saws equipped with guards above and below the base shoe? <input type="checkbox"/> <input type="checkbox"/> Are circular saw guards checked to assure they are not wedged up, thus leaving the lower portion of the blade unguarded? |
| Y | N | | | | |
| <input type="checkbox"/> | <input type="checkbox"/> | | | | |

- Are rotating or moving parts of equipment guarded to prevent physical contact?
- Are all cord-connected, electrically operated tools and equipment effectively grounded or of the approved double insulated type?
- Are effective guards in place over belts, pulleys, chains, sprockets, on equipment such as air compressors?
- Are portable fans provided with full guards or screens having openings 1/2 inch (1.2700 centimeters) or less?
- Is hoisting equipment available and used for lifting heavy objects, and are hoist ratings and characteristics appropriate for the task?
- Are ground-fault circuit interrupters provided on all temporary electrical 15 and 20 ampere circuits, used during periods of construction?
- Are pneumatic and hydraulic hoses on power-operated tools checked regularly for deterioration or damage?

WOODWORKING TOOLS

- | | | |
|--------------------------|--------------------------|---|
| Y | N | |
| <input type="checkbox"/> | <input type="checkbox"/> | Do All woodworking tools and machinery meet applicable requirements of American National Standards Institute, 01.1-1961, <i>Safety Code for Woodworking Machinery</i> ? |
| <input type="checkbox"/> | <input type="checkbox"/> | Before a worker is permitted to operate any woodworking machine, has he/she received instructions in the hazards of the machine and the safe method of its operation? Are workers operating any woodworking machinery instructed to do the following: |
| <input type="checkbox"/> | <input type="checkbox"/> | Learn the machine's applications and limitations, as well as the specific potential hazards peculiar to this machine and follow available operating instructions and safety rules carefully? |
| <input type="checkbox"/> | <input type="checkbox"/> | Keep working areas clean and to use adequate lighting? |
| <input type="checkbox"/> | <input type="checkbox"/> | Do not wear loose clothing, gloves, bracelets, necklaces, or ornaments? |
| <input type="checkbox"/> | <input type="checkbox"/> | Wear face, eye, ear, respiratory, and body protection devices, as indicated for the operation or environment? |
| <input type="checkbox"/> | <input type="checkbox"/> | Not to use cutting tools larger or heavier than the machine is designed to accommodate and to never operate a cutting tool at greater speed than recommended? |
| <input type="checkbox"/> | <input type="checkbox"/> | Keep hands well away from saw blades and other cutting tools and to use a push stock or push block to hold or guide the work when working close to a cutting tool? |
| <input type="checkbox"/> | <input type="checkbox"/> | Whenever possible, use properly locked clamps, jig, or vise to hold the work? |
| <input type="checkbox"/> | <input type="checkbox"/> | When an applicable guard cannot be used, combs (feather boards) shall be used? |

- Never stand directly in line with a horizontally rotating cutting tool? (This is particularly true when first starting a new tool, or a new tool is initially installed on the arbor.)
- Be sure the power is disconnected from the machine before tools are serviced?
- Never leave the machine with the power on?
- Be positive that hold-downs and anti-kickback devices are positioned properly, and that the workpiece is being fed through the cutting tool in the right direction?
- Do not use a dull, gummy, bent, or cracked cutting tool?
- Be sure that keys and adjusting wrenches have been removed before turning power on?
- Use only accessories designed for the machine.
- Adjust the machine for minimum exposure of cutting tool necessary to perform the operation?
- Is there a cover or guard installed on machines that throw stock, material, or objects, such as rip saws?
- Is there a machine stop or machine feed stop switch that operators can reach without leaving their normal operating position?
- On fixed machines, are stop buttons red or orange?
- Are one or more stop buttons provided depending on the working position of the operator or operators?
- Are all belts, pulleys, gears, shafts, and moving parts guarded?
- Is all equipment electrically grounded?
- Are feather-boards or suitable jigs used when a standard guard will not work, such as when dadoing, grooving, jointing, moulding, and rabbeting?
- Are the "OFF" switches located so operators do not have to leave to shut off the machines?
- Are all power and operating controls within reach of the operator?
- Are foot-operated controls protected from unexpected or accidental activation?
- Are feed rolls of feeder attachments guarded to protect the operator from contacting hazardous parts?
- Are both sides of band-saw wheels covered?
- Are all unused portions of a band-saw blade covered?
- Does the radial arm saw have a hood that completely encloses the upper portion of the blade, including the end of the saw arbor?
- Is the blade of the radial arm saw prevented from extending beyond the front edge of the table or roll case?

- Is there a lower blade guard that encloses the radial arm saw blade and automatically adjusts to the thickness of the material?
- Are machine control switches located or guarded to prevent unexpected or accidental movement?
- Are electrical-switch start buttons recessed?
- Are machines designed for a fixed location securely anchored to prevent walking or moving?
- When ripping, does the radial arm saw have a spreader in line with the blade and anti-kickback fingers on each side of the blade?
- Does the radial arm saw blade automatically return gently and stay at the back of the table?
- Does the table saw have a hood that covers the blade at least to the depth of the teeth?
- Does the table saw hood automatically adjust itself to the thickness of the material being cut?
- Does the table saw hood protect the operator from flying splinters and broken saw teeth?
- When ripping, does the table saw have a spreader in line with the blade and anti-kickback fingers on each side of the blade?
- Are push sticks used to guide short stock and ends through table saws?

ABRASIVE WHEEL EQUIPMENT (GRINDERS)

- | | |
|----------|----------|
| Y | N |
|----------|----------|
- Is the work rest used and kept adjusted to within 1/8 inch (0.3175 centimeters) of the wheel?
 - Is the adjustable tongue on the top side of the grinder used and kept adjusted to within 1/4 inch (0.6350 centimeters) of the wheel?
 - Do side guards cover the spindle, nut, and flange and 75 percent of the wheel diameter?
 - Are bench and pedestal grinders permanently mounted?
 - Are goggles or face shields always worn when grinding?
 - Is the maximum RPM rating of each abrasive wheel compatible with the RPM rating of the grinder motor?
 - Are fixed or permanently mounted grinders connected to their electrical supply system with metallic conduit or other permanent wiring method?
 - Does each grinder have an individual on and off control switch?
 - Is each electrically operated grinder effectively grounded?
 - Before new abrasive wheels are mounted, are they visually inspected and ring tested?
 - Are dust collectors and powered exhausts provided on grinders used in operations that produce large amounts of dust?

- Are splash guards mounted on grinders that use coolant to prevent the coolant reaching employees?
- Is cleanliness maintained around grinders?

POWDER-ACTUATED TOOLS

- | | |
|----------|----------|
| Y | N |
|----------|----------|
- Are employees who operate powder-actuated tools trained in their use and carry a valid operators card?
 - Is each powder-actuated tool stored in its own locked container when not being used?
 - Is a sign at least 7 inches (17.78 centimeters) by 10 inches (25.40 centimeters) with bold face type reading "POWDER-ACTUATED TOOL IN USE" conspicuously posted when the tool is being used?
 - Are powder-actuated tools left unloaded until they are actually ready to be used?
 - Are powder-actuated tools inspected for obstructions or defects each day before use?
 - Do powder-actuated tool operators have and use appropriate personal protective equipment such as hard hats, safety goggles, safety shoes and ear protectors?

MACHINE GUARDING

- | | |
|----------|----------|
| Y | N |
|----------|----------|
- Is there a training program to instruct employees on safe methods of machine operation?
 - Is there adequate supervision to ensure that employees are following safe machine operating procedures?
 - Is there a regular program of safety inspection of machinery and equipment?
 - Is all machinery and equipment kept clean and properly maintained?
 - Is sufficient clearance provided around and between machines to allow for safe operations, set up and servicing, material handling and waste removal?
 - Is equipment and machinery securely placed and anchored, when necessary to prevent tipping or other movement that could result in personal injury?
 - Is there a power shut-off switch within reach of the operator's position at each machine?
 - Can electric power to each machine be locked out for maintenance, repair, or security?
 - Are the non-current-carrying metal parts of electrically operated machines bonded and grounded?
 - Are foot-operated switches guarded or arranged to prevent accidental actuation by personnel or falling objects?
 - Are manually operated valves and switches controlling the operation of equipment and machines clearly identified and readily accessible?

- Are all emergency stop buttons colored red?
- Are all pulleys and belts that are within 7 feet (2.1336 meters) of the floor or working level properly guarded?
- Are all moving chains and gears properly guarded?
- Are splash guards mounted on machines that use coolant to prevent the coolant from reaching employees?
- Are methods provided to protect the operator and other employees in the machine area from hazards created at the point of operation, ingoing nip points, rotating parts, flying chips, and sparks?
- Are machinery guards secure and so arranged that they do not offer a hazard in their use?
- If special hand tools are used for placing and removing material, do they protect the operator's hands?
- Are revolving drums, barrels, and containers required to be guarded by an enclosure that is interlocked with the drive mechanism, so that revolution cannot occur unless the guard enclosures is in place, so guarded?
- Do arbors and mandrels have firm and secure bearings and are they free from play?
- Are provisions made to prevent machines from automatically starting when power is restored after a power failure or shutdown?
- Are machines constructed so as to be free from excessive vibration when the largest size tool is mounted and run at full speed?
- If machinery is cleaned with compressed air, is air pressure controlled and personal protective equipment or other safeguards utilized to protect operators and other workers from eye and body injury?
- Are fan blades protected with a guard having openings no larger than 1/2 inch (1.2700 centimeters), when operating within 7 feet (2.1336 meters) of the floor?
- Are saws used for ripping, equipped with anti-kick back devices and spreaders?
- Are radial arm saws so arranged that the cutting head will gently return to the back of the table when released?

LOCKOUT/TAGOUT PROCEDURES

- | | | |
|--------------------------|--------------------------|--|
| Y | N | |
| <input type="checkbox"/> | <input type="checkbox"/> | Is all machinery or equipment capable of movement, required to be de-energized or disengaged and locked-out during cleaning, servicing, adjusting or setting up operations, whenever required? |
| <input type="checkbox"/> | <input type="checkbox"/> | Where the power disconnecting means for equipment does not also disconnect the electrical control circuit: |

- | | | |
|--------------------------|--------------------------|--|
| <input type="checkbox"/> | <input type="checkbox"/> | Are the appropriate electrical enclosures identified? |
| <input type="checkbox"/> | <input type="checkbox"/> | Is means provided to assure the control circuit can also be disconnected and locked-out? |
| <input type="checkbox"/> | <input type="checkbox"/> | Is the locking-out of control circuits in lieu of locking-out main power disconnects prohibited? |
| <input type="checkbox"/> | <input type="checkbox"/> | Are all equipment control valve handles provided with a means for locking-out? |
| <input type="checkbox"/> | <input type="checkbox"/> | Does the lock-out procedure require that stored energy (mechanical, hydraulic, air, etc.) be released or blocked before equipment is locked-out for repairs? |
| <input type="checkbox"/> | <input type="checkbox"/> | Are appropriate employees provided with individually keyed personal safety locks? |
| <input type="checkbox"/> | <input type="checkbox"/> | Are employees required to keep personal control of their key(s) while they have safety locks in use? |
| <input type="checkbox"/> | <input type="checkbox"/> | Is it required that only the employee exposed to the hazard, place or remove the safety lock? |
| <input type="checkbox"/> | <input type="checkbox"/> | Is it required that employees check the safety of the lock-out by attempting a startup after making sure no one is exposed? |
| <input type="checkbox"/> | <input type="checkbox"/> | Are employees instructed to always push the control circuit stop button immediately after checking the safety of the lock-out? |
| <input type="checkbox"/> | <input type="checkbox"/> | Is there a means provided to identify any or all employees who are working on locked-out equipment by their locks or accompanying tags? |
| <input type="checkbox"/> | <input type="checkbox"/> | Are a sufficient number of accident preventive signs or tags and safety padlocks provided for any reasonably foreseeable repair emergency? |
| <input type="checkbox"/> | <input type="checkbox"/> | When machine operations, configuration or size requires the operator to leave his or her control station to install tools or perform other operations, and that part of the machine could move if accidentally activated, is such element required to be separately locked or blocked out? |
| <input type="checkbox"/> | <input type="checkbox"/> | In the event that equipment or lines cannot be shut down, locked-out and tagged, is a safe job procedure established and rigidly followed? |

WELDING, CUTTING AND BRAZING

- | | | |
|--------------------------|--------------------------|--|
| Y | N | |
| <input type="checkbox"/> | <input type="checkbox"/> | Are only authorized and trained personnel permitted to use welding, cutting or brazing equipment? |
| <input type="checkbox"/> | <input type="checkbox"/> | Does each operator have a copy of the appropriate operating instructions and are they directed to follow them? |
| <input type="checkbox"/> | <input type="checkbox"/> | Are compressed gas cylinders regularly examined for obvious signs of defects, deep rusting, or leakage? |
| <input type="checkbox"/> | <input type="checkbox"/> | Is care used in handling and storing cylinders, safety valves, and relief valves to prevent damage? |
| <input type="checkbox"/> | <input type="checkbox"/> | Are precautions taken to prevent the mixture of air or oxygen with flammable gases, except at a burner or in a standard torch? |

- Are only approved apparatus (torches, regulators, pressure reducing valves, acetylene generators, manifolds) used?
- Are cylinders kept away from sources of heat?
- Are the cylinders kept away from elevators, stairs, or gangways?
- Is it prohibited to use cylinders as rollers or supports?
- Are empty cylinders appropriately marked and their valves closed?
- Are signs reading: DANGER—NO SMOKING, MATCHES, OR OPENLIGHTS, or the equivalent, posted?
- Are cylinders, cylinder valves, couplings, regulators, hoses, and apparatus kept free of oily or greasy substances?
- Is care taken not to drop or strike cylinders?
- Unless secured on special trucks, are regulators removed and valve-protection caps put in place before moving cylinders?
- Do cylinders without fixed hand wheels have keys, handles, or non-adjustable wrenches on stem valves when in service?
- Are liquefied gases stored and shipped valve-end up with valve covers in place?
- Are provisions made to never crack a fuel gas cylinder valve near sources of ignition?
- Before a regulator is removed, is the valve closed and gas released from the regulator?
- Is red used to identify the acetylene (and other fuelgas) hose, green for oxygen hose, and black for inert gas and air hose?
- Are pressure-reducing regulators used only for the gas and pressures for which they are intended?
- Is open circuit (No Load) voltage of arc welding and cutting machines as low as possible and not in excess of the recommended limits?
- Under wet conditions, are automatic controls for reducing no load voltage used?
- Is grounding of the machine frame and safety ground connections of portable machines checked periodically?
- Are electrodes removed from the holders when not in use?
- Is it required that electric power to the welder be shut off when no one is in attendance?
- Is suitable fire extinguishing equipment available for immediate use?
- Is the welder forbidden to coil or loop welding electrode cable around his body?
- Are wet machines thoroughly dried and tested before being used?
- Are work and electrode lead cables frequently inspected for wear and damage, and replaced when needed?

- Do means for connecting cable lengths have adequate insulation?
- When the object to be welded cannot be moved and fire hazards cannot be removed, are shields used to confine heat, sparks, and slag?
- Are fire watchers assigned when welding or cutting is performed in locations where a serious fire might develop?
- Are combustible floors kept wet, covered by damp sand, or protected by fire-resistant shields?
- When floors are wet down, are personnel protected from possible electrical shock?
- When welding is done on metal walls, are precautions taken to protect combustibles on the other side?
- Before hot work is begun, are used drums, barrels, tanks, and other containers so thoroughly cleaned that no substances remain that could explode, ignite, or produce toxic vapors?
- Is it required that eye protection helmets, hand shields and goggles meet appropriate standards?
- Are employees exposed to the hazards created by welding, cutting, or brazing operations protected with personal protective equipment and clothing?
- Is a check made for adequate ventilation in and where welding or cutting is performed?
- When working in confined places, are environmental monitoring tests taken and means provided for quick removal of welders in case of an emergency?

COMPRESSORS AND COMPRESSED AIR

- | Y | N | |
|--------------------------|--------------------------|---|
| <input type="checkbox"/> | <input type="checkbox"/> | Are compressors equipped with pressure relief valves, and pressure gauges? |
| <input type="checkbox"/> | <input type="checkbox"/> | Are compressor air intakes installed and equipped so as to ensure that only clean uncontaminated air enters the compressor? |
| <input type="checkbox"/> | <input type="checkbox"/> | Are air filters installed on the compressor intake? |
| <input type="checkbox"/> | <input type="checkbox"/> | Are compressors operated and lubricated in accordance with the manufacturer's recommendations? |
| <input type="checkbox"/> | <input type="checkbox"/> | Are safety devices on compressed air systems checked frequently? |
| <input type="checkbox"/> | <input type="checkbox"/> | Before any repair work is done on the pressure system of a compressor, is the pressure bled off and the system locked-out? |
| <input type="checkbox"/> | <input type="checkbox"/> | Are signs posted to warn of the automatic starting feature of the compressors? |
| <input type="checkbox"/> | <input type="checkbox"/> | Is the belt drive system totally enclosed to provide protection for the front, back, top, and sides? |

- Is it strictly prohibited to direct compressed air towards a person?
- Are employees prohibited from using highly compressed air for cleaning purposes?
- If compressed air is used for cleaning off clothing, is the pressure reduced to less than 10 psi?
- When using compressed air for cleaning, do employees wear protective chip guarding and personal protective equipment?
- Are safety chains or other suitable locking devices used at couplings of high pressure hose lines where a connection failure would create a hazard?
- Before compressed air is used to empty containers of liquid, is the safe working pressure of the container checked?
- When compressed air is used with abrasive blast cleaning equipment, is the operating valve a type that must be held open manually?
- When compressed air is used to inflate auto ties, is a clip-on chuck and an inline regulator preset to 40 psi required?
- Is it prohibited to use compressed air to clean up or move combustible dust if such action could cause the dust to be suspended in the air and cause a fire or explosion hazard?

COMPRESSORS & AIR RECEIVERS

- Y N**
- Is every receiver equipped with a pressure gauge and with one or more automatic, spring-loaded safety valves?
 - Is the total relieving capacity of the safety valve capable of preventing pressure in the receiver from exceeding the maximum allowable working pressure of the receiver by more than 10 percent?
 - Is every air receiver provided with a drain pipe and valve at the lowest point for the removal of accumulated oil and water?
 - Are compressed air receivers periodically drained of moisture and oil?
 - Are all safety valves tested frequently and at regular intervals to determine whether they are in good operating condition?
 - Is there a current operating permit used by the Division of Occupational Safety and Health?
 - Is the inlet of air receivers and piping systems kept free of accumulated oil and carbonaceous materials?

COMPRESSED GAS CYLINDERS

- Y N**
- Are cylinders with a water weight capacity over 30 pounds (13.5 kilograms), equipped with means for connecting a valve protector device, or with a collar or recess to protect the valve?

- Are cylinders legibly marked to clearly identify the gas contained?
- Are compressed gas cylinders stored in areas which are protected from external heat sources such as flame impingement, intense radiant heat, electric arcs, or high temperature lines?
- Are cylinders located or stored in areas where they will not be damaged by passing or falling objects or subject to tampering by unauthorized persons?
- Are cylinders stored or transported in a manner to prevent them from creating a hazard by tipping, falling or rolling?
- Are cylinders containing liquefied fuel gas, stored or transported in a position so that the safety relief device is always in direct contact with the vapor space in the cylinder?
- Are valve protectors always placed on cylinders when the cylinders are not in use or connected for use?
- Are all valves closed off before a cylinder is moved, when the cylinder is empty, and at the completion of each job?
- Are low pressure fuel-gas cylinders checked periodically for corrosion, general distortion, cracks, or any other defect that might indicate a weakness or render it unfit for service?
- Does the periodic check of low pressure fuel-gas cylinders include a close inspection of the cylinders' bottom?

HOIST AND AUXILIARY EQUIPMENT

- Y N**
- Is each overhead electric hoist equipped with a limit device to stop the hook travel at its highest and lowest point of safe travel?
 - Will each hoist automatically stop and hold any load up to 125 percent of its rated load if its actuating force is removed?
 - Is the rated load of each hoist legibly marked and visible to the operator?
 - Are stops provided at the safe limits of travel for trolley hoist?
 - Are the controls of hoist plainly marked to indicate the direction of travel or motion?
 - Is each cage-controlled hoist equipped with an effective warning device?
 - Are close-fitting guards or other suitable devices installed on hoist to assure hoist ropes will be maintained in the sheave grooves?
 - Are all hoist chains or ropes of sufficient length to handle the full range of movement of the application while still maintaining two full wraps on the drum at all times?
 - Are nip points or contact points between hoist ropes and sheaves which are permanently located within 7 feet (2.1336 meters) of the floor, ground or working platform, guarded?

- Is it prohibited to use chains or rope slings that are kinked or twisted?
- Is it prohibited to use the hoist rope or chain wrapped around the load as a substitute, for a sling?
- Is the operator instructed to avoid carrying loads over people?

INDUSTRIAL TRUCKS – FORKLIFTS

- | | | |
|---|---|--|
| Y | N | |
|---|---|--|
- Are only employees who have been trained in the proper use of hoists allowed to operate them?
 - Are only trained personnel allowed to operate industrial trucks?
 - Is substantial overhead protective equipment provided on high lift rider equipment?
 - Are the required lift truck operating rules posted and enforced?
 - Is directional lighting provided on each industrial truck that operates in an area with less than 2 foot-candles per square foot of general lighting?
 - Does each industrial truck have a warning horn, whistle, gong, or other device which can be clearly heard above the normal noise in the areas where operated?
 - Are the brakes on each industrial truck capable of bringing the vehicle to a complete and safe stop when fully loaded?
 - Will the industrial trucks' parking brake effectively prevent the vehicle from moving when unattended?
 - Are industrial trucks operating in areas where flammable gases or vapors, or combustible dust or ignitable fibers may be present in the atmosphere, approved for such locations?
 - Are motorized hand and hand/rider trucks so designed that the brakes are applied, and power to the drive motor shuts off when the operator releases his or her grip on the device that controls the travel?
 - Are industrial trucks with internal combustion engine, operated in buildings or enclosed areas, carefully checked to ensure such operations do not cause harmful concentration of dangerous gases or fumes?
 - Are powered industrial trucks being safely operated?

SPRAYING OPERATIONS

- | | | |
|---|---|--|
| Y | N | |
|---|---|--|
- Is adequate ventilation assured before spray operations are started?
 - Is mechanical ventilation provided when spraying operations are done in enclosed areas?
 - When mechanical ventilation is provided during spraying operations, is it so arranged that it will not circulate the contaminated air?

- Is the spray area free of hot surfaces?
- Is the spray area at least 20 feet (6.096 meters) from flames, sparks, operating electrical motors and other ignition sources?
- Are portable lamps used to illuminate spray areas suitable for use in a hazardous location?
- Is approved respiratory equipment provided and used when appropriate during spraying operations?
- Do solvents used for cleaning have a flash point to 100° F or more?
- Are fire control sprinkler heads kept clean?
- Are "NO SMOKING" signs posted in spray areas, paint rooms, paint booths, and paint storage areas?
- Is the spray area kept clean of combustible residue?
- Are spray booths constructed of metal, masonry, or other substantial noncombustible material?
- Are spray booth floors and baffles noncombustible and easily cleaned?
- Is infrared drying apparatus kept out of the spray area during spraying operations?
- Is the spray booth completely ventilated before using the drying apparatus?
- Is the electric drying apparatus properly grounded?
- Are lighting fixtures for spray booths located outside of the booth and the interior lighted through sealed clear panels?
- Are the electric motors for exhaust fans placed outside booths or ducts?
- Are belts and pulleys inside the booth fully enclosed?
- Do ducts have access doors to allow cleaning?
- Do all drying spaces have adequate ventilation?

ENTERING CONFINED SPACES

- | | | |
|---|---|--|
| Y | N | |
|---|---|--|
- Are confined spaces thoroughly emptied of any corrosive or hazardous substances, such as acids or caustics, before entry?
 - Are all lines to a confined space, containing inert, toxic, flammable, or corrosive materials valved off and blanked or disconnected and separated before entry?
 - Are all impellers, agitators, or other moving parts and equipment inside confined spaces locked-out if they present a hazard?
 - Is either natural or mechanical ventilation provided prior to confined space entry?
 - Are appropriate atmospheric tests performed to check for oxygen deficiency, toxic substances and explosive concentrations in the confined space before entry?
 - Is adequate illumination provided for the work to be performed in the confined space?

- Is the atmosphere inside the confined space frequently tested or continuously monitored during conduct of work?
- Is there an assigned safety standby employee outside of the confined space, when required, whose sole responsibility is to watch the work in progress, sound an alarm if necessary, and render assistance?
- Is the standby employee appropriately trained and equipped to handle an emergency?
- Is the standby employee or other employees prohibited from entering the confined space without lifelines and respiratory equipment if there is any question as to the cause of an emergency?
- Is approved respiratory equipment required if the atmosphere inside the confined space cannot be made acceptable?
- Is all portable electrical equipment used inside confined spaces either grounded and insulated, or equipped with ground fault protection?
- Before gas welding or burning is started in a confined space, are hoses checked for leaks, compressed gas bottles forbidden inside of the confined space, torches lighted only outside of the confined area and the confined area tested for an explosive atmosphere each time before a lighted torch is to be taken into the confined space?
- If employees will be using oxygen-consuming equipment—such as salamanders, torches, and furnaces, in a confined space—is sufficient air provided to assure combustion without reducing the oxygen concentration of the atmosphere below 19.5 percent by volume?
- Whenever combustion-type equipment is used in a confined space, are provisions made to ensure the exhaust gases are vented outside of the enclosure?
- Is each confined space checked for decaying vegetation or animal matter which may produce methane?
- Is the confined space checked for possible industrial waste which could contain toxic properties?
- If the confined space is below the ground and near areas where motor vehicles will be operating, is it possible for vehicle exhaust or carbon monoxide to enter the space?

ENVIRONMENTAL CONTROLS

- Are all work areas properly illuminated?
- Are employees instructed in proper first-aid and other emergency procedures?

- Are hazardous substances, blood, and other potentially infectious materials identified, which may cause harm by inhalation, ingestion, or skin absorption or contact?
- Are employees aware of the hazards involved with the various chemicals they may be exposed to in their work environment, such as ammonia, chlorine, epoxies, caustics, etc.?
- Is employee exposure to chemicals in the workplace kept within acceptable levels?
- Can a less harmful method or process be used?
- Is the work area's ventilation system appropriate for the work being performed?
- Are spray painting operations done in spray rooms or booths equipped with an appropriate exhaust system?
- Is employee exposure to welding fumes controlled by ventilation, use of respirators, exposure time, or other means?
- Are welders and other workers nearby provided with flash shields during welding operations?
- If forklifts and other vehicles are used in buildings or other enclosed areas, are the carbon monoxide levels kept below maximum acceptable concentration?
- Has there been a determination that noise levels in the facilities are within acceptable levels?
- Are steps being taken to use engineering controls to reduce excessive noise levels?
- Are proper precautions being taken when handling asbestos and other fibrous materials?
- Are caution labels and signs used to warn of hazardous substances (e.g., asbestos) and biohazards (e.g., bloodborne pathogens)?
- Are wet methods used, when practicable, to prevent the emission of airborne asbestos fibers, silica dust and similar hazardous materials?
- Are engineering controls examined and maintained or replaced on a scheduled basis?
- Is vacuuming with appropriate equipment used whenever possible rather than blowing or sweeping dust?
- Are grinders, saws, and other machines that produce respirable dusts vented to an industrial collector or central exhaust system?
- Are all local exhaust ventilation systems designed and operating properly such as air flow and volume necessary for the application, ducts not plugged or belts slipping?
- Is personal protective equipment provided, used and maintained wherever required?
- Are there written standard operating procedures for the selection and use of respirators where needed?
- Are restrooms and washrooms kept clean and sanitary?

- Is all water provided for drinking, washing, and cooking potable?
- Are all outlets for water not suitable for drinking clearly identified?
- Are employees' physical capacities assessed before being assigned to jobs requiring heavy work?
- Are employees instructed in the proper manner of lifting heavy objects?
- Where heat is a problem, have all fixed work areas been provided with spot cooling or air conditioning?
- Are employees screened before assignment to areas of high heat to determine if their health condition might make them more susceptible to having an adverse reaction?
- Are employees working on streets and roadways where they are exposed to the hazards of traffic, required to wear bright colored (traffic orange) warning vests?
- Are exhaust stacks and air intakes so located that contaminated air will not be recirculated within a building or other enclosed area?
- Is equipment producing ultraviolet radiation properly shielded?
- Are universal precautions observed where occupational exposure to blood or other potentially infectious materials can occur and in all instances where differentiation of types of body fluids or potentially infectious materials is difficult or impossible?

FLAMMABLE AND COMBUSTIBLE MATERIALS

- | | | |
|--------------------------|--------------------------|--|
| Y | N | |
| <input type="checkbox"/> | <input type="checkbox"/> | Are combustible scrap, debris, and waste materials (oily rags, etc.) stored in covered metal receptacles and removed from the worksite promptly? |
| <input type="checkbox"/> | <input type="checkbox"/> | Is proper storage practiced to minimize the risk of fire including spontaneous combustion? |
| <input type="checkbox"/> | <input type="checkbox"/> | Are approved containers and tanks used for the storage and handling of flammable and combustible liquids? |
| <input type="checkbox"/> | <input type="checkbox"/> | Are all connections on drums and combustible liquid piping, vapor and liquid tight? |
| <input type="checkbox"/> | <input type="checkbox"/> | Are all flammable liquids kept in closed containers when not in use (e.g., parts cleaning tanks, pans, etc.)? |
| <input type="checkbox"/> | <input type="checkbox"/> | Are bulk drums of flammable liquids grounded and bonded to containers during dispensing? |
| <input type="checkbox"/> | <input type="checkbox"/> | Do storage rooms for flammable and combustible liquids have explosion-proof lights? |
| <input type="checkbox"/> | <input type="checkbox"/> | Do storage rooms for flammable and combustible liquids have mechanical or gravity ventilation? |

- Is liquefied petroleum gas stored, handled, and used in accordance with safe practices and standards?
- Are "NO SMOKING" signs posted on liquefied petroleum gas tanks?
- Are liquefied petroleum storage tanks guarded to prevent damage from vehicles?
- Are all solvent wastes, and flammable liquids kept in fire-resistant, covered containers until they are removed from the worksite?
- Is vacuuming used whenever possible rather than blowing or sweeping combustible dust?
- Are firm separators placed between containers of combustibles or flammables, when stacked one upon another, to assure their support and stability?
- Are fuel gas cylinders and oxygen cylinders separated by distance, and fire-resistant barriers, while in storage?
- Are fire extinguishers selected and provided for the types of materials in areas where they are to be used?
Class A-Ordinary combustible material fires.
Class B-Flammable liquid, gas or grease fires.
Class C-Energized-electrical equipment fires.
- Are appropriate fire extinguishers mounted within 75 feet (22.86 meters) of outside areas containing flammable liquids, and within 10 feet (3.048 meters) of any inside storage area for such materials?
- Are extinguishers free from obstructions or blockage?
- Are all extinguishers serviced, maintained and tagged at intervals not to exceed 1 year?
- Are all extinguishers fully charged and in their designated places?
- Where sprinkler systems are permanently installed, are the nozzle heads so directed or arranged that water will not be sprayed into operating electrical switch boards and equipment?
- Are "NO SMOKING" signs posted where appropriate in areas where flammable or combustible materials are used or stored?
- Are safety cans used for dispensing flammable or combustible liquids at a point of use?
- Are all spills of flammable or combustible liquids cleaned up promptly?
- Are storage tanks adequately vented to prevent the development of excessive vacuum or pressure as a result of filling, emptying, or atmosphere temperature changes?
- Are storage tanks equipped with emergency venting that will relieve excessive internal pressure caused by fire exposure?

- Are "NO SMOKING" rules enforced in areas involving storage and use of hazardous materials?

HAZARDOUS CHEMICAL EXPOSURE

- | | |
|---|---|
| Y | N |
|---|---|
- Are employees trained in the safe handling practices of hazardous chemicals such as acids, caustics, etc.?
 - Are employees aware of the potential hazards involving various chemicals stored or used in the workplace such as acids, bases, caustics, epoxies, and phenols?
 - Is employee exposure to chemicals kept within acceptable levels?
 - Are eye wash fountains and safety showers provided in areas where corrosive chemicals are handled?
 - Are all containers, such as vats, and storage tanks labeled as to their contents, e.g., "CAUSTICS"?
 - Are all employees required to use personal protective clothing and equipment when handling chemicals (gloves, eye protection, and respirators)?
 - Are flammable or toxic chemicals kept in closed containers when not in use?
 - Are chemical piping systems clearly marked as to their content?
 - Where corrosive liquids are frequently handled in open containers or drawn from storage vessels or pipe lines, are adequate means readily available for neutralizing or disposing of spills or overflows and performed properly and safely?
 - Have standard operating procedures been established, and are they being followed when cleaning up chemical spills?
 - Where needed for emergency use, are respirators stored in a convenient, clean, and sanitary location?
 - Are respirators intended for emergency use adequate for the various uses for which they may be needed?
 - Are employees prohibited from eating in areas where hazardous chemicals are present?
 - Is personal protective equipment provided, used and maintained whenever necessary?
 - Are there written standard operating procedures for the selection and use of respirators where needed?
 - If you have a respirator protection program, are your employees instructed on the correct usage and limitations of the respirators? Are the respirators NIOSH-approved for this particular application? Are they regularly inspected and cleaned, sanitized and maintained?

- If hazardous substances are used in your processes, do you have a medical or biological monitoring system in operation?
- Are you familiar with the Threshold Limit Values or Permissible Exposure Limits of airborne contaminants and physical agents used in your workplace?
- Have control procedures been instituted for hazardous materials, where appropriate, such as respirators, ventilation systems, and handling practices?
- Whenever possible, are hazardous substances handled in properly designed and exhausted booths or similar locations?
- Do you use general dilution or local exhaust ventilation systems to control dusts, vapors, gases, fumes, smoke, solvents or mists which may be generated in your workplace?
- Is ventilation equipment provided for removal of contaminants from such operations as production grinding, buffing, spray painting, and/or vapor degreasing, and is it operating properly?
- Do employees complain about dizziness, headaches, nausea, irritation, or other factors of discomfort when they use solvents or other chemicals?
- Is there a dermatitis problem? Do employees complain about dryness, irritation, or sensitization of the skin?
- Have you considered the use of an industrial hygienist or environmental health specialist to evaluate your operation?
- If internal combustion engines are used, is carbon monoxide kept within acceptable levels?
- Is vacuuming used, rather than blowing or sweeping dusts whenever possible for clean-up?
- Are materials which give off toxic asphyxiant, suffocating or anesthetic fumes, stored in remote or isolated locations when not in use?

HAZARDOUS SUBSTANCES COMMUNICATION

- | | |
|---|---|
| Y | N |
|---|---|
- Is there a list of hazardous substances used in your workplace?
 - Is there a current written exposure control plan for occupational exposure to bloodborne pathogens and other potentially infectious materials, where applicable?
 - Is there a written hazard communication program dealing with Material Safety Data Sheets (MSDS), labeling, and employee training?

- Is each container for a hazardous substance (i.e., vats, bottles, storage tanks, etc.) labeled with product identity and a hazard warning (communication of the specific health hazards and physical hazards)?
- Is there a Material Safety Data Sheet readily available for each hazardous substance used?
- Is there an employee training program for hazardous substances?
Does this program include:
 - An explanation of what an MSDS is and how to use and obtain one?
 - MSDS contents for each hazardous substance or class of substances?
 - Explanation of "Right to Know?"
 - Identification of where an employee can see the employers written hazard communication program and where hazardous substances are present in their work areas?
 - The physical and health hazards of substances in the work area, and specific protective measures to be used?
 - Details of the hazard communication program, including how to use the labeling system and MSDS's?
 - Are employees trained in the following:
 - How to recognize tasks that might result in occupational exposure?
 - How to use work practice and engineering controls and personal protective equipment and to know their limitations?
 - How to obtain information on the types, selection, proper use, location, removal, handling, decontamination, and disposal of personal protective equipment?
 - Who to contact and what to do in an emergency?

ELECTRICAL

- Y N**
- Do you specify compliance with OSHA for all contract electrical work?
 - Are all employees required to report as soon as practicable any obvious hazard to life or property observed in connection with electrical equipment or lines?
 - Are employees instructed to make preliminary inspections and/or appropriate tests to determine what conditions exist before starting work on electrical equipment or lines?
 - When electrical equipment or lines are to be serviced, maintained or adjusted, are necessary switches opened, locked-out and tagged whenever possible?
 - Are portable electrical tools and equipment grounded or of the double insulated type?

- Are electrical appliances such as vacuum cleaners, polishers, and vending machines grounded?
- Do extension cords being used have a grounding conductor?
- Are multiple plug adaptors prohibited?
- Are ground-fault circuit interrupters installed on each temporary 15 or 20 ampere, 120 volt AC circuit at locations where construction, demolition, modifications, alterations or excavations are being performed?
- Are all temporary circuits protected by suitable disconnecting switches or plug connectors at the junction with permanent wiring?
- Do you have electrical installations in hazardous dust or vapor areas? If so, do they meet the National Electrical Code (NEC) for hazardous locations?
- Is exposed wiring and cords with frayed or deteriorated insulation repaired or replaced promptly?
- Are flexible cords and cables free of splices or taps?
- Are clamps or other securing means provided on flexible cords or cables at plugs, receptacles, tools, equipment, etc., and is the cord jacket securely held in place?
- Are all cord, cable and raceway connections intact and secure?
- In wet or damp locations, are electrical tools and equipment appropriate for the use or location or otherwise protected?
- Is the location of electrical power lines and cables (overhead, underground, underfloor, other side of walls) determined before digging, drilling or similar work is begun?
- Are metal measuring tapes, ropes, handlines or similar devices with metallic thread woven into the fabric prohibited where they could come in contact with energized parts of equipment or circuit conductors?
- Is the use of metal ladders prohibited in areas where the ladder or the person using the ladder could come in contact with energized parts of equipment, fixtures or circuit conductors?
- Are all disconnecting switches and circuit breakers labeled to indicate their use or equipment served?
- Are disconnecting means always opened before fuses are replaced?
- Do all interior wiring systems include provisions for grounding metal parts of electrical raceways, equipment and enclosures?
- Are all electrical raceways and enclosures securely fastened in place?

- Are all energized parts of electrical circuits and equipment guarded against accidental contact by approved cabinets or enclosures?
- Is sufficient access and working space provided and maintained about all electrical equipment to permit ready and safe operations and maintenance?
- Are all unused openings (including conduit knockouts) in electrical enclosures and fittings closed with appropriate covers, plugs or plates?
- Are electrical enclosures such as switches, receptacles, and junction boxes, provided with tight-fitting covers or plates?
- Are disconnecting switches for electrical motors in excess of two horsepower, capable of opening the circuit when the motor is in a stalled condition, without exploding? (Switches must be horsepower rated equal to or in excess of the motor hp rating.)
- Is low voltage protection provided in the control device of motors driving machines or equipment which could cause probable injury from inadvertent starting?
- Is each motor disconnecting switch or circuit breaker located within sight of the motor control device?
- Is each motor located within sight of its controller or the controller disconnecting means capable of being locked in the open position or is a separate disconnecting means installed in the circuit within sight of the motor?
- Is the controller for each motor in excess of two horsepower, rated in horsepower equal to or in excess of the rating of the motor it serves?
- Are employees who regularly work on or around energized electrical equipment or lines instructed in the cardiopulmonary resuscitation (CPR) methods?
- Are employees prohibited from working alone on energized lines or equipment over 600 volts?

NOISE

- Are there areas in the workplace where continuous noise levels exceed 85dBA?
- Is there an ongoing preventive health program to educate employees in: safe levels of noise, exposures; effects of noise on their health; and the use of personal protection?
- Have work areas where noise levels make voice communication between employees difficult been identified and posted?
- Are noise levels being measured using a sound level meter or an octave band analyzer and are records being kept?

- Have engineering controls been used to reduce excessive noise levels? Where engineering controls are determined not feasible, are administrative controls (i.e., worker rotation) being used to minimize individual employee exposure to noise?
- Is approved hearing protective equipment (noise attenuating devices) available to every employee working in noisy areas?
- Have you tried isolating noisy machinery from the rest of your operation?
- If you use ear protectors, are employees properly fitted and instructed in their use?
- Are employees in high noise areas given periodic audiometric testing to ensure that you have an effective hearing protection system?

FUELING

- Is it prohibited to fuel an internal combustion engine with a flammable liquid while the engine is running?
- Are fueling operations done in such a manner that likelihood of spillage will be minimal?
- When spillage occurs during fueling operations, is the spilled fuel washed away completely, evaporated, or other measures taken to control vapors before restarting the engine?
- Are fuel tank caps replaced and secured before starting the engine?
- In fueling operations, is there always metal contact between the container and the fuel tank?
- Are fueling hoses of a type designed to handle the specific type of fuel?
- Is it prohibited to handle or transfer gasoline in open containers?
- Are open lights, open flames, sparking, or arcing equipment prohibited near fueling or transfer of fuel operations?
- Is smoking prohibited in the vicinity of fueling operations?
- Are fueling operators prohibited in buildings or other enclosed areas that are not specifically ventilated for this purpose?
- Where fueling or transfer of fuel is done through a gravity flow system, are the nozzles of the self-closing type?

IDENTIFICATION OF PIPING SYSTEMS

- When non-potable water is piped through a facility, are outlets or taps posted to alert employees that it is unsafe and not to be used for drinking, washing or other personal use?
- When hazardous substances are transported through above ground piping, is each pipeline identified at points where confusion could introduce hazards to employees?

- When pipelines are identified by color painting, are all visible parts of the line so identified?
- When pipelines are identified by color painted bands or tapes, are the bands or tapes located at reasonable intervals and at each outlet, valve or connection?
- When pipelines are identified by color, is the color code posted at all locations where confusion could introduce hazards to employees?
- When the contents of pipelines are identified by name or name abbreviation, is the information readily visible on the pipe near each valve or outlet?
- When pipelines carrying hazardous substances are identified by tags, are the tags constructed of durable materials, the message carried clearly and permanently distinguishable and are tags installed at each valve or outlet?
- When pipelines are heated by electricity, steam or other external source, are suitable warning signs or tags placed at unions, valves, or other serviceable parts of the system?

MATERIAL HANDLING

- | | | | | | |
|---|--------------------------|---|--------------------------|--------------------------|--|
| <table border="0"> <tr> <td style="padding-right: 5px;">Y</td> <td style="padding-right: 5px;">N</td> </tr> <tr> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> </tr> </table> | Y | N | <input type="checkbox"/> | <input type="checkbox"/> | <ul style="list-style-type: none"> Is there safe clearance for equipment through aisles and doorways? Are aiseways designated, permanently marked, and kept clear to allow unhindered passage? Are motorized vehicles and mechanized equipment inspected daily or prior to use? Are vehicles shut off and brakes set prior to loading or unloading? Are containers of combustibles or flammables, when stacked while being moved, always separated by dunnage sufficient to provide stability? Are dock boards (bridge plates) used when loading or unloading operations are taking place between vehicles and docks? Are trucks and trailers secured from movement during loading and unloading operations? Are dock plates and loading ramps constructed and maintained with sufficient strength to support imposed loading? Are hand trucks maintained in safe operating condition? Are chutes equipped with sideboards of sufficient height to prevent the materials being handled from falling off? Are chutes and gravity roller sections firmly placed or secured to prevent displacement? At the delivery end of the rollers or chutes, are provisions made to brake the movement of the handled materials? Are pallets usually inspected before being loaded or moved? |
| Y | N | | | | |
| <input type="checkbox"/> | <input type="checkbox"/> | | | | |

- Are hooks with safety latches or other arrangements used when hoisting materials so that slings or load attachments won't accidentally slip off the hoist hooks?
- Are securing chains, ropes, chockers or slings adequate for the job to be performed?
- When hoisting material or equipment, are provisions made to assure no one will be passing under the suspended loads?
- Are material safety data sheets available to employees handling hazardous substances?

TRANSPORTING EMPLOYEES AND MATERIALS

- | | | | | | |
|---|--------------------------|---|--------------------------|--------------------------|---|
| <table border="0"> <tr> <td style="padding-right: 5px;">Y</td> <td style="padding-right: 5px;">N</td> </tr> <tr> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> </tr> </table> | Y | N | <input type="checkbox"/> | <input type="checkbox"/> | <ul style="list-style-type: none"> Do employees who operate vehicles on public thoroughfares have valid operator's licenses? When seven or more employees are regularly transported in a van, bus or truck, is the operator's license appropriate for the class of vehicle being driven? Is each van, bus or truck used regularly to transport employees equipped with an adequate number of seats? When employees are transported by truck, are provisions provided to prevent their falling from the vehicle? Are vehicles used to transport employees equipped with lamps, brakes, horns, mirrors, windshields and turn signals and are they in good repair? Are transport vehicles provided with handrails, steps, stirrups or similar devices, so placed and arranged that employees can safely mount or dismount? Are employee transport vehicles equipped at all times with at least two reflective type flares? Is a full charged fire extinguisher, in good condition, with at least 4 B:C rating maintained in each employee transport vehicle? When cutting tools or tools with sharp edges are carried in passenger compartments of employee transport vehicles, are they placed in closed boxes or containers which are secured in place? Are employees prohibited from riding on top of any load which can shift, topple, or otherwise become unstable? |
| Y | N | | | | |
| <input type="checkbox"/> | <input type="checkbox"/> | | | | |

CONTROL OF HARMFUL SUBSTANCES BY VENTILATION

- | | | | | | |
|---|--------------------------|---|--------------------------|--------------------------|--|
| <table border="0"> <tr> <td style="padding-right: 5px;">Y</td> <td style="padding-right: 5px;">N</td> </tr> <tr> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> </tr> </table> | Y | N | <input type="checkbox"/> | <input type="checkbox"/> | <ul style="list-style-type: none"> Is the volume and velocity of air in each exhaust system sufficient to gather the dusts, fumes, mists, vapors or gases to be controlled, and to convey them to a suitable point of disposal? Are exhaust inlets, ducts and plenums designed, constructed, and supported to prevent collapse or failure of any part of the system? |
| Y | N | | | | |
| <input type="checkbox"/> | <input type="checkbox"/> | | | | |

- Are clean-out ports or doors provided at intervals not to exceed 12 feet (3.6576 meters) in all horizontal runs of exhaust ducts?
- Where two or more different type of operations are being controlled through the same exhaust system, will the combination of substances being controlled, constitute a fire, explosion or chemical reaction hazard in the duct?
- Is adequate makeup air provided to areas where exhaust systems are operating?
- Is the source point for makeup air located so that only clean, fresh air, which is free of contaminants, will enter the work environment?
- Where two or more ventilation systems are serving a work area, is their operation such that one will not offset the functions of the other?

SANITIZING EQUIPMENT AND CLOTHING

- Is personal protective clothing or equipment that employees are required to wear or use, of a type capable of being cleaned easily and disinfected?
- Are employees prohibited from interchanging personal protective clothing or equipment, unless it has been properly cleaned?
- Are machines and equipment, which process, handle or apply materials that could be injurious to employees, cleaned and/or decontaminated before being overhauled or placed in storage?
- Are employees prohibited from smoking or eating in any area where contaminants that could be injurious if ingested are present?

- When employees are required to change from street clothing into protective clothing, is a clean change room with separate storage facility for street and protective clothing provided?
- Are employees required to shower and wash their hair as soon as possible after a known contact has occurred with a carcinogen?
- When equipment, materials, or other items are taken into or removed from a carcinogen regulated area, is it done in a manner that will contaminate non-regulated areas or the external environment?

TIRE INFLATION

- Where tires are mounted and/or inflated on drop center wheels, is a safe practice procedure posted and enforced?
- Where tires are mounted and/or inflated on wheels with split rims and/or retainer rings, is a safe practice procedure posted and enforced?
- Does each tire inflation hose have a clip-on chuck with at least 24 inches (6.9 centimeters) of hose between the chuck and an in-line hand valve and gauge?
- Does the tire inflation control valve automatically shutoff the air flow when the valve is released?
- Is a tire restraining device such as a cage, rack or other effective means used while inflating tires mounted on split rims, or rims using retainer rings?
- Are employees strictly forbidden from taking a position directly over or in front of a tire while it's being inflated?

Notes/Comments: _____

Signature of Person Performing Inspection _____ Date _____

Signature of Person Performing Inspection _____ Date _____

File this document in your "Company Safety and Health File."

Chapter 10 Bloodborne Pathogens

Arena Fire Protection, Inc. is committed to the safety and health of our employees and prohibiting the spread of bloodborne pathogens. Therefore, the following bloodborne pathogens safety program has been adopted. In the event an employee is exposed to bloodborne pathogens all measures within this program shall be provided to eliminate the spread of disease.



Exposure Determination

All employees who, as a result of performing their job duties, must engage in activities where exposure to blood or other potentially infectious materials is reasonably anticipated are considered to have occupational exposure to bloodborne pathogen. Employees shall take necessary precautions to avoid direct contact with body fluids.

- ★ The most common concern for spread of bloodborne pathogen is during the administration of first aid. Employees designated as First Aid Responders are considered at risk of occupational exposure due to the nature of these duties (e.g., assisting bleeding victims, resuscitation).

Contaminated Equipment

In order to prevent occupational exposure to blood or other potentially infectious material, all equipment or material that comes into contact with pathogens shall be decontaminated. Contaminated equipment or other contaminated items are not to be placed or stored in areas where food is kept, and decontamination should be accomplished as soon as possible. Decontamination is not to take place in any area where food or drink is consumed. Cloths used to wipe contaminated equipment can be discarded as refuse unless they would somehow become contaminated to the extent that they would be considered regulated waste. A biohazard label is to be attached to any large contaminated equipment and is to state which portions are or remain contaminated. For smaller pieces of equipment, the biohazard label should be attached as above, and the piece of equipment should be placed in a bag prior to shipping.

EXAMPLES OF CONTAMINATED EQUIPMENT OR MATERIAL:

- ☐ Objects that may have been bled upon
- ☐ Bandages or gauze
- ☐ Equipment used during first aid

Personal Protective Equipment

Although employees are expected to avoid the handling of blood or other potentially infectious materials as well as contact with surfaces or items contaminated with such materials during the course of first aid administration, it is likely that the employee shall be exposed to blood. Therefore, personal protective equipment such as gloves shall be provided in the first aid kit.

These gloves are not to be washed or decontaminated for reuse. First Aid Responders are to include disposable resuscitation masks as well. Such equipment is to be used for the employee's protection in cases where the employee is expected to provide ventilator assistance. Decontaminant shall also be available to all employees to decontaminate equipment.

Hepatitis B Vaccination and Post-exposure Evaluation and Follow-up

This company offers the hepatitis B vaccine and vaccination series to personnel with duties that may require the employee to come in contact with blood (i.e. first aid administration). This company also offers post-exposure evaluation and follow-up after an exposure incident to any employee who suffers an exposure incident while performing duties on the job. All medical evaluations and procedures are to be made available at no cost to employees, at a reasonable time and place.

- ① ***Hepatitis B Vaccination*** is available to employees at any Public Health Service facility where physical examinations are performed. All employees, whose job duties involve occupational exposure, are to be offered the hepatitis B vaccination. The vaccine will be made available after receiving training regarding blood borne pathogens and within 10 days of initial assignment of the employee to duties with occupational exposure. Personnel, even after training, may decline to receive the hepatitis B vaccine. In such case, the declining employee is to sign the declination statement. The employee can receive the vaccine after signing the declination statement if a change of mind occurs and if duties still involve those with occupational exposure. Management will assure that each employee scheduled for immunization at a Public Health Service facility is provided with the written opinion sample format in Appendix C of this Plan. These materials are to be taken by the employee to the evaluating physician for completion. The written opinion should be returned to the Office where the employee is assigned. A copy of medical records related to hepatitis B vaccination should be obtained by the employee or first aid provider before departing the facility where vaccination takes place. The employee should insert this copy of such records in a copy of Appendix D. Should an exposure incident occur, Appendix D, including the hepatitis B related records, serves as the Materials for the Evaluating Physician and is to be given to the evaluating physician.
- ② ***Post-exposure Evaluation and Follow-up*** — Management shall instruct the compliance officer to seek medical attention in the same manner that it would be sought should any injury occur. In the event of an exposure incident (as defined in 29 CFR 1910.1030):
 - ★ The employee is to immediately wash any skin with soap and water and flush mucous membranes with water when such areas have had contact with blood or other potentially infectious materials.
 - ★ The employee should then seek medical attention. It must be realized that any exposure incident is an event for which immediate attention must be sought, as the effectiveness of prophylaxis depends on the immediacy of its delivery.
 - ★ In addition, the employee who has had an exposure incident is to report such incident to his or her supervisor as soon as possible.

- ② **Information Provided to the Evaluating Physician** — Post-exposure evaluation and follow-up are to be provided to the employee consistent with the OSHA requirements of 29 CFR 1910.1030. Therefore, upon presenting for evaluation, the employee will give to the physician the Materials for the Evaluating Physician (Appendix C of this Plan for Hepatitis B vaccination, Appendix D of this Plan for Evaluation following Exposure Incident). The instructions for the physician describe the requirements of 29 CFR 1910.1030 and instruct the physician to give the physician's written opinion to the employee to return to the company. The evaluation results will become a part of the employee's confidential medical records. Records regarding any exposure incidents of Technical Center personnel will be maintained in a confidential manner.

Communication of Hazards to Employees

- ① **Labels and Bags** — Biohazard labels to be affixed to bags containing any contaminated equipment or material. Bags will be disposed of as ordinary refuse unless in the rare instance when they are contaminated to the extent that they are considered regulated waste as defined by the standard.
- ★ Bags should be located in first aid kits and stocked regularly
- ② **Information and Training** — Personnel whose job duties involve occupational exposure, as specified in section I of this Plan are to participate in a training program for bloodborne pathogens at the time of initial assignment to tasks where occupational exposure occurs. The training program contains all the elements specified in 29 CFR 1910.1030(g) (2).

Recordkeeping

- ① **Medical Records** — Medical records are to be maintained, as part of the medical files of employees. Such records are maintained in accordance with 29 CFR 1910.20 and are kept confidential.
- ② **Training Records** — Training records are to contain all information specified in 29 CFR 1910.1030(h) (2) and will be maintained for 3 years from the date on which the training occurred.
- ③ **Transfer of Records** — the company will comply with the requirements of 29 CFR 1910.20(h) involving any transfer of records. The employee may request and receive a copy of such records when transferring to another assignment or job.

Investigation of Exposure Incidents

All exposure incidents shall be investigated and proper accident/incident investigation procedures shall be followed.

DECLINATION STATEMENT

I understand that due to my occupational exposure to blood or other potentially infectious materials I may be at risk of acquiring Hepatitis B virus (HBV) infection. I have been given the opportunity to be vaccinated with Hepatitis B vaccine, at no charge to myself. However, I decline Hepatitis vaccination at this time. I understand that by declining this vaccine, I continue to be at risk of acquiring Hepatitis B, a serious disease. If in the future I continue to have occupational exposure to blood or other potentially infectious materials and I want to be vaccinated with Hepatitis B vaccine, I can receive the vaccination series at no charge to me.

Employee Signature _____ Date _____

Written Opinion

To the Evaluating Physician:

After you have determined whether there are contra indications to vaccination of this employee with Hepatitis B vaccine, please state in the space below only:

(A) _____ If vaccine was indicated

(B) _____ If vaccine was received.

(All other findings are to remain confidential and are not to be included on this page)

Please return this sheet to this employee:

(Name of Employee) _____

Thank you for your evaluation of this employee.

Physician's name (printed) date

Physician's signature

Instructions for the Evaluating Physician

This employee may have suffered an exposure incident to a Bloodborne Pathogen. In accordance with the standard's provision for post exposure evaluation and follow up, the employer submits to you for the following evaluations:

- (A) A copy of 29 CFR 1910.1030, Occupational Exposure to Bloodborne Pathogens;
- (B) A description of the exposed employee's duties as they relate to the exposure incident;
- (C) Documentation of the routes of exposure and circumstances under which exposure occurred;
- (D) Results of the source individual's blood testing, if available; and
- (E) All medical records relevant to this employee's appropriate treatment, including vaccination status.

After completing the evaluation, please:

- (A) Inform the employee regarding the evaluation results and any follow up needed;
- (B) Complete the attached written opinion form and give it to the employee. (This form will be maintained in the office to which the employee is assigned); and
- (C) Send a copy of all evaluation results and records to:

U.S. Department of Labor - OSHA Office of Occupational Medicine Room N3653 200 Constitution Avenue, NW Washington, DC 20210 CONFIDENTIAL: MEDICAL RECORDS
These copies will be maintained as part of the employee's confidential medical record in OSHA's Office of Occupational Medicine Medical Records Section.

Should you have any questions regarding the evaluations or medical records, please contact OSHA's Office of Occupational Medicine at (202) 219-5003.

Date exposure incident occurred? _____

Describe the circumstances under which the exposure incident occurred (what happened that resulted in the incident)

What body fluid(s) were you exposed to? _____

What was the route of exposure (e.g., mucosal contact, contact with non-intact skin, percutaneous)? _____

Describe any personal protective equipment in use at time of exposure incident _____

Did PPE fail? _____ If yes, how? _____

Identification of source individual(s) (names) _____

Other pertinent information _____

Section Notes:

SEXUAL HARASSMENT POLICY

Sexual harassment is a form of sex discrimination that violates Title VII of the Civil Rights Act of 1964. Unwelcome sexual advances, requests for sexual favors, and other verbal or physical conduct of a sexual nature constitutes sexual harassment when submission to or rejection of this conduct explicitly or implicitly affects an individual's employment, unreasonably interferes with an individual's work performance or creates an intimidating, hostile, or offensive work environment.

Statement of Company Policy

It is this Company's Policy that illegal sexual discrimination, unwelcome sexual advances, requests for sexual favors, and any other verbal, visual, or physical conduct of a sexual nature is strictly prohibited.

Requiring coworkers, subordinate employees, or prospective employees to submit to conduct of this nature, explicitly or implicitly, as a term or condition of employment, or used as a basis for any employment decisions is forbidden.

Any and all behavior that has the purpose or effect of unreasonably interfering with an individual's work performance, or creating an intimidating, hostile, or offensive work environment is hereby banned.

Sexual harassment can occur in a variety of circumstances, including but not limited to:

- ★ The victim as well as the harasser may be a woman or a man. The victim does not have to be of the opposite sex.
- ★ The harasser can be the victim's supervisor, an agent of the employer, a supervisor in another area, a co-worker, or a non-employee.
- ★ The victim does not have to be the person harassed but could be anyone affected by the offensive conduct.
- ★ Unlawful sexual harassment may occur without economic injury to or discharge of the victim.
- ★ The harasser's conduct must be unwelcome.

Prevention is the best tool to eliminate sexual harassment in the workplace. Appropriate managers have been designated, rather than a direct supervisor, and other alternative routes provided to receive the filing of formal complaints of sexual harassment. If possible, it is requested that any victimized employee attempt to informally resolve a sexual harassment issue by directly informing the harasser that the conduct is unwelcome and must stop. If informal resolution is unsuccessful, the victim should use the formal complaint form and submit it to the designated manager of their choice. This Company will take immediate and appropriate action when any employee files a formal complaint.

This Company recognizes that the question of whether a particular course of conduct constitutes sexual harassment requires a factual determination. The Company also recognizes that false accusations of sexual harassment can have serious effects on innocent persons. If an investigation results in a finding that a person who has accused another of sexual harassment has maliciously or recklessly made false accusations, the accuser will be subject to appropriate sanctions, including discharge.

When investigating allegations of sexual harassment, this Company will look at the whole record: the circumstances, such as the nature of the sexual advances, and the context in which the alleged incidents occurred. A determination on the allegations is made from the facts on a case-by-case basis. It is this Company's Policy that sexual harassment will not be tolerated.

Equal Employment Opportunity Commission (EEOC) Regulations on Sexual Harassment. (29CFR § 1604.11 as written)

(a) Harassment on the basis of sex is a violation of section 703 of title VII. 1

Unwelcome sexual advances, requests for sexual favors, and other verbal or physical conduct of a sexual nature constitute sexual harassment when:

(1) Submission to such conduct is made either explicitly or implicitly a term or condition of an individual's employment,

(2) Submission to or rejection of such conduct by an individual is used as the basis for employment decisions affecting such individual, or

(3) Such conduct has the purpose or effect of unreasonably interfering with an individual's work performance or creating an intimidating, hostile, or offensive working environment.

(b) In determining whether alleged conduct constitutes sexual harassment, the Commission will look at the record as a whole and at the totality of the circumstances, such as the nature of the sexual advances and the context in which the alleged incidents occurred. The determination of the legality of a particular action will be made from the facts, on a case by case basis.

(c) [Reserved]

(d) With respect to conduct between fellow employees, an employer is responsible for acts of sexual harassment in the workplace where the employer (or its agents or supervisory employees) knows or should have known of the conduct, unless it can show that it took immediate and appropriate corrective action.

(e) An employer may also be responsible for the acts of non-employees, with respect to sexual harassment of employees in the workplace, where the employer (or its agents or supervisory employees) knows or should have known of the conduct and fails to take immediate and appropriate corrective action. In reviewing these cases the Commission will consider the extent of the employer's control and any other legal responsibility which the employer may have with respect to the conduct of such non-employees.

(f) Prevention is the best tool for the elimination of sexual harassment. An employer should take all steps necessary to prevent sexual harassment from occurring, such as affirmatively raising the subject, expressing strong disapproval, developing appropriate sanctions, informing employees of their right to raise and how to raise the issue of harassment under title VII, and developing methods to sensitize all concerned.

(g) Other related practices: Where employment opportunities or benefits are granted because of an individual's submission to the employer's sexual advances or requests for sexual favors, unlawful sex discrimination against other persons who were qualified for but denied that employment opportunity or benefit.

Your Role in Prevention

The elimination of sexual harassment in the workforce is extremely important for every employer. There is a financial imperative to eliminate improper conduct as well as a moral one, as such conduct can result in extensive monetary liability imposed by juries that determine sexual harassment has occurred.

It is difficult to eliminate sexual harassment because attempting to regulate romance runs contrary to some strong human urges. Ninth Federal Circuit Court of Appeals Justice Alex Kozinski notes that while the "bright line 'never mix business and sexual relationships'...is easy to remember, it is impossible to enforce, as men and women are drawn to each other in the workplace, as elsewhere. Even were it enforceable, do we really want to live in a society where normal flirtations, courtships and matings are routinely banned from the workplace?"

Before you can begin to consider the interplay between the rights of free people to associate and the pervasive patterns of state and federal anti-harassment laws and regulations, it is important to know what sexual harassment is, and how to recognize it.

The interpretative regulations of the EEOC (as previously quoted) define two distinct types of sexual harassment.

① The more obvious is "quid pro quo" sexual harassment, which occurs when a beneficial condition of employment is premised upon an employee's submission to sexual advances. Frequently, that claim is also raised when an employee rejects a sexual advance, and claims a connection between that rejection and a subsequent adverse job action. That action might be a denial of a raise or promotion, a termination, or a "constructive discharge" where an employee claims that the retaliation made his or her job conditions intolerable.

② Far more pervasive and more evident in the courts is harassment based upon a "hostile work environment." According to the case law and the EEOC's interpretative regulations, a "hostile environment" is one that is so pervasive that it materially alters the terms and conditions of employment.

There is no clear definition of a "hostile work environment." It can occur where jokes, suggestive remarks, physical interference with movement (such as blocking one's path), pictures, cartoons, or sexually derogatory comments alter the circumstances of the workplace. Generally, repeated conduct is required to prove a hostile work environment, and a "stray comment" has been held not to alter the working conditions sufficiently to create a cause of action. However, some comments or conduct can be so severe that a single incident can create liability.

The practical advice for employers evaluating potentially harassing conduct is to be as conservative as possible. If conduct might be construed as harassing, it has no place in the workplace. If an employee (and especially a manager or a supervisor) is not sure whether or not conduct will be unwelcome, the best advice is to avoid such conduct.

Creating a Harassment-Free Workplace

An employer's obligations with regard to sexual harassment arise before any act of sexual harassment occurs. The EEOC requires that employers take reasonable steps to prevent harassment before it occurs. Most states have discrimination prohibition enforcement agencies, which generally impose similar requirements. Many states (including California) require an employer to post a sexual harassment prevention notice advising employees of their right to a harassment-free workplace; this is different from, and over and above, an employer's obligation under Title VII to post a general discrimination prevention poster.

An important component of harassment prevention is the creation and dissemination of a sexual harassment prohibition policy and reporting procedure. This policy is critical because under federal case law, an employer fulfills its obligation if it takes all reasonable steps to prevent harassment before it occurs, and to take effective steps to remedy harassment after it takes place. If an employer demonstrates those attempts at prevention and remediation, it might not be found liable for the act of harassment itself. Other states, such as California, impose a "strict liability" test, where employers are liable for the conduct of their supervisors and managers regardless of their best efforts to prevent and to remedy harassment.

The EEOC's Views on Employer Liability for Harassment by Supervisors When Harassment Violates Federal Law

Harassment violates federal law if it involves discriminatory treatment based on race, color, sex (with or without sexual conduct), religion, national origin, age, disability, or because the employee opposed job discrimination or participated in an investigation or complaint proceeding under the EEO statutes. Federal law does not prohibit simple teasing, offhand comments, or isolated incidents that are not extremely serious. The conduct must be sufficiently frequent or severe to create a hostile work environment or result in a "tangible employment action," such as hiring, firing, promotion, or demotion.

When an Employer is Legally Responsible for Harassment by a Supervisor

An employer is always responsible for harassment by a supervisor that culminated in a tangible employment action. If the harassment did not lead to a tangible employment action, the employer is liable unless it proves that:

- ① It exercised reasonable care to prevent and promptly correct any harassment.
- ② The employee unreasonably failed to complain to management or to otherwise avoid harm.

Qualifications as a "Supervisor" for Purposes of Employer Liability

An individual qualifies as an employee's "supervisor" if the individual has the authority to recommend tangible employment decisions affecting the employee or if the individual has the authority to direct the employee's daily work activities.

Definition of a "Tangible Employment Action."

A "tangible employment action" means a significant change in employment status. Examples include hiring, firing, promotion, demotion, undesirable reassignment, a decision causing a significant change in benefits, compensation decisions, and work assignment. An Example of this would be if a supervisor fires or demotes a subordinate because she rejects his sexual demands, or promotes her because she submits to his sexual demands.

Employee Reporting Responsibilities

The employee must take reasonable steps to avoid harm from the harassment. Usually, the employee will exercise this responsibility by using the complaint procedure.

It may make sense to wait to see if management corrects the harassment before filing a charge. However, if management does not act promptly to investigate the complaint and undertake corrective action, then it may be appropriate to file a charge. The deadline for filing an EEOC charge is either 180 or 300 days after the last date of alleged harassment, depending on the state in which the allegation arises. This deadline is not extended because of an employer's internal investigation of the complaint.

Policy and Complaint Procedure

It generally is necessary for employers to establish, publicize, and enforce anti-harassment policies and complaint procedures. "Title VII is designed to encourage the creation of anti-harassment policies and effective grievance mechanisms."

An employer should provide every employee with a copy of the policy and complaint procedure, and redistribute it periodically. The policy and complaint procedure should be written in a way that will be understood by all employees in the employer's workforce.

Other measures to ensure effective dissemination of the policy and complaint procedure include posting them in central locations and incorporating them into employee handbooks. If feasible, the employer should provide training to all employees to ensure that they understand their rights and responsibilities.

An anti-harassment policy and complaint procedure should contain, at a minimum, the following elements:

- ① A clear explanation of prohibited conduct.
- ② Assurance that employees who make complaints of harassment or provide information related to such complaints will be protected against retaliation.
- ③ A clearly described complaint process that provides accessible avenues of complaint.
- ④ Assurance that the employer will protect the confidentiality of harassment complaints to the extent possible.
- ⑤ A complaint process that provides a prompt, thorough, and impartial investigation.
- ⑥ Assurance that the employer will take immediate and appropriate corrective action when it determines that harassment has occurred.

The above elements are explained in the following subsections.

1. *Prohibition against Harassment*

An employer's policy should make clear that it will not tolerate harassment based on sex (with or without sexual conduct), race, color, religion, national origin, age, disability, and protected activity (i.e., opposition to prohibited discrimination or participation in the statutory complaint process). This prohibition should cover harassment by anyone in the workplace – supervisors, co-workers, or non-employees. Management should convey the seriousness of the prohibition. One way to do that is for the mandate to "come from the top," i.e., from upper management.

The policy should encourage employees to report harassment before it becomes severe or pervasive. While isolated incidents of harassment generally do not violate federal law, a pattern of such incidents may be unlawful. Therefore, to discharge its duty of preventive care, the employer must make clear to employees that it will stop harassment before it rises to the level of a violation of federal law.

2. *Protection against Retaliation*

An employer should make clear that it will not tolerate adverse treatment of employees because they report harassment or provide information related to such complaints. An anti-harassment policy and complaint procedure will not be effective without such an assurance.

Management should undertake whatever measures are necessary to ensure that retaliation does not occur. For example, when management investigates a complaint of harassment, the official who interviews the parties and witnesses should remind these individuals about the prohibition against retaliation. Management also should scrutinize employment decisions affecting the complainant and witnesses during and after the investigation to ensure that such decisions are not based on retaliatory motives.

3. *Effective Complaint Process*

An employer's harassment complaint procedure should be designed to encourage victims to come forward. To that end, it should clearly explain the process and ensure that there are no unreasonable obstacles to complaints. A complaint procedure should not be rigid, since that could defeat the goal of preventing and correcting harassment. When an employee complains to management about alleged harassment, the employer is obligated to investigate the allegation regardless of whether it conforms to a particular format or is made in writing.

The complaint procedure should provide accessible points of contact for the initial complaint. A complaint process is not effective if employees are always required to complain first to their supervisors about alleged harassment, since the supervisor may be a harasser. Moreover, reasonable care in preventing and correcting harassment requires an employer to instruct all supervisors to report complaints of harassment to appropriate officials.

It is advisable for an employer to designate at least one official outside an employee's chain of command to take complaints of harassment. For example, if the employer has an office of human resources, one or more officials in that office could be authorized to take complaints. Allowing an employee to bypass his or her chain of command provides additional assurance that the complaint will be handled in an impartial manner, since an employee who reports harassment by his or her supervisor may feel that officials within the chain of command will more readily believe the supervisor's version of events.

It also is important for an employer's anti-harassment policy and complaint procedure to contain information about the time frames for filing charges of unlawful harassment with the EEOC or state fair employment practice agencies and to explain that the deadline runs from the last date of unlawful harassment, not from the date that the complaint to the employer is resolved. While a prompt complaint process should make it feasible for an employee to delay deciding whether to file a charge until the complaint to the employer is resolved, he or she is not required to do so.

4. Confidentiality

An employer should make clear to employees that it will protect the confidentiality of harassment allegations to the extent possible. An employer cannot guarantee complete confidentiality, since it cannot conduct an effective investigation without revealing certain information to the alleged harasser and potential witnesses. However, information about the allegation of harassment should be shared only with those who need to know about it. Records relating to harassment complaints should be kept confidential on the same basis.

A conflict between an employee's desire for confidentiality and the employer's duty to investigate may arise if an employee informs a supervisor about alleged harassment, but asks him or her to keep the matter confidential and take no action. Inaction by the supervisor in such circumstances could lead to employer liability. While it may seem reasonable to let the employee determine whether to pursue a complaint, the employer must discharge its duty to prevent and correct harassment. One mechanism to help avoid such conflicts would be for the employer to set up an informational phone line which employees can use to discuss questions or concerns about harassment on an anonymous basis.

5. Effective Investigative Process

An employer should set up a mechanism for a prompt, thorough, and impartial investigation into alleged harassment. As soon as management learns about alleged harassment, it should determine whether a detailed fact-finding investigation is necessary. For example, if the alleged harasser does not deny the accusation, there would be no need to interview witnesses, and the employer could immediately determine appropriate corrective action.

If a fact-finding investigation is necessary, it should be launched immediately. The amount of time that it will take to complete the investigation will depend on the particular circumstances. If, for example, multiple individuals were allegedly harassed, then it will take longer to interview the parties and witnesses.

It may be necessary to undertake intermediate measures before completing the investigation to ensure that further harassment does not occur. Examples of such measures are making scheduling changes so as to avoid contact between the parties; transferring the alleged harasser; or placing the alleged harasser on non-disciplinary leave with pay pending the conclusion of the investigation. The complainant should not be involuntarily transferred or otherwise burdened, since such measures could constitute unlawful retaliation.

The employer should ensure that the individual who conducts the investigation will objectively gather and consider the relevant facts. The alleged harasser should not have supervisory authority over the individual who conducts the investigation and should not have any direct or indirect control over the investigation. Whoever conducts the investigation should be well-trained in the skills that are required for interviewing witnesses and evaluating credibility.

Questions to Ask Parties and Witnesses

When detailed fact-finding is necessary, the investigator should interview the complainant, the alleged harasser, and third parties who could reasonably be expected to have relevant information. Information relating to the personal lives of the parties outside the workplace would be relevant only in unusual circumstances. When interviewing the parties and witnesses, the investigator should refrain from offering his or her opinion.

The following are examples of questions that may be appropriate to ask the parties and potential witnesses. Any actual investigation must be tailored to the particular facts.

Questions to Ask the Complainant:

- Who, what, when, where, and how: Who committed the alleged harassment?
- What exactly occurred or was said?
- When did it occur and is it still ongoing?
- Where did it occur?
- How often did it occur?
- How did it affect you?
- How did you react?
- What response did you make when the incident(s) occurred or afterwards?
- How did the harassment affect you?
- Has your job been affected in any way?
- Are there any persons who have relevant information?
- Was anyone present when the alleged harassment occurred?
- Did you tell anyone about it?
- Did anyone see you immediately after episodes of alleged harassment?
- Did the person who harassed you harass anyone else?
- Do you know whether anyone complained about harassment by that person?
- Are there any notes, physical evidence, or other documentation regarding the incident(s)?
- How would you like to see the situation resolved?
- Do you know of any other relevant information?

Questions to Ask the Alleged Harasser:

- What is your response to the allegations?
- If the harasser claims that the allegations are false, ask why the complainant might lie.
- Are there any persons who have relevant information?
- Are there any notes, physical evidence, or documents regarding the incident?
- Do you know of any other relevant information?

Questions to Ask Third Parties:

- What did you see or hear?
- When did this occur?
- Describe the alleged harasser's behavior toward the complainant and toward others in the workplace.
- What did the complainant tell you?
- When did he/she tell you this?
- Do you know of any other relevant information?
- Are there other persons who have relevant information?

Credibility Determinations

If there are conflicting versions of relevant events, the employer will have to weigh each party's credibility. Credibility assessments can be critical in determining whether the alleged harassment in fact occurred. Factors to consider include:

Inherent Plausibility: Is the testimony believable on its face? Does it make sense?

Demeanor: Did the person seem to be telling the truth or lying?

Motive to Falsify: Did the person have a reason to lie?

Corroboration: Is there witness testimony (such as testimony by eye-witnesses, people who saw the person soon after the alleged incidents, or people who discussed the incidents with him or her at around the time that they occurred) or physical evidence (such as written documentation) that corroborates the party's testimony?

Past Record: Did the alleged harasser have a history of similar behavior in the past?

None of the above factors are determinative as to credibility. For example, the fact there are no eye-witnesses to the alleged harassment by no means necessarily defeats the complainant's credibility, since harassment often occurs behind closed doors. Furthermore, the fact that the alleged harasser engaged in similar behavior in the past does not necessarily mean that he or she did so again.

Reaching a Determination

Once all of the evidence is in, interviews are finalized, and credibility issues are resolved, management should make a determination as to whether harassment occurred. That determination could be made by the investigator, or by a management official who reviews the investigator's report. The parties should be informed of the determination.

In some circumstances, it may be difficult for management to reach a determination because of direct contradictions between the parties and a lack of documentary or eye-witness corroboration. In such cases, a credibility assessment may form the basis for a determination, based on factors such as those set forth above.

If no determination can be made because the evidence is inconclusive, the employer should still undertake further preventive measures, such as training and monitoring.

6. Assurance of Immediate & Appropriate Corrective Action

An employer should make clear that it will undertake immediate and appropriate corrective action, including discipline, whenever it determines that harassment has occurred in violation of the employer's policy. Management should inform both parties about these measures.

Remedial measures should be designed to stop the harassment, correct its effects on the employee, and ensure that the harassment does not recur. These remedial measures need not be those that the employee requests or prefers, as long as they are effective.

In determining disciplinary measures, management should keep in mind that the employer could be found liable if the harassment does not stop. At the same time, management may have concerns that overly punitive measures may subject the employer to claims such as wrongful discharge, and may simply be inappropriate.

To balance the competing concerns, disciplinary measures should be proportional to the seriousness of the offense. If the harassment was minor, such as a small number of "off-color" remarks by an individual with no prior history of similar misconduct, then counseling and an oral warning might be all that is necessary. On the other hand, if the harassment was severe or persistent, then suspension or discharge may be appropriate.

Remedial measures should not adversely affect the complainant. Thus, for example, if it is necessary to separate the parties, then the harasser should be transferred (unless the complainant prefers otherwise). Remedial responses that penalize the complainant could constitute unlawful retaliation and are not effective in correcting the harassment.

Remedial measures also should correct the effects of the harassment. Such measures should be designed to put the employee in the position he/she would have been in had the misconduct not occurred.

Examples of Measures to Stop Harassment and Ensure it Does Not Recur:

- | | |
|--|---|
| ★ Oral or written warning or reprimand | ★ Training or counseling of harasser to ensure that he/she understands why his or her conduct violated the employer's anti-harassment policy. |
| ★ Transfer or reassignment | |
| ★ Demotion and/or reduction of wages | |
| ★ Suspension | ★ Monitoring of harasser to ensure that harassment stops. |
| ★ Discharge | |

Examples of Measures to Correct the Effects of the Harassment:

- ★ Restoration of leave taken because of the harassment.
- ★ Expungement of negative evaluation(s) in employee's personnel file that arose from the harassment.
- ★ Reinstatement.
- ★ Apology by the harasser.
- ★ Monitoring treatment of employee to ensure that he/she is not subjected to retaliation by the harasser or others in the work place because of the complaint.
- ★ Correction of any other harm caused by the harassment (e.g., compensation for losses).

Other Preventive and Corrective Measures

An employer's responsibility to exercise reasonable care to prevent and correct harassment is not limited to implementing an anti-harassment policy and complaint procedure.

An employer's duty to exercise due care includes instructing all of its supervisors and managers to address or report to appropriate officials complaints of harassment regardless of whether they are officially designated to take complaints and regardless of whether a complaint was framed in a way that conforms to the organization's particular complaint procedures. For example, if an employee files an EEOC charge alleging unlawful harassment, the employer should launch an internal investigation even if the employee did not complain to management through its internal complaint process.

An employer should ensure that its supervisors and managers understand their responsibilities under the organization's anti-harassment policy and complaint procedure. Periodic training of those individuals can help achieve that result. Such training should explain the types of conduct that violate the employer's anti-harassment policy; the seriousness of the policy; the responsibilities of supervisors and managers when they learn of alleged harassment; and the prohibition against retaliation. An employer should keep track of its supervisors' and managers' conduct to make sure that they carry out their responsibilities under the organization's anti-harassment program.

Finally, it is advisable for an employer to keep records of all complaints of harassment. Without such records, the employer could be unaware of a pattern of harassment by the same individual. Such a pattern would be relevant to credibility assessments and disciplinary measures.

Conclusion

The difficulty in differentiating between wholesome human romance and offensive sexual harassment is that it is always determined in retrospect, through a veil of human emotions, observations, and stereotypes.

Is it sexual harassment to use a company's electronic mail system to ask a subordinate out on a date? Why is it the company's business if a company executive and a secretary go out on dates over the weekend, and agree to keep their relationship out of the office? In support of the view that the workplace should not prohibit any of that conduct, Ninth Federal Circuit Court of Appeals Justice Alex Kozinski wrote: "While many frown on romance in the workplace, it is a fact of life. Indeed, I would suggest that it is an important and enduring reality and that, within bounds of propriety and good taste, romance in the workplace should be accepted rather than forbidden."

The problem is that the "bounds of propriety and good taste" are very difficult for a jury to demarcate two years after the fact. Whether a liaison was a voluntary, mature choice made by two adults or an abuse of power by a supervisor requesting sexual favors is hard to prove in retrospect. A claim that an employee was too intimidated to challenge the sexually charged work environment created by the supervisor is even harder to disprove. Whether a consensual sexual relationship will stay out of the office will not be known until it is too late.

Society demands two mutually exclusive things from employers. First, the workplace has become a place where workers bring much of their personal lives, as a central point of their existence. However, the workplace environment is not permitted to cross an ill-defined line; if crossed, allegations of medical discrimination, age discrimination, sexual harassment, or other forms of unlawful conduct can be made. Employers must walk a tightrope between an emotionally rich environment and a legally prohibited one. A proper sexual harassment policy that is consistently enforced can help maintain that fine distinction.

Statement of Company Policy on Sexual Harassment

It is this Company's Policy that illegal sexual discrimination, unwelcome sexual advances, requests for sexual favors, and any other verbal, visual, or physical conduct of a sexual nature is strictly prohibited.

Requiring coworkers, subordinate employees, or prospective employees to submit to conduct of this nature, explicitly or implicitly, as a term or condition of employment, or used as a basis for any employment decisions is forbidden.

Any and all behavior that has the purpose or effect of unreasonably interfering with an individual's work performance, or creating an intimidating, hostile, or offensive work environment is hereby banned.

Sexual harassment can occur in a variety of circumstances, including but not limited to:

- ★ The victim as well as the harasser may be a woman or a man. The victim does not have to be of the opposite sex.
- ★ The harasser can be the victim's supervisor, an agent of the employer, a supervisor in another area, a co-worker, or a non-employee.
- ★ The victim does not have to be the person harassed but could be anyone affected by the offensive conduct.
- ★ Unlawful sexual harassment may occur without economic injury to or discharge of the victim.
- ★ The harasser's conduct must be unwelcome.

Prevention is the best tool to eliminate sexual harassment in the workplace. Appropriate managers have been designated, rather than a direct supervisor, and other alternative routes provided to receive the filing of formal complaints of sexual harassment. If possible, it is requested that any victimized employee attempt to informally resolve a sexual harassment issue by directly informing the harasser that the conduct is unwelcome and must stop. If informal resolution is unsuccessful, the victim should use the formal complaint form and submit it to the designated manager of their choice. This Company will take immediate and appropriate action when any employee files a formal complaint.

This Company recognizes that the question of whether a particular course of conduct constitutes sexual harassment requires a factual determination. The Company also recognizes that false accusations of sexual harassment can have serious effects on innocent persons. If an investigation results in a finding that a person who has accused another of sexual harassment has maliciously or recklessly made false accusations, the accuser will be subject to appropriate sanctions, including discharge.

When investigating allegations of sexual harassment, this Company will look at the whole record: the circumstances, such as the nature of the sexual advances, and the context in which the alleged incidents occurred. A determination on the allegations is made from the facts on a case-by-case basis. It is this Company's Policy that sexual harassment will not be tolerated.

| DESIGNATED MANAGEMENT PERSONNEL ASSIGNED TO RECEIVE SEXUAL HARASSMENT COMPLAINTS | |
|--|--|
| | |
| | |
| | |
| | |

Signature of Company President, CEO, or General Manager

Date

SEXUAL HARASSMENT COMPLAINT FORM

| | | | |
|---|------------|--|------------|
| Please write legibly and fill out form completely. Submit completed form to appropriate management personnel. | | | |
| Complainant: | | Alleged Harasser: | |
| Department: | Job Title: | Department: | Job Title: |
| Mailing Address: | | Other relevant information about Alleged Harasser: | |
| Home Phone: | | Work Phone: | |
| Details of Incident | | | |
| What exactly occurred or was said? | | | |
| When did it occur and is it still ongoing? | | | |
| Where did it occur? | | | |
| How often did it occur? | | | |
| How did it affect you? | | | |
| What response did you make when the incident(s) occurred or afterwards and how did you react? | | | |
| Has your job been affected in any way? | | | |
| Was anyone present when the alleged harassment occurred? List any third party witnesses: | | | |
| | | | |
| | | | |
| Are there any persons who have relevant information? | | | |
| Did you tell anyone about it? | | | |
| Did anyone see you immediately after episodes of alleged harassment? | | | |
| Did the person who harassed you harass anyone else? | | | |
| Do you know whether anyone complained about harassment by that person? | | | |
| Are there any notes, physical evidence, or other documentation regarding the incident(s)? | | | |
| Do you know of any other relevant information? | | | |
| How would you like to see the situation resolved? | | | |
| I am aware that false accusations of sexual harassment can have serious effects on innocent persons. I further understand that if it is determined, after investigation, that I have maliciously or recklessly made false accusations, I will be subject to appropriate sanctions, including discharge. | | | |
| Complainant's Signature | | | Date |
| Received by: | Print Name | Signature | Date |

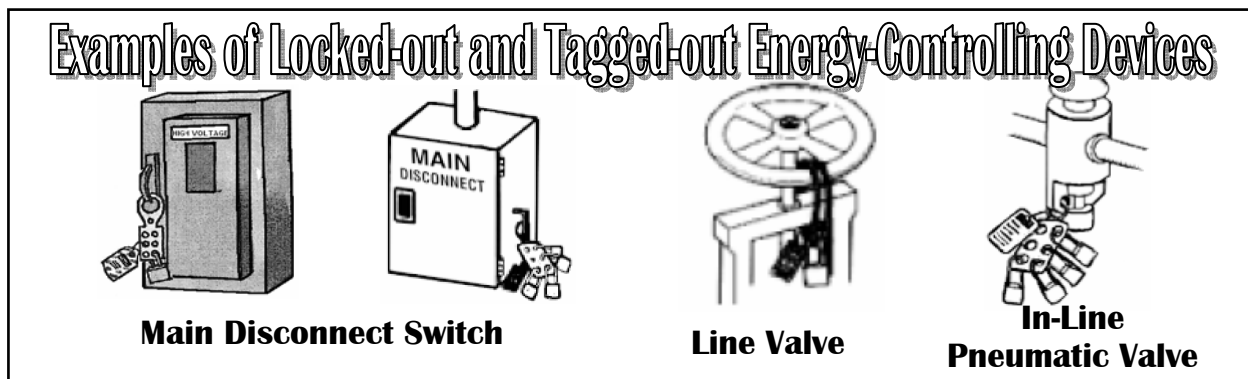
Section Notes:

Chapter 12 Lockout/Tagout – Controlling Hazardous Energy

Only Company authorized employees may perform electrical work.

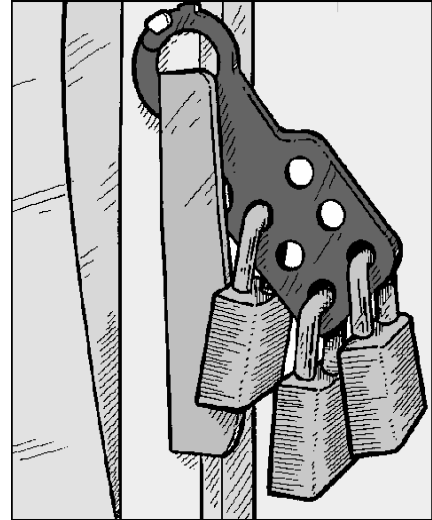
Contents

| | |
|---|----|
| What is “Lockout/Tagout”? | 2 |
| Lockout/Tagout Concerns | 3 |
| When OSHA Standards Apply | 3 |
| When OSHA Standards Do Not Apply | 3 |
| Lockout/Tagout Requirements that Apply to Service & Maintenance Operations | 4 |
| OSHA Requirements | 5 |
| What Energy Control Procedures Must Include | 7 |
| What Workers Must Do Before Beginning Service or Maintenance Activities | 7 |
| What Workers Must Do Before Removing Lockout/Tagout Device(s) and Reenergizing Equipment | 7 |
| How and When to Use Lockout | 8 |
| Determine if the Energy-Isolating Device Can Be Locked-Out | 8 |
| If Equipment Can Not Be Locked-Out | 9 |
| Other Options | 9 |
| When Tagout Devices Can Be Used Instead of Lockout Devices | 9 |
| Limitations of Tagout Devices | 9 |
| Requirements for Lockout/Tagout Devices | 10 |
| What Employees Need to Know About Lockout/Tagout Programs | 10 |
| When Training is Necessary | 11 |
| When Power is Needed to Test or Position Machines, Equipment, or Components | 11 |
| Using Outside Contractors for Service or Maintenance Procedures | 12 |
| When a Group Performs Service or Maintenance Activities | 12 |
| When a Shift Changes During Machine Service or Maintenance | 14 |
| Review of Lockout/Tagout Procedures | 14 |
| What a Review Should Involve | 14 |
| Commonly Used Terms | 14 |
| Lockout/Tagout Policy | 16 |
| Lockout/Tagout Program Audit | 21 |



What is “Lockout/Tagout”?

“Lockout/Tagout” refers to specific practices and procedures to safeguard employees from the unexpected energization or startup of machinery and equipment, or the release of hazardous energy during service or maintenance activities. This requires, in part, that a designated individual turns off and disconnects the machinery or equipment from its energy source(s) before performing service or maintenance and that the authorized employee(s) either lock or tag the energy-isolating device(s) to prevent the release of hazardous energy and take steps to verify that the energy has been isolated effectively. If the potential exists for the release of hazardous stored energy or for the reaccumulation of stored energy to a hazardous level, the employer must ensure that the employee(s) take steps to prevent injury that may result from the release of the stored energy.



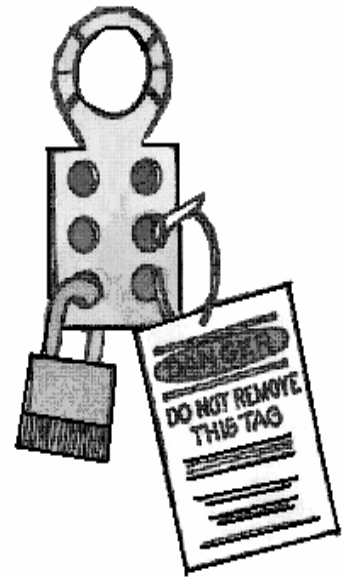
Lockout devices hold energy-isolation devices in a safe or “off” position. They provide protection by preventing machines or equipment from becoming energized because they are positive restraints that no one can remove without a key or other unlocking mechanism, or through extraordinary means, such as bolt cutters. Tagout devices, by contrast, are prominent warning devices that an authorized employee fastens to energy-isolating devices to warn employees not to reenergize the machine while he or she services or maintains it. Tagout devices are easier to remove and, by themselves, provide employees with less protection than do lockout devices.

| Forms of Hazardous Energy | |
|----------------------------------|---|
| Energy Form | Description |
| <i>Potential</i> | Stored energy that can be drawn upon to do work. Suspended loads, compressed springs, and pressurized hydraulic systems are examples. Potential energy can be converted to kinetic energy and many of the other energy forms below. |
| <i>Kinetic</i> | Energy resulting from moving objects such as released loads and uncoiling springs. When these objects are released, their potential energy is converted to kinetic energy. |
| <i>Flammable</i> | Energy converted from the combustion of gasses, liquids, solid chemicals, and vapors. |
| <i>Chemical</i> | The capacity of a substance to do work or produce heat through a change in its composition. Chemical energy can be converted from gasses, liquids, solid chemicals, and vapors. |
| <i>Electrical</i> | Energy generated through the conversion of other forms such as mechanical, thermal, or chemical energy. Energy stored between plates of a charged capacitor is an example of potential electrical energy. Typical electrical energy sources include open buss bars, motors, and generators. |
| <i>Thermal</i> | Energy transferred from one body to another as the result of a difference in temperature. Heat flows from the hotter to the cooler body. Sources include mechanical work, radiation, chemical reactions, and electrical resistance. |

Lockout/Tagout Concerns

Employees can be seriously or fatally injured if machinery they service or maintain unexpectedly energizes, starts up, or releases stored energy. OSHA's standard on the Control of Hazardous Energy (Lockout/Tagout) spells out the steps employers must take to prevent accidents associated with hazardous energy. The standard addresses practices and procedures necessary to disable machinery and prevent the release of potentially hazardous energy while maintenance or servicing activities are performed.

Two other OSHA standards also contain energy control provisions. In addition, some standards relating to specific types of machinery contain de-energization requirements (requiring the switches to be "open and locked in the open position" before performing preventive maintenance on overhead and gantry cranes). These provisions apply in conjunction with the other machine-specific standards to assure that employees will be adequately protected against hazardous energy.



When OSHA Standards Apply

If your employees service or maintain machines where the unexpected startup, energization, or the release of stored energy could cause injury, the standards likely apply to you. The standards apply to all sources of energy, including, but not limited to: mechanical, electrical, hydraulic, pneumatic, chemical, and thermal energy.

Controlling hazardous energy in installations for the exclusive purpose of power generation, transmission, and distribution, including related equipment for communication or metering, is covered by 29 CFR 1910.269.

When OSHA Standards do not Apply

The standard does not apply to general industry service and maintenance activities in the following situations, when:

- ▣ Exposure to hazardous energy is controlled completely by unplugging the equipment from an electric outlet and where the employee doing the service or maintenance has exclusive control of the plug. This applies only if electricity is the only form of hazardous energy to which employees may be exposed. This exception encompasses many portable hand tools and some cord and plug connected machinery and equipment.
- ▣ An employee performs hot-tap operations on pressurized pipelines that distribute gas, steam, water, or petroleum products, for which the employer shows the following:
 - ☆ Continuity of service is essential.
 - ☆ Shutdown of the system is impractical.
 - ☆ The employee follows documented procedures and uses special equipment that provides proven, effective employee protection.
- ▣ The employee is performing minor tool changes or other minor servicing activities that are routine, repetitive, and integral to production, and that occur during normal production operations. In these cases, employees must have effective, alternative protection.

Criteria for Lockout and Tagout Devices

| Criterion | Description |
|-------------------------------------|---|
| <i>Singularly Identified</i> | This means that any employee who sees a lockout or tagout device recognizes it and does not mistake its purpose. Each lock or tag must identify the employee who attached it and can only be used on an energy-isolating device. <i>Each lock must have a unique key or combination; this means that only the employee who uses the lock must have the key or the combination to that lock.</i> |
| <i>Durable</i> | Lockout devices must work under the environmental conditions in which they are used. Tagout device warnings must remain legible even when they are used in wet, damp, or corrosive conditions. |
| <i>Standardized</i> | Lockout and tagout devices must be designated by color, shape, or size. Tagout devices must have a standardized print and warning format. |
| <i>Substantial</i> | Lockout devices and tagout devices must be strong enough that they can not be removed inadvertently. Tagout devices must be attached with a single-use, self-locking material such as a nylon cable tie. |

Lockout/Tagout Requirements that Apply to Service & Maintenance Operations

The standard applies to the control of hazardous energy when employees are involved in service or maintenance activities such as constructing, installing, setting up, adjusting, inspecting, modifying, and maintaining or servicing machines or equipment. These activities include lubricating, cleaning or unjamming machines, and making adjustments or tool changes, where the employees may be exposed to hazardous energy.

If a service or maintenance activity is part of the normal production operation, the employee performing the servicing may be subjected to hazards not normally associated with the production operation itself. Although machine guarding provisions cover most normal production operations, workers doing service or maintenance activities during normal production operations must follow lockout/tagout procedures if they:

- Remove or bypass machine guards or other safety devices
- Place any part of their bodies in or near a machine's point of operation
- Place any part of their bodies in a danger zone associated with machine operations

Work involving minor tool changes and adjustments or other servicing activities that are routine, repetitive, and integral to the use of the production equipment and that occur during normal production operations are not covered by the lockout/tagout standard. This exception is limited, however, and applies only when economic considerations prevent the use of prescribed energy-isolation measures and when the employer provides and requires alternative measures to ensure effective, alternative protection.

Whenever the standard is applicable, the machinery must be shut off and isolated from its energy sources, and lockout or tagout devices must be applied to the energy-isolation devices. In addition, the authorized employee(s) must take steps to verify that he or she has effectively isolated the energy. When there is stored or residual energy, the authorized employee(s) must take steps to render that energy safe. If the possibility exists for reaccumulation of stored energy to hazardous levels, the employer must ensure that the worker(s) perform verification steps regularly to detect such reaccumulation before it has the potential to cause injury.

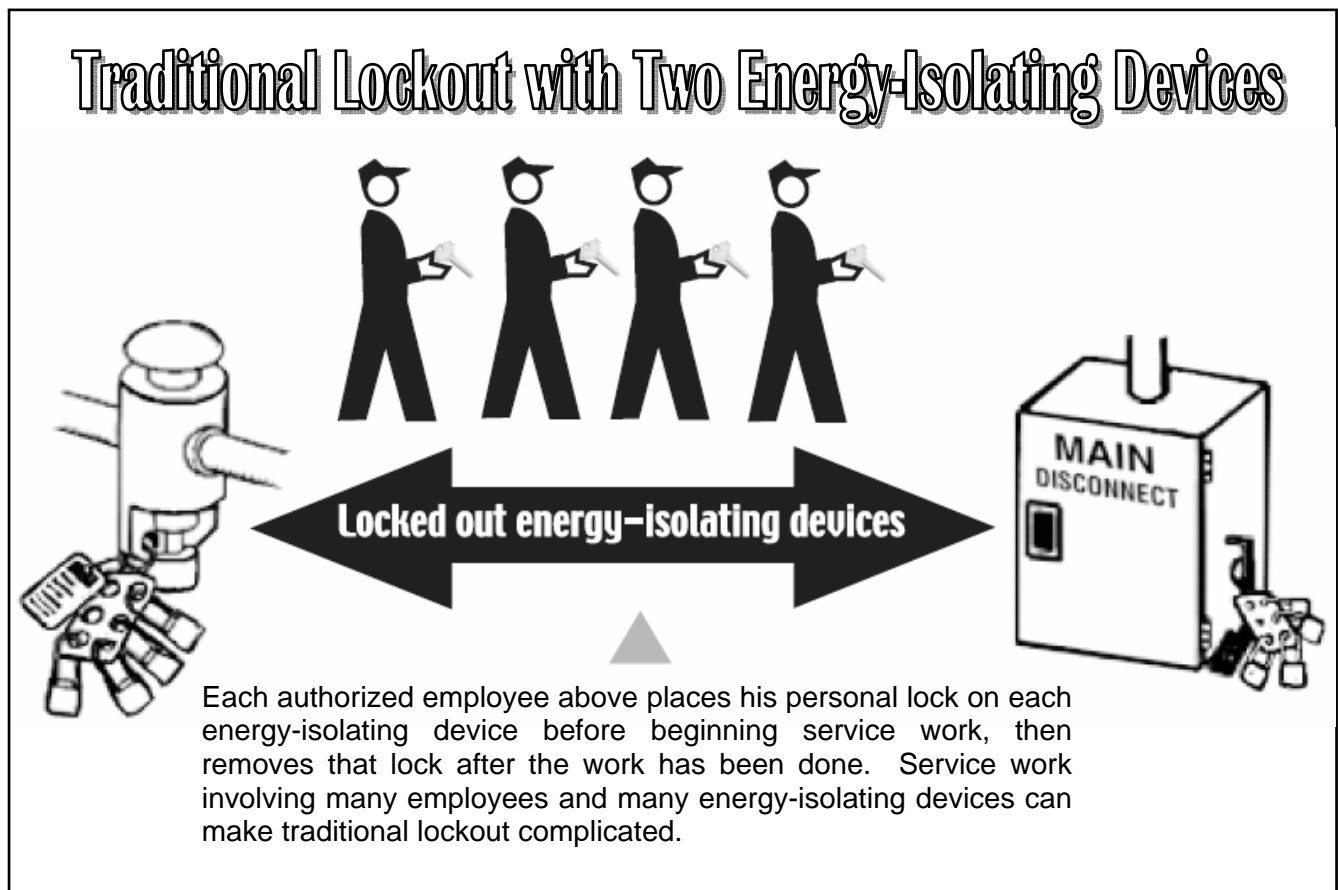
OSHA's Requirements

OSHA's standard establishes minimum performance requirements for controlling hazardous energy. The standard specifies that employers must establish an energy-control program to ensure that employees isolate machines from their energy sources and render them inoperative before any employee services or maintains them.

As part of an energy-control program, employers must:

- ❑ Establish energy-control procedures for removing the energy supply from machines and for putting appropriate lockout or tagout devices on the energy-isolating devices to prevent unexpected reenergization. When appropriate, the procedure also must address stored or potentially reaccumulated energy.
- ❑ Train employees on the energy-control program, including the safe application, use, and removal of energy controls.
- ❑ Inspect these procedures periodically (at least annually) to ensure that they are being followed and that they remain effective in preventing employee exposure to hazardous energy.

If employers use tagout devices on machinery that can be locked out, they must adopt additional measures to provide the same level of employee protection that lockout devices would provide. Within the broad boundaries of the standard, employers have the flexibility to develop programs and procedures that meet the needs of their individual workplaces and the particular types of machines being maintained or serviced.



Procedure for Shutting Down Equipment and Controlling Hazardous Energy

| Critical Step | Action |
|---------------|--|
| ① | <p>Prepare to shut down the equipment — Each <i>authorized employee</i> who shuts down equipment must know the type and magnitude of the energy, its hazards, and how to control the energy. All <i>affected employees</i> must know that the equipment is being serviced and that it will be shut down and locked out for the duration of the service work. (An authorized employee is one who locks out or tags out the energy-isolating device and services the equipment. An affected employee may use the equipment or work in the area where the equipment is being serviced under a lockout or tagout procedure.</p> |
| ② | <p>Shut down the equipment — If the equipment is operating, shut it down as you normally would.</p> |
| ③ | <p>De-energize the equipment: isolate or block the hazardous energy — The method(s) you use depends on the form of energy and the means available to control it.</p> <p>To isolate the energy</p> <ul style="list-style-type: none"> ✦ Disconnect motors that power the equipment. ✦ De-energize electrical circuits by disconnecting the power source from the circuit. <p>To block the energy</p> <ul style="list-style-type: none"> ✦ Block fluid flow in hydraulic, pneumatic, or steam systems with control valves or by capping or blanking the lines. ✦ Block equipment parts that could be moved by gravity. |
| ④ | <p>Dissipate any potential (stored) energy — Some forms of energy must also be dissipated after equipment has been de-energized. Capacitors; coiled springs; elevated machine members; rotating flywheels; and air, gas, steam, chemical, and water systems are sources of hazardous stored energy. If the energy could return to a hazardous level, you must make sure that it remains isolated from the equipment until all service work is finished.</p> <ul style="list-style-type: none"> ✦ Vent pressurized fluids until internal pressure levels reach atmospheric levels. ✦ Discharge capacitors by grounding them. ✦ Release or block tensioned springs. ✦ Ensure that all moving parts have stopped completely. |
| ⑤ | <p>Lock out or tag out the energy-isolating device — If you can lock out the energy-isolating device, then you must lock it out. If you tag out the device, you must ensure that your tag will be as effective as a lock.</p> <p>To lock out the device — Attach your lock and a personal identification tag to the device. The lock must hold the energy-isolating device in a “safe” or “off” position.</p> <p>To tag out the device — Attach the tag to the device or as close to it as possible. The tag must clearly state that changing the energy-isolating device from the “safe” or “off” position is prohibited.</p> |
| ⑥ | <p>Verify that the equipment is isolated from the hazardous energy — Before servicing locked-out or tagged-out equipment, verify that the equipment is, in fact, de-energized and isolated from all energy sources.</p> <ul style="list-style-type: none"> ✦ Verify that the equipment is isolated or disconnected from all energy sources. ✦ Verify that no one is near the equipment. ✦ Push the start button or engage the normal operating control(s) to make certain the equipment will not operate. ✦ Return operating control(s) to neutral or “off” position after verifying that the equipment does not start. |

What Energy-Control Procedures Must Include

Employers must develop, document, and use procedures to control potentially hazardous energy. The procedures explain what employees must know and do to control hazardous energy effectively when they service or maintain machinery. If this information is the same for the various machines used at a workplace, then a single energy-control procedure may suffice. For example, similar machines (those using the same type and magnitude of energy) that have the same or similar types of control measures can be covered by a single procedure. Employers must develop separate energy-control procedures if their workplaces have more variable conditions such as multiple energy sources, different power connections, or different control sequences that workers must follow to shut down various pieces of machinery.

The energy-control procedures must outline the scope, purpose, authorization, rules, and techniques that employees will use to control hazardous energy sources, as well as the means that will be used to enforce compliance. These procedures must provide employees at least the following information:

- ▣ A statement on how to use the procedures.
- ▣ Specific procedural steps to shut down, isolate, block, and secure machines.
- ▣ Specific steps designating the safe placement, removal, and transfer of lockout/tagout devices and identifying who has responsibility for the lockout/tagout devices.
- ▣ Specific requirements for testing machines to determine and verify the effectiveness of lockout devices, tagout devices, and other energy-control measures.

What Workers Must Do Before Beginning Service or Maintenance Activities

Before beginning service or maintenance, the following steps must be accomplished in sequence and according to the specific provisions of the employer's energy-control procedure:

- ① Prepare for shutdown.
- ② Shut down the machine.
- ③ Disconnect or isolate the machine from the energy source(s).
- ④ Apply the lockout or tagout device(s) to the energy-isolating device(s).
- ⑤ Release, restrain, or otherwise render safe all potential hazardous stored or residual energy. If a possibility exists for reaccumulation of hazardous energy, regularly verify during the service and maintenance that such energy has not reaccumulated to hazardous levels.
- ⑥ Verify the isolation and de-energization of the machine.

What Workers Must Do Before Removing Lockout/Tagout Device(s) and Reenergizing Machinery or Equipment

Employees who work on deenergized machinery may be seriously injured or killed if someone removes lockout/tagout devices and reenergizes machinery without their knowledge. Thus, it is extremely important that all employees respect lockout and tagout devices and that only the person(s) who applied these devices remove them.

Before removing lockout or tagout devices, the employees must take the following steps in accordance with the specific provisions of the employer’s energy-control procedure:

- ▣ Inspect machines or their components to assure that they are operationally intact and that nonessential items are removed from the area.
- ▣ Check to assure that everyone is positioned safely and away from machines.

After removing the lockout or tagout devices but before reenergizing the machine, the employer must assure that all employees who operate or work with the machine, as well as those in the area where service or maintenance is performed, know that the devices have been removed and that the machine is capable of being reenergized. In the rare situation in which the employee who placed the lockout/tagout device is unable to remove that device, another person may remove it under the direction of the employer, provided that the employer strictly adheres to the specific procedures outlined in the standard.

| Procedure for Removing Lockout or Tagout Devices And Re-Energizing Equipment | |
|---|--|
| Critical Step | Action |
| ① | Inspect the repair or maintenance work — Make sure you have all your work tools and that you have replaced all equipment components. |
| ② | Tell coworkers that you are removing the lockout or tagout device — Check the work area to ensure that all workers are clear of the area. |
| ③ | Check the equipment power controls — Verify that the equipment power controls are in a neutral or off position. |
| ④ | Remove the lockout or tagout device — The person who attached the device must also remove it. |
| ⑤ | Re-energize the equipment. |

How and When to Use Lockout

You must use a lockout program (or tagout program that provides a level of protection equal to that achieved through lockout) whenever your employees engage in service or maintenance operations on machines that are capable of being locked out and that expose them to hazardous energy from unexpected energization, startup, or release of stored energy. The primary way to prevent the release of hazardous energy during service and maintenance activities is by using energy-isolating devices such as manually operated circuit breakers, disconnect switches, and line valves and safety blocks. Lockout requires use of a lock or other lockout device to hold the energy-isolating device in a safe position to prevent machinery from becoming reenergized. Lockout also requires employees to follow an established procedure to ensure that machinery will not be reenergized until the same employee who placed the lockout device on the energy-isolating device removes it.

Determine if the Energy-Isolating Device Can Be Locked Out

An energy-isolating device is considered “capable of being locked out” if it meets one of the following requirements:

- ▣ Is designed with a hasp or other part to which you can attach a lock such as a lockable electric disconnect switch.
- ▣ Has a locking mechanism built into it.
- ▣ Can be locked without dismantling, rebuilding, or replacing the energy-isolating device or permanently altering its energy-control capability, such as a lockable valve cover or circuit breaker blockout.

If Equipment Can Not Be Locked Out

Sometimes it is not possible to lock out the energy-isolating device associated with the machinery. In that case, you must securely fasten a tagout device as close as safely possible to the energy-isolating device in a position where it will be immediately obvious to anyone attempting to operate the device. You also must meet all of the tagout provisions of the standard. The tag alerts employees to the hazard of reenergization and states that employees may not operate the machinery to which it is attached until the tag is removed in accordance with an established procedure.

Other Options

If it is possible to lock out an energy-isolating device, employers must use lockout devices unless they develop, document, and use a tagout procedure that provides employees with a level of protection equal to that provided by a lockout device. In a tagout program, an employer can attain an equal level of protection by complying with all tagout-related provisions of the standard and using at least one added safety measure that prevents unexpected reenergization. Such measures might include removing an isolating circuit element, blocking a controlling switch, opening an extra disconnecting device, or removing a valve handle to minimize the possibility that machines might inadvertently be reenergized while employees perform service and maintenance activities.

When Tagout Devices Can Be Used Instead of Lockout Devices

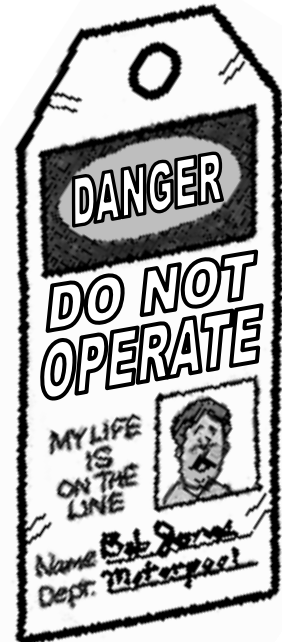
When an energy-isolating device cannot be locked out, the employer must modify or replace the energy-isolating device to make it capable of being locked out or use a tagout system. Whenever employers significantly repair, renovate, or modify machinery or install new or replacement machinery, however, they must ensure that the energy-isolating devices for the machinery are capable of being locked out.

Tagout devices may be used on energy-isolating devices that are capable of being locked out if the employer develops and implements the tagout in a way that provides employees with a level of protection equal to that achieved through a lockout system.

When using a tagout system, the employer must comply with all tagout-related provisions of the standard and train employees in the limitations of tags, in addition to providing normal hazardous energy control training for all employees.

Limitations of Tagout Devices

A tagout device is a prominent warning that clearly states that the machinery being controlled must not be operated until the tag is removed in accordance with an established procedure.



Tags are essentially warning devices and do not provide the physical restraint of a lock. Tags may evoke a false sense of security. For these reasons, OSHA considers lockout devices to be more secure and more effective than tagout devices in protecting employees from hazardous energy.

Requirements for Lockout/Tagout Devices

Whether lockout or tagout devices are used, they must be the only devices the employer uses in conjunction with energy-isolating devices to control hazardous energy. The employer must provide these devices and they must be singularly identified and not used for other purposes. In addition, they must have the following characteristics:

- ▣ Durable enough to withstand workplace conditions. Tagout devices must not deteriorate or become illegible even when used with corrosive components such as acid or alkali chemicals or in wet environments.
- ▣ Standardized according to color, shape, or size. Tagout devices also must be standardized according to print and format. Tags must be legible and understandable by all employees. They must warn employees about the hazards if the machine is energized, and offer employees clear instruction such as:
 - ★ *“Do Not Start”*
 - ★ *“Do Not Open”*
 - ★ *“Do Not Close”*
 - ★ *“Do Not Energize”*
 - ★ *“Do Not Operate”*
- ▣ Substantial enough to minimize the likelihood of premature or accidental removal. Employees should be able to remove locks only by using excessive force with special tools such as bolt cutters or other metal-cutting tools. Tag attachments must be non-reusable, self-locking, and non-releasable, with a minimum unlocking strength of 50 pounds. Tags must be attachable by hand, and the device for attaching the tag should be a one-piece nylon cable tie or its equivalent so it can withstand all environments and conditions.
- ▣ Labeled to identify the specific employees authorized to apply and remove them.

What Employees Need to Know About Lockout/Tagout Programs

Training must ensure that employees understand the purpose, function, and restrictions of the energy-control program. Employers must provide training specific to the needs of “authorized,” “affected,” and “other” employees.

“Authorized” employees are those responsible for implementing the energy-control procedures or performing the service or maintenance activities. They need the knowledge and skills necessary for the safe application, use, and removal of energy-isolating devices. They also need training in the following:

- ▣ Hazardous energy source recognition.
- ▣ The type and magnitude of the hazardous energy sources in the workplace.
- ▣ Energy-control procedures, including the methods and means to isolate and control those energy sources.

“Affected” employees (usually machine operators or users) are employees who operate the relevant machinery or whose jobs require them to be in the area where service or maintenance is performed. These employees do not service or maintain machinery or perform lockout/tagout activities.

Affected employees must receive training in the purpose and use of energy-control procedures. They also need to be able to do the following:

- ▣ Recognize when the energy-control procedure is being used.
- ▣ Understand the purpose of the procedure.
- ▣ Understand the importance of not tampering with lockout or tagout devices and not starting or using equipment that has been locked or tagged out.

All other employees whose work operations are or may be in an area where energy-control procedures are used must receive instruction regarding the energy-control procedure and the prohibition against removing a lockout or tagout device and attempting to restart, reenergize, or operate the machinery.

In addition, if tagout devices are used, all employees must receive training regarding the limitations of tags.

| Training for Authorized and Affected Employees | | |
|---|---|--|
| Employees | The Nature of Their Work | What Their Training Must Include |
| <i>Authorized</i> | Those who lock out or tag out the equipment and who do the maintenance work on the equipment. | <ul style="list-style-type: none"> ★ How to find and recognize hazardous energy sources. ★ The types and magnitudes of energy used in the workplace. ★ How to isolate energy sources. |
| <i>Affected</i> | Those who may use equipment serviced under lockout or tagout procedures and other employees who work in area <i>affected</i> by the procedures. (An affected employee becomes an authorized employee when that employee's duties includes service or maintenance work on equipment.) | <ul style="list-style-type: none"> ★ The purpose of energy-control procedures. ★ How energy-control procedures are applied. ★ How energy-control procedures will protect them. |

When Training is Necessary

The employer must provide initial training before starting service and maintenance activities and must provide retraining as necessary. In addition, the employer must certify that the training has been given to all employees covered by the standard. The certification must contain each employee's name and dates of training.

Employers must provide retraining for all authorized and affected employees whenever there is a change in the following:

- ▣ Job assignments.
- ▣ Machinery or processes that present a new hazard.
- ▣ Energy-control procedures.

Retraining also is necessary whenever a periodic inspection reveals, or an employer has reason to believe, that shortcomings exist in an employee's knowledge or use of the energy-control procedure.

When Power is needed to Test or Position Equipment

OSHA allows the temporary removal of lockout or tagout devices and the reenergization of the machine only in limited situations for particular tasks that require energization—for example, when power is needed to test or position machines, equipment, or components. However, this temporary exception applies only for the limited time required to perform the particular task requiring energization. Employers must provide effective protection from hazardous energy when employees perform these operations.

The following steps must be performed in sequence before reenergization:

- ① Clear tools and materials from machines.
- ② Clear employees from the area around the machines.
- ③ Remove the lockout or tagout devices as specified in the standard.
- ④ Energize the machine and proceed with testing or positioning.
- ⑤ Deenergize all systems, isolate the machine from the energy source, and reapply energy-control measures if additional service or maintenance is required.

The employer must develop, document, and use energy-control procedures that establish a sequence of actions to follow whenever reenergization is required as a part of a service or maintenance activity, since employees may be exposed to significant risks during these transition periods.

| Procedure for Temporary Removal of Lockout and Tagout Devices | |
|--|---|
| Critical Step | Action |
| ① | Clear all tools or other materials near the equipment. |
| ② | Make sure no workers are near the equipment. |
| ③ | Remove the lockout or tagout devices. |
| ④ | Energize the equipment. |
| ⑤ | Shut down the equipment. |

Using Outside Contractors for Service or Maintenance Procedures

If an outside contractor services or maintains machinery, the onsite employer and the contractor must inform each other of their respective lockout or tagout procedures. The onsite employer also must ensure that employees understand and comply with all requirements of the contractor's energy-control program(s).

When a Group Performs Service or Maintenance Activities

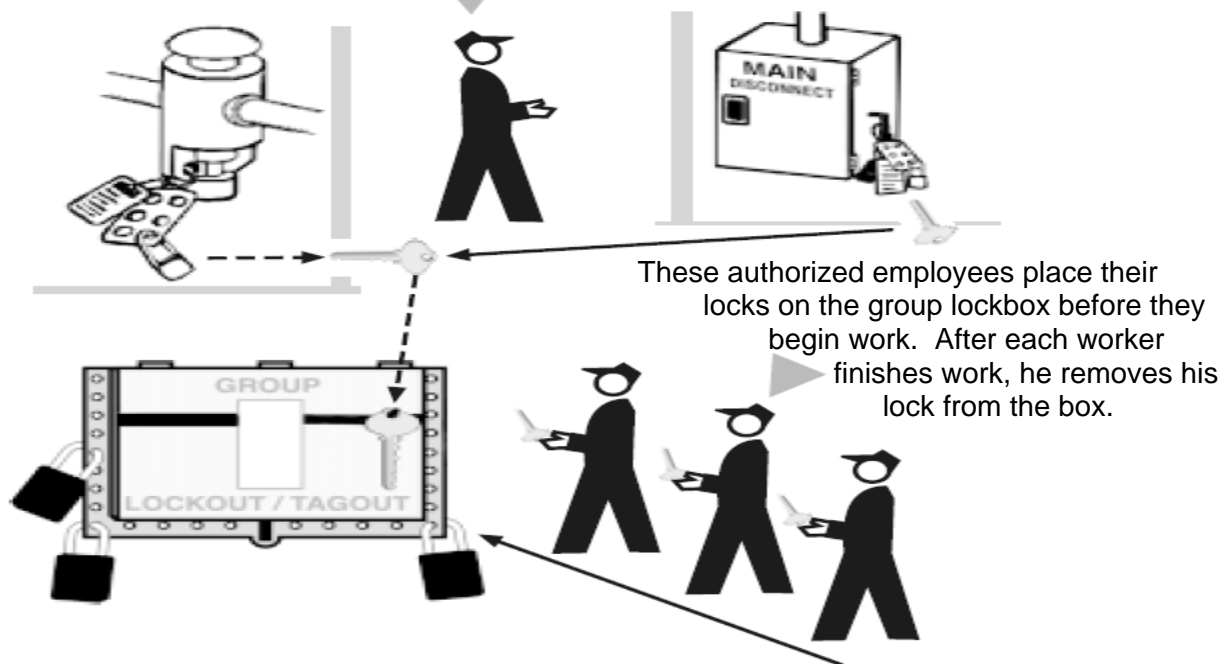
When a crew, department, or other group performs service or maintenance, they must use a procedure that provides all employees a level of protection equal to that provided by a personal lockout or tagout device. Each employee in the group must have control over the sources of hazardous energy while he or she is involved in service and maintenance activities covered by the standard. Personal control is achieved when each authorized employee affixes a personal lockout/tagout device to a group lockout mechanism instead of relying on a supervisor or other person to provide protection against hazardous energy.

Group Lockout – The Group Lockbox Variation

| Step | Activity |
|------|---|
| ① | An authorized employee secures each energy-isolating device with a personal lock. |
| ② | The same authorized employee places the key that fits each lock in a group lock box with a multi-lock hasp. |
| ③ | The other authorized employees in the group secure the lockbox – they attach their personal locks to the box – before beginning their service work. |
| ④ | After each employee finishes service work on the equipment, that employee removes his personal lock from the lockbox. |
| ⑤ | After all the employees have finished their service work and removed their personal locks from the lockbox, the authorized employee who placed the key in the box removes it. |
| ⑥ | The authorized employee uses the key to remove the locks on the energy-isolating devices. |

Group Lockout with Two Energy-Isolating Devices

This authorized employee locks out each of these energy-isolating devices and puts the key into a group lockbox with a multi-lock hasp.



When a Shift Changes During Machine Service or Maintenance

Employers must make sure that there is a continuity of lockout or tagout protection. This includes the orderly transfer of lockout or tagout device protection between outgoing and incoming shifts to control hazardous energy. When lockout or tagout devices remain on energy-isolation devices from a previous shift, the incoming shift members must verify that the machinery is effectively isolated and deenergized.

Review of Lockout/Tagout Procedures

Employees are required to review their procedures at least once a year to ensure that they provide adequate worker protection. As part of the review, employers must correct any deviations and inadequacies identified in the energy-control procedure or its application.

What a Review Should Involve

The periodic inspection is intended to assure that employees are familiar with their responsibilities under the procedure and continue to implement energy-control procedures properly. The inspector, who must be authorized and not involved in the particular control procedure being inspected, must be able to determine the following:

- ☐ Employees are following steps in the energy-control procedure.
- ☐ Employees involved know their responsibilities under the procedure.
- ☐ The procedure is adequate to provide the necessary protection, and what changes, if any, are needed.

For a lockout procedure, the periodic inspection must include a review of each authorized employee's responsibilities under the energy-control procedure being inspected. Where tagout is used, the inspector's review also extends to affected employees because of the increased importance of their role in avoiding accidental or inadvertent activation of the machinery. In addition, the employer must certify that the designated inspectors perform periodic inspections. The certification must specify the following:

- ☐ Machine or equipment on which the energy-control procedure was used.
- ☐ Date of the inspection.
- ☐ Names of employees included in the inspection.
- ☐ Name of the person who performed the inspection.

Note: *An annual Lockout/Tagout audit form is provided for your use at the end of this section.*

Commonly Used Terms

Affected Employee — An employee whose job requires him/her to operate or use a machine or equipment on which servicing or maintenance is being performed under lockout or tagout, or whose job requires him/her to work in an area in which such servicing or maintenance is being performed.

Authorized Employee — A person who locks out or tags out machines or equipment in order to perform servicing or maintenance on that machine or equipment. An affected employee becomes an authorized employee when that employee's duties include performing servicing or maintenance covered under the standard.

Capable of Being Locked Out — An energy-isolating device is capable of being locked out if it has a hasp or other means of attachment to which, or through which, a lock can be affixed, or it has a locking mechanism built into it. Other energy-isolating devices are capable of being locked out, if lockout can be achieved, without the need to dismantle, rebuild, or replace the energy-isolating device or permanently alter its energy control capability.

Energized — Connected to an energy source or containing residual or stored energy.

Energy-Isolating Device — A mechanical device that physically prevents the transmission or release of energy, including but not limited to the following: a manually operated electrical circuit breaker; a disconnect switch; a manually operated switch by which the conductors of a circuit can be disconnected from all ungrounded supply conductors, and in addition, no pole can be operated independently; a line valve; a block; and any similar device used to block or isolate energy. Push buttons, selector switches and other control circuit-type devices are not energy-isolating devices.

Energy Source — Any source of electrical, mechanical, hydraulic, pneumatic, chemical, thermal, or other energy.

Hot Tap — A procedure used in the repair, maintenance, and services activities, which involve welding on a piece of equipment (pipelines, vessels, or tanks) under pressure, in order to install connections or appurtenances. It is commonly used to replace or add sections of pipeline without the interruption of service for air, gas, water, steam, and petrochemical distribution systems.

Lockout — The placement of a lockout device on an energy-isolating device, in accordance with an established procedure, ensuring that the energy-isolating device and the equipment being controlled cannot be operated until the lockout device is removed.

Lockout Device — A device that uses a positive means such as a lock, either key or combination type, to hold an energy-isolating device in the safe position and prevent the energizing of a machine or equipment. Included are blank flanges and bolted slip blinds.

Normal Production Operations — The utilization of a machine or equipment to perform its intended production function.

Servicing and/or Maintenance — Workplace activities such as constructing, installing, setting up, adjusting, inspecting, modifying, and maintaining and/or servicing machines or equipment. These activities include lubricating, cleaning or unjamming machines or equipment and making adjustments or tool changes where the employee may be exposed to the unexpected energization or startup of the equipment or release of hazardous energy.

Setting Up — Any work performed to prepare a machine or equipment to perform its normal production operation.

Tagout — The placement of a tagout device on an energy-isolating device, in accordance with an established procedure, to indicate that the energy-isolating device and the equipment being controlled may not be operated until the tagout device is removed.

Tagout Device — A prominent warning device, such as a tag and a means of attachment, which can be securely fastened to an energy-isolating device in accordance with an established procedure, to indicate that the energy-isolating device and the equipment being controlled may not be operated until the tagout device is removed.



Company Lockout/Tagout Policy

Purpose

Arena Fire Protection, Inc. has established this "Lockout/Tagout Policy and Procedure" to provide maximum safety protection to our employees whenever they must service or perform maintenance on machinery and equipment.

Scope

These procedures must be used by all employees authorized to service or maintain our equipment to ensure that machines or equipment is completely isolated from all potentially hazardous energy sources. All employees affected in any way by servicing and maintenance activities must also be knowledgeable of lockout/tagout procedures.

Application

These procedures must be followed whenever unexpected energizing, star-up or release of stored energy could cause injury. These procedures do not apply when servicing or maintenance of equipment during normal production operations unless:

- ① Guards, or other safety devices, must be removed or bypassed.
- ② An employee places him/herself in an area where work on materials, etc., is actually being performed.
- ③ An employee places him/herself in any area considered dangerous during the normal operating cycle.

Compliance

All supervisors are responsible and accountable for the use of safe lockout/tagout procedures by all employees under their supervision. Compliance with lockout/tagout procedures is mandatory. Non-compliance with these procedures is considered a violation of an employee's condition of employment.

Authorization

Employees who are properly trained and certified on equipment maintenance and lockout/tagout procedures, and approved by the facility manager, are authorized to implement lockout/tagout procedures as appropriate. Attachment C lists authorized employees and associated equipment/machinery.

Lockout/Tagout Procedures

Preparation for Lockout

Review

Prior to lockout, the authorized employee(s) will review the lockout/tagout procedures for each machine/piece of equipment. As a minimum the following information will be reviewed:

- ☐ Types and magnitudes of energy.
- ☐ Hazards posed by that energy.
- ☐ Methods to effectively control the energy.

Particularly close attention must be given to energies (such as gravity, electrical, high pressure) that can be stored or re-accumulated after shut-down.

Notification

Prior to shutdown all affected employees will be notified to clear their work area and/or any other area that might be hazardous.

Lockout/Tagout

Shutdown

Machinery and equipment will be shut down in an orderly manner using the shutdown checklist procedures on the associated lockout/tagout procedures for each machine/piece of equipment. If more than one authorized employee is involved in shutdown, the maintenance team leader will make sure all assistants have accomplished their tasks and are aware that shutdown will occur.

Isolation

All energy isolation devices will be located and operated to completely de-energize and isolate the equipment. The authorized employee, or team leader will verify operation of each energy isolation device.

Applying Lockout/Tagout Devices

Lockout devices — will be used to secure energy isolating devices unless the machinery or equipment is not capable of being locked out. Only authorized employees will affix lockout/tagout devices. Lockout devices must be able to hold energy isolation devices in a "safe" or "off" position.

Tagout devices — will be used only if machinery or equipment is not capable of being locked out. Tags will clearly state that moving energy isolating devices from the "safe" or "off" position is strictly prohibited. If a tag cannot be affixed to the energy isolating device, it will be located as close as safely possible to the device so that the tag is obvious to anyone attempting to operate the device.

Lockout/Tagout materials and hardware — will be provided by the employer. Each lockout/tagout device will be used only for lockout/tagout.

Lockout devices will have the following characteristics:

- Capable of withstanding harsh environments
- Standardized within the Company. Same color, shape, size, etc.
- Prevent removal without excessive force
- Singularly identify the user
- Uniquely keyed

In addition, tagout devices will also have the following characteristics:

- Non-reusable
- Attachable by hand
- Self-locking
- Non-releasable with not less than 50 LB locking strength
- Design/characteristics at least equivalent to a one-piece, all environment-tolerant nylon cable tie.

Stored Energy — Immediately after applying lockout or tagout devices, the authorized employee will ensure all potentially hazardous stored or residual energy is relieved, disconnected, restrained, and otherwise rendered safe.

If stored energy can be re-accumulated, the authorized employee will verify that the energy is isolated until maintenance is complete or the energy no longer exists.

Verification of Isolation — Before starting work on a machine or equipment that is locked or tagged out, the authorized employee will verify that the machinery or equipment is actually isolated and de-energized.

Release from Lockout or Tagout

The authorized employee will follow the procedures below prior to removing lockout or tagout devices and restoring energy:

- ☐ **Equipment** — Make sure machinery or equipment is properly re-assembled. Inspect machinery or equipment to make sure nonessential items have been removed.
- ☐ **Employees** — Make sure all employees are safely positioned outside danger zones. Notify affected employees that lockout/tagout devices have been removed and that energy is going to be re-applied.
- ☐ **Removing lockout/tagout devices** — Only the authorized employee who applied the lockout/tagout device may remove that device. Exception: When the authorized employee is not at the facility and all reasonable efforts have been made to inform the employee that their lockout/tagout device has been removed:
 - ★ The owner is authorized and will remove the device following procedures in this section.
 - ★ Each owner will be trained in proper lockout/tagout procedures.
 - ★ The owner will ensure the authorized employee has this knowledge before he/she resumes work.

Testing/Positioning Machines or Equipment

Whenever lockout/tagout devices are removed to test or position machines and equipment, or their components, the authorized employee will complete the following procedures in the sequence presented:

- ☐ Clear the machine or equipment of tools and materials.
- ☐ Remove employees from danger zones.
- ☐ Remove lockout/tagout devices.
- ☐ Energize and proceed with testing or positioning.
- ☐ De-energize all systems and re-apply lockout/tagout devices.

Outside Personnel (Contractors, etc.)

- ☐ Outside servicing personnel contracted to perform maintenance or other services covered by these lockout/tagout procedures will not begin work until the owner is satisfied that their lockout/tagout procedures are at least equivalent to company procedures.
- ☐ The owner will also ensure company employees understand and comply with contracted personnel lockout/tagout procedures.

Shift/Personnel Changes

When a shift change occurs during a lockout/tagout procedure, the following procedures will be followed:

- ☐ The on-coming authorized employee(s) will attach lockout/tagout devices and verify complete isolation.
- ☐ The on-coming authorized employee(s) will receive a comprehensive briefing on the maintenance being performed from the off-going authorized employee(s).
- ☐ The off-going authorized employee(s) will remove their lockout/tagout devices.

Special Procedure: In the event that communication between off-going and on-coming authorized employee(s) is impossible and work is to be done on the equipment/machinery by the on-coming authorized employee(s), then the following procedures must be followed:

- ☐ The off-going authorized employee(s) will each check out a "department" lock from the maintenance department and record in the checkout log the status and condition of the equipment in question.
- ☐ The off-going authorized employee(s) will attach the "department" lock to the equipment/machinery and remove their personal lock.
- ☐ The on-coming authorized employee(s), upon realization there is a "department" lock in place on the equipment/machinery to be worked on, will go to the maintenance department and read the checkout log, and sign for the appropriate key.
- ☐ The on-coming authorized employee(s) will attach their personal lock to the equipment/machinery and remove the "department" lock.
- ☐ The on-coming authorized employee(s) will immediately return the "department" lock and key to the maintenance department and sign in the key and lock.

Training

Training in Lockout/Tagout — will be provided to all employees who may be in an area where energy control procedures are used. This training will make sure that the purpose and function of the energy control program are understood and that employees gain the needed knowledge and skills to safely apply, use, and remove energy controls. As a minimum, training will include:

- ☐ ***Authorized employees must be able to recognize:*** hazardous energy sources, type and magnitude of energy in the workplace, and methods and means necessary to isolate and control the energy.
- ☐ ***Affected employees must be able to recognize:*** purpose and use of the energy control procedures.
- ☐ ***Other employees must be able to recognize:*** procedures and prohibitions of the energy control program.

Training for Tagout Devices — Further training on tagout systems need to emphasize that:

- ☐ Tags are warning devices only and do not provide a physical restraint that lockout devices provide.
- ☐ Tags must not be removed without the authorized employee's approval, and should never be bypassed, ignored, or otherwise defeated.

- ▣ Tags must be legible, and understandable by all employees.
- ▣ Tags must be able to withstand environmental conditions in the workplace.
- ▣ Tags may give employees a false sense of security.
- ▣ Tags must be securely attached to prevent being accidentally detached during use.

Retraining — Employees will be retrained at the following times:

- ▣ Initial assignment.
- ▣ Change in job assignment.
- ▣ Change in machinery or equipment.
- ▣ Change in operating procedures.

Inspections

Annual inspection on lockout/tagout procedures will be conducted by an authorized employee other than the one(s) using the control procedure being inspected.

- ▣ The purpose of the inspection is to correct any deviations or inadequacies in the procedures.
- ▣ The inspector and authorized employee must review responsibilities under the energy control procedure.
- ▣ The owner will certify that the inspection was conducted. Elements of the certification include:
 - ★ Identification of equipment or machinery.
 - ★ Date of inspection.
 - ★ Employees included in the inspection.
 - ★ Person performing inspection.

Owner Signature

Date

Company Lockout/Tagout Audit

This audit covers the servicing and maintenance of machines and equipment in which the unexpected start up of the machines or equipment, or release of stored energy could cause injury to employees. Mark your item choices in the boxes: Y=Yes, N=No, and N/A=Not Applicable.

Energy Control Program

Y N N/A

Y N N/A

1. Has the employer established an energy control program consisting of energy control procedures, employee training and periodic inspections?
2. Is a responsible person appointed to monitor the effectiveness of the energy control program?

Lockout/Tagout

1. Is a tagout system used only if an energy isolating device is not capable of being locked out?
2. Can the employer prove that the utilization of a tagout system will provide full employee protection?
3. Whenever replacement or major repair, renovation or modification of a machine or equipment is performed, and whenever new machines or equipment are installed, are energy isolating devices for such machine or equipment designed to accept a lockout device?

Energy Control Procedure

1. Are written procedures in place, documented and used for the control of potentially hazardous energy?

Exception: The employer need not document the required procedure for a particular machine or equipment, when all of the following elements exist:

- ① The machine or equipment has no potential for stored or residual energy or re-accumulation of stored energy after shut down which could endanger employees.
 - ② The machine or equipment has a single energy source which can be readily identified and isolated.
 - ③ The isolation and locking out of that energy source will completely de-energize and de-activate the machine or equipment.
 - ④ The machine or equipment is isolated from that energy source and locked out during servicing or maintenance.
 - ⑤ A single lockout device will achieve a locked-out condition.
 - ⑥ The lockout device is under the exclusive control of the authorized employee performing the servicing or maintenance.
 - ⑦ The servicing or maintenance does not create hazards for other employees.
 - ⑧ The employer, in utilizing this exception, has had no accidents involving the unexpected activation or re-energizing of the machine or equipment during servicing or maintenance.
2. Do procedures clearly and specifically outline the scope, purpose, authorization, rules, and techniques to be utilized for the control of hazardous energy, and the means to enforce compliance? Do procedures include:
- A. A specific statement of the intended use of the procedure.
- B. Specific procedural steps for shutting down, isolating, blocking and securing machines or equipment to control hazardous energy.
- C. Specific procedural steps to place, remove, and transfer lockout devices/ tagout devices and the responsibility for them.

Y N N/A

- D.** Specific requirements for testing a machine or equipment to determine and verify the effectiveness of lockout devices, tagout devices, and other energy control measures.

Protective Materials and Hardware

- 1.** Are locks, tags, chains, wedges, key blocks, adapter pins, self-locking fasteners, or other hardware provided by the employer for isolating, securing or blocking of machines or equipment from energy sources?
- 2.** Are lockout devices and tagout devices singularly identified; the only device(s) used for controlling energy, and not used for other purposes?
- 3.** Are lockout and tagout devices capable of withstanding the environment to which they are exposed for the maximum period of time that exposure is expected?
- 4.** Are tagout devices constructed and printed so that exposure to weather conditions or wet and damp locations will not cause the tag to deteriorate or the message on the tag to become illegible?
- 5.** Are tags made so that they will not deteriorate when used in corrosive environments such as areas where acid and alkali chemicals are handled and stored?
- 6.** Are lockout and tagout devices standardized within the facility in at least one of the following criteria: color; shape; or size; and additionally, in the case of tagout devices, print and format
- 7.** Are lockout devices substantial enough to prevent removal without the use of excessive force or unusual techniques, such as the use of bolt cutters or other metal cutting tools?
- 8.** Are tagout devices, including their means of attachment, substantial enough to prevent inadvertent or accidental removal?
- 9.** Are the means of attaching tagout devices of a non-reusable type, attachable by hand, self-locking, and non-releasable with a minimum unlocking strength of no less than 50 pounds?
- 10.** Is the general design and basic characteristics of the means of attachment at least equivalent to a one-piece, all environment-tolerant nylon cable tie?
- 11.** Do lockout devices and tagout devices indicate the identity of the employee applying the device(s)?
- 12.** Do tagout devices warn against hazardous conditions if the machine or equipment is energized and include a legend such as the following: **Do Not Start. Do Not Open. Do Not Close. Do Not Energize. Do Not Operate?**
- 13.** Does each person's lock have either a key or combination which is unique to that device?

Periodic Inspection

- 1.** Does the employer conduct a periodic inspection of the energy control procedure at least annually?
- 2.** Is the periodic inspection performed by an authorized employee other than the one(s) utilizing the energy control procedure being inspected?
- 3.** Is the periodic inspection conducted to correct any deviations or inadequacies identified?
- 4.** Does the periodic inspection include a review, between the inspector and each authorized employee, of that employee's responsibilities under the energy control procedure being inspected?
- 5.** Does the employer certify in writing that the periodic inspections have been performed?

Note: The certification must identify the machine or equipment on which the energy control procedure was being utilized, the date of the inspection, the employees included in the inspection, and the person performing the inspection.

Training and Communication

Y N N/A

- 1.** Does the employer provide training to make sure that the purpose and function of the energy control program is understood by employees, and that the knowledge and skills required for the safe application, use, and removal of the energy controls are acquired by employees?
- 2.** Does the training include the following:
- A.** Authorized employees. The recognition of applicable hazardous energy sources, the type and magnitude of the energy available in the workplace, and the methods and means necessary for energy isolation and control.
 - B.** Affected employees. The purpose and use of the energy control procedure.
 - C.** All other employees. General lockout/tagout program and procedures, and the prohibition relating to attempts to restart or re-energize machines or equipment which are locked out or tagged out.
- 3.** When a tagout system is used, employees should be trained that:
- A.** Tags are essentially warning devices affixed to energy isolating devices, and do not provide the physical restraint on those devices that is provided by a lock.
 - B.** When a tag is attached to an energy isolating means, it is not to be removed without authorization of the authorized person responsible for it, and it is never to be bypassed, ignored, or otherwise defeated.
 - C.** Tags must be legible and understandable by all authorized employees, affected employees, and all other employees whose work operations are or may be in the area, in order to be effective.
 - D.** Tags and their means of attachment must be made of materials which will withstand the environmental conditions encountered in the workplace.
 - E.** Tags may evoke a false sense of security, and their meaning needs to be understood as part of the overall energy control program.
 - F.** Tags must be securely attached to energy isolating devices so that they can not be inadvertently or accidentally detached during use.

Employee Retraining

- 1.** Is retraining provided for all authorized and affected employees whenever there is a change in their job assignments, a change in machines, equipment or processes that present a new hazard, or when there is a change in the energy control procedures?
- 2.** Is additional retraining conducted whenever a periodic inspection reveals, or whenever the employer has reason to believe that there are deviations from or inadequacies in the employee's knowledge or use of the energy control procedures?
- 3.** Does retraining re-establish employee proficiency and introduce new or revised control methods and procedures, as necessary?
- 4.** Does the employer certify that employee training has been accomplished and is being kept up-to-date, and does the certification contain each employee's name and dates of training?

Energy Isolation

- 1.** Is lockout or tagout performed only by the authorized employees who are performing the servicing or maintenance?

Notification of Employees

Y N N/A

- 1. Are affected employees notified by the employer or authorized employee of the application and removal of lockout or tagout devices?
- 2. Is notification given before the controls are applied, and after they are removed from the machine or equipment?

Application of Controls

- 1. Are established procedures for the application of energy control (the lockout or tagout procedures) being accomplished in proper sequence?

Step One: Preparation for shutdown

- 1. Does the authorized employee have knowledge of the type and magnitude of the energy, the hazards of the energy to be controlled, and the method or means to control the energy before turning off a machine or equipment?

Step Two: Machine or equipment shutdown

- 1. Are machines or equipment turned off or shut down using orderly, established procedures?

Step Three: Machine or equipment isolation

- 1. Are all energy isolating devices needed to control the energy to the machine or equipment physically located and operated in such a manner as to isolate the machine or equipment?

Step Four: Lockout or tagout device application

- 1. Are lockout or tagout devices affixed to each energy isolating device by authorized employees?
- 2. Are lockout devices affixed in a manner that will hold the energy isolating devices in a "safe" or "off" position?
- 3. Are tagout devices, where used, affixed in such a manner as will clearly indicate that the operation or movement of energy isolating devices from the "safe" or "off" position is prohibited?
- 4. Where tagout devices are used with energy isolating devices designed with the capability of being locked, is the tag fastened at the same point at which the lock would have been attached? (Remember using tags is not allowed unless full employee protection can be proved.)
- 5. Where a tag cannot be affixed directly to the energy isolating device, is the tag located as close as safely possible to the device, and in a position that will be immediately obvious to anyone attempting to operate the device?
- 6. Following the application of lockout or tagout devices to energy isolating devices, is all potentially hazardous stored or residual energy relieved, disconnected, restrained, and otherwise rendered safe?
- 7. If there is a possibility of re-accumulation of stored energy to a hazardous level, is isolation verification continued until the servicing or maintenance is completed, or until the possibility of such accumulation no longer exists?
- 8. Prior to starting work on machines or equipment that have been locked out or tagged out, does the authorized employee verify that isolation and de-energizing of the machine or equipment have been accomplished?

Release from Lockout or Tagout

Y N N/A

- 1.** Before lockout or tagout devices are removed and energy is restored to the machine or equipment, are the following actions taken?
 - A.** The work area is inspected to ensure that non-essential items have been removed and that machine or equipment components are operationally intact.
 - B.** The work area is checked to make sure all employees have been safely positioned or removed.
 - C.** Before lockout or tagout devices are removed and before machines or equipment are energized, affected employees are notified that the lockout devices have been removed.
 - D.** After lockout or tagout devices have been removed and before a machine or equipment is started, affected employees are notified that the lockout or tagout device(s) have been removed.
- 2.** Is each lockout or tagout device removed from each energy isolating device by the employee who applied the device?
- 3.** When the authorized employee who applied the lockout or tagout device is not available to remove it, is the device removed under the direction of the employer using specific procedures? Do those procedures include:
 - A.** Verification by the employer that the authorized employee who applied the device is not at the facility;
 - B.** Making all reasonable efforts to contact the authorized employee to inform them that their lockout or tagout device has been removed; and
 - C.** Ensuring that the authorized employee has this knowledge before he/she resumes work at that facility.

Testing or Positioning of Machines, Equipment or Components Thereof

- 1.** When lockout or tagout devices must be temporarily removed to test or position the machine, equipment or component, is the following sequence of actions followed:
 - A.** Clear the machine or equipment of tools and materials.
 - B.** Remove employees from the machine or equipment area.
 - C.** Remove the lockout or tagout devices.
 - D.** Energize and proceed with testing or positioning.
 - E.** De-energize all systems and reapply energy control measures to continue the servicing and/or maintenance.

Outside Personnel (contractors, etc.)

- 1.** Whenever outside servicing personnel are to be engaged in activities, does the on-site employer and the outside employer inform each other of their respective lockout or tagout procedures?
- 2.** Does the on-site employer make sure that his/her employees understand and comply with the guidelines and restrictions of the outside employer's energy control program?

Shift or Personnel Changes

- 1.** Are specific procedures used during shift or personnel changes to ensure continuity of lockout or tagout protection?
- 2.** Do shift change procedures include the orderly transfer of lockout or tagout device protection between off-going and on-coming employees?

Inspector's Name

©SAFETY SERVICES COMPANY

Signature

12-25

Date

Section Notes:

Chapter 13 Hazard Communication Program

Arena Fire Protection, Inc. shall ensure that all containers are labeled, a current inventory list of all hazardous chemicals/material is maintained, and current Material Safety Data Sheets are available.

Allen Davidson is responsible for updating and maintaining this program and for compiling a current inventory of all chemical/material and updating MSDS as needed. All employees have free access to MSDS.

MSDS are stored in/at: **the jobsite toolbox or work truck.**

Introduction

OSHA's Hazard Communication Standard (HCS) is based on a simple concept – that employees have both a need and a right to know the hazards and identities of the chemicals they are exposed to when working. They also need to know what protective measures are available to prevent adverse effects from occurring. OSHA designed the HCS to provide employees with the information they need to know.

The HCS addresses the issues of evaluating and communicating hazards to workers including issues such as chemical labeling, Material Safety Data Sheets (MSDSs), a written program, and employee training requirements.

OSHA requires that all employers develop a written Hazard Communication Program and train their workers on the aspects the program covers. This is a difficult task for construction companies since job sites and tasks change frequently. In addition, other employers at the job site affect employees' chemical exposures and necessitate clear communication between employers to ensure employee protection.

The HCS requires the development of a comprehensive list of hazardous chemicals used at the job site as well as MSDSs for these chemicals. Normal "consumer products" such as those available at local retail or home improvement stores are exempt from the labeling, MSDS, and training requirements of the HCS when used in the same quantity and manner as a normal consumer. For example, can of spray paint used with the same frequency or duration as would be expected at home would not be covered. However, the same spray paint used everyday as part of the construction process would be subject to the requirements of the hazard communication standard including MSDSs, labeling, and training. Frequently overlooked items usually covered by HCS requirements on a construction site include: adhesives, gasoline, paint thinner, grease, cleaners, solvents, and sealers.

MSDSs are usually very easy to obtain. Retail stores (including hardware and home improvement stores) selling hazardous chemicals to employers having a commercial account are required to provide MSDSs upon request. MSDSs are also usually available on manufacturers' web sites. In addition, there are a number of MSDS repositories available to the public on the internet including the following:

★ <http://www.siri.org> ★ <http://www.msds.com> ★ <http://www.msdsprovider.com>



General Information

The management staff of **Arena Fire Protection, Inc.** is committed to the prevention of incidents, exposures, or happenings that result in injury and/or illness and to comply with all applicable federal and state health and safety rules. In order to comply with the Occupational Safety and Health Administration (OSHA) the following written hazard communication program has been established.

All employees of this Company will participate in the Hazard Communication Program. A copy of this written program will be available at The Company's main office and on each jobsite for review by any interested employee.



Container Labeling

Allen Davidson is responsible for container labeling procedures, reviewing, and updating. The labeling system to be used is as follows:

Specified Interior Products will rely primarily on the use of the manufacturers' labels to meet the labeling requirement of the standard.

- ☐ All chemicals on site will be stored in their original container with manufacturers' label attached.
- ☐ Workers may dispense chemicals from original containers in small quantities for immediate use by a single employee on a single shift. These secondary containers will be labeled with at least the generic name of the product dispensed (e.g., paint, thinner, etc.). Excess chemical will be returned to the original container at the end of the shift or given for proper handling to The Safety Coordinator.
- ☐ **Allen Davidson** will ensure that all containers are labeled with the manufacturers' label or equivalent containing the following information:
 - ★ Chemical Name; Manufacturers' Name and Address; and Appropriate hazard warnings such as "Flammable", "Toxic", etc.
- ☐ No unmarked containers of any size will be left in the work area unattended.

Hazardous Chemical List & Material Safety Data Sheets

A master list of all the hazardous chemicals used on a job site will be maintained by **Allen Davidson** and kept: *(Compile and maintain list using the provided form.)*

Enter Location(s): _____

This list will be available for employee review at any time.

Copies of MSDSs for all hazardous chemicals to which employees of this company may be exposed will be kept:

Enter Location(s): _____ ,
and at each jobsite. MSDSs will be available for employee review at any time.

Anyone purchasing new chemicals must request a copy of the MSDS. The Company Safety Coordinator will ensure that new MSDSs are distributed to the appropriate job sites. If MSDSs are not available or new chemicals in use do not have an MSDS, immediately contact The Company Safety Coordinator.

Employee Information and Training (Document training using provided forms.)

Prior to starting work, each new employee will attend a health and safety orientation and will receive information and training on the following:

- ☐ An overview of the requirements in OSHA's Hazard Communication Standard.
- ☐ Chemicals present at their job site.
- ☐ Location and availability of the MSDS file and the written hazard communication program.
- ☐ Physical hazards and health effects of the hazardous chemicals.
- ☐ Methods used to determine the presence or release of hazardous chemicals in the work area.
- ☐ Methods to reduce or prevent exposure to these hazardous chemicals including safe work practices and personal protective equipment.
- ☐ Steps The COMPANY has taken to reduce or prevent exposure to these chemicals.
- ☐ Safety emergency procedures to follow if the employee is exposed to these chemicals.
- ☐ How to read labels and review MSDSs to obtain appropriate hazard information.

Prior to introducing a new hazardous chemical into any operational section of **Arena Fire Protection, Inc.**, affected employees will be given updated information and training for new chemical as outlined above.

Hazardous Non-Routine Tasks

Periodically, employees must perform hazardous non-routine tasks. Before starting work on such projects, each affected employee will be given information by their supervisor about hazardous chemicals to which he or she may be exposed during such activity.

This information will include:

- ☐ Specific chemical hazards.
- ☐ Protective/safety measures employees can take.
- ☐ Measures THE COMPANY has taken to reduce the hazards, including ventilation, respirators, presence of another employee, and emergency procedures.

Informing Other Employers

It is the responsibility of **Allen Davidson** to insure all employers on the job site exchange the following information:

- ☐ Hazardous chemicals which employees may be exposed while on the job site.
- ☐ Procedures for obtaining MSDSs from each employer
- ☐ Precautions employees should take to lessen the possibility of exposure.
- ☐ Location of written Hazard Communication programs for each company.
- ☐ Contact information for the safety coordinator for each company.

Each employer will be responsible for providing necessary hazard information to their affected employees.

Understanding Material Safety Data Sheets (MSDS)

OSHA has estimated that more than 32 million workers are exposed to 650,000 hazardous chemical products in more than 3 million American workplaces. This poses a serious problem for exposed workers and their employers.

The basic goal of a Hazard Communication Program is to be sure employers and employees know about work hazards and how to protect themselves. This should help to reduce the incidence of chemical related illnesses and injuries.



Chemicals pose a wide range of health hazards (such as irritation, sensitization, and carcinogenicity) and physical hazards (such as flammability, corrosion, and reactivity). OSHA's Hazard Communication Standard (HCS) is designed to ensure that information about these hazards and associated protective measures are disseminated to workers and employers. This is accomplished by requiring chemical manufacturers and importers to evaluate the hazards of the chemicals they produce or import, and to provide information about them through labels on shipped containers and more detailed information sheets called material safety data sheets (MSDSs). All employers with hazardous chemicals in their workplaces must prepare and implement a written hazard communication program. Employers must ensure that all containers are labeled, that employees are provided access to MSDSs, and that an effective training program is conducted for all potentially exposed employees.

A vital part of an effective "Hazard Communication Program" is maintaining Material Safety Data Sheets (MSDSs) and insuring employees have the necessary training to understand the terminology contained in MSDSs. The following pages provide brief explanations of terminology that can be used during employee training.

Manufacturers, importers, distributors, and suppliers are required to provide you with Material Safety Data Sheets (MSDSs) for each of their hazardous chemicals. As an employer or contractor, you are required to maintain a file of MSDSs for the hazardous chemicals you use. According to OSHA, you will be able to determine if a substance is hazardous by referring to the MSDS and the label. The OSHA Standard specifies the information required on each data sheet, and all information must be written in English.

Review the MSDS's you receive for accuracy and completeness, and make sure you have the latest version on file. When an MSDS includes new information or a new compound has been added to it, additional employee training is required.

To ensure proper recordkeeping and maintenance of MSDSs, you should:

- ① Make sure any employee who purchases supplies for your company is on the lookout for MSDSs.
- ② Include a request for an MSDS and a label that meets the requirements of the Hazard Communication Standard on all purchase orders.
- ③ Ask for an MSDS for materials with labels indicating they are hazard unless an MSDS is already on file.
- ④ To deal with a multi-employer situation, other contractors on the site may be asked to provide hazardous substance information for the chemicals they bring to the site.



While MSDSs will appear in many different formats, they will contain essentially the same information. An MSDS should contain the following information:

Identification

- ① Chemical name, as it appears on the label.
- ② Manufacturer's name and address.
- ③ Emergency phone number in case of an emergency involving the substance.
- ④ Date prepared and the signature of the preparer.



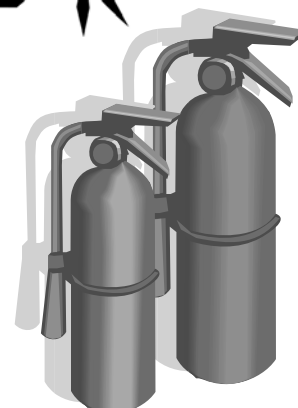
Hazardous Ingredients/Identity Information

- ① **Hazardous Components:** Contains the specific chemical identity, its formula, and any common names it is known by.
- ② **OSHA Permissible Exposure Limits (PELs):** PEL is the permissible maximum amount or concentration of the chemical a person may be safely exposed to without harm.
- ③ **American Conference of Governmental Industrial Hygienists (ACGIH) Threshold Limit Value (TLV):** The TLV is the concentration of a chemical in the air that can be inhaled for five consecutive eight-hour workdays by most persons without harmful effects. It is generally expressed in parts per million or milligrams per cubic meter of air.
- ④ **Other Exposure Limits:** Any other recommended limitation on the use of the chemical by any agency, scientific group, or organization should be included.



Physical/Chemical Characteristics

- ① **Boiling Point:** The temperature at which a liquid boils.
- ② **Vapor Pressure (mm Hg):** Vapor pressure measures a liquid's tendency to evaporate. The higher the vapor pressure, the faster it will evaporate.
- ③ **Vapor Density:** Indicates the weight of the vapor compared with the weight of an equal volume of air. If a vapor is heavier than air (vapor density greater than 1), it will sink to the ground. If it is lighter than air (vapor density less than 1), it will rise. For example, with flammable materials, when the vapor density is greater than 1, vapors tend to collect in the lowest spot. A contractor must be alert to vapors traveling to an ignition source, then flashing back to the vapor source. Under some circumstances chemical vapors may displace oxygen.
- ④ **Solubility in Water:** Indicates whether the chemical can mix with water in any ratio without separating.
- ⑤ **Appearance and Odor:** A brief description of the chemical's color and smell.
- ⑥ **Specific Gravity:** Ratio of a material's weight to the weight of an equal volume of water. The specific gravity determines whether the material floats or sinks in water. Specific gravity values less than or equal to one indicate that water should NOT be used to extinguish a fire involving the substance unless the water comes from automatic sprinklers.
- ⑦ **Melting Point:** Indicates the temperature at which a solid changes to a liquid.
- ⑧ **Evaporation Rate:** Indicates temperatures at which a substance evaporates.



Fire and Explosion Hazard Data

- ① **Flash Point:** Indicates the lowest temperature at which a liquid gives off enough vapor to ignite in air when exposed to flame. When the flash point is between 100 and 110° Fahrenheit (F), extra care must be taken in hot environments. The liquid's temperature could be high enough to be ignitable if an ignition source is introduced. Such sources might be cigarette smoking, electrical equipment and wiring, cutting and welding, or static electricity. A red diamond label is required on all liquids classified by OSHA as flammable (flash point values of 99.9° F or below).
- ② **Flammable Limits:** Indicates the range of vapor concentrations, which will explode when an ignition source is present. The "Lower Explosive Limit" (LEL) is the minimum amount of vapor in the air that can be ignited. The "Upper Explosive Limit" (UEL) is the maximum amount of vapor in the air that will sustain fire.

- ③ **Extinguishing Media:** Materials suitable for putting-out a fire involving the identified chemical. These fire-fighting agents are water, fog, foam, alcohol foam, carbon dioxide, and dry chemical.

The four classes of fires are:

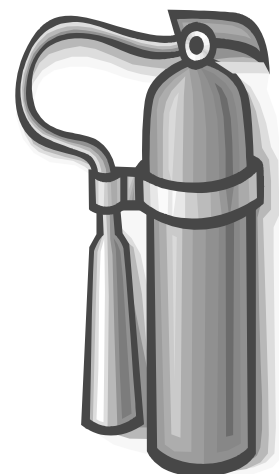
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| Class A - | paper, wood, straw, cloth |
| Class B - | flammable and combustible liquids |
| Class C - | fire involving energized electrical equipment |
| Class D - | combustible metals |

Testing laboratories classify fire extinguishers based on the class of fire they are designed to put out. Each extinguisher type may contain a different extinguishing agent. For example:

| | |
|------------------|--|
| Class A - | contain water |
| Class B - | contain carbon dioxide, foam, or dry chemical agents |
| Class C - | contain carbon dioxide or dry chemical agents |
| Class D - | contain highly specialized extinguishing compounds |

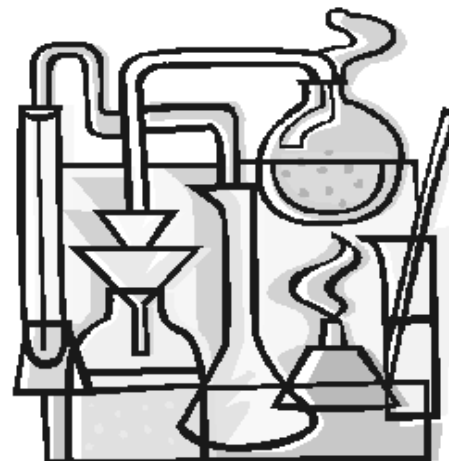
- ④ **Special Fire Fighting Procedures:** Indicates the chemical's special characteristics when it comes in contact with fire, such as whether it is difficult to put out; whether it will re-ignite spontaneously; whether it is extinguished by water or other fire-fighting agents. This subsection will also indicate any required protective equipment needed when fighting the fire. It will describe toxic materials given off by the chemical when it is burned.

- ⑤ **Unusual Fire and Explosion Hazards:** Indicates any special types of hazards requiring attention. The description will indicate whether the chemical is difficult to extinguish, will re-ignite spontaneously, and how it reacts with water and other extinguishing agents. For example, if water is applied to a combustible liquid with a flash point above 212° F, it may foam violently or boil over, endangering workers and firefighters.



Reactivity Data

- ① **Stability:** Indicates conditions that contribute to the stability or instability of a chemical when it is exposed to heat, pressure, or excessive shock during storage, use, misuse, or transport. Look to this section to identify specific conditions to be avoided. These warnings, for example, may be "reacts violently with water" or "avoid sudden shock."



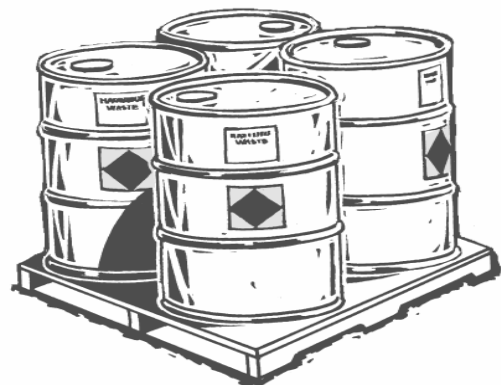
- ② **Incompatibility (materials to avoid):** Indicates various materials or conditions you must keep the chemical away from to avoid adverse reactions. For example, a substance which ignites or explodes when it comes in contact with the chemical.
- ③ **Hazardous Decomposition or By-products:** Indicates gases, or vapors, which are released when the chemical is burned or decomposes. It tells you what hazardous substances your employees may be exposed to as a result of heating, working with, or burning the chemical.
- ④ **Hazardous Polymerization:** Polymerization is a chemical reaction where molecules of the chemical combined with molecules of another material to form a different material. This reaction is accompanied by the release of large amounts of energy that can produce fire or other hazards. Polymerization can occur when the chemical comes in contact with certain plastics, rubber, or coatings. This section of the MSDS will indicate possible storage conditions that could result in polymerization. It will also indicate any inhibitor—chemicals that can be added to prevent or delay polymerization—and the expected time period in which an inhibitor is used up.

Health Hazard Data

- ① **Route(s) of Entry:** A chemical may enter the body either through inhalation, by contact with the skin or eyes, or by being swallowed.
- ② **Health Hazards:** Indicates any long-term (chronic) or short-term (acute) effects of a chemical on the human body.
- ③ **Carcinogenicity:** Indicates whether the chemical causes cancer. It is important that your employees understand that not all hazardous substances cause cancer when an individual is exposed to them.
- ④ **Signs and Symptoms of Exposure:** Indicates and describes the effects of exposure to the chemical (employee's appearance/behavior), the most common resulting sensations (headache, dizziness or nausea).
- ⑤ **Medical Conditions Severely Aggravated by Exposure:** Indicates how the chemical will affect any pre-existing medical conditions.
- ⑥ **Emergency and First Aid Procedures:** Indicates first aid procedures to use in order to reduce the hazardous effects of the chemical. The techniques covered will deal only with inhalation, eye contact, or skin contact with the chemical. You must emphasize that these are emergency procedures only. Exposed employees should be examined by a doctor immediately.

Precautions for Safe Handling and Use

- ① **Steps to be Taken in Case Material is Released or Spilled:** Indicates precautions such as: "avoid breathing gases or vapors"; "avoid contact with liquids and solids"; "remove ignition sources"; "use special equipment for cleanups". This section also gives recommended techniques to use in controlling land or water spills.



- ② **Waste Disposal Methods:** Indicates how to dispose of the chemical and contaminated materials.
- ③ **Precautions to Take in Handling and Storing:** Indicates safe handling and storage procedures to be taken to avoid hazardous reactions. This section will emphasize incompatibility and polymerization hazards, which could occur during storage or handling of the chemical.
- ④ **Other Precautions:** Indicates special precautions to use in handling or disposing of the chemical.

Control Measures

The measures described below should be taken whenever the chemical is handled or disposed of during normal use. They are not solely intended for emergencies or accidental spills.

- ① **Respiratory Protection:** If needed, specifies type of respirators required by OSHA when the chemical is used, even as a precautionary measure in non-emergency situations.
- ② **Ventilation:** Indicates ventilating systems needed to prevent over-exposure to the chemical. "Local exhaust ventilation" is a system with high speed and low volume that will capture a chemical quickly after it has been released. The objective is to prevent the substance from reaching the employee's breathing zone. "Mechanical (general) ventilation" is used to heat and/or cool an enclosed area in a permanent facility.
- ③ **Protective Gloves:** Indicates whether or not gloves must be worn when the chemical is handled. If gloves are required for skin protection, the type of material they should be made of will be indicated.
- ④ **Eye Protection:** Indicates appropriate eye protection such as face shields, safety goggles or glasses.
- ⑤ **Other Protective Clothing or Equipment:** Indicates protective equipment (aprons and boots) and what material it should be made of to prevent skin contact.



An MSDS example: "ACETONE"

Chemical Product and Company Identification

Item name: ACETONE, ACS
Company name and address: xxxx
Company's emergency phone number: xxxx
Company's information phone number: xxxx
MSDS preparation date: 09/18/04

Hazard characteristic code: F2
Unit of issue container qty: 16 OZ
Type of container: BOTTLE
Net unit weight: 0.8 LBS
CAS #: 67-64-1

Identity of the Chemical

Ingredient: ACETONE (SARA III)

OSHA PEL: 1000 PPM

Physical and Chemical Characteristics

Appearance and odor: COLORLESS LIQUID,
MINT-LIKE ODOR.

Boiling point: 133°F, 56°C

Melting point: -138°F, -94°C

Vapor pressure (mm hg/70° F): 180 mmhg

Vapor density (Air = 1): 2.0

Specific gravity: 0.7972

Decomposition temperature: UNKNOWN

Evaporation rate: 14.48

Solubility in water: MISCIBLE

Corrosion rate (IPY): UNKNOWN

Auto-ignition temperature: 869°F

Physical Hazard Data

Flash point: 0°F, -18°C

Flash point method: CC

Lower explosive limit: 2.6

Upper explosive limit: 12.8

Extinguishing media: DRY CHEMICAL,
CARBON DIOXIDE, WATER SPRAY,
ALCOHOL, FOAM.

Special fire fighting protective clothing:
WEAR SELF-CONTAINED BREATHING
APPARATUS AND FULL PROTECTIVE
CLOTHING. COOL FLAME-EXPOSED
CONTAINERS WITH WATER
UNTIL WELL AFTER FIRE IS OUT.

Unusual fire and explosive hazards:

VAPORS MAY TRAVEL TO SOURCE
OF IGNITION AND FLASH BACK.
CONTAINER MAY EXPLODE IN
HEAT OR FIRE. STAY UPWIND,
OUT OF LOW AREAS.

Reactivity

Stability: YES

Conditions to avoid: HEAT, SPARK, & FLAME.

Materials to avoid: OXIDIZERS, ACID,
HYDROGEN PEROXIDE, CHROMIC
ANHYDRIDE, CHOLOROFORM,
ACTIVATED CARBON, NITRIC PLUS
ACETIC ACID, OLEUM.

An MSDS example: "ACETONE"

Health Hazard Data

Route of entry – Inhalation: YES

Route of entry – Skin: YES

Route of entry – Ingestion: YES

Health hazards acute and chronic:

NARCOTIC AT HIGH CONCENTRATION.
INDUSTRY REPORTS NO INJURIOUS
EFFECTS OTHER THAN SKIN
DEFATTING AND HEADACHE AT
PROLONGED INHALATION.

Carcinogenicity – NTP: NO

Carcinogenicity – IARC: NO

Carcinogenicity – OSHA: NO

Explanation carcinogenicity: THIS CHEMICAL
IS NOT LISTED BY IARC, NTP, OR OSHA
AS A SUSPECTED OR CONFIRMED
CARCINOGEN.

Signs/symptoms of overexposure:

IRRITATION OF EYES, NOSE AND
THROAT; HEADACHE, DIZZINESS,
AND DERMATITIS.

**Medical conditions aggravated by
exposure:** SKIN AND RESPIRATORY
CONDITIONS.

Emergency/first aid procedures:

EYES, SKIN – IMMEDIATE WATER
FLUSH.

INHALATION – REMOVE TO FRESH AIR.

INGESTION – CALL PHYSICIAN! IF
CONSCIOUS, INDUCE VOMITING

Precautions for Safe Handling and Use

Steps if released or spilled: ELIMINATE
IGNITION SOURCES. WEAR PROPER
PROTECTIVE EQUIPMENT. USE
WATER SPRAY TO REDUCE VAPORS.
TAKE UP WITH NON-COMBUSTIBLE
ABSORBENT MATERIAL AND
CONTAINERIZE FOR LATER DISPOSAL.

Waste disposal method: TO BE PERFORMED
IN COMPLIANCE WITH ALL CURRENT
LOCAL, STATE, AND FEDERAL
REGULATIONS.

Precautions-handling/storing: DO NOT GET
LIQUID OR VAPOR IN EYES, ON
SKIN, ON CLOTHING. AVOID
BREATHING VAPOR. KEEP AWAY
FROM HEAT, SPARKS, & FLAME.

Other precautions: OBSERVE ALL LABEL
PRECAUTIONS WHEN HANDLING
"EMPTY" CONTAINERS AND
POSSIBLE RESIDUE THEREIN.

Control Measures

Respiratory protection: ORGANIC CANNISTER
MASK OR SUPPLIED AIR, @1000 PPM.

Ventilation: USE ADEQUATE EXPLOSION-
PROOF VENTILATION TO CONTROL
AIRBORNE CONCENTRATIONS BELOW
THE EXPOSURE LIMITS.

Protective gloves: BUTYL RUBBER GLOVES
ARE RECOMMENDED

Eye protection: FULL FACE SHIELD,
SPLASH GOGGLES

Other protective equipment: CHEMICAL
RESISTANT CLOTHING. EYE
WASH STATION AND SAFETY
SHOWER.

Work hygienic practices: WORK SAFELY.
RESPECT THE MATERIAL. WASH
AFTER HANDLING.

MSDS Form (continued)

| Section V—Reactivity Data | | | |
|---|-------------------------------|------------------|---------------------|
| Stability | Unstable | | Conditions to Avoid |
| | Stable | | |
| Incompatibility (<i>Materials to Avoid</i>) | | | |
| Hazardous Decomposition or Byproducts | | | |
| Hazardous Polymerization | May Occur | | Conditions to Avoid |
| | Will Not Occur | | |
| Section VI—Health Hazard Data | | | |
| Route(s) of Entry | Inhalation? | Skin? | Ingestion? |
| Health Hazards (<i>Acute and Chronic</i>) | | | |
| | | | |
| | | | |
| Carcinogenicity | NTP? | IARC Monographs? | OSHA Regulated? |
| Signs and Symptoms of Exposure | | | |
| | | | |
| Medical Conditions Generally Aggravated by Exposure | | | |
| | | | |
| Emergency and First Aid Procedures | | | |
| | | | |
| Section VII—Precautions for Safe Handling and Use | | | |
| Steps to Be Taken in Case Material Is Released or Spilled | | | |
| | | | |
| | | | |
| Waste Disposal Method | | | |
| | | | |
| Precautions to Be Taken in Handling and Storing | | | |
| | | | |
| Other Precautions | | | |
| | | | |
| | | | |
| Section VIII—Control Measures | | | |
| Respiratory Protection (<i>Specify Type</i>) | | | |
| Ventilation | Local Exhaust | Special | |
| | Mechanical (<i>General</i>) | Other | |
| Protective Gloves | | Eye Protection | |
| Other Protective Clothing or Equipment | | | |
| | | | |
| | | | |
| Work/Hygienic Practices | | | |
| | | | |

Sample Labels for Hazardous Chemical Containers

The sample labels show the type of information you must list on containers of hazardous chemicals. You can copy and use these labels or you can make your own.

Be sure your labels contain the following information:

- Name of Chemical**
- Physical Hazards**
- Health Hazards, Target Organs or Systems**
- Optional information, such as Personal Protective Equipment or Safe Handling*

| | |
|---|---|
| <p>HAZARDOUS CHEMICAL</p> <p>NAME OF CHEMICAL:</p> <hr/> <p><i>Physical Hazards:</i></p> <hr/> <hr/> <p><i>Health Hazards, Target Organs, or Systems:</i></p> <hr/> <hr/> <p><i>Optional Information, such as Personal Protective Equipment or Safe Handling:</i></p> <hr/> <hr/> | <p>HAZARDOUS CHEMICAL</p> <p>NAME OF CHEMICAL:</p> <hr/> <p><i>Physical Hazards:</i></p> <hr/> <hr/> <p><i>Health Hazards, Target Organs, or Systems:</i></p> <hr/> <hr/> <p><i>Optional Information, such as Personal Protective Equipment or Safe Handling:</i></p> <hr/> <hr/> |
| <p>HAZARDOUS CHEMICAL</p> <p>NAME OF CHEMICAL:</p> <hr/> <p><i>Physical Hazards:</i></p> <hr/> <hr/> <p><i>Health Hazards, Target Organs, or Systems:</i></p> <hr/> <hr/> <p><i>Optional Information, such as Personal Protective Equipment or Safe Handling:</i></p> <hr/> <hr/> | <p>HAZARDOUS CHEMICAL</p> <p>NAME OF CHEMICAL:</p> <hr/> <p><i>Physical Hazards:</i></p> <hr/> <hr/> <p><i>Health Hazards, Target Organs, or Systems:</i></p> <hr/> <hr/> <p><i>Optional Information, such as Personal Protective Equipment or Safe Handling:</i></p> <hr/> <hr/> |

Alternate Container Labeling Systems

Note: These labeling systems are examples only. They are not mandatory. You may use any system as long as it conveys the minimum required information.

| Hazard Class | |
|---------------------|---|
| ○ ○ ○ | <input type="checkbox"/> Inhalation <input type="checkbox"/> Ingestion <input type="checkbox"/> Skin Absorption <input type="checkbox"/> Skin/Eye Contact |
| | Target Organs and Affects |
| | <input type="checkbox"/> Lungs <input type="checkbox"/> Prostate <input type="checkbox"/> Heart <input type="checkbox"/> Blood <input type="checkbox"/> Kidney <input type="checkbox"/> Liver <input type="checkbox"/> Eyes <input type="checkbox"/> CNS <input type="checkbox"/> Skin <input type="checkbox"/> CVS |

HMIS

Hazardous Materials Identification System

| | |
|----------|---|
| Extreme | 4 |
| Serious | 3 |
| Moderate | 2 |
| Slight | 1 |
| Minimal | 0 |

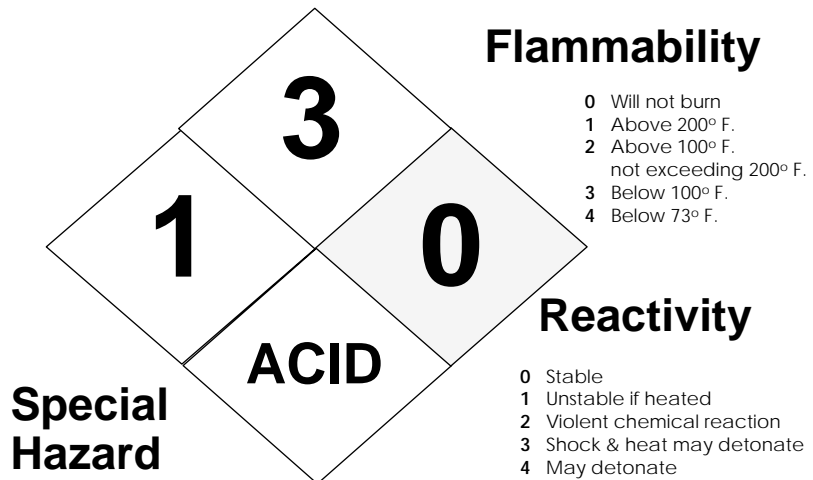
| | |
|---------------------|---|
| HEALTH | 3 |
| FLAMMABILITY | 0 |
| REACTIVITY | 2 |
| PERSONAL PROTECTION | C |

NFPA

National Fire Protection Association

- Health**
- 0 Normal Material
 - 1 Slightly hazardous
 - 2 Hazardous
 - 3 Extreme Danger
 - 4 Deadly

- OX** Oxidizer
- ACID** Acid
- ALK** Alkali
- COR** Corrosive
- W** Use No Water
- R** Radiation Hazard



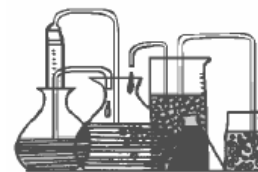
- Flammability**
- 0 Will not burn
 - 1 Above 200° F.
 - 2 Above 100° F. not exceeding 200° F.
 - 3 Below 100° F.
 - 4 Below 73° F.

- Reactivity**
- 0 Stable
 - 1 Unstable if heated
 - 2 Violent chemical reaction
 - 3 Shock & heat may detonate
 - 4 May detonate



GLOSSARY OF TERMS

(relevant to Hazard Communication)



ABSOLUTE PRESSURE — The total pressure within a vessel or pipe not offset by external atmospheric pressure.

ABSORB, ABSORPTION — To take in and make a part of an existing whole. The penetration of a solid substance by a liquid through capillary, osmotic, solvent, or chemical action. To collect gas or liquid molecules on the surface of another material.

ACGIH — American Conference of Governmental Industrial Hygienists. ACGIH develops and publishes recommended occupational exposure limits for chemical substances and physical agents.

ACID — Any chemical which undergoes dissociation in water with the formation of hydrogen ions. Acids have a sour taste and may cause severe burns. They turn litmus paper red and have Ph values of 0 to 6.

ACTION LEVEL — Exposure level at which OSHA regulations to protect employees takes effect. Exposure at or above the action level is termed occupational exposure. Exposure below this level also may be harmful.

ACUTE EFFECT — Adverse effect on a human or animal body that takes place soon after exposure.

ACUTE TOXICITY — Adverse effects resulting from a single dose of or exposure to a substance.

AEROSOL — Fine aerial suspension of liquid (mist, fog) or solid (dust, fume, smoke) particles small enough to be stable.

AIR-LINE RESPIRATOR — A respirator that is connected to a compressed breathable air source by a small-diameter hose. The air is delivered continuously or intermittently in a sufficient volume to meet the wearer's breathing requirements.

AIR-PURIFYING RESPIRATOR — A respirator that uses chemicals to remove specific gases and vapors from the air or that uses a mechanical filter to remove particulate matter. An air-purifying respirator must be used only when there is sufficient oxygen to sustain life and the air contaminant level is below the concentration limits of the device.

ALARA — Acronym for "as low as reasonably achievable."

ALKALI — Any chemical substance that forms soluble soaps with fatty acids. Alkalis are also known as bases and may cause severe burns. Alkalis turn litmus paper blue and have pH values from 8 to 14.

AMBIENT — Usual or surrounding conditions.

ANHYDRIDE — A compound formed by removing water from a more complex compound.

ANHYDROUS — A substance in which no water molecules are present as hydrate or as water crystallization.

ANSI — American National Standards Institute. A privately funded organization that identifies industrial/public national consensus standards and coordinates their development.

APPEARANCE — Physical state of a material.

AQUEOUS — Water-based solution or suspension. A gaseous compound dissolved in water.

ASBESTOSIS — Chronic lung disease caused by inhaling airborne asbestos fibers.

ASPHYXIA — Lack of oxygen and interference with the oxygenation of the blood. Can lead to unconsciousness.

ASPHYXIAN — Vapor or gas that causes unconsciousness or death by suffocation. Most simple asphyxiants are harmful to the body only when they become so concentrated that they reduce oxygen in air (normally 21 percent) to dangerous levels (16 percent or lower). Some chemicals such as carbon dioxide, function as chemical asphyxiants by reducing the blood's ability to carry oxygen.

ASTM — American Society for Testing and Materials.

ASYMPTOMATIC — Neither causing nor exhibiting symptoms.

ATMOSPHERE — (atm.) Pressure measurement. One atmosphere (atm) equals 14.7 lbs./sq. in.

AUTOIGNITION TEMPERATURE — Minimum temperature to which a substance must be heated without flame or spark to cause the substance to ignite.

BASE — Substances that usually liberate OH anions when dissolved in water. Bases react with acids to form salts and water. Bases have a pH greater than 7, turn litmus paper blue, and may be corrosive to human tissue. A strong base is called alkaline or caustic.

BIOLOGICAL — Numerical values derived from procedures to determine the exposure indexes (BEI) amount of a material absorbed into the human body by measuring it or its metabolic products in tissue, fluid, or exhaled air.

BIODEGRADABLE — Organic material's capacity for decomposition from attack by microorganisms.

BIOLOGICAL MONITORING — Periodic examination of body substances, such as blood or urine, to determine the extent of hazardous material absorption.

BOILING LIQUID — Condition in which liquids are excessively heated, which may expanding vapor result in the violent rupture of a container and the rapid explosion (BLEVE) vaporization of the material. The possibility of a BLEVE increases with the volatility of the material.

BODY BURDEN — Total amount of a toxic material that a person has ingested or inhaled from all sources over time.

BOILING POINT — (BP) Temperature at which a liquid changes to a vapor state at a given pressure. Flammable materials with low boiling points generally present special fire hazards.

BONDING — Safety practice where two objects are interconnected with clamps and bare wire. This equalizes electrical potential between the objects and helps prevent static sparks that could ignite flammable materials.

BRITISH THERMAL UNIT — (BTU) Quantity of heat required to raise the temperature of 1 pound of water 1 degree F at 39.2F, its temperature of maximum density.

BUFFER — Substance that reduces the change in hydrogen ion concentration (pH) that otherwise would be produced by adding acids or bases to a solution.

C — Centigrade, a unit of temperature.

CALORIE — Standard unit of heat. A calorie is the amount of heat required to raise 1 gram of water 1 degree C.

CARBON DIOXIDE — (CO₂) Heavy, colorless gas produced by combustion and decomposition of organic substances and as a by-product of chemical processes. Will not burn, relatively non-toxic, and unreactive. Can cause oxygen-deficient environments in large concentrations. Is useful as fire-extinguishing agent to block oxygen and smother fire.

CARBON MONOXIDE — (CO) Colorless, odorless, flammable, and very toxic gas produced by the incomplete combustion of carbon compounds and as a byproduct of many chemical processes. A chemical asphyxiant, it reduces the blood's ability to carry oxygen.

CARCINOGEN — Substance or agent capable of causing or producing cancer in mammals.

CAS — An assigned number that identifies a chemical. CAS stands for Chemical Abstracts Service, an organization that indexes information published in Chemical Abstracts by the American Chemical Society and that provides index guides by which information about particular substances may be located in the abstracts. The CAS number is a concise, unique means of material identification.

CATALYST — Substance that modifies a chemical reaction (makes it faster or slower) without being consumed.

CAUSTIC — See "alkali."

CC — (Closed Cup) One of the methods used to measure flash points of flammable liquids.

CEILING — Maximum allowable human exposure limit for airborne substances; not to be exceeded even momentarily.

cm, centimeter — 1/100 meter. One centimeter equals approximately 0.4 inch.

CERCLA — Comprehensive Environmental Response, Compensation, and Liability Act. The Superfund Law. The EPA has jurisdiction.

CFR — Code of Federal Regulations. A collection of the regulations established by law.

CHEMICAL — Any element, chemical compound, or mixture of elements and/or compounds.

CHEMICAL-CARTRIDGE — Respirator using various chemical substances to purify inhaled air respirator of certain contaminative gases or vapors. Typically effective for concentrations no more than 10 times the TLV of the contaminant if it has warning properties (odor or irritation) below the TLV.

CHEMICAL FAMILY — Group of single elements or compounds with a common general name.

CHEMICAL FORMULA — Gives the number and kinds of atoms that comprise a molecule of a material.

CHEMICAL MANUFACTURER — An employer in a workplace in which chemicals are produced for use or distribution.

CHEMICAL NAME — Scientific name that clearly identifies chemical for hazard evaluation purposes.

CHEMICAL REACTIVITY — Ability of a material to chemically change. Undesirable and dangerous effects, such as heat, explosions, or the production of noxious substances, can result.

CHEMTREC — 24-hour toll-free telephone number [(800) 424-9300], intended primarily for use by those who respond to chemical-transportation emergencies. Established by the Chemical Manufacturer's Association.

CHEMICAL HYGIENE — A written plan that includes specific work practices, standard plan (CHP) operating procedures, equipment, engineering controls, and policies to ensure that employees are protected from hazardous exposure levels to all potentially hazardous chemicals in use in their work areas. The chemical hygiene plan, under OSHA rules, includes training, employee access to information, medical consultations, examinations, hazard-identification procedures, respirator use, and record-keeping practices.

CHRONIC EFFECT — Adverse effect on a human or animal body with symptoms that develop slowly over a long period of time or that recur frequently.

CHRONIC EXPOSURE — Long-term contact with a substance.

CHRONIC TOXICITY — Adverse effects resulting from repeated doses of or exposures to a material over a relatively prolonged period of time. Ordinarily used to denote effects noted in experimental animals.

CNS — Central nervous system. The brain and spinal cord.

COMBUSTIBLE LIQUIDS — Term used by NFPA and DOT to classify certain liquids that will burn, on the basis of flash points. NFPA and DOT generally define "combustible liquids" as having a flash point of 100°F or higher. They do not ignite as easily as flammable liquids; however, they can be ignited under certain conditions, and must be handled with caution.

COMMERCIAL ACCOUNT — An arrangement whereby a retail distributor sells hazardous chemicals to an employer, generally in large quantities over time, and/or at costs that are below the regular retail price.

COMMON NAME — Designation for material other than chemical name, such as code, trade, brand, or generic name.

COMPRESSED GAS — Material contained under pressure (dissolved gas, liquefied by compression or refrigeration).

CONCENTRATION — Relative amount of a substance when combined or mixed with other substances.

CONDITIONS TO AVOID — Conditions encountered during handling or storage that could cause a substance to become unstable.

CONTAINER — Any bag, barrel, bottle, box, can, cylinder, drum, reaction vessel, storage tank, or the like that contains a hazardous chemical. Under hazard communication rules (1910.1200), pipes or piping systems, and engines, fuel tanks, or other operating systems in a vehicle are not considered to be containers.

CORROSION RATE — Expressed in inches per year.

CORROSIVE — Liquid or solid that causes visible destruction or irreversible alterations in skin tissue at site of contact, or liquid that has severe corrosion rate on steel.

CRITICAL PRESSURE/TEMPERATURE — Temperature above which a gas cannot be liquefied by pressure. The critical pressure is that pressure required to liquefy a gas at its critical temperature.

CRYOGENIC — Relating to extremely low temperature as for refrigerated gases.

cu ft, ft³ — Cubic foot. Cu ft is more common.

cu m, m³ — Cubic meter. m³ is preferred.

CUTANEOUS — Pertaining to the skin.

CYANOSIS — Dark purplish coloration of skin and mucous membrane caused by deficient oxygenation of the blood.

CWA — Clean Water Act

DANGEROUSLY REACTIVE — Material that can react by itself or with water/air producing material hazardous condition.

DECOMPOSITION — Breakdown of a material or substance into parts or elements or simpler compounds.

DEFATTING — Removal of natural oils from the skin by fat-dissolving solvents or other chemicals.

DENSITY — Ratio of weight to volume of a material, usually in grams per cubic centimeter.

DERMAL — Used on or applied to the skin.

DERMAL TOXICITY — Ratings corresponding to the following are derived from data obtained from the test methods as described in 16 CFR 1500.40 and categories of toxicity as described in 16 CFR 1500.3.

★ **NON-TOXIC** — The probable lethal dose of undiluted product to 50 percent of the test animals determined from dermal toxicity studies. LD50 is greater than 2 grams per kilogram of body weight.

★ **TOXIC** — The probable lethal dose of undiluted product to 50 percent of the test animals determined from dermal toxicity studies. LD50 is greater than 200 milligrams and less than or equal to 2 grams per kilogram of body weight.

★ **HIGHLY TOXIC** — The probable lethal dose of undiluted product to 50 percent of the test animals determined from dermal toxicity studies. LD50 is less than or equal to 200 milligrams per kilogram of body weight.

DERMATITIS — Inflammation of the skin.

DESIGNATED — Any individual or organization to whom an employee gives representative written authorization to exercise his or her rights.

DILUTION VENTILATION — Air flow designed to dilute contaminants to acceptable levels.

DISTRIBUTOR — A business, other than a chemical manufacturer or importer, which supplies hazardous chemicals to other distributors or to employers.

DOT — U.S. Department of Transportation

DRY CHEMICAL — Powdered fire extinguishing agent, usually composed of sodium bicarbonate or potassium bicarbonate.

DUST — Solid particles suspended in air produced by some mechanical process, such as crushing, grinding, abrading, or blasting. Most dusts are inhalation, fire, or dust explosion hazards.

EMPLOYEE — A worker who may be exposed to hazardous chemicals under normal operating conditions or in foreseeable emergencies.

EMPLOYER — A person engaged in a business in which chemicals are either used, distributed, or produced for use or distribution, including a contractor or subcontractor.

ENDOTHERMIC — A chemical reaction that absorbs heat.

ENGINEERING CONTROLS — Systems that reduce potential hazards by isolating the worker from the hazard or by removing the hazard from the work environment. Methods include ventilation, isolation, and enclosure.

EPA — Environmental Protection Agency

EPCRA — Emergency Planning and Community Right-to-Know Act

EPIDEMIOLOGY — Science that deals with the study of disease in a general population.

ERGONOMICS — Study of human characteristics for the appropriate design of living and work environments.

EVAPORATION RATE — Rate at which a particular material will vaporize when compared to the rate of vaporization of a known material. Evaporation rate can be useful in evaluating the health and fire hazards of a material.

EXPLOSIVE — Material that produces a sudden, almost instantaneous release of pressure, gas, and heat when subjected to abrupt shock, pressure, or high temperature.

EXPOSURE OR "EXPOSED" — An employee who is subjected during the course of employment to a chemical that is a physical or health hazard; includes accidental or possible exposure. "Subjected" includes any route of entry: inhalation, ingestion, skin contact, or absorption.

EXPOSURE LIMITS — Concentration in air of a chemical that is thought to be acceptable.

EXTINGUISHING MEDIA — Fire extinguisher or extinguishing method appropriate for use on specific material.

EYE IRRITATION — Ratings corresponding to the following definitions are derived from data obtained from test methods described in the 16 CFR 1500.42:

- ★ **PRACTICALLY NON-IRRITATING** — The undiluted product, when instilled into the eyes of rabbits produces no noticeable irritation, or slight transient conjunctiva irritation.
- ★ **SLIGHTLY IRRITATING** — The undiluted product, when instilled into the eyes of rabbits, produces slight to moderate conjunctiva irritation, slight corneal involvement, and/or slight iritis.
- ★ **MODERATELY IRRITATING** — The undiluted product, when instilled into the eyes of rabbits, produces moderate corneal involvement with or without severe iritis.
- ★ **SEVERELY IRRITATING** — (or corrosive) The undiluted product, when instilled into the eyes of rabbits, produces severe corneal involvement with or without severe iritis.

FEDERAL REGISTER — Daily publication that lists and discusses the regulations of federal agencies.

FIBER — Basic form of matter, usually crystalline, with a high ratio of length to diameter.

FIBROSIS — Formation of fibrous tissue, as in reparative or reactive process to particulates, in excess of amounts normally present in lung tissue walls.

FIRE DIAMOND — Symbol designed by the NFPA to give a quick number rating for the particular material's degree of health (blue), flammability (red), reactivity (yellow), and specific (white) hazard.

FIRE POINT — Lowest temperature at which liquid will produce sufficient vapor to flash near its surface and continue to burn.

FLAMMABLE CHEMICALS — Chemicals that fall into one of the following categories:

- ★ **AEROSOL, FLAMMABLE** — An aerosol that, when tested by the method described in 16 CFR 1500.45, yields a flame projection exceeding 18 inches at full valve opening, or a flashback (a flame extending back to the valve) at any degree of valve opening.
- ★ **GAS, FLAMMABLE** — A gas that, at ambient temperature and pressure, forms a flammable mixture with air at a concentration of 13 percent by volume or less; or a gas that, at ambient temperature and pressure, forms a range of flammable mixtures with air wider than 12 percent by volume, regardless of the lower limit.

- ★ **LIQUID, FLAMMABLE** — Any liquid having a flash point below 100°F; any mixture having components with flash points of 100°F or higher, the total of which make up 99 percent or more of the total volume of the mixture.
- ★ **SOLID, FLAMMABLE** — A solid, other than a blasting agent or explosive defined in OSHA 1910.109(a), that can cause fire through friction, absorption of moisture, spontaneous chemical change, or retained heat from manufacturing or processing, or which can be ignited readily and when ignited burns so vigorously and persistently as to create a serious hazard.

FLAMMABLE LIMITS — Minimum and maximum concentrations of flammable gas or vapor between which ignition occurs.

FLASH BACK — Occurs when a trail of flammable material is ignited by a distant spark or ignition source. The flame then travels along the trail of the material back to its source.

FLASH POINT — Temperature at which a liquid will give off enough flammable vapor to ignite. There are several methods for testing flash points; flash points for the same material may vary depending on the test method.

FOG — Visible suspension of fine droplets in a gas.

FORESEEABLE EMERGENCY — Potential occurrence such as equipment failure, rupture of containers, or failure of control equipment which could result in an uncontrolled release of a hazardous chemical.

FORMULA — The scientific expression of the chemical composition of a material (e.g., water H₂O, sulfuric acid H₂SO₄, sulfur dioxide is SO₂).

FREEZING POINT — Temperature at which a material changes its physical state from liquid to solid.

FULL PROTECTIVE CLOTHING — Fully protective gear that keeps gases, vapor, liquid, and solids from any contact with skin and prevents them from being inhaled or ingested.

FUME — Airborne suspension consisting of minute solid particles arising from the heating of a solid.

g — Gram. Metric unit of weight.

GAS — Formless fluid that occupies the space of its enclosure. Can settle to the bottom or top of an enclosure when mixed with other materials. Can be changed to its liquid or solid state only by increased pressure and decreased temperature.

GENERAL VENTILATION — Removal of contaminated air and its replacement with clean air from general workplace area.

GENERIC NAME — Identify of a chemical other than its chemical name.

GENETIC — Pertaining to or carried by genes. Hereditary.

GRAM — Metric unit of mass weight. One U.S. ounce is about 28 grams and one pound is 454 grams.

GRAM/KILOGRAM — Expression of dose used in oral and dermal toxicology testing to indicate the grams of substance dosed per kilogram of animal body weight.

HAZARD WARNING — Words, pictures, or symbols that convey specific physical and health hazards.

HAZARDOUS — Breaking down or separation of a substance into its constituent decomposition parts, elements, or into simpler compounds accompanied by the release of heat, gas, or hazardous materials.

HAZARDOUS CHEMICAL — Any chemical whose presence or use is a physical hazard or a health hazard.

HAZARDOUS INGREDIENTS — Hazardous substances that make up a mixture.

HAZARDOUS MATERIAL — Any substance or mixture of substances having properties capable of producing adverse effects on the health or safety of a human being.

HAZARDOUS MATERIALS IDENTIFICATION SYSTEM — (HMIS) Developed by the NPCA to provide information about health, flammability, and reactivity hazards encountered in the workplace. A number is assigned to a material indicating the degree of hazard, from 0 for the least up to 4 for the most severe. Letters are used to designate personal protective equipment.

HAZARDOUS WASTE — Identification number assigned by the EPA, per RCRA law, to number identify and track hazardous wastes.

HEALTH HAZARD — A chemical for which there is statistically significant evidence based on at least one study conducted in accordance with established scientific principles that acute or chronic health effects may occur in exposed employees.

HEMATOPOIETIC SYSTEM — The blood-forming mechanism of the human body.

HEPATIC — Pertaining to the liver.

HEPATOTOXIN — A substance that causes injury to the liver.

HIGHLY TOXIC — A chemical that has any of the following categories:

- ★ Has a median lethal dose (LD50) of 50 milligrams or less per kilogram of body weight when administered orally to albino rats between 200 and 300 grams each.
- ★ Has a median lethal dose (LD50) of 200 milligrams or less per kilogram of body weight when administered by continuous contact for 24 hours (or less if death occurs within 24 hours) with the bare skin of albino rabbits weighing between 2 and 3 kilograms each.
- ★ Has a median lethal concentration (LC50) in air of 200 parts per million by volume or less of gas or vapor, or 2 milligrams per liter or less of mist, fume, or dust when administered by continuous inhalation for 1 hour (or less if death occurs within 1 hour) to albino rats weighing between 200 and 300 grams each.

HYDROCARBON — Organic compound composed only of carbon and hydrogen. Petroleum, natural gas, and coal are the main sources of hydrocarbons for industry.

HYDROPHILIC — Materials having large molecules that absorb and retain water, causing them to swell and frequently to gel.

HYGROSCOPIC — Readily adsorbing available moisture in any form.

HYPERGOLIC — Self-igniting upon contact of its components without a spark or external aid.

HYPOXIA — Insufficient oxygen, especially applied to body cells.

IDENTITY — Any chemical or common name which is indicated on the material safety data sheet (MSDS) for the chemical. The identity must permit cross references to be made among the required list of hazardous chemicals, the label, and the MSDS.

IGNITION TEMPERATURE — Lowest temperature at which a combustible material will catch fire in air and will continue to burn independently of the source of heat when heated.

INHALATION TOXICITY — Ratings corresponding to the following are derived from the test methods and categories of toxicity described in 16 CFR 1500.3:

- ★ **NON-TOXIC** — The probable lethal concentration of the undiluted product to 50 percent of the test animals (LC50) is greater than 200 milligrams per liter by volume when inhaled continuously for one hour or less.

★ **TOXIC** — The probable lethal concentration of the undiluted product to 50 percent of the test animals (LC50) is greater than 2 milligrams and less than or equal to 200 milligrams per liter by volume when inhaled continuously for one hour or less.

★ **HIGHLY TOXIC** — The probable lethal concentration of the undiluted product to 50 percent of the test animals (LC50) is less than or equal to 2 milligrams per liter by volume when inhaled continuously for one hour or less.

IMMEDIATE USE — The hazardous chemical will be under the control of and used only by the person who transfers it from a labeled container and only within the work shift in which it is transferred.

IMMEDIATELY DANGEROUS TO LIFE AND HEALTH — (IDLH) Maximum concentration from which one could escape within 30 minutes without any escape-impairing symptoms or any irreversible health effects.

IMPORTER — The first business with employees within the customs territory of the U.S. that receives hazardous chemicals produced in other countries for the purpose of supplying them to distributors or employers within U.S.

INCOMPATIBLE — Materials that could cause dangerous reactions from direct contact with one another.

INERT INGREDIENTS — Anything other than the active ingredient in a product; not having active properties.

INGESTION — Taking in a substance through the mouth.

INHALATION — Breathing in a substance as a gas, vapor, fume, mist, or dust.

INORGANIC MATERIALS — Compounds derived from other than vegetable or animal sources; generally, inorganic materials do not contain carbon atoms.

INSOLUBLE — Incapable of being dissolved in a liquid.

IRRITANT — Substance which will cause an inflammatory response or reaction of the eye, skin, or respiratory system.

KILOGRAM — Metric unit of weight, about 2.2 pounds.

LABEL — Any written, printed, or graphic sign or symbol displayed on containers of hazardous chemicals; includes identity of the material, appropriate hazard warnings, and name and address of the chemical manufacturer, importer, or other responsible party.

LATENCY PERIOD — Time that elapses between exposure and the first manifestations of disease or illness.

LC50 — Lethal concentration 50, median lethal concentration. The concentration of a material in air that on the basis of laboratory tests is expected to kill 50 percent of a group of test animals when administered as a single exposure in a specific time period, usually 1 hour. LC50 is expressed as parts of material per million parts of air, by volume (ppm) for gases and vapors, as micrograms of material per liter of air ($\mu\text{g}/\text{l}$), or milligrams of material per cubic meter of air (mg/m^3) for dusts and mists, as well as for gases and vapors.

LCLO — Lethal concentration low. The lowest concentration of a substance in air reported to have caused death in humans or animals.

LD50 — Lethal dose 50. The single dose of a substance that causes the death of 50 percent of an animal population from exposure to the substance by any route other than inhalation. LD50 is usually expressed as milligrams or grams of material per kilogram of animal weight (mg/kg or g/kg). The animal species and means of administering the dose (oral, intravenous, etc.) should also be stated.

LDLO — Lethal dose low. The lowest dose of a substance introduced by any route, other than inhalation, reported to have caused death in humans or animals.

LOCAL EFFECTS — Toxic or irritation effects that occur at the site of contact with a chemical or substance.

LOCAL VENTILATION — Drawing off and replacement of contaminated air directly from its source.

LOWER EXPLOSIVE LIMIT — (LEL) Lowest concentration (percentage of the substance in air) that will produce a flash of fire when heat, electric arc, or flame is present.

MATERIAL SAFETY DATA SHEET — (MSDS) Written or printed material concerning a hazardous chemical prepared in accordance with OSHA 1910.1200(g).

MELTING POINT — Temperature at which a solid substance changes to a liquid state. For mixtures, a melting range may be given.

mg — Milligram. One-thousandth of a gram.

mg/kg — Milligram per kilogram. Dosage used in toxicology testing to indicate a dose administered per kg of body weight.

mg/m³ — Milligram per cubic meter of air.

MICROGRAM — (µg) One-millionth of a gram.

MICROMETER — (µm) One-millionth of a meter; often referred to as a micron.

MILLIMETER — (mm) One-thousandth of a meter.

MISCIBLE — Extent to which liquids or gases can be mixed or blended.

MIST — Suspended liquid droplets in the air generated by condensation from the gaseous to the liquid state or by mechanically breaking up the liquid by splashing or atomizing.

MIXTURE — Heterogeneous association of materials that cannot be represented by a chemical formula and that does not undergo chemical change as a result of interaction among the mixed materials.

ml — Milliliter. One-thousandth of a liter. For practical purposes, equal to 1 cubic centimeter.

mm Hg — A measure of pressure in millimeters of a mercury column above a reservoir, or difference of level in a U-tube.

MOLE — Quantity of a chemical substance that has a weight in a unit numerically equal to the molecular weight.

MOLECULAR WEIGHT — The sum of the atomic weights of the atoms in a molecule.

MPPCF — Millions of particles per cubic foot of air, based on impinger samples counted by light-field techniques (OSHA).

MUCOUS MEMBRANE — The mucous-secreting lining that lines the hollow organs of the body.

MUTAGEN — Substance or agent capable of altering the genetic material in a living cell.

NARCOSIS — Stupor or unconsciousness produced by narcotics or other materials.

NECROSIS — Localized death of tissue.

NEPHROTOXIC — Poisonous to the kidney.

NEUTRALIZE — To render chemically harmless; return the pH to a neutral level of 7.

NEUROTOXIN — A poison that affects the nervous system.

NFPA — National Fire Protection Association

NIOSH — The National Institute for Occupational Safety and Health

NONCOMBUSTIBLE — Not flammable

NOX — A general formula for oxides of nitrogen (NO,NO₂). These react with moisture in the respiratory tract to produce acids that corrode and irritate tissue, causing congestion and pulmonary edema. Symptoms of acute exposure can develop over 6 to 24 hours. Chronic exposure to low levels can cause irritation, cough, headache, and tooth corrosion. Exposure to 5 to 50 ppm of NO₂ can cause slowly evolving pulmonary edema. Commonly produced by combustion processes, including motor vehicle engines.

NPCA — National Paint and Coatings Association

NTP — The National Toxicology Program

NUISANCE PARTICULATES — Dusts that do not produce significant organic disease or toxic effect from "reasonable" concentrations and exposures.

ODOR — Description of the smell of the substance.

ODOR THRESHOLD — Lowest concentration of a substance's vapor, in air, that can be smelled.

OLFACTORY — Relating to the sense of smell.

OPAQUE — Impervious to light rays.

OPEN TRANSFER — Any transfer that involves contact of a moving fluid with the atmosphere, air, or oxygen. Open transfer of flammable liquids, especially Class IA liquids, is dangerous due to the release of flammable vapors into the work area.

ORAL — Used in or taken into the body through the mouth.

ORAL TOXICITY — Ratings derived from data obtained from the test methods and categories of toxicity described in 16 CFR 1500.3.

ORGANIC MATERIALS — Compounds composed of carbon, hydrogen, and other elements with chain or ring structures.

OVEREXPOSURE — Exposure to a hazardous material beyond the allowable exposure levels.

OXIDATION — Reaction in which a substance combines with oxygen provided by an oxidizer or oxidizing agent. An oxidation reaction is always accompanied by an offsetting reduction reaction in which oxygen is removed from a compound or atoms, molecules, or ions gain electrons.

OXIDIZER — Substance that yields oxygen readily to stimulate the combustion of organic matter.

OXIDIZING AGENT — Chemical or substance that brings about an oxidation reaction.

PARTICULATE — Small, separate pieces of an airborne material. Generally, anything that is not a fiber and has an aspect ratio of 3 to 1.

PARTS PER MILLION — (ppm) Unit for measuring concentration of a gas or vapor in air. Parts of the gas or vapor in a million parts of air. Also used to indicate the concentration of a particular substance in a liquid or solid.

PERCENT VOLATILE — The percentage of a liquid or solid (by volume) that will evaporate at an ambient temperature of 70°F (unless some other temperature is specified). Examples: butane, gasoline, and paint thinner (mineral spirits) are 100 percent volatile; their individual evaporation rates vary but each will evaporate completely.

PERMISSIBLE EXPOSURE LIMIT — (PEL) Legally enforced exposure limit for a substance established by OSHA. The PEL indicates the permissible concentration of air contaminants to which nearly all workers may be repeatedly exposed 8 hours a day, 40 hours a week, over a working lifetime (40 years), without adverse effects.

PEROXIDE — The oxide of an element that contains an unusually large amount of oxygen.

PERSONAL HYGIENE — Precautionary measures taken to maintain good health when exposed to harmful materials.

PERSONAL PROTECTIVE EQUIPMENT — (PPE) Devices or clothing worn to help isolate a worker from direct exposure to hazardous materials.

PETROLEUM DISTILLATE — Complex mixture of hydrocarbons, liquid at normal ambient conditions, separated from crude oil and other refinery process streams by distillation.

pH — Scale of 0 to 14 representing acidity or alkalinity of aqueous solution. Pure water has pH of 7.

PHYSICAL HAZARD — A chemical for which there is scientifically valid evidence that it is a combustible liquid, a compressed gas, explosive, flammable, an organic peroxide, an oxidizer, pyrophoric, unstable (reactive), or water reactive.

PHYSICAL STATE — Condition of a material (solid, liquid, or gas) at room temperature.

POISON — Any substance that is injurious to health and may lead to death when relatively small amounts are taken either internally or externally.

POISON, CLASS A — A DOT term for an extremely dangerous poison, such as a poisonous gas or liquid, of which a very small amount mixed with air is dangerous to life.

POISON, CLASS B — A DOT term for liquid, solid, paste, or semisolid substances other than class A poisons or irritating materials known to be a health hazard during transportation.

POISON CONTROL CENTER — Provides medical information on a 24-hour-a-day basis for accidents involving ingestion of potentially poisonous materials.

POLYCHLORINATED BIPHENYL — (PCB) Pathogenic and teratogenic compound used as a heat transfer medium. It accumulates in tissue.

POLYMERIZATION — Chemical reaction in which one or more small molecules combine to form larger molecules.

PPE — Personal protective equipment. Clothing or devices worn to help insulate a worker from direct exposure to hazardous materials. Examples include gloves and respirators.

PRODUCE — To manufacture, process, blend, extract, generate, emit, formulate, or repackage.

PRODUCT IDENTIFICATION NUMBER — Four-digit number, prefaced by UN or NA, used in Canada under the Transportation of Dangerous Goods Regulation for use by emergency personnel to identify a material in the event of an accident.

PRIMARY SKIN IRRITANT — A non-corrosive substance that produces severe skin irritation.

PSIA — Pounds per square inch absolute.

PSIG — Pounds per square inch gauge (i.e., above atmospheric pressure).

PYROPHORIC — Materials that ignite spontaneously in air below 130°F. Occasionally friction will ignite them.

RCRA — Resource Conservation and Recovery Act

REACTION — Chemical transformation or change; interaction of two or more substances to form a new substance.

REACTIVE MATERIAL — Chemical substance or mixture that will vigorously polymerize, decompose, condense, or become self-reactive due to shock, pressure, or temperature. Includes explosive materials, organic peroxides, pressure-generating materials, and water-reactive materials.

REACTIVITY — Tendency of a substance to undergo chemical reaction with the release of energy.

REAGENT — Substance used in a chemical reaction to produce another substance or to detect its composition.

RECOMMENDED EXPOSURE LIMIT — The highest allowable airborne concentration that is not expected to injure a worker. Expressed as a ceiling limit or as a time-weighted average, usually for a 10-hour work shift.

REDUCING AGENT — Substance that combines with oxygen or loses electrons to the reaction during a reduction reaction.

REGISTRY OF TOXIC SUBSTANCES — Published by NIOSH. Presents basic toxicity data on thousands of effects of chemical materials. Its objective is to identify “all known toxic substances” and to reference original studies.

REPORTABLE QUANTITY — (RQ) Amount of material that when spilled must be reported to the federal, state, and local authorities under CERCLA, EPCRA, and the CWA.

REPRODUCTIVE-HEALTH HAZARD — Any agent that has a harmful effect on the adult male or female reproductive system or the developing fetus or child.

RESPIRATORY SYSTEM — Breathing system, including the lungs and air passages, as well as the associated system of nerves and circulatory supply.

RESPIRATORY PROTECTION — Devices that will protect the wearer’s respiratory system from over-exposure by inhalation to airborne contaminants. Respiratory protection is used when a worker must work in an area where he/she might be exposed to concentration in excess of the allowable exposure limit.

RESPONSIBLE PARTY — Someone who can provide additional information on the hazardous chemical and appropriate emergency procedures, if necessary.

ROUTES OF ENTRY — Means by which material may gain access to the body (inhalation, ingestion, skin contact).

RTECS — Registry of Toxic Effects of Chemical Substances

SARA — Superfund Amendments and Reauthorization Act.

SCBA — Self-contained breathing apparatus.

SENSITIZATION — State of immune-response reaction in which further exposure elicits an immune or allergic response. A person previously exposed to a certain material is more sensitive when he experiences further contact with it.

SENSITIZER — Substance which, on first exposure, causes little or no reaction in humans or test animals but which, on repeated exposure, may cause a marked response not necessarily limited to the contact site.

SIGNAL WORDS — Distinctive words on MSDS s which alert the reader to the existence and relative degree of hazards. Signal words include:

- ★ **DANGER** — Materials that are highly toxic, corrosive to living tissue, extremely flammable, or are suspected human carcinogens.
- ★ **WARNING** — Materials that are moderately toxic, have severe skin irritation potential, cause allergic skin reactions, or are flammable.
- ★ **CAUTION** — Materials that have a low order of toxicity, produce only slight to moderate skin irritation, or are combustible.

SKIN IRRITATION — Ratings corresponding to the following are derived from data obtained from the test methods in 16 CFR 1500.41 and categories of toxicity in 16 CFR 1500.3:

- ★ **PRACTICALLY NON-IRRITATING** — The undiluted product causes no noticeable irritation or causes slight inflammation of intact or abraded skin of rabbits during the study period.
- ★ **MODERATELY IRRITATING** — The undiluted product causes well-defined inflammation of the intact or abraded skin of rabbits during the study period.
- ★ **PRIMARY SKIN IRRITANT** — The undiluted product cause moderate to severe inflammation of the intact or abraded skin of rabbits during the study period.
- ★ **CORROSIVE** — The undiluted product causes visible destruction or irreversible alterations of the tissue structure at the site of contact on intact or abraded skin of rabbits during the study period.

SLURRY — Pourable mixture of solid and liquid.

SMOKE — Dry particles and droplets generated by incomplete combustion of an organic material combined with and suspended in the gases from combustion.

SOLUBILITY IN WATER — Percentage of a material by weight that will dissolve in water at ambient temperature.

SOLUTION — Uniformly dispersed mixture. Composed of a solvent and a dissolved substance, called the solute.

SOLVENT — Substance, usually liquid, in which other substances are dissolved. Water is the most common solvent.

SO_x — Oxides of sulfur where x equals the number of oxygen atoms.

SPECIFIC CHEMICAL IDENTITY — Chemical name, CAS number, or other information that reveals the precise chemical designation of the substance.

SPECIFIC GRAVITY — Weight of material compared to equal volume of water: expression of density of material.

STABILITY — Ability of a material to remain unchanged. A material is stable if it remains in the same form under expected and reasonable conditions of storage or use.

STEL — Short-term exposure limit.

SUBCUTANEOUS — Beneath the skin.

SYNONYM — Another name or names by which a material is known.

TARGET ORGAN TOXIN — Toxic substance that attacks a specific organ of the body.

TERATOGEN — Substance or agent to which exposure of a pregnant female can result in malformation of the fetus.

THRESHOLD LIMIT VALUE — Airborne concentration of a material to which nearly all persons can be exposed day after day, without adverse effects. TLVs are expressed in three ways:

- ★ **TLV-C** — Ceiling limit, concentration that should not be exceeded even instantaneously.
- ★ **TLV-STEL** — Short term exposure limit, maximum concentration for a continuous 15-minute exposure period.
- ★ **TLV-TWA** — Time-weighted average, concentration for a normal 8-hour work day or 40-hour work week.

THRESHOLD PLANNING QUANTITY — (TPQ) The amount of material at a facility that requires emergency planning and notification under CERCLA.

TOXICITY — Sum of adverse effects resulting from exposure to a material, generally by the mouth, skin, or respiratory tract.

TOXICOLOGY — Study of the nature, effects, and detection of poisons in living organisms. Also, substances that are usually harmless but toxic under certain conditions.

TOXIC SUBSTANCE — Chemical or material that has evidence of an acute or chronic health hazard, and is listed in the RTECS manual. The substance causes harm at any dose level; causes cancer or reproductive effects in animals at any dose level; has a median lethal dose level of less than 500 mg per kg of body weight when administered orally to rats; has a median lethal dose level of less than 1000 mg per kg of body weight when administered by continuous contact to the bare skin of albino rabbits; or, has a median lethal concentration in air of less than 2000 ppm by volume of gas or vapor, or less than 20 mg per liter of mist, fume, or dust when administered to albino rats.

TOXIC SUBSTANCES CONTROL ACT — (TSCA) 40 CFR 700-799. Controls the exposure to and use of raw industrial chemicals not subject to other laws. Chemicals are to be evaluated prior to use and can be controlled based on risk. The act provides for a listing of all chemicals that are to be evaluated prior to manufacture or use in the U.S. EPA has jurisdiction.

TRADE NAME — Trademark name or commercial trade name for a material given by the manufacturer.

TRADE SECRET — Any confidential formula pattern, process, device, information, or compilation of information used in an employer's business that gives the employer an opportunity to obtain an advantage over competitors.

TWA — Time-weighted average exposure is the airborne concentration of a material to which a person is exposed, averaged over the total exposure time, generally the total workday (8 to 12 hours).

UPPER EXPOSIVE (FLAMMABLE) LIMIT — (UEL) Highest concentration (percentage of the substance in air) that will produce a flash of fire when heat, electric arc, or flame is present.

UNSTABLE — Tending toward decomposition or other unwanted chemical change during normal handling or storage.

USE — To package, handle, react, or transfer.

VAPOR — Gaseous state of a material suspended in air that would be a liquid or solid under ordinary conditions.

VAPOR DENSITY — Weight of vapor or gas compared to an equal volume of air; expression of the density of the vapor or gas.

VAPOR PRESSURE — Pressure exerted by a saturated vapor above its liquid in a closed container.

VAPOR — Gaseous form of a solid or liquid substance as it evaporates.

VENTILATION — Circulating fresh air to replace contaminated air.

VISCOSITY — Tendency of a fluid to resist internal flow without regard to its density.

VOLATILE ORGANIC COMPOUNDS — (VOC) Used in coatings and paint because they evaporate very rapidly.

VOLATILITY — Measure of how quickly a substance forms a vapor at ordinary temperatures.

WATER REACTIVE — Material that reacts with water to release a gas that is either flammable or presents a health hazard.

WORK AREA — A room or defined space in a workplace where hazardous chemicals are produced or used and where employees are present.

WORKPLACE — An establishment at one geographical location containing one or more work areas.



Chapter 14 Personal Protective Equipment (PPE)

The following list of personal protective equipment (PPE) is available to all employees and shall be used as required by Company Policy and/or Federal, State, or Local regulations:



hard hats, eye, foot, hearing and fall arrest protection.

Employees can request PPE equipment from **Allen Davidson**.

Policy

This company shall ensure that all work practices and job hazards are evaluated for potential injury. This evaluation shall determine the appropriate personal protective equipment required for the job.

OSHA Personal Protective Equipment Standards

Introduction

Hazards exist in every workplace in many different forms: sharp edges, falling objects, flying sparks, chemicals, noise and a myriad of other potentially dangerous situations. The Occupational Safety and Health Administration (OSHA) require that employers protect their employees from workplace hazards that can cause injury. Controlling a hazard at its source is the best way to protect employees. Depending on the hazard or workplace conditions, OSHA recommends the use of engineering or work practice controls to manage or eliminate hazards to the greatest extent possible. For example, building a barrier between the hazard and the employees is an engineering control; changing the way in which employees perform their work is a work practice control. When engineering, work practice and administrative controls are not feasible or do not provide sufficient protection, employers must provide "Personal Protective Equipment" (PPE) to their employees and ensure its use. Personal protective equipment, commonly referred to as "PPE", is equipment worn to minimize exposure to a variety of hazards. Examples of PPE include such items as gloves, foot and eye protection, protective hearing devices (earplugs, muffs) hard hats, respirators and full body suits.

This information will help both employers and employees do the following:

- Understand the types of PPE.
- Know the basics of conducting a "Hazard Assessment" of the workplace.
- Select appropriate PPE for a variety of circumstances.
- Understand what kind of training is needed in the proper use and care of PPE.

The following information is general in nature and does not address all workplace hazards or PPE requirements. The information, methods and procedures in this guide are based on the OSHA requirements for PPE.

Important Note: This guide does not address PPE requirements related to respiratory protection as this information is extensive and is covered in detail in the "Respiratory Protection" Appendix.

Requirement for PPE

To ensure the greatest possible protection for employees in the workplace, the cooperative efforts of both employers and employees will help in establishing and maintaining a safe and healthful work environment.

In general, employers are responsible for:

- ☐ Performing a "hazard assessment" of the workplace to identify and control physical and health hazards.
- ☐ Identifying and providing appropriate PPE for employees.
- ☐ Training employees in the use and care of the PPE.
- ☐ Maintaining PPE, including replacing worn or damaged PPE.
- ☐ Periodically reviewing and evaluating the effectiveness of the PPE program.

In general, employees should:

- ☐ Properly wear PPE.
- ☐ Attend training sessions on PPE.
- ☐ Care for, clean, and maintain PPE.
- ☐ Inform a supervisor of the need to repair or replace PPE.

Specific requirements for PPE are presented in many different OSHA standards, published in 29 CFR. Some standards require that employers provide PPE at no cost to the employee while others simply state that the employer must provide PPE.

The Hazard Assessment

A first critical step in developing a comprehensive safety and health program is to identify physical and health hazards in the workplace. This process is known as a "Hazard Assessment." Potential hazards may be physical or health-related and a comprehensive hazard assessment should identify hazards in both categories. Examples of physical hazards include moving objects, fluctuating temperatures, high intensity lighting, rolling or pinching objects, electrical connections and sharp edges. Examples of health hazards include overexposure to harmful dusts, chemicals, or radiation.

The hazard assessment should begin with a walk-through survey of the facility to develop a list of potential hazards in the following basic hazard categories:

- | | |
|---------------------------|-----------------------------|
| ☐ Impact | ☐ Heat/Cold |
| ☐ Penetration | ☐ Harmful Dust |
| ☐ Compression (roll-over) | ☐ Light (optical) Radiation |
| ☐ Chemical | ☐ Biological |

In addition to noting the basic layout of the workplace and reviewing any history of occupational illnesses or injuries, things to look for during the walk-through survey include:

- ☐ Sources of electricity.
- ☐ Sources of motion such as machines or processes where movement may exist that could result in an impact between personnel and equipment.
- ☐ Sources of high temperatures that could result in burns, eye injuries or fire.
- ☐ Types of chemicals used in the workplace.
- ☐ Sources of harmful dusts.
- ☐ Sources of light radiation, such as welding, brazing, cutting, furnaces, heat treating, high intensity lights, etc.
- ☐ The potential for falling or dropping objects.
- ☐ Sharp objects that could poke, cut, stab or puncture.
- ☐ Biologic hazards such as blood or other potentially infected material.

When the walk-through is complete, the employer should organize and analyze the data so that it may be efficiently used in determining the proper types of PPE required at the worksite. The employer should become aware of the different types of PPE available and the levels of protection offered. It is definitely a good idea to select PPE that will provide a level of protection greater than the minimum required to protect employees from hazards. The workplace should be periodically reassessed for any changes in conditions, equipment, or operating procedures that could affect occupational hazards. This periodic reassessment should also include a review of injury and illness records to spot any trends or areas of concern and taking appropriate corrective action. The suitability of existing PPE, including an evaluation of its condition and age, should be included in the reassessment.

Documentation of the hazard assessment is required through a written certification that includes the following information:

- Identification of the workplace evaluated.
- Name of the person conducting the assessment.
- Date of the assessment.
- Identification of the document certifying completion of the hazard assessment.

Selecting PPE

All PPE clothing and equipment should be of safe design and construction, and should be maintained in a clean and reliable fashion. Employers should take the fit and comfort of PPE into consideration when selecting appropriate items for their workplace. PPE that fits well and is comfortable to wear will encourage employee use of PPE. Most protective devices are available in multiple sizes and care should be taken to select the proper size for each employee. If several different types of PPE are worn together, make sure they are compatible. If PPE does not fit properly, it can make the difference between being safely covered or dangerously exposed. It may not provide the level of protection desired and may discourage employee use.

OSHA requires that many categories of PPE meet or be equivalent to standards developed by the American National Standards Institute (ANSI). ANSI has been preparing safety standards since the 1920s, when the first safety standard was approved to protect the heads and eyes of industrial workers. Employers who need to provide PPE in the categories listed below must make certain that any new equipment procured meets the cited ANSI standard. Existing PPE stocks must meet the ANSI standard in effect at the time of its manufacture or provide protection equivalent to PPE manufactured to the ANSI criteria. Employers should inform employees who provide their own PPE of the employer's selection decisions and ensure that any employee-owned PPE used in the workplace conforms to the employer's criteria, based on the hazard assessment, OSHA requirements and ANSI standards.

OSHA requires PPE to meet the following ANSI standards:

- Eye and Face Protection: ANSI Z87.1-1989
- Head Protection: ANSI Z89.1-1986.
- Foot Protection: ANSI Z41.1-1991.

For hand protection, there is no ANSI standard for gloves but OSHA recommends that selection be based upon the tasks to be performed and the performance and construction characteristics of the glove material. For protection against chemicals, glove selection must be based on the chemicals encountered, the chemical resistance and the physical properties of the glove material.

Training Employees in the Proper Use of PPE

Employers are required to train each employee who must use PPE.

Employees must be trained to know at least the following:

- When PPE is necessary.
- What PPE is necessary.
- How to properly put on, take off, adjust and wear the PPE.
- The limitations of the PPE.
- Proper care, maintenance, useful life and disposal of PPE.

Employers should make sure that each employee demonstrates an understanding of the PPE training as well as the ability to properly wear and use PPE before they are allowed to perform work requiring the use of the PPE. If an employer believes that a previously trained employee is not demonstrating the proper understanding and skill level in the use of PPE, that employee should receive retraining.

Other situations that require additional or retraining of employees include the following circumstances: changes in the workplace or in the type of required PPE that make prior training obsolete.

The employer must document the training of each employee required to wear or use PPE by preparing a certification containing the name of each employee trained, the date of training and a clear identification of the subject of the certification.

Eye and Face Protection

Employees can be exposed to a large number of hazards that pose danger to their eyes and face. OSHA requires employers to ensure that employees have appropriate eye or face protection if they are exposed to eye or face hazards from flying particles, molten metal, liquid chemicals, acids or caustic liquids, chemical gases or vapors, potentially infected material or potentially harmful light radiation.

Many occupational eye injuries occur because workers are not wearing any eye protection while others result from wearing improper or poorly fitting eye protection. Employers must be sure that their employees wear appropriate eye and face protection and that the selected form of protection is appropriate to the work being performed and properly fits each worker exposed to the hazard.

Prescription Lenses

Everyday use of prescription corrective lenses will not provide adequate protection against most occupational eye and face hazards, so employers must make sure that employees with corrective lenses either wear eye protection that incorporates the prescription into the design or wear additional eye protection over their prescription lenses. It is important to ensure that the protective eyewear does not disturb the proper positioning of the prescription lenses so that the employee's vision will not be inhibited or limited. Also, employees who wear contact lenses must wear eye or face PPE when working in hazardous conditions.

Eye Protection for Exposed Workers

OSHA suggests that eye protection be routinely considered for use by carpenters, electricians, machinists, mechanics, millwrights, plumbers and pipefitters, sheet metal workers and tinsmiths, assemblers, sanders, grinding machine operators, sawyers, welders, laborers, chemical process operators and handlers, and timber cutting and logging workers. Employers of workers in other job categories should decide whether there is a need for eye and face PPE through a hazard assessment.

Examples of potential eye or face injuries include:

- ☐ Dust, dirt, metal or wood chips entering the eye from activities such as chipping, grinding, sawing, hammering, the use of power tools or even strong wind forces.
- ☐ Chemical splashes from corrosive substances, hot liquids, solvents or other hazardous solutions.
- ☐ Objects swinging into the eye or face, such as tree limbs, chains, tools or ropes.
- ☐ Radiant energy from welding, harmful rays from the use of lasers or other radiant light (as well as heat, glare, sparks, splash and flying particles).

Types of Eye Protection

Selecting the most suitable eye and face protection for employees should take into consideration the following elements:

- ☐ Ability to protect against specific workplace hazards.
- ☐ Should fit properly and be reasonably comfortable to wear.
- ☐ Should provide unrestricted vision and movement.
- ☐ Should be durable and cleanable.
- ☐ Should allow unrestricted functioning of any other required PPE.

The eye and face protection selected for employee use must clearly identify the manufacturer. Any new eye and face protective devices must comply with ANSI Z87.1-1989 or be at least as effective as this standard requires.

An employer may choose to provide one pair of protective eyewear for each position rather than individual eyewear for each employee. If this is done, the employer must make sure that employees disinfect shared protective eyewear after each use. Protective eyewear with corrective lenses may only be used by the employee for whom the corrective prescription was issued and may not be shared among employees.

Some of the most common types of eye and face protection include:

- ☐ ***Safety Spectacles*** — These protective eyeglasses have safety frames constructed of metal or plastic and impact-resistant lenses. Side shields are available on some models.
- ☐ ***Goggles*** — These are tight-fitting eye protection that completely cover the eyes, eye sockets and the facial area immediately surrounding the eyes and provide protection from impact, dust and splashes. Some goggles will fit over corrective lenses.
- ☐ ***Welding shields*** — Constructed of vulcanized fiber or fiberglass and fitted with a filtered lens, welding shields protect eyes from burns caused by infrared or intense radiant light; they also protect both the eyes and face from flying sparks, metal spatter and slag chips produced during welding, brazing, soldering and cutting operations. OSHA requires filter lenses to have a shade number appropriate to protect against the specific hazards of the work being performed in order to protect against harmful light radiation.
- ☐ ***Laser safety goggles*** — These specialty goggles protect against intense concentrations of light produced by lasers. The type of laser safety goggles an employer chooses will depend upon the equipment and operating conditions in the workplace.

- ❑ **Face shields** — These transparent sheets of plastic extend from the eyebrows to below the chin and across the entire width of the employee's head. Some are polarized for glare protection. Face shields protect against nuisance dusts and potential splashes or sprays of hazardous liquids but will not provide adequate protection against impact hazards. Face shields used in combination with goggles or safety spectacles will provide additional protection against impact hazards.

Each type of protective eyewear is designed to protect against specific hazards. Employers can identify the specific workplace hazards that threaten employees' eyes and faces by completing a hazard assessment as outlined in the earlier section.

Welding Operations

The intense light associated with welding operations can cause serious and sometimes permanent eye damage if operators do not wear proper eye protection. The intensity of light or radiant energy produced by welding, cutting or brazing operations varies according to a number of factors including the task producing the light, the electrode size and the arc current.

Head Protection

Protecting employees from potential head injuries is a key element of any safety program. A head injury can impair an employee for life or it can be fatal. Wearing a safety helmet or hard hat is one of the easiest ways to protect an employee's head from injury. Hard hats can protect employees from impact and penetration hazards as well as from electrical shock and burn hazards.

Employers must ensure that their employees wear head protection if any of the following apply:

- ❑ Objects might fall from above and strike them on the head.
- ❑ They might bump their heads against fixed objects, such as pipes or beams.
- ❑ There is a possibility of accidental head contact with electrical hazards.

Some examples of occupations in which employees should be required to wear head protection include construction workers, carpenters, electricians, linemen, plumbers and pipefitters, timber and log cutters, and welders, among many others. Whenever there is a danger of objects falling from above, such as working below others who are using tools or working under a conveyor belt, head protection must be worn. Hard hats must be worn with the bill forward to protect employees properly.

In general, protective helmets or hard hats should do the following:

- ❑ Resist penetration by objects.
- ❑ Absorb the shock of a blow.
- ❑ Be water-resistant and slow burning.
- ❑ Have clear instructions explaining proper adjustment and replacement of the suspension and headband. Hard hats must have a hard outer shell and a shock-absorbing lining that incorporates a headband and straps that suspend the shell from 1 to 1 1/4 inches away from the head. This type of design provides shock absorption during an impact and ventilation during normal wear.

Protective headgear must meet ANSI Standard Z89.1-1986 (Protective Headgear for Industrial Workers) or provide an equivalent level of protection.

Types of Hard Hats

There are many types of hard hats available in the marketplace today. In addition to selecting protective headgear that meets ANSI standard requirements, employers should ensure that employees wear hard hats that provide appropriate protection against potential workplace hazards. It is important for employers to understand all potential hazards when making this selection, including electrical hazards. This can be done through a comprehensive hazard analysis and an awareness of the different types of protective headgear available.

Hard hats are divided into three industrial classes:

- ① Class A hard hats provide impact and penetration resistance along with limited voltage protection (up to 2,200 volts).
- ② Class B hard hats provide the highest level of protection against electrical hazards, with high-voltage shock and burn protection (up to 20,000 volts). They also provide protection from impact and penetration by flying/falling objects.
- ③ Class C hard hats provide lightweight comfort and impact protection but offer no protection from electrical hazards.

Another class of protective headgear on the market is called a “bump hat,” designed for use in areas with low head clearance. They are recommended for areas where protection is needed from head bumps and lacerations. These are not designed to protect against falling or flying objects and are not ANSI approved. It is essential to check the type of hard hat employees are using to ensure that the equipment provides appropriate protection. Each hat should bear a label inside the shell that lists the manufacturer, the ANSI designation and the class of the hat.

Size and Care Considerations

Head protection that is either too large or too small is inappropriate for use, even if it meets all other requirements. Protective headgear must fit appropriately on the body and for the head size of each individual. Most protective headgear comes in a variety of sizes with adjustable headbands to ensure a proper fit (many adjust in 1/8-inch increments). A proper fit should allow sufficient clearance between the shell and the suspension system for ventilation and distribution of an impact. The hat should not bind, slip, fall off or irritate the skin.

Some protective headgear allows for the use of various accessories to help employees deal with changing environmental conditions, such as slots for earmuffs, safety glasses, face shields and mounted lights. Optional brims may provide additional protection from the sun and some hats have channels that guide rainwater away from the face. Protective headgear accessories must not compromise the safety elements of the equipment.

Periodic cleaning and inspection will extend the useful life of protective headgear. A daily inspection of the hard hat shell, suspension system and other accessories for holes, cracks, tears or other damage that might compromise the protective value of the hat is essential. Paints, paint thinners and some cleaning agents can weaken the shells of hard hats and may eliminate electrical resistance. Consult the helmet manufacturer for information on the effects of paint and cleaning materials on their hard hats. Never drill holes, paint or apply labels to protective headgear as this may reduce the integrity of the protection. Do not store protective headgear in direct sunlight, such as on the rear window shelf of a car, since sunlight and extreme heat can damage them.

Helmets with any of the following defects should be immediately replaced:

- ▣ Perforation, cracking, or deformity of the brim or shell;
- ▣ Indication of exposure of the brim or shell to heat, chemicals or ultraviolet light and other radiation (in addition to a loss of surface gloss, such signs include chalking or flaking). It is a good idea to always replace a hard hat if it sustains an impact, even if damage is not noticeable. Suspension systems are offered as replacement parts and should be replaced when damaged or when excessive wear is noticed. It is not necessary to replace the entire hard hat when deterioration or tears of the suspension systems are noticed.

Foot and Leg Protection

Employees who face possible foot or leg injuries from falling or rolling objects, or from crushing or penetrating materials, should wear protective footwear. Also, employees whose work involves exposure to hot substances or corrosive or poisonous materials must have protective gear to cover exposed body parts, including legs and feet. If an employee's feet may be exposed to electrical hazards, non-conductive footwear should be worn. On the other hand, workplace exposure to static electricity may necessitate the use of conductive footwear.

Situations where an employee should wear foot and/or leg protection include:

- ▣ When heavy objects or tools might roll onto or fall on the employee's feet.
- ▣ Working with sharp objects such as nails or spikes that could pierce the soles or uppers of ordinary shoes.
- ▣ Exposure to molten metal that might splash on feet or legs.
- ▣ Working on or around hot, wet or slippery surfaces.
- ▣ Working when electrical hazards are present.

Safety footwear must meet ANSI minimum compression and impact performance standards in ANSI Z41-1991. All ANSI approved footwear has a protective toe and offers impact and compression protection, but the type and amount of protection is not always the same. Different footwear protects in different ways. Check the product's labeling or consult the manufacturer to make sure the footwear will protect the user from the hazards they face.

Foot and leg protection choices include the following:

- ▣ Leggings protect the lower legs and feet from heat hazards such as molten metal or welding sparks. Safety snaps allow leggings to be removed quickly.
- ▣ Metatarsal guards protect the instep area from impact and compression. Made of aluminum, steel, fiber or plastic, these guards may be strapped to the shoes.
- ▣ Toe guards fit over the toes of regular shoes to protect the toes from impact and compression hazards. They may be made of steel, aluminum or plastic. Combination foot and shin guards protect the lower legs and feet, and may be used in combination with toe guards when greater protection is needed.
- ▣ Safety shoes have impact-resistant toes and heat-resistant soles that protect the feet against hot work surfaces common in roofing, paving and hot metal industries. The metal insoles of some safety shoes protect against puncture wounds. Safety shoes may also be designed to be electrically conductive to prevent the buildup of static electricity in areas with the potential for explosive atmospheres or nonconductive to protect workers from workplace electrical hazards.

Special Purpose Shoes

Electrically conductive shoes provide protection against the buildup of static electricity. Employees working in explosive and hazardous locations such as explosives manufacturing facilities or grain elevators must wear conductive shoes to reduce the risk of static electricity buildup on the body that could produce a spark and cause an explosion or fire. Foot powder should not be used in conjunction with protective conductive footwear because it reduces the conductive ability of the shoes.

Silk, wool and nylon socks can produce static electricity and should not be worn with conductive footwear. Conductive shoes must be removed when the task requiring their use is completed.

Note: Employees exposed to electrical hazards must never wear conductive shoes.

Electrical hazard, safety-toe shoes are nonconductive and will prevent the wearers' feet from completing an electrical circuit to the ground. These shoes can protect against open circuits of up to 600 volts in dry conditions and should be used in conjunction with other insulating equipment and additional precautions to reduce the risk of a worker becoming a path for hazardous electrical energy. The insulating protection of electrical hazard, safety-toe shoes may be compromised if the shoes become wet, the soles are worn through, metal particles become embedded in the sole or heel, or workers touch conductive, grounded items.

Note: Nonconductive footwear must not be used in explosive or hazardous locations.

Foundry Shoes

In addition to insulating the feet from the extreme heat of molten metal, foundry shoes keep hot metal from lodging in shoe eyelets, tongues or other shoe parts. These snug-fitting leather or leather-substitute shoes have leather or rubber soles and rubber heels. All foundry shoes must have built-in safety toes.

Care of Protective Footwear

As with all protective equipment, safety footwear should be inspected prior to each use. Shoes and leggings should be checked for wear and tear at reasonable intervals. This includes looking for cracks or holes, separation of materials, broken buckles or laces. The soles of shoes should be checked for pieces of metal or other embedded items that could present electrical or tripping hazards. Employees should follow the manufacturers' recommendations for cleaning and maintenance of protective footwear.

Hand and Arm Protection

If a workplace hazard assessment reveals that employees face potential injury to hands and arms that cannot be eliminated through engineering and work practice controls, employers must ensure that employees wear appropriate protection. Potential hazards include skin absorption of harmful substances, chemical or thermal burns, electrical dangers, bruises, abrasions, cuts, punctures, fractures and amputations. Protective equipment includes gloves, finger guards and arm coverings or elbow-length gloves.

Employers should explore all possible engineering and work practice controls to eliminate hazards and use PPE to provide additional protection against hazards that cannot be completely eliminated through other means. For example, machine guards may eliminate a hazard. Installing a barrier to prevent workers from placing their hands at the point of contact between a table saw blade and the item being cut is another method.

Types of Protective Gloves

There are many types of gloves available today to protect against a wide variety of hazards. The nature of the hazard and the operation involved will affect the selection of gloves. The variety of potential occupational hand injuries makes selecting the right pair of gloves challenging. It is essential that employees use gloves specifically designed for the hazards and tasks found in their workplace because gloves designed for one function may not protect against a different function even though they may appear to be an appropriate protective device.

Factors that may influence the selection of protective gloves for a workplace:

- ☐ Type of chemicals handled.
- ☐ Nature of contact (total immersion, splash, etc.).
- ☐ Duration of contact.
- ☐ Thermal protection.
- ☐ Area requiring protection (hand only, forearm, arm).
- ☐ Grip requirements (dry, wet, oily).
- ☐ Size and comfort.
- ☐ Abrasion/resistance requirements.

Gloves made from a wide variety of materials are designed for many types of workplace hazards. In general, gloves fall into four groups:

- ① Gloves made of leather, canvas or metal mesh.
- ② Fabric and coated fabric gloves.
- ③ Chemical- and liquid-resistant gloves.
- ④ Insulating rubber gloves.

Leather, Canvas or Metal Mesh Gloves

Sturdy gloves made from metal mesh, leather, or canvas provide protection against cuts and burns. Leather or canvas gloves also protect against sustained heat. Leather gloves protect against sparks, moderate heat, blows, chips and rough objects.

- ☐ Aluminized gloves provide reflective and insulating protection against heat and require an insert made of synthetic materials to protect against heat and cold.
- ☐ Aramid fiber gloves protect against heat and cold, are cut- and abrasive-resistant and wear well.
- ☐ Synthetic gloves of various materials offer protection against heat and cold are cut- and abrasive-resistant and may withstand some diluted acids. These materials do not stand up against alkalis and solvents.

Fabric and Coated Fabric Gloves

Fabric and coated fabric gloves are made of cotton or other fabric to provide varying degrees of protection.

- ☐ Fabric gloves protect against dirt, slivers, chafing and abrasions. They do not provide sufficient protection for use with rough, sharp or heavy materials. Adding a plastic coating will strengthen some fabric gloves.
- ☐ Coated fabric gloves are normally made from cotton flannel with napping on one side. By coating the unnapped side with plastic, fabric gloves are transformed into general-purpose hand protection offering slip-resistant qualities.

These gloves are used for tasks ranging from handling bricks and wire to chemical laboratory containers. When selecting gloves to protect against chemical exposure hazards, always check with the manufacturer or review the product literature to determine the gloves' effectiveness against specific workplace chemicals and conditions.

Chemical- and Liquid-Resistant Gloves

Chemical-resistant gloves are made with different kinds of rubber: natural, butyl, neoprene, nitrile and fluorocarbon (viton); or various kinds of plastic: polyvinyl chloride (PVC), polyvinyl alcohol and polyethylene. These materials can be blended or laminated for better performance. As a general rule, the thicker the glove material, the greater the chemical resistance but thick gloves may impair grip and dexterity, having a negative impact on safety.

Some examples of chemical-resistant gloves include:

- ❑ Butyl gloves are made of a synthetic rubber and protect against a wide variety of chemicals, such as peroxide, rocket fuels, highly corrosive acids (nitric acid, sulfuric acid, hydrofluoric acid and red-fuming nitric acid), strong bases, alcohols, aldehydes, ketones, esters, and nitro compounds. Butyl gloves also resist oxidation, ozone corrosion and abrasion, and remain flexible at low temperatures. Butyl rubber does not perform well with aliphatic and aromatic hydrocarbons and halogenated solvents.
- ❑ Natural (latex) rubber gloves are comfortable to wear, which makes them a popular general-purpose glove. They feature outstanding tensile strength, elasticity and temperature resistance. In addition to resisting abrasions caused by grinding and polishing, these gloves protect workers' hands from most water solutions of acids, alkalis, salts and ketones. Latex gloves have caused allergic reactions in some individuals and may not be appropriate for all employees. Hypoallergenic gloves, glove liners and powderless gloves are possible alternatives for workers who are allergic to latex gloves.
- ❑ Neoprene gloves are made of synthetic rubber and offer good pliability, finger dexterity, high density and tear resistance. They protect against hydraulic fluids, gasoline, alcohols, organic acids, and alkalis. They generally have chemical & wear resistance properties superior to those made of natural rubber.
- ❑ Nitrile gloves are made of a copolymer and provide protection from chlorinated solvents such as trichloroethylene and perchloroethylene. Although intended for jobs requiring dexterity and sensitivity, nitrile gloves stand up to heavy use even after prolonged exposure to substances that cause other gloves to deteriorate. They offer protection when working with oils, greases, acids, caustics and alcohols but are generally not recommended for use with strong oxidizing agents, aromatic solvents, ketones and acetates.

Care of Protective Gloves

Protective gloves should be inspected before each use to ensure that they are not torn, punctured or made ineffective in any way. A visual inspection will help detect cuts or tears but a more thorough inspection by filling the gloves with water and tightly rolling the cuff towards the fingers will help reveal any pinhole leaks. Gloves that are discolored or stiff may also indicate deficiencies caused by excessive use or degradation from chemical exposure. Any gloves with impaired protective ability should be discarded and replaced. Reuse of chemical-resistant gloves should be evaluated carefully, taking into consideration the absorptive qualities of the gloves. A decision to reuse chemically-exposed gloves should take into consideration the toxicity of the chemicals involved and factors such as duration of exposure, storage and temperature.

Body Protection

Employees who face possible bodily injury of any kind that cannot be eliminated through engineering, work practice or administrative controls, must wear appropriate body protection while performing their jobs. In addition to cuts and radiation, the following are examples of workplace hazards that could cause bodily injury:

- ☐ Temperature extremes.
- ☐ Hot splashes from molten metals and other hot liquids.
- ☐ Potential impacts from tools, machinery and materials.
- ☐ Hazardous chemicals.

There are many varieties of protective clothing available for specific hazards. Employers are required to ensure that their employees wear personal protective equipment only for the parts of the body exposed to possible injury. Examples of body protection include laboratory coats, coveralls, vests, jackets, aprons, surgical gowns and full body suits.

If a hazard assessment indicates a need for full body protection against toxic substances or harmful physical agents, the clothing should be carefully inspected before each use, it must fit each worker properly and it must function properly and for the purpose for which it is intended.

Protective clothing comes in a variety of materials, each effective against particular hazards, such as:

- ☐ Paper-like fiber used for disposable suits protects against dust and splashes.
- ☐ Treated wool and cotton adapts well to changing temperatures, is comfortable, fire-resistant, and protects against dust, abrasions and irritating surfaces.
- ☐ Duck is a closely woven cotton fabric that protects against cuts and bruises when handling heavy, sharp or rough materials.
- ☐ Leather is often used to protect against dry heat and flames.
- ☐ Rubber, rubberized fabrics, neoprene and plastics protect against certain chemicals and physical hazards. When chemical or physical hazards are present, check with the clothing manufacturer to ensure that the material selected will provide protection against the specific hazard.

Hearing Protection

Determining the need to provide hearing protection for employees can be challenging. Employee exposure to excessive noise depends upon a number of factors, including:

- ☐ The loudness of the noise as measured in decibels (dB).
- ☐ The duration of each employee's exposure to the noise.
- ☐ Whether employees move between work areas with different noise levels.
- ☐ Whether noise is generated from one or multiple sources.

Generally, the louder the noise, the shorter the exposure time before hearing protection is required. For instance, employees may be exposed to a noise level of 90 dB for 8 hours per day (unless they experience a Standard Threshold Shift) before hearing protection is required. On the other hand, if the noise level reaches 115 dB hearing protection is required if the anticipated exposure exceeds 15 minutes.

Noises are considered continuous if the interval between occurrences of the maximum noise level is one second or less. Noises not meeting this definition are considered impact or impulse noises (loud momentary explosions of sound) and exposures to this type of noise must not exceed 140 dB.

Examples of situations or tools that may result in impact or impulse noises are powder-actuated nail guns, a punch press or drop hammers.

If engineering and work practice controls do not lower employee exposure to workplace noise to acceptable levels, employees must wear appropriate hearing protection. It is important to understand that hearing protectors reduce only the amount of noise that gets through to the ears. The amount of this reduction is referred to as attenuation, which differs according to the type of hearing protection used and how well it fits. Hearing protectors worn by employees must reduce an employee's noise exposure to within the acceptable limits.

Manufacturers of hearing protection devices must display the device's NRR on the product packaging. If employees are exposed to occupational noise at or above 85 dB averaged over an eight hour period, the employer is required to institute a hearing conservation program.

Some types of hearing protection include:

- ▣ Single-use earplugs are made of waxed cotton, foam, silicone rubber or fiberglass wool. They are self-forming and, when properly inserted, they work as well as most molded earplugs.
- ▣ Pre-formed or molded earplugs must be individually fitted by a professional and can be disposable or reusable. Reusable plugs should be cleaned after each use.
- ▣ Earmuffs require a perfect seal around the ear. Glasses, facial hair, long hair or facial movements such as chewing may reduce the protective value of earmuffs.

OSHA requires that employers protect their employees from workplace hazards that can cause injury. Controlling a hazard at its source is the best way to protect employees. Depending on the hazard or workplace conditions, OSHA recommends the use of engineering or work practice controls to manage or eliminate hazards to the greatest extent possible. For example, building a barrier between the hazard and the employees is an engineering control; changing the way in which employees perform their work is a work practice control. When engineering, work practice and administrative controls are not feasible or do not provide sufficient protection, employers must provide PPE to their employees and ensure its use.

Section Notes:

Respiratory Protection Program



Arena Fire Protection, Inc. requires that all employees exposed to respiratory hazards be provided adequate respiratory protection.

When this protection requires the use of respirators, employees shall be provided respirators and must meet the following criteria:

- ★ Pass the medical evaluation (questionnaire or full evaluation).
- ★ Be fit tested with the respirator that they will be assigned (to ensure a proper seal).
- ★ Receive and understand training regarding proper respirator use, maintenance, inspection, cleaning, and care of the respirator.

Allen Davidson shall be the program administrator for the respiratory protection program for the Company.

The requirement for a respirator program to be in writing entails a great deal of pre-planning of the implementation steps for the program. These steps include selection, medical fitness, maintenance, training, fit testing, use, program evaluation, etc. This pre-planning is by design and intended to ensure the respirator wearer is safely using the proper respirator. The program evaluation facet allows for continuous improvements or changes to be made, as necessary, to maintain a protective program.

General

All employees shall be provided a medical evaluation to determine the employee's ability to use a respirator, before the employee is fit tested or required to use the respirator in the workplace.

The employer may discontinue an employee's medical evaluations when the employee is no longer required to use a respirator.

General Requirements

We shall identify and evaluate the respiratory hazard(s) in the workplace; this evaluation shall include a reasonable estimate of employee exposures to respiratory hazard(s) and an identification of the contaminant's chemical state and physical form. If we cannot identify or reasonably estimate the employee exposure, we shall consider the atmosphere to be IDLH (atmospheres **I**mmediately **D**angerous to **L**ife or **H**ealth). An appropriate respirator based on the respiratory hazard(s) to which the worker is exposed and workplace and user factors that affect respirator performance and reliability. We shall select respirators from a sufficient number of respirator models and sizes so that the respirator is acceptable to, and correctly fits, the user. The company shall select a NIOSH-certified respirator. The respirator shall be used in compliance with the conditions of its certification.

Selection of Respirators

Respirators for IDLH Atmospheres

The company shall provide the following respirators for employee use in IDLH atmospheres:

- ☑ A full face-piece pressure demand SCBA certified by NIOSH for a minimum service life of thirty minutes.
- ☑ A combination full face-piece pressure demand supplied-air respirator (SAR) with auxiliary self-contained air supply.
- ☑ Respirators provided only for escape from IDLH atmospheres shall be NIOSH-certified for escape from the atmosphere in which they will be used.
- ☑ All oxygen-deficient atmospheres shall be considered IDLH. Exception: If our company demonstrates that, under all foreseeable conditions, the oxygen concentration can be maintained within the ranges specified in Table II of this section (i.e., for the altitudes set out in the table), then any atmosphere-supplying respirator may be used.

Respirators for Atmospheres that are not IDLH

The company shall provide a respirator that is adequate to protect the health of the employee and ensure compliance with all other OSHA statutory and regulatory requirements, under routine and reasonably foreseeable emergency situations. The respirator selected shall be appropriate for the chemical state and physical form of the contaminant.

For protection against gases and vapors, the company shall provide:

- ☑ An atmosphere-supplying respirator.
- ☑ The respirator is equipped with an end-of-service-life indicator (ESLI) certified by NIOSH for the contaminant.
- ☑ If there is no ESLI appropriate for conditions in the company's workplace, the company implements a change schedule for canisters and cartridges that is based on objective information or data that will ensure that canisters and cartridges are changed before the end of their service life. The company shall describe in the respirator program the information and data relied upon and the basis for the canister and cartridge change schedule and the basis for reliance on the data.

For protection against particulates, the company shall provide:

- ☑ An atmosphere-supplying respirator.
- ☑ An air-purifying respirator equipped with a filter certified by NIOSH under 30 CFR part 11 as a high efficiency particulate air (HEPA) filter, or an air-purifying respirator equipped with a filter certified for particulates by NIOSH under 42 CFR part 84.
- ☑ For contaminants consisting primarily of particles with mass median aerodynamic diameters (MMAD) of at least 2 micrometers, an air-purifying respirator equipped with any filter certified for particulates by NIOSH.

Use of Respirators

This company prohibits conditions (facial hair) that may result in face-piece seal leakage, prevents employees from removing respirators in hazardous environments, takes actions to ensure continued effective respirator operation throughout the work shift, and establishes procedures for the use of respirators in IDLH atmospheres or in interior structural firefighting situations.

Medical Evaluation Procedures

This company shall identify a physician or other licensed health care professional (PLHCP) to perform medical evaluations using a medical questionnaire or an initial medical examination that obtains the same information as the medical questionnaire.

The medical evaluation shall obtain the information requested by the questionnaire.

All medical questionnaires and examinations are confidential and handled during the employee's normal working hours or at a time and place convenient to the employee. The medical questionnaire is administered so that the employee understands its content. All employees are provided an opportunity to discuss the questionnaire and examination results with their physician or other licensed health care professional (PLHCP).

Medical Determination

In determining the employee's ability to use a respirator, this company shall:

- ☑ Obtain a written recommendation regarding the employee's ability to use the respirator from the PLHCP. The recommendation shall provide only the following information.
- ☑ Any limitations on respirator use related to the medical condition of the employee, or relating to the workplace conditions in which the respirator will be used, including whether or not the employee is medically able to use the respirator.
- ☑ The need, if any, for follow-up medical evaluations.
- ☑ A statement that the PLHCP has provided the employee with a copy of the PLHCP's written recommendation.

If the respirator is a negative pressure respirator and the PLHCP finds a medical condition that may place the employee's health at increased risk if the respirator is used, the company shall provide a PAPR if the PLHCP's medical evaluation finds that the employee can use such a respirator; if a subsequent medical evaluation finds that the employee is medically able to use a negative pressure respirator, then the company is no longer required to provide a PAPR.

Program Evaluation

Employees need to be medically cleared to wear respirators before commencing use. All respirators generally place a burden on the employee. Negative pressure respirators restrict breathing, some respirators can cause claustrophobia and self-contained breathing apparatuses are heavy. Each of these conditions may adversely affect the health of some employees who wear respirators. A physician or other licensed health care professional operating within the scope of his/her practice needs to medically evaluate employees to determine under what conditions they can safely wear respirators. This section requires the employer to conduct evaluations of the workplace to ensure that the written respiratory protection program is being properly implemented, and to consult employees to ensure that they are using the respirators properly.

This company shall conduct evaluations of the workplace as necessary to ensure that the provisions of the current written program are being effectively implemented and that it continues to be effective.

This company shall regularly consult employees required to use respirators to assess the employees' views on program effectiveness and to identify any problems. Any problems that are identified during this assessment shall be corrected. Factors to be assessed include, but are not limited to:

- ☑ Respirator fit (including the ability to use the respirator without interfering with effective workplace performance).
- ☑ Appropriate respirator selection for the hazards to which the employee is exposed.
- ☑ Proper respirator use under the workplace conditions the employee encounters.
- ☑ Proper respirator maintenance.

Medical Evaluation

Using a respirator may place a physiological burden on employees that varies with the type of respirator worn, the job and workplace conditions in which the respirator is used, and the medical status of the employee. Accordingly, this paragraph specifies the minimum requirements for medical evaluation that must be implemented to determine the employee's ability to use a respirator. Records of medical evaluations required by this section must be retained and made available in accordance with 29.CFR 1910.1020. The following is a synopsis of the some of the requirements of the new standard.

- ☑ Companies are to develop cartridge/canister change schedules based on available data or information. Such information includes the exposure assessment and information based on breakthrough test data, mathematically based estimates, and/or reliable use recommendations from the company's respirator and/or chemical suppliers.
- ☑ Reliance on odor thresholds and other warning properties will not be permitted as the primary basis for determining the service life of gas and vapor cartridges and canisters.

OSHA emphasizes that a conservative approach is recommended when evaluating service life testing data. Temperature, humidity, air flow through the filter, the work rate, and the presence of other potential interfering chemicals in the workplace all can have a serious effect on the service life of an air-purifying cartridge or canister.

Follow-up Medical Examination

The company shall ensure that a follow-up medical examination is provided for an employee who gives a positive response to any question among questions 1 through 8 in Section 2, Part A of Appendix C or whose initial medical examination demonstrates the need for a follow-up medical examination. The follow-up medical examination shall include any medical tests, consultations, or diagnostic procedures that the PLHCP deems necessary to make a final determination.

Additional Medical Evaluations

At a minimum, this company shall provide additional medical evaluations that comply with the requirements of this section if:

- ☑ An employee reports medical signs or symptoms that are related to ability to use a respirator.
- ☑ A PLHCP, supervisor, or the respirator program administrator informs the employer that an employee needs to be reevaluated.
- ☑ Information from the respiratory protection program, including observations made during fit testing and program evaluation, indicates a need for employee reevaluation.
- ☑ A change occurs in workplace conditions (e.g., physical work effort, protective clothing, and temperature) that may result in a substantial increase in the physiological burden placed on an employee.

Fit Testing

This company requires that, before an employee may be required to use any respirator with a negative or positive pressure tight-fitting face-piece; the employee must be fit tested with the same make, model, style, and size of respirator that will be used. This paragraph specifies the kinds of fit tests allowed, the procedures for conducting them, and how the results of the fit tests must be used.

The company will ensure that employees using a tight-fitting face-piece respirator pass an appropriate qualitative fit test (QLFT) or quantitative fit test (QNFT) as stated in this paragraph.

The company will ensure that an employee using a tight-fitting face-piece respirator is fit tested prior to initial use of the respirator, whenever a different respirator face-piece (size, style, model or make) is used, and at least annually thereafter.

This company will conduct an additional fit test whenever the employee reports, or the PLHCP, supervisor, or program administrator makes visual observations of, changes in the employee's physical condition that could affect respirator fit. Such conditions include, but are not limited to, facial scarring, dental changes, cosmetic surgery, or an obvious change in body weight.

If after passing a QLFT or QNFT, the employee subsequently notifies the program administrator, supervisor, or PLHCP that the fit of the respirator is unacceptable, the employee shall be given a reasonable opportunity to select a different respirator face-piece and to be retested.

The fit test shall be administered using an OSHA-accepted QLFT or QNFT protocol. The OSHA-accepted QLFT and QNFT protocols and procedures are contained in Appendix A of this section.

QLFT may only be used to fit test negative pressure air-purifying respirators that must achieve a fit factor of 100 or less.

If the fit factor, as determined through an OSHA-accepted QNFT protocol, is equal to or greater than 100 for tight-fitting half face-pieces, or equal to or greater than 500 for tight-fitting full face-pieces, the QNFT has been passed with that respirator.

Fit testing of tight-fitting atmosphere-supplying respirators and tight-fitting powered air-purifying respirators shall be accomplished by performing quantitative or qualitative fit testing in the negative pressure mode, regardless of the mode of operation (negative or positive pressure) that is used for respiratory protection.

Qualitative fit testing of these respirators shall be accomplished by temporarily converting the respirator user's actual face-piece into a negative pressure respirator with appropriate filters, or by using an identical negative pressure air-purifying

respirator face-piece with the same sealing surfaces as a surrogate for the atmosphere-supplying or powered air-purifying respirator face-piece.

Any modifications to the respirator face-piece for fit testing shall be completely removed, and the face-piece restored to NIOSH-approved configuration, before that face-piece can be used in the workplace.

Employees must pass one of the following fit test types that follow the protocols and procedures contained in 29 CFR 1910.134 Appendix A:

QLFT (Only used to fit test negative pressure air-purifying respirators that must achieve a fit factor of 100 or less. May be used to test tight-fitting atmosphere-supplying respirators and tight-fitting powered air-purifying respirators if tested in the negative pressure mode); or

QNFT (May be used to fit test a tight-fitting half face-piece respirator that must achieve a fit factor of 100 or greater OR a tight-fitting full face-piece respirator that must achieve a fit factor of 500 or greater OR tight-fitting atmosphere-supplying respirators and tight-fitting powered air-purifying respirators if tested in the negative pressure mode).

Face-Piece Seal Protection

This company shall not permit respirators with tight-fitting face-pieces to be worn by employees who have:

- Facial hair that comes between the sealing surface of the face-piece and the face or that interferes with valve function.
- Any condition that interferes with the face to face-piece seal or valve function.
- If an employee wears corrective glasses or goggles or other personal protective equipment, the employer shall ensure that such equipment is worn
- In a manner that does not interfere with the seal of the face-piece to the face of the user.
- For all tight-fitting respirators, the employer shall ensure that employees perform a user seal check each time they put on the respirator using the procedures in 29 CFR 1910.134 Appendix B-1 or procedures recommended by the respirator manufacturer that the employer demonstrates are as effective as those in Appendix B-1.

Continuing Respirator Effectiveness

Appropriate surveillance shall be maintained of work area conditions and degree of employee exposure or stress. When there is a change in work area conditions or degree of employee exposure or stress that may affect respirator effectiveness, this company shall reevaluate the continued effectiveness of the respirator.

This company shall ensure that employees leave the respirator use area:

- To wash their faces and respirator face-pieces as necessary to prevent eye or skin irritation associated with respirator use.
- If they detect vapor or gas breakthrough, changes in breathing resistance, or leakage of the face-piece; or to replace the respirator, filter, cartridge, or canister elements.
- If the employee detects vapor or gas breakthrough, changes in breathing resistance, or leakage of the face-piece, the employer must replace or repair the respirator before allowing the employee to return to the work area.

Supplemental Information for the PLHCP

The following information must be provided to the PLHCP before the PLHCP makes a recommendation concerning an employee's ability to use a respirator:

- ☑ (A) The type and weight of the respirator to be used by the employee.
- ☑ The duration and frequency of respirator use (including use for rescue and escape).
- ☑ The expected physical work effort.
- ☑ Additional protective clothing and equipment to be worn.
- ☑ Temperature and humidity extremes that may be encountered.
- ☑ Any supplemental information provided previously to the PLHCP regarding an employee need not be provided for a subsequent medical evaluation if the information and the PLHCP remain the same.
- ☑ This company shall provide the PLHCP with a copy of the written respiratory protection program and a copy of this section.

Procedures for IDLH Atmospheres

For all IDLH atmospheres, this company shall ensure that:

- ☑ Appropriate retrieval equipment for removing the employee(s) who enter(s) these hazardous atmospheres where retrieval equipment would contribute to the rescue of the employee(s) and would not increase the overall risk resulting from entry.
- ☑ One employee or, when needed, more than one employee is located outside the IDLH atmosphere.
- ☑ Visual, voice, or signal line communication is maintained between the employee(s) in the IDLH atmosphere and the employee(s) located outside the IDLH atmosphere.
- ☑ The company or designee is notified before the employee(s) located outside the IDLH atmosphere enter the IDLH atmosphere to provide emergency rescue.
- ☑ The company or designee authorized to do so by the employer, once notified, provides necessary assistance appropriate to the situation.
- ☑ The employee(s) located outside the IDLH atmosphere are trained and equipped to provide effective emergency rescue.
- ☑ Employee(s) located outside the IDLH atmospheres are equipped with:
 - *Equivalent means for rescue where retrieval equipment is not required under paragraph (g) (3) (VI) (B).
 - *Pressure demand or other positive pressure SCBAs, or a pressure demand or other positive pressure supplied-air respirator with auxiliary SCBA; and either.

Note 1 to paragraph (g): One of the two individuals located outside the IDLH atmosphere may be assigned to an additional role, such as incident commander in charge of the emergency or safety officer, so long as this individual is able to perform assistance or rescue activities without jeopardizing the safety or health of any firefighter working at the incident.

Note 2 to paragraph (g): Nothing in this section is meant to preclude firefighters from performing emergency rescue activities before an entire team has assembled.

Procedures for Interior Structural Firefighting

In addition to the requirements set forth under paragraph (g) (3), in interior structural fires, the employer shall ensure that:

- ☑ At least two employees enter the IDLH atmosphere and remain in visual or voice contact with one another at all times.
- ☑ At least two employees are located outside the IDLH atmosphere.
- ☑ All employees engaged in interior structural firefighting use SCBAs.

Maintenance and Care of Respirators

This paragraph requires the employer to provide for the cleaning and disinfecting, storage, inspection, and repair of respirators used by employees.

To ensure continuing protection from respiratory protective devices, it is necessary to establish and implement proper maintenance and care procedures and schedules. A lax attitude toward maintenance and care will negate successful selection and fit because the devices will not deliver the assumed protection unless they are kept in good working order.

Cleaning and Disinfecting

This company shall provide each respirator user with a respirator that is clean, sanitary, and in good working order. The company shall ensure that respirators are cleaned and disinfected using the procedures in Appendix B-2 of this section, or procedures recommended by the respirator manufacturer, provided that such procedures are of equivalent effectiveness. The respirators shall be cleaned and disinfected at the following intervals:

- ☑ Respirators issued for the exclusive use of an employee shall be cleaned and disinfected as often as necessary to be maintained in a sanitary condition.
- ☑ Respirators issued to more than one employee shall be cleaned and disinfected before being worn by different individuals.
- ☑ Respirators maintained for emergency use shall be cleaned and disinfected after each use.
- ☑ Respirators used in fit testing and training shall be cleaned and disinfected after each use.

Procedures for Cleaning Respirators

- ☑ Remove filters, cartridges, or canisters. Disassemble face-pieces by removing speaking diaphragms, demand and pressure- demand valve assemblies, hoses, or any components recommended by the manufacturer. Discard or repair any defective parts.
- ☑ Wash components in warm (43 deg. C [110 deg. F] maximum) water with a mild detergent or with a cleaner recommended by the manufacturer. A stiff bristle (not wire) brush may be used to facilitate the removal of dirt.
- ☑ Rinse components thoroughly in clean, warm (43 deg. C [110 deg. F] maximum), preferably running water. Drain.
- ☑ When the cleaner used does not contain a disinfecting agent, respirator components should be immersed for two minutes in one of the following.
- ☑ Hypochlorite solution (50 ppm of chlorine) made by adding approximately one milliliter of laundry bleach to one liter of water at 43 deg. C (110 deg. F).

- ☑ Aqueous solution of iodine (50 ppm iodine) made by adding approximately 0.8 milliliters of tincture of iodine (6-8 grams ammonium and/or potassium iodide/100 cc of 45% alcohol) to one liter of water at 43 deg. C (110 deg. F).
- ☑ Other commercially available cleansers of equivalent disinfectant quality when used as directed, if their use is recommended or approved by the respirator manufacturer.
- ☑ Rinse components thoroughly in clean, warm (43 deg. C [110 deg. F] maximum), preferably running water. Drain. The importance of thorough rinsing cannot be overemphasized. Detergents or disinfectants that dry on face-pieces may result in dermatitis. In addition, some disinfectants may cause deterioration of rubber or corrosion of metal parts if not completely removed.
- ☑ Components should be hand-dried with a clean lint-free cloth or air-dried.
- ☑ Reassemble face-piece, replacing filters, cartridges, and canisters where necessary.

Recordkeeping

The company will establish and retain written information regarding medical evaluations, fit testing, and the respirator program. This information will facilitate employee involvement in the respirator program, assist the company in auditing the adequacy of the program, and provide a record for compliance determinations by OSHA.

Storage

This company shall ensure that respirators are stored as follows:

- ☑ All respirators shall be stored to protect them from damage, contamination, dust, sunlight, extreme temperatures, excessive moisture, and damaging chemicals, and they shall be packed or stored to prevent deformation of the face-piece and exhalation valve.
- ☑ In addition to the requirements of paragraph (h) (2) (i) of this section, emergency respirators shall be.
 - ★ Kept accessible to the work area.
 - ★ Stored in compartments or in covers that are clearly marked as on training emergency respirators.
 - ★ Stored in accordance with any applicable manufacturer instructions.

Inspection

This company shall ensure that respirators are inspected as follows:

- ☑ All respirators used in routine situations shall be inspected before each use and during cleaning.
- ☑ All respirators maintained for use in emergency situations shall be inspected at least monthly and in accordance with the manufacturer's recommendations, and shall be checked for proper function before and after each use.
- ☑ Emergency escape-only respirators shall be inspected before being carried into the workplace for use.

This company shall ensure that respirator inspections include the following:

- ☑ A check of respirator function, tightness of connections, and the condition of the various parts including, but not limited to, the face-piece, head straps, valves, connecting tube, and cartridges, canisters or filters.
- ☑ Self-contained breathing apparatus shall be inspected monthly. Air and oxygen cylinders shall be maintained in a fully charged state and shall be recharged when the pressure falls to 90% of the manufacturer's recommended pressure level. The company shall determine that the regulator and warning devices function properly.
- ☑ A check of elastomeric parts for pliability and signs of deterioration.

For respirators maintained for emergency use, the company shall:

- ☑ Certify the respirator by documenting the date the inspection was performed, the name (or signature) of the person who made the inspection, the findings, required remedial action, and a serial number or other means of identifying the inspected respirator.
- ☑ Provide this information on a tag or label that is attached to the storage compartment for the respirator, is kept with the respirator, or is included in inspection reports stored as paper or electronic files. This information shall be maintained until replaced following a subsequent certification.

Fit Testing

This company shall establish a record of the qualitative and quantitative fit tests administered to an employee including:

- ☑ The name or identification of the employee tested.
- ☑ Type of fit test performed.
- ☑ Specific make, model, style, and size of respirator tested.
- ☑ Date of test.
- ☑ The pass/fail results for QLFTs or the fit factor and strip chart recording or other recording of the test results for QNFTs.
- ☑ Fit test records shall be retained for respirator users until the next fit test is administered.
- ☑ A written copy of the current respirator program shall be retained by the employer.

All respirators that rely on a mask-to-face seal need to be annually checked with either qualitative or quantitative methods to determine whether the mask provides an acceptable fit to a wearer. The qualitative fit test procedures rely on a subjective sensation (taste, irritation, smell) of the respirator wearer to a particular test agent while the quantitative use measuring instruments to measure face-seal leakage. The relative workplace exposure level determines what constitutes an acceptable fit and which fit test procedure is required. For negative pressure air purifying respirators, users may rely on either a qualitative or a quantitative fit test procedure for exposure levels less than 10 times the occupational exposure limit. Exposure levels greater than 10 times the occupational exposure limit must utilize a quantitative fit test procedure for these respirators. Fit testing of tight-fitting atmosphere-supplying respirators and tight-fitting powered air-purifying respirators shall be accomplished by performing quantitative or qualitative fit testing in the negative pressure mode.

Written materials required to be retained under this paragraph shall be made available upon request to affected employees and to the Assistant Secretary or designee for examination and copying.

Repairs

This company shall ensure that respirators that fail an inspection or are otherwise found to be defective are removed from service, and are discarded or repaired or adjusted in accordance with the following procedures:

- ☑ Repairs or adjustments to respirators are to be made only by persons appropriately trained to perform such operations and shall use only the respirator manufacturer's NIOSH-approved parts designed for the respirator.
- ☑ Repairs shall be made according to the manufacturer's recommendations and specifications for the type and extent of repairs to be performed.
- ☑ Reducing and admission valves, regulators, and alarms shall be adjusted or repaired only by the manufacturer or a technician trained by the manufacturer.

Discarding of Respirators

Respirators that fail an inspection or are otherwise not fit for use and cannot be repaired must be discarded.

Breathing Air Quality and Use

This company will provide employees using atmosphere-supplying respirators (supplied-air and SCBA) with breathing gases of high purity. The company shall ensure that compressed air, compressed oxygen, liquid air, and liquid oxygen used for respiration accords with the following specifications and Compressed and liquid oxygen shall meet the United States Pharmacopoeia requirements for medical or breathing oxygen; and Compressed breathing air shall meet at least the requirements for Grade D breathing air described in ANSI/Compressed Gas Association Commodity Specification for Air, G-7.1-1989, to include:

- ☑ Oxygen content (v/v) of 19.5-23.5%.
- ☑ Hydrocarbon (condensed) content of 5 milligrams per cubic meter of air or less.
- ☑ Carbon monoxide (CO) content of 10 ppm or less.
- ☑ Carbon dioxide content of 1,000 ppm or less; and Lack of noticeable odor.
- ☑ The company shall ensure that compressed oxygen is not used in atmosphere-supplying respirators that have previously used compressed air.
- ☑ The company shall ensure that oxygen concentrations greater than 23.5% are used only in equipment designed for oxygen service or distribution.
- ☑ The company shall ensure that cylinders used to supply breathing air to respirators meet the following requirements.
- ☑ Cylinders are tested and maintained as prescribed in the Shipping Container Specification Regulations of the Department of Transportation (49 CFR part 173 and part 178).
- ☑ Cylinders of purchased breathing air have a certificate of analysis from the supplier that the breathing air meets the requirements for Grade D breathing air.

- ☑ The moisture content in the cylinder does not exceed a dew point of -50 deg. F (-45.6 deg. C) at 1 atmosphere pressure.
- ☑ The company shall ensure that compressors used to supply breathing air to respirators are constructed and situated so as to.
- ☑ Prevent entry of contaminated air into the air-supply system.
- ☑ Minimize moisture content so that the dew point at 1 atmosphere pressure is 10 degrees F (5.56 deg. C) below the ambient temperature.
- ☑ Have suitable in-line air-purifying sorbent beds and filters to further ensure breathing air quality. Sorbent beds and filters shall be maintained and replaced or refurbished periodically following the manufacturer's instructions.
- ☑ Have a tag containing the most recent change date and the signature of the person authorized by the employer to perform the change. The tag shall be maintained at the compressor.
- ☑ For compressors that are not oil-lubricated, the company shall ensure that carbon monoxide levels in the breathing air do not exceed 10 ppm.
- ☑ For oil-lubricated compressors, the company shall use high-temps. Or carbon monoxide alarm, or both, to monitor carbon monoxide levels. If only high-temperature alarms are used, the air supply shall be monitored at intervals sufficient to prevent carbon monoxide in the breathing air from exceeding 10 ppm.
- ☑ The company shall ensure that breathing air couplings are incompatible with outlets for non-irrespirable worksite air or other gas systems. No asphyxiating substance shall be introduced into breathing air lines.
- ☑ The company shall use breathing gas containers marked in accordance with the NIOSH respirator certification standard, 42 CFR part 84.

Identification of Filters, Cartridges, and Canisters

This company shall ensure that all filters, cartridges and canisters used in the workplace are labeled and color coded with the NIOSH approval label and that the label is not removed and remains legible.

Training and Information

This company will provide effective training to employees who are required to use respirators. The training will be comprehensive, understandable, and recur annually and more often if necessary. This company will also provide the basic information on respirators in Appendix D of this section to employees who wear respirators when not required by this section or by the company to do so.

This company shall ensure that each employee can demonstrate knowledge of at least the following:

- ☑ Why the respirator is necessary and how improper fit, usage, or maintenance can compromise the protective effect of the respirator.
- ☑ What the limitations and capabilities of the respirator are.
- ☑ How to use the respirator effectively in emergency situations, including situations in which the respirator malfunctions.
- ☑ How to inspect, put on and remove, use, and check the seals of the respirator.
- ☑ What the procedures are for maintenance and storage of the respirator.

- ☑ How to recognize medical signs and symptoms that may limit or prevent the effective use of respirators.
- ☑ The general requirements of this section.
- ☑ The training shall be conducted in a manner that is understandable to the employee.
- ☑ This company shall provide the training prior to requiring the employee to use a respirator in the workplace.

An employer who is able to demonstrate that a new employee has received training within the last 12 months that addresses the elements specified in paragraph(k)(1)(i) through (vii) is not required to repeat such training provided that, as required by paragraph (k)(1). The employee can demonstrate knowledge of those element(s). Previous training not repeated initially by the employer must be provided no later than 12 months from the date of the previous training.

Our employees are trained sufficiently to be able to demonstrate knowledge of at least these seven elements:

1. Why the respirator is necessary and how improper fit, usage, or maintenance can compromise the protective effect of the respirator.
2. What the limitations and capabilities of the respirator are.
3. How to use the respirator effectively in emergency situations, including situations in which the respirator malfunctions.
4. How to inspect, put on, remove, use, and check the seals of the respirator.
5. What the procedures are for maintenance and storage of the respirator.
6. How to recognize medical signs and symptoms that may limit or prevent the effective use of respirators.
7. The general requirements of 29 CFR 1910.134.

Retraining shall be administered annually, and when the following situations occur:

- ☑ Changes in the workplace or the type of respirator render previous training obsolete.
- ☑ Inadequacies in the employee's knowledge or use of the respirator indicate that the employee has not retained the requisite understanding or skill.
- ☑ Any other situation arises in which retraining appears necessary to ensure safe respirator use.
- ☑ The basic advisory information on respirators, as presented in Appendix D of this section, shall be provided by the company in any written or oral format, to employees who wear respirators when such use is not required by this section or by the employer.

Information for Employees using Respirators when not Required under the Standard

Respirators are an effective method of protection against designated hazards when properly selected and worn. Respirator use is encouraged, even when exposures are below the exposure limit, to provide an additional level of comfort and protection for workers. However, if a respirator is used improperly or not kept clean, the respirator itself can become a hazard to the worker.

Sometimes, workers may wear respirators to avoid exposures to hazards, even if the amount of hazardous substance does not exceed the limits set by OSHA standards. If your employer provides respirators for your voluntary use, or if you provide your own respirator, you need to take certain precautions to be sure that the respirator itself does not present a hazard. You should do the following:

1. Read and heed all instructions provided by the manufacturer on use, maintenance, cleaning and care, and warnings regarding the respirators limitations.
2. Choose respirators certified for use to protect against the contaminant of concern. NIOSH, the National Institute for Occupational Safety and Health of the U.S. Department of Health and Human Services, certifies respirators. A label or statement of certification should appear on the respirator or respirator packaging. It will tell you what the respirator is designed for and how much it will protect you.
3. Do not wear your respirator into atmospheres containing contaminants for which your respirator is not designed to protect against. For example, a respirator designed to filter dust particles will not protect you against gases, vapors, or very small solid particles of fumes or smoke.
4. Keep track of your respirator so that you do not mistakenly use someone else's respirator.

Appendices

Appendix 1—References

The following documents are helpful references:

- ☑ 29 CFR 1910.134, Respiratory Protection, and Appendices,
- ☑ 42 CFR 84, Approval of Respiratory Protective Devices,
- ☑ ANSI Z88.2, Respiratory Protection,
- ☑ NIOSH Guide to Industrial Respiratory Protection-1987 (however, this may be out of date),
- ☑ NIOSH Guide to the Selection and Use of Particulate Respirators Certified Under 42 CFR 84 (4/23/96).

Fit Testing Procedures (Mandatory)

Part I. OSHA-Accepted Fit Test Protocols

A. Fit Testing Procedures-General Requirements.

The employer shall conduct fit testing using the following procedures. The requirements in this appendix apply to all OSHA-accepted fit test methods, both QLFT and QNFT.

1. The test subject shall be allowed to pick the most acceptable respirator from a sufficient number of respirator models and sizes so that the respirator is acceptable to, and correctly fits, the user.
2. Prior to the selection process, the test subject shall be shown how to put on a respirator, how it should be positioned on the face, how to set strap tension and how to determine an acceptable fit. A mirror shall be available to assist the subject in evaluating the fit and positioning of the respirator. This instruction may not constitute the subject's formal training on respirator use, because it is only a review.

3. The test subject shall be informed that he/she is being asked to select the respirator that provides the most acceptable fit. Each respirator represents a different size and shape, and if fitted and used properly, will provide adequate protection.
4. The test subject shall be instructed to hold each chosen face-piece up to the face and eliminate those that obviously do not give an acceptable fit.
5. The more acceptable face-pieces are noted in case the one selected proves unacceptable; the most comfortable mask is donned and worn at least five minutes to assess comfort. Assistance in assessing comfort can be given by discussing the points in the following item A. If the test subject is not familiar with using a particular respirator, the test subject shall be directed to don the mask several times and to adjust the straps each time to become adept at setting proper tension on the straps.
6. Assessment of comfort shall include a review of the following points with the test subject and allowing the test subject adequate time to determine the comfort of the respirator.
 - (a) Position of the mask on the nose.
 - (b) Room for eye protection.
 - (c) Room to talk.
 - (d) Position of mask on face and cheeks.
7. The following criteria shall be used to help determine the adequacy of the respirator fit:
 - (a) Chin properly placed.
 - (b) Adequate strap tension, not overly tightened.
 - (c) Fit across nose bridge.
 - (d) Respirator of proper size to span distance from nose to chin.
 - (e) Tendency of respirator to slip.
 - (f) Self-observation in mirror to evaluate fit and respirator position.
8. The test subject shall be informed that he/she is being asked to select the respirator that provides the most acceptable fit. Each respirator represents a different size and shape, and if fitted and used properly, will provide adequate protection.
9. The test subject shall be instructed to hold each chosen face-piece up to the face and eliminate those that obviously do not give an acceptable fit.
10. The more acceptable face-pieces are noted in case the one selected proves unacceptable; the most comfortable mask is donned and worn at least five minutes to assess comfort. Assistance in assessing comfort can be given by discussing the points in the following item A.6. If the test subject is not familiar with using a particular respirator, the test subject shall be directed to don the mask several times and to adjust the straps each time to become adept at setting proper tension on the straps.
11. Assessment of comfort shall include a review of the following points with the test subject and allowing the test subject adequate time to determine the comfort of the respirator.
 - (a) Position of the mask on the nose.

- (b) Room for eye protection.
 - (c) Room to talk.
 - (d) Position of mask on face and cheeks.
- 12.** The following criteria shall be used to help determine the adequacy of the respirator fit:
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 - (b) Adequate strap tension, not overly tightened.
 - (c) Fit across nose bridge.
 - (d) Respirator of proper size to span distance from nose to chin.
 - (e) Tendency of respirator to slip.
 - (f) Self-observation in mirror to evaluate fit and respirator position.
- 13.** The test subject shall conduct a user seal check, either the negative and positive pressure seal checks described in Appendix B-1 or those recommended by the respirator manufacturer which provide equivalent protection to the procedures in Appendix B-1. Before conducting the negative and positive pressure checks, the subject shall be told to seat the mask on the face by moving the head from side-to-side and up and down slowly while taking in a few slow deep breaths. Another face-piece shall be selected and retested if the test subject fails the user seal check tests.
- 14.** The test shall not be conducted if there is any hair growth between the skin and the face-piece sealing surface, such as stubble beard growth, beard, mustache or sideburns which cross the respirator sealing surface. Any type of apparel which interferes with a satisfactory fit shall be altered or removed.
- 15.** If a test subject exhibits difficulty in breathing during the tests, she or he shall be referred to a physician or other licensed health care professional, as appropriate, to determine whether the test subject can wear a respirator while performing her or his duties.
- 16.** If the employee finds the fit of the respirator unacceptable, the test subject shall be given the opportunity to select a different respirator and to be retested.
- 17.** Exercise regimen. Prior to the commencement of the fit test, the test subject shall be given a description of the fit test and the test subject's responsibilities during the test procedure. The description of the process shall include a description of the test exercises that the subject will be performing. The respirator to be tested shall be worn for at least 5 minutes before the start of the fit test.
- 18.** The fit test shall be performed while the test subject is wearing any applicable safety equipment that may be worn during actual respirator use which would interfere with respirator fit.
- 19. Test Exercises**
- (a) The following test exercises are to be performed for all fit testing methods prescribed in this appendix, except for the CNP method. A separate fit testing exercise regimen is contained in the CNP protocol. The test subject shall perform exercises, in the test environment, in the following manner.

- (1) Normal breathing. In a normal standing position, without talking, the subject shall breathe normally.
- (2) Deep breathing. In a normal standing position, the subject shall breathe slowly and deeply, taking caution so as not to hyperventilate.
- (3) Turning head side to side. Standing in place, the subject shall slowly turn his/her head from side to side between the extreme positions on each side. The head shall be held at each extreme momentarily so the subject can inhale at each side.
- (4) Moving head up and down. Standing in place, the subject shall slowly move his/her head up and down. The subject shall be instructed to inhale in the up position (i.e., when looking toward the ceiling).
- (5) Talking. The subject shall talk out loud slowly and loud enough so as to be heard clearly by the test conductor. The subject can read from a prepared text such as the Rainbow Passage, count backward from 100, or recite a memorized poem or song.

Rainbow Passage

When the sunlight strikes raindrops in the air, they act like a prism and form a rainbow. The rainbow is a division of white light into many beautiful colors. These take the shape of a long round arch, with its path high above, and its two ends apparently beyond the horizon. There is, according to legend, a boiling pot of gold at one end. People look, but no one ever finds it. When a man looks for something beyond reach, his friends say he is looking for the pot of gold at the end of the rainbow

- (6) Grimace. The test subject shall grimace by smiling or frowning.
(This applies only to QNFT testing; it is not performed for QLFT).

Bending over. The test subject shall bend at the waist as if he/she were to touch his/her toes. Jogging in place shall be substituted for this exercise in those test environments such as shroud type QNFT or QLFT units that do not permit bending over at the waist.

Normal breathing. Same as exercise (1). (b) Each test exercise shall be performed for one minute except for the grimace exercise which shall be performed for 15 seconds. The test subject shall be questioned by the test conductor regarding the comfort of the respirator upon completion of the protocol. If it has become unacceptable, another model of respirator shall be tried. The respirator shall not be adjusted once the fit test exercises begin. Any adjustment voids the test, and the fit test must be repeated.

B. Qualitative Fit Test (QLFT) Protocols

1. General

(a) The employer shall ensure that persons administering QLFT are able to prepare test solutions, calibrate equipment and perform tests properly, recognize invalid tests, and ensure that test equipment is in proper working order.

(b) The employer shall ensure that QLFT equipment is kept clean and well maintained so as to operate within the parameters for which it was designed.

2. *Isoamyl Acetate Protocol*

(a) Odor Threshold Screening. Odor threshold screening, performed without wearing a respirator, is intended to determine if the individual tested can detect the odor of isoamyl acetate at low levels.

Note: This protocol is not appropriate to use for the fit testing of particulate respirators. If used to fit test particulate respirators, the respirator must be equipped with an organic vapor filter.

- (1) Three 1 liter glass jars with metal lids are required.
- (2) Odor-free water (e.g., distilled or spring water) at approximately 25 deg. C (77 deg. F) shall be used for the solutions.
- (3) The isoamyl acetate (IAA) (also known as isopentyl acetate) stock solution is prepared by adding 1 ml of pure IAA to 800 ml of odor-free water in a 1 liter jar, closing the lid and shaking for 30 seconds. A new solution shall be prepared at least weekly.
- (4) The screening test shall be conducted in a room separate from the room used for actual fit testing. The two rooms shall be well-ventilated to prevent the odor of IAA from becoming evident in the general room air where testing takes place.
- (5) The odor test solution is prepared in a second jar by placing 0.4 ml of the stock solution into 500 ml of odor-free water using a clean dropper or pipette. The solution shall be shaken for 30 seconds and allowed to stand for two to three minutes so that the IAA concentration above the liquid may reach equilibrium. This solution shall be used for only one day.
- (6) A test blank shall be prepared in a third jar by adding 500 cc of odor-free water.
- (7) The odor test and test blank jar lids shall be labeled (e.g., 1 and 2) for jar identification. Labels shall be placed on the lids so that they can be peeled off periodically and switched to maintain the integrity of the test.
- (8) The following instruction shall be typed on a card and placed on the table in front of the two test jars (i.e., 1 and 2): "The purpose of this test is to determine if you can smell banana oil at a low concentration. The two bottles in front of you contain water. One of these bottles also contains a small amount of banana oil. Be sure the covers are on tight, and then shake each bottle for two seconds. Unscrew the lid of each bottle, one at a time, and sniff at the mouth of the bottle. Indicate to the test conductor which bottle contains banana oil".
- (9) The mixtures used in the IAA odor detection test shall be prepared in an area separate from where the test is performed, in order to prevent olfactory fatigue in the subject.
- (10) If the test subject is unable to correctly identify the jar containing the odor test solution, the IAA qualitative fit test shall not be performed.
- (11) If the test subject correctly identifies the jar containing the odor test solution, the test subject may proceed to respirator selection and fit testing.

(b) Isoamyl Acetate Fit Test

- (1)** The fit test chamber shall be a clear 55-gallon drum liner suspended inverted over a 2-foot diameter frame so that the top of the chamber is about 6 inches above the test subject's head. If no drum liner is available, a similar chamber shall be constructed using plastic sheeting. The inside top center of the chamber shall have a small hook attached.
- (2)** Each respirator used for the fitting and fit testing shall be equipped with organic vapor cartridges or offer protection against organic vapors.
- (3)** After selecting, donning, and properly adjusting a respirator, the test subject shall wear it to the fit testing room. This room shall be separate from the room used for odor threshold screening and respirator selection, and shall be well-ventilated, as by an exhaust fan or lab hood, to prevent general room contamination.
- (4)** A copy of the test exercises and any prepared text from which the subject is to read shall be taped to the inside of the test chamber.
- (5)** Upon entering the test chamber, the test subject shall be given a 6-inch by 5-inch piece of paper towel, or other porous, absorbent, single-ply material, folded in half and wetted with 0.75 ml of pure IAA. The test subject shall hang the wet towel on the hook at the top of the chamber. An IAA test swab or ampoule may be substituted for the IAA wetted paper towel provided it has been demonstrated that the alternative IAA source will generate an IAA test atmosphere with a concentration equivalent to that generated by the paper towel method.
- (6)** Allow two minutes for the IAA test concentration to stabilize before starting the fit test exercises. This would be an appropriate time to talk with the test subject; to explain the fit test, the importance of his/her cooperation, and the purpose for the test exercises; or to demonstrate some of the exercises.
- (7)** If at any time during the test, the subject detects the banana-like odor of IAA, the test is failed. The subject shall quickly exit from the test chamber and leave the test area to avoid olfactory fatigue.
- (8)** If the test is failed, the subject shall return to the selection room and remove the respirator. The test subject shall repeat the odor sensitivity test, select and put on another respirator, return to the test area and again begin the fit test procedure described in (b) (1) through (7) above. The process continues until a respirator that fits well has been found. Should the odor sensitivity test be failed, the subject shall wait at least 5 minutes before retesting. Odor sensitivity will usually have returned by this time.
- (9)** If the subject passes the test, the efficiency of the test procedure shall be demonstrated by having the subject break the respirator face seal and take a breath before exiting the chamber.
- (10)** When the test subject leaves the chamber, the subject shall remove the saturated towel and return it to the person conducting the test, so that there is no significant IAA concentration buildup in the chamber during subsequent tests. The used towels shall be kept in a self-sealing plastic bag to keep the test area from being contaminated.

- 3. Saccharin Solution Aerosol Protocol.** The entire screening and testing procedure shall be explained to the test subject prior to the conduct of the screening test.
- (a) Taste threshold screening. The saccharin taste threshold screening, performed without wearing a respirator, is intended to determine whether the individual being tested can detect the taste of saccharin.
- (1) During threshold screening as well as during fit testing, subjects shall wear an enclosure about the head and shoulders that is approximately 12 inches in diameter by 14 inches tall with at least the front portion clear and that allows free movements of the head when a respirator is worn. An enclosure substantially similar to the 3M hood assembly, parts # FT 14 and # FT 15 combined, is adequate.
 - (2) The test enclosure shall have a 3/4-inch (1.9 cm) hole in front of the test subject's nose and mouth area to accommodate the nebulizer nozzle.
 - (3) The test subject shall don the test enclosure. Throughout the threshold screening test, the test subject shall breathe through his/her slightly open mouth with tongue extended. The subject is instructed to report when he/she detects a sweet taste.
 - (4) Using a DeVilbiss Model 40 Inhalation Medication Nebulizer or equivalent, the test conductor shall spray the threshold check solution into the enclosure. The nozzle is directed away from the nose and mouth of the person. This nebulizer shall be clearly marked to distinguish it from the fit test solution nebulizer.
 - (5) The threshold check solution is prepared by dissolving 0.83 gram of sodium saccharin USP in 100 ml of warm water. It can be prepared by putting 1 ml of the fit test solution (see (b) (5) below) in 100 ml of distilled water.
 - (6) To produce the aerosol, the nebulizer bulb is firmly squeezed so that it collapses completely, then released and allowed to fully expand.
 - (7) Ten squeezes are repeated rapidly and then the test subject is asked whether the saccharin can be tasted. If the test subject reports tasting the sweet taste during the ten squeezes, the screening test is completed. The taste threshold is noted as ten regardless of the number of squeezes actually completed.
 - (8) If the first response is negative, ten more squeezes are repeated rapidly and the test subject is again asked whether the saccharin is tasted. If the test subject reports tasting the sweet taste during the second ten squeezes, the screening test is completed. The taste threshold is noted as twenty regardless of the number of squeezes actually completed.
 - (9) If the second response is negative, ten more squeezes are repeated rapidly and the test subject is again asked whether the saccharin is tasted. If the test subject reports tasting the sweet taste during the third set of ten squeezes, the screening test is completed. The taste threshold is noted as thirty regardless of the number of squeezes actually completed.
 - (10) The test conductor will take note of the number of squeezes required to solicit a taste response.
 - (11) If the saccharin is not tasted after 30 squeezes (step 10), the test subject is unable to taste saccharin and may not perform the saccharin fit test.

Note to subsection 3. (a): If the test subject eats or drinks something sweet before the screening test, he/she may be unable to taste the weak saccharin solution.

- (12) If a taste response is elicited, the test subject shall be asked to take note of the taste for reference in the fit test.
- (13) Correct use of the nebulizer means that approximately 1 ml of liquid is used at a time in the nebulizer body.
- (14) The nebulizer shall get thoroughly rinsed in water, shaken dry and refilled at least each morning and afternoon or at least every four hours.

(b) *Saccharin solution aerosol fit test procedure.*

- (1) The test subject may not eat, drink (except for plain water), smoke, or chew gum for 15 minutes before the test.
- (2) The fit test uses the same enclosure described in 3. (a) above.
- (3) The test subject shall don the enclosure while wearing the respirator selected in section I. A. of this appendix. The respirator shall be properly adjusted and equipped with a particulate filter(s).
- (4) A second DeVilbiss Model 40 Inhalation Medication Nebulizer or equivalent is used to spray the fit test solution into the enclosure. This nebulizer shall be clearly marked to distinguish it from the screening test solution nebulizer.
- (5) The fit test solution is prepared by adding 83 grams of sodium saccharin to 100 ml of warm water.
- (6) As before, the test subject shall breathe through the slightly open mouth with the tongue extended, and report if he/she tastes the sweet taste of saccharin.
- (7) The nebulizer is inserted into the hole in the front of the enclosure and an initial concentration of saccharin fit test solution is sprayed into the enclosure using the same number of squeezes (either 10, 20 or 30 squeezes) based on the number of squeezes required to elicit a taste response as noted during the screening test. A minimum of 10 squeezes is required.
- (8) After generating the aerosol, the test subject shall be instructed to perform the exercises in section I. A. 14. of this appendix.
- (9) Every 30 seconds the aerosol concentration shall be replenished using one half the original number of squeezes used initially (e.g., 5, 10, or 15).
- (10) The test subject shall indicate to the test conductor if at any time during the fit test the taste of saccharin is detected. If the test subject does not report tasting the saccharin, the test is passed.
- (11) If the taste of saccharin is detected, the fit is deemed unsatisfactory and the test is failed. A different respirator shall be tried and the entire test procedure is repeated (taste threshold screening and fit testing).
- (12) Since the nebulizer has a tendency to clog during use, the test operator must make periodic checks of the nebulizer to ensure that it is not clogged. If clogging is found at the end of the test session, the test is invalid.

4. **Bitrex™ (Denatonium Benzoate) Solution Aerosol Qualitative Fit Test Protocol.** The Bitrex™ (Denatonium benzoate) solution aerosol QLFT protocol uses the published saccharin test protocol because that protocol is widely accepted. Bitrex is routinely used as a taste aversion agent in household liquids which children should not be drinking and is endorsed by the American Medical Association, the National Safety Council, and the American Association of Poison Control Centers. The entire screening and testing procedure shall be explained to the test subject prior to the conduct of the screening test.
- (a) **Taste Threshold Screening.** The Bitrex taste threshold screening, performed without wearing a respirator, is intended to determine whether the individual being tested can detect the taste of Bitrex.
- (1) During threshold screening as well as during fit testing, subjects shall wear an enclosure about the head and shoulders that is approximately 12 inches (30.5 cm) in diameter by 14 inches (35.6 cm) tall. The front portion of the enclosure shall be clear from the respirator and allow free movement of the head when a respirator is worn. An enclosure substantially similar to the 3M hood assembly, parts #14 and #15 combined, is adequate.
 - (2) The test enclosure shall have a 3/4 inch (1.9 cm) hole in front of the test subject's nose and mouth area to accommodate the nebulizer nozzle.
 - (3) The test subject shall don the test enclosure. Throughout the threshold screening test, the test subject shall breathe through his or her slightly open mouth with tongue extended. The subject is instructed to report when he/she detects a bitter taste.
 - (4) Using a DeVilbiss Model 40 Inhalation Medication Nebulizer or equivalent, the test conductor shall spray the Threshold Check Solution into the enclosure. This Nebulizer shall be clearly marked to distinguish it from the fit test solution nebulizer.
 - (5) The Threshold Check Solution is prepared by adding 13.5 milligrams of Bitrex to 100 ml of 5% salt (NaCl) solution in distilled water.
 - (6) To produce the aerosol, the nebulizer bulb is firmly squeezed so that the bulb collapses completely, and is then released and allowed to fully expand.
 - (7) An initial ten squeezes are repeated rapidly and then the test subject is asked whether the Bitrex can be tasted. If the test subject reports tasting the bitter taste during the ten squeezes, the screening test is completed. The taste threshold is noted as ten regardless of the number of squeezes actually completed.
 - (8) If the first response is negative, ten more squeezes are repeated rapidly and the test subject is again asked whether the Bitrex is tasted. If the test subject reports tasting the bitter taste during the second ten squeezes, the screening test is completed. The taste threshold is noted as twenty regardless of the number of squeezes actually completed.
 - (9) If the second response is negative, ten more squeezes are repeated rapidly and the test subject is again asked whether the Bitrex is tasted. If the test subject reports tasting the bitter taste during the third set of ten squeezes, the screening test is completed. The taste threshold is noted as thirty regardless of the number of squeezes actually completed.
 - (10) The test conductor will take note of the number of squeezes required to solicit a taste response.

- (11) If the Bitrex is not tasted after 30 squeezes (step 10), the test subject is unable to taste Bitrex and may not perform the Bitrex fit test.
- (12) If a taste response is elicited, the test subject shall be asked to take note of the taste for reference in the fit test.
- (13) Correct use of the nebulizer means that approximately 1 ml of liquid is used at a time in the nebulizer body.
- (14) The nebulizer shall be thoroughly rinsed in water, shaken to dry and refilled at least each morning and afternoon or at least every four hours.

(b) *Bitrex Solution Aerosol Fit Test Procedure.*

- (1) The test subject may not eat, drink (except plain water), smoke, or chew gum for 15 minutes before the test.
- (2) The fit test uses the same enclosure as that described in 4. (a) above.
- (3) The test subject shall don the enclosure while wearing the respirator selected according to section I. A. of this appendix. The respirator shall be properly adjusted and equipped with any type particulate filter(s).
- (4) A second DeVilbiss Model 40 Inhalation Medication Nebulizer or equivalent is used to spray the fit test solution into the enclosure. This nebulizer shall not be clearly marked to distinguish it from the screening test solution nebulizer.
- (5) The fit test solution is prepared by adding 337.5 mg of Bitrex to 200 ml of a 5% salt (NaCl) solution in warm water.
- (6) As before, the test subject shall breathe through his or her slightly open mouth with tongue extended, and be instructed to report if he/she tastes the bitter taste of Bitrex.
- (7) The nebulizer is inserted into the hole in the front of the enclosure and an initial concentration of the fit test solution is sprayed into the enclosure using the same number of squeezes (either 10, 20 or 30 squeezes) based on the number of squeezes required to elicit a taste response as noted during the screening test.
- (8) After generating the aerosol, the test subject shall be instructed to perform the exercises in section I. A. 14. of this appendix.
- (9) Every 30 seconds the aerosol concentration shall be replenished using one half the number of squeezes used initially (e.g., 5, 10 or 15).
- (10) The test subject shall indicate to the test conductor if at any time during the fit test the taste of Bitrex is detected. If the test subject does not report tasting the Bitrex, the test is passed.
- (11) If the taste of Bitrex is detected, the fit is deemed unsatisfactory and the test is failed. A different respirator shall be tried and the entire test procedure is repeated (taste threshold screening and fit testing).

5. ***Irritant Smoke (Stannic Chloride) Protocol.*** This qualitative fit test uses a person's response to the irritating chemicals released in the "smoke" produced by a stannic chloride ventilation smoke tube to detect leakage into the respirator.

(a) *General Requirements and Precautions.*

- (1) The respirator to be tested shall be equipped with high efficiency particulate air (HEPA) or P100 series filter(s).
- (2) Only stannic chloride smoke tubes shall be used for this protocol.

- (3) No form of test enclosure or hood for the test subject shall be used.
 - (4) The smoke can be irritating to the eyes, lungs, and nasal passages. The test conductor shall take precautions to minimize the test subject's exposure to irritant smoke. Sensitivity varies, and certain individuals may respond to a greater degree to irritant smoke. Care shall be taken when performing the sensitivity screening checks that determine whether the test subject can detect irritant smoke to use only the minimum amount of smoke necessary to elicit a response from the test subject.
 - (5) The fit test shall be performed in an area with adequate ventilation to prevent exposure of the person conducting the fit test or the build-up of irritant smoke in the general atmosphere.
- (b) ***Sensitivity Screening Check.*** The person to be tested must demonstrate his or her ability to detect a weak concentration of the irritant smoke.
- (1) The test operator shall break both ends of a ventilation smoke tube containing stannic chloride, and attach one end of the smoke tube to a low flow air pump set to deliver 200 milliliters per minute, or an aspirator squeeze bulb. The test operator shall cover the other end of the smoke tube with a short piece of tubing to prevent potential injury from the jagged end of the smoke tube.
 - (2) The test operator shall advise the test subject that the smoke can be irritating to the eyes, lungs, and nasal passages and instruct the subject to keep his/her eyes closed while the test is performed.
 - (3) The test subject shall be allowed to smell a weak concentration of the irritant smoke before the respirator is donned to become familiar with its irritating properties and to determine if he/she can detect the irritating properties of the smoke. The test operator shall carefully direct a small amount of the irritant smoke in the test subject's direction to determine that he/she can detect it.
- (c) ***Irritant Smoke Fit Test Procedure***
- (1) The person being fit tested shall don the respirator without assistance, and perform the required user seal check(s).
 - (2) The test subject shall be instructed to keep his/her eyes closed.
 - (3) The test operator shall direct the stream of irritant smoke from the smoke tube toward the face-seal area of the test subject, using the low flow pump or the squeeze bulb. The test operator shall begin at least 12 inches from the face-piece and move the smoke stream around the whole perimeter of the mask. The operator shall gradually make two more passes around the perimeter of the mask, moving to within six inches of the respirator.
 - (4) If the person being tested has not had an involuntary response and/or detected the irritant smoke, proceed with the test exercises.
 - (5) The exercises identified in section I. A. 14. of this appendix shall be performed by the test subject while the respirator seal is being continually challenged by the smoke, directed around the perimeter of the respirator at a distance of six inches.
 - (6) If the person being fit tested reports detecting the irritant smoke at any time, the test is failed. The person being retested must repeat the entire sensitivity check and fit test procedure.

- (7) Each test subject passing the irritant smoke test without evidence of a response (involuntary cough, irritation) shall be given a second sensitivity screening check, with the smoke from the same smoke tube used during the fit test, once the respirator has been removed, to determine whether he/she still reacts to the smoke. Failure to evoke a response shall void the fit test.
- (8) If a response is produced during this second sensitivity check, then the fit test is passed.
- (d). **Quantitative Fit Test (QNFT) Protocols.** The following quantitative fit testing procedures have been demonstrated to be acceptable: Quantitative fit testing using a non-hazardous test aerosol (such as corn oil, polyethylene glycol 400 [PEG 400], di-2-ethyl hexyl sebacate [DEHS], or sodium chloride) generated in a test chamber, and employing instrumentation to quantify the fit of the respirator; Quantitative fit testing using ambient aerosol as the test agent and appropriate instrumentation (condensation nuclei counter) to quantify the respirator fit; Quantitative fit testing using controlled negative pressure and appropriate instrumentation to measure the volumetric leak rate of a face-piece to quantify the respirator fit.

1. General

- (a) The employer shall ensure that persons administering QNFT are able to calibrate equipment and perform tests properly, recognize invalid tests, calculate fit factors properly and ensure that test equipment is in proper working order.
- (b) The employer shall ensure that QNFT equipment is kept clean, and is maintained and calibrated according to the manufacturer's instructions so as to operate at the parameters for which it was designed.

2. Generated Aerosol Quantitative Fit Testing Protocol

(a) Apparatus.

- (1) Instrumentation. Aerosol generation, dilution, and measurement systems using particulates (corn oil, polyethylene glycol 400 [PEG 400], di-2-ethyl hexyl sebacate [DEHS] or sodium chloride) as test aerosols shall be used for quantitative fit testing.
- (2) Test chamber. The test chamber shall be large enough to permit all test subjects to perform freely all required exercises without disturbing the test agent concentration or the measurement apparatus. The test chamber shall be equipped and constructed so that the test agent is effectively isolated from the ambient air, yet uniform in concentration throughout the chamber.
- (3) When testing air-purifying respirators, the normal filter or cartridge element shall be replaced with a high efficiency particulate air (HEPA) or P100 series filter supplied by the same manufacturer.
- (4) The sampling instrument shall be selected so that a computer record or strip chart record may be made of the test showing the rise and fall of the test agent concentration with each inspiration and expiration at fit factors of at least 2,000. Integrators or computers that integrate the amount of test agent penetration leakage into the respirator for each exercise may be used provided a record of the readings is made.
- (5) The combination of substitute air-purifying elements, test agent and test agent concentration shall be such that the test subject is not exposed in excess of an established exposure limit for the test agent at any time during

the testing process, based upon the length of the exposure and the exposure limit duration.

- (6) The sampling port on the test specimen respirator shall be placed and constructed so that no leakage occurs around the port (e.g., where the respirator is probed), a free air flow is allowed into the sampling line at all times, and there is no interference with the fit or performance of the respirator. The in-mask sampling device (probe) shall be designed and used so that the air sample is drawn from the breathing zone of the test subject, midway between the nose and mouth and with the probe extending into the face-piece cavity at least 1/4 inch.
- (7) The test setup shall permit the person administering the test to observe the test subject inside the chamber during the test.
- (8) The equipment generating the test atmosphere shall maintain the concentration of test agent constant to within a 10 percent variation for the duration of the test.
- (9) The time lag (interval between an event and the recording of the event on the strip chart or computer or integrator) shall be kept to a minimum. There shall be a clear association between the occurrence of an event and its being recorded.
- (10) The sampling line tubing for the test chamber atmosphere and for the respirator sampling port shall be of equal diameter and of the same material. The length of the two lines shall be equal.
- (11) The exhaust flow from the test chamber shall pass through an appropriate filter (i.e., high efficiency particulate filter) before release.
- (12) When sodium chloride aerosol is used, the relative humidity inside the test chamber shall not exceed 50 percent.
- (13) The limitations of instrument detection shall be taken into account when determining the fit factor.
- (14) Test respirators shall be maintained in proper working order and be inspected regularly for deficiencies such as cracks or missing valves and gaskets.

(b) Procedural Requirements.

- (1) When performing the initial user seal check using a positive or negative pressure check, the sampling line shall be crimped closed in order to avoid air pressure leakage during either of these pressure checks.
- (2) The use of an abbreviated screening QLFT test is optional. Such a test may be utilized in order to quickly identify poor fitting respirators that passed the positive and/or negative pressure test and reduce the amount of QNFT time. The use of the CNC QNFT instrument in the count mode is another optional method to obtain a quick estimate of fit and eliminate poor fitting respirators before going on to perform a full QNFT.
- (3) A reasonably stable test agent concentration shall be measured in the test chamber prior to testing. For canopy or shower curtain types of test units, the determination of the test agent's stability may be established after the test subject has entered the test environment.
- (4) Immediately after the subject enters the test chamber, the test agent concentration inside the respirator shall be measured to ensure that the

peak penetration does not exceed 5 percent for a half mask or 1 percent for a full face-piece respirator.

- (5) A stable test agent concentration shall be obtained prior to the actual start of testing.
- (6) Respirator restraining straps shall not be over-tightened for testing. The straps shall be adjusted by the wearer without assistance from other persons to give a reasonably comfortable fit typical of normal use. The respirator shall not be adjusted once the fit test exercises begin.
- (7) The test shall be terminated whenever any single peak penetration exceeds 5 percent for half masks and 1 percent for full face-piece respirators. The test subject shall be refitted and retested.

(8) Calculation of fit factors.

(i) The fit factor shall be determined for the quantitative fit test by taking the ratio of the average chamber concentration to the concentration measured inside the respirator for each test exercise except the grimace exercise.

(ii) The average test chamber concentration shall be calculated as the arithmetic average of the concentration measured before and after each test (i.e., 7 exercises) or the arithmetic average of the concentration measured before and after each exercise or the true average measured continuously during the respirator sample.

(iii) The concentration of the challenge agent inside the respirator shall be determined by one of the following methods:

- (A) Average peak penetration method means the method of determining test agent penetration into the respirator utilizing a strip chart recorder, integrator, or computer. The agent penetration is determined by an average of the peak heights on the graph or by computer integration, for each exercise except the grimace exercise. Integrators or computers that calculate the actual test agent penetration into the respirator for each exercise will also be considered to meet the requirements of the average peak penetration method.
- (B) Maximum peak penetration method means the method of determining test agent penetration in the respirator as determined by strip chart recordings of the test. The highest peak penetration for a given exercise is taken to be representative of average penetration into the respirator for that exercise.
- (C) Integration by calculation of the area under the individual peak for each exercise except the grimace exercise. This includes computerized integration.
- (D) The calculation of the overall fit factor using individual exercise fit factors involves first converting the exercise fit factors to penetration values, determining the average, and then converting that result back to a fit factor. This procedure is described in the following equation:

Overall Fit Factor =

Number of exercises

$$1/ff1 + 1/ff2 + 1/ff3 + 1/ff4 + 1/ff5 + 1/ff6 + 1/ff7 + 1/ff8$$

Where ff1, ff2, ff3, etc. are the fit factors for exercises 1, 2, 3, etc.

(9) The test subject shall not be permitted to wear a half mask or quarter face-piece respirator unless a minimum fit factor of 100 is obtained, or a full face-piece respirator unless a minimum fit factor of 500 is obtained.

(10) Filters used for quantitative fit testing shall be replaced whenever increased breathing resistance is encountered, or when the test agent has altered the integrity of the filter media.

3. ***Ambient aerosol condensation nuclei counter (CNC) quantitative fit testing protocol.*** The ambient aerosol condensation nuclei counter (CNC) quantitative fit testing (Portacount™) protocol quantitatively fit tests respirators with the use of a probe. The probed respirator is only used for quantitative fit tests. A probed respirator has a special sampling device, installed on the respirator that allows the probe to sample the air from inside the mask.

A probed respirator is required for each make, style, model, and size that the employer uses and can be obtained from the respirator manufacturer or distributor. The CNC instrument manufacturer, TSI Inc., also provides probe attachments (TSI sampling adapters) that permit fit testing in an employee's own respirator. A minimum fit factor pass level of at least 100 is necessary for a half-mask respirator and a minimum fit factor pass level of at least 500 is required for a full face-piece negative pressure respirator. The entire screening and testing procedure shall be explained to the test subject prior to the conduct of the screening test.

(a) Portacount Fit Test Requirements.

(1) Check the respirator to make sure the sampling probe and line are properly attached to the face-piece and that the respirator is fitted with a particulate filter capable of preventing significant penetration by the ambient particles used by the fit test (e.g. NIOSH 42 CFR 84 series 100, 99 or 95 particulate filter) per manufacturer's instruction.

(2) Instruct the person to be tested to don the respirator for five minutes before the fit test starts. This purges the ambient particles trapped inside the respirator and permits the wearer to make certain the respirator is comfortable. This individual shall already have been trained on how to wear the respirator properly.

(3) Check the following conditions for the adequacy of the respirator fit: Chin properly placed; Adequate strap tension, not overly tightened; Fit across nose bridge; Respirator of proper size to span distance from nose to chin; Tendency of the respirator to slip; Self-observation in a mirror to evaluate fit and respirator position.

(4) Have the person wearing the respirator do a user seal check. If leakage is detected, determine the cause. If leakage is from a poorly fitting face-piece, try another size of the same model respirator, or another model of respirator.

(5) Follow the manufacturer's instruction for operating the Portacount and proceed with the test.

(6) The test subject shall be instructed to perform the exercises in section I. A. 14. of this appendix.

(7) After the test exercises, the test subject shall be questioned by the test conductor regarding the comfort of the respirator upon completion of the protocol. If it has become unacceptable, another model of respirator shall be tried.

(b) Portacount Test Instrument.

- (1) The Portacount will automatically stop and calculate the overall fit factor for the entire set of exercises. The overall fit factor is what counts.
The Pass or Fail message will indicate whether or not the test was successful. If the test was a Pass, the fit test is over.
- (2) Since the pass or fail criterion of the Portacount is user programmable, the test operator shall ensure that the pass or fail criterion meet the requirements for minimum respirator performance in this Appendix.
- (3) A record of the test needs to be kept on file, assuming the fit test was successful. The record must contain the test subject's name; overall fit factor; make, model, style, and size of respirator used; and date tested.
- (4) Controlled negative pressure (CNP) quantitative fit testing protocol. The CNP protocol provides an alternative to aerosol fit test methods. The CNP fit test method technology is based on exhausting air from a temporarily sealed respirator face-piece to generate and then maintain a constant negative pressure inside the face-piece. The rate of air exhaust is controlled so that a constant negative pressure is maintained in the respirator during the fit test. The level of pressure is selected to replicate the mean inspiratory pressure that causes leakage into the respirator under normal use conditions. With pressure held constant, air flow out of the respirator is equal to air flow into the respirator. Therefore, measurement of the exhaust stream that is required to hold the pressure in the temporarily sealed respirator constant yields a direct measure of leakage air flow into the respirator.

The CNP fit test method measures leak rates through the face-piece as a method for determining the face-piece fit for negative pressure respirators. The CNP instrument manufacturer Dynatech Nevada also provides attachments (sampling manifolds) that replace the filter cartridges to permit fit testing in an employee's own respirator.

To perform the test, the test subject closes his or her mouth and holds his/her breathe, after which an air pump removes air from the respirator face-piece at a pre-selected constant pressure. The face-piece fit is expressed as the leak rate through the face-piece, expressed as milliliters per minute. The quality and validity of the CNP fit tests are determined by the degree to which the in-mask pressure tracks the test pressure during the system measurement time of approximately five seconds. Instantaneous feedback in the form of a real-time pressure trace of the in-mask pressure is provided and used to determine test validity and quality. A minimum fit factor pass level of 100 is necessary for a half-mask respirator and a minimum fit factor of at least 500 is required for a full face-piece respirator. The entire screening and testing procedure shall be explained to the test subject prior to conduct of the screening test.

(a) CNP Fit Test Requirements

- (1) The instrument shall have a non-adjustable test pressure of 15.0 mm water pressure.
- (2) The CNP system defaults selected for test pressure shall be set at -15 mm of water (-0.58 inches of water) and the modeled inspiratory flow rate shall be 53.8 liters per minute for performing fit tests.

Note: CNP systems have built-in capability to conduct fit testing that is specific to unique work rate, mask, and gender situations that might apply in a specific workplace.

Use of system default values, which were selected to represent respirator wear with medium cartridge resistance at a low-moderate work rate, will allow inter-test comparison of the respirator fit.

- (3) The individual who conducts the CNP fit testing shall be thoroughly trained to perform the test.
- (4) The respirator filter or cartridge needs to be replaced with the CNP test manifold. The inhalation valve downstream from the manifold either needs to be temporarily removed or propped open.
- (5) The test subject shall be trained to hold his or her breath for at least 20 seconds.
- (6) The test subject shall don the test respirator without any assistance from the individual who conducts the CNP fit test.
- (7) The QNFT protocol shall be followed according to section I. C. 1. of this appendix with an exception for the CNP test exercises.

(b) CNP Test Exercises.

- (1) **Normal breathing.** In a normal standing position, without talking, the subject shall breathe normally for 1 minute. After the normal breathing exercise, the subject needs to hold head straight ahead and hold his or her breath for 10 seconds during the test measurement.
- (2) **Deep breathing.** In a normal standing position, the subject shall breathe slowly and deeply for 1 minute, being careful not to hyperventilate. After the deep breathing exercise, the subject shall hold his or her head straight ahead and hold his or her breath for 10 seconds during test measurement.
- (3) **Turning head side to side.** Standing in place, the subject shall slowly turn his or her head from side to side between the extreme positions on each side for 1 minute. The head shall be held at each extreme momentarily so the subject can inhale at each side. After the turning head side to side exercise, the subject needs to hold head full left and hold his or her breath for 10 seconds during test measurement. Next, the subject needs to hold head full right and hold his or her breath for 10 seconds during test measurement.
- (4) **Moving head up and down.** Standing in place, the subject shall slowly move his or her head up and down for 1 minute. The subject shall be instructed to inhale in the up position (i.e., when looking toward the ceiling). After the moving head up and down exercise, the subject shall hold his or her head full up and hold his or her breath for 10 seconds during test measurement. Next, the subject shall hold his or her head full down and hold his or her breath for 10 seconds during test measurement.
- (5) **Talking.** The subject shall talk out loud slowly and loud enough so as to be heard clearly by the test conductor. The subject can read from a prepared text such as the Rainbow Passage, count backward from 100, or recite a memorized poem or song for 1 minute. After the talking exercise, the subject shall hold his or her head straight ahead and hold his or her breath for 10 seconds during the test measurement.

- (6) **Grimace.** The test subject shall grimace by smiling or frowning for 15 seconds
- (7) **Bending Over.** The test subject shall bend at the waist as if he or she were to touch his or her toes for 1 minute. Jogging in place shall be substituted for this exercise in those test environments such as shroud-type QNFT units that prohibit bending at the waist. After the bending over exercise, the subject shall hold his or her head straight ahead and hold his or her breath for 10 seconds during the test measurement.
- (8) **Normal Breathing.** The test subject shall remove and re-don the respirator within a one-minute period. Then, in a normal standing position, without talking, the subject shall breathe normally for 1 minute. After the normal breathing exercise, the subject shall hold his or her head straight ahead and hold his or her breath for 10 seconds during the test measurement. After the test exercises, the test subject shall be questioned by the test conductor regarding the comfort of the respirator upon completion of the protocol. If it has become unacceptable, another model of a respirator shall be tried.

(c) CNP Test Instrument.

- (1) The test instrument shall have an effective audio warning device when the test subject fails to hold his or her breath during the test. The test shall be terminated whenever the test subject failed to hold his or her breath. The test subject may be refitted and retested.
- (2) A record of the test shall be kept on file, assuming the fit test was successful. The record must contain the test subject's name; overall fit factor; make, model, style and size of respirator used; and date tested.

Part II. New Fit Test Protocols

- (A) Any person may submit to OSHA an application for approval of a new fit test protocol. If the application meets the following criteria, OSHA will initiate a rulemaking proceeding under section 6(b)(7) of the OSH Act to determine whether to list the new protocol as an approved protocol in this Appendix A.
- (B) The application must include a detailed description of the proposed new fit test protocol. This application must be supported by either:
 - (1) A test report prepared by an independent government research laboratory (e.g., Lawrence Livermore National Laboratory, Los Alamos National Laboratory, the National Institute for Standards and Technology) stating that the laboratory has tested the protocol and had found it to be accurate and reliable;
 - (2) An article that has been published in a peer-reviewed industrial hygiene journal describing the protocol and explaining how test data support the protocol's accuracy and reliability.
- (C) If OSHA determines that additional information is required before the Agency commences a rulemaking proceeding under this section; OSHA will so notify the applicant and afford the applicant the opportunity to submit the supplemental information. Initiation of a rulemaking proceeding will be deferred until OSHA has received and evaluated the supplemental information.

User Seal Check Procedures (Mandatory)

The individual who uses a tight-fitting respirator is to perform a user seal check to ensure that an adequate seal is achieved each time the respirator is put on. Either the positive and negative pressure checks listed in this appendix, or the respirator manufacturers recommended user seal check method shall be used. User seal checks are not substitutes for qualitative or quantitative fit tests.

Face-piece Positive and/or Negative Pressure Checks.

- A. Positive pressure check. Close off the exhalation valve and exhale gently into the face-piece. The face fit is considered satisfactory if a slight positive pressure can be built up inside the face-piece without any evidence of outward leakage of air at the seal. For most respirators this method of leak testing requires the wearer to first remove the exhalation valve cover before closing off the exhalation valve and then carefully replacing it after the test.
- B. Negative pressure check. Close off the inlet opening of the canister or cartridge(s) by covering with the palm of the hand(s) or by replacing the filter seal(s), inhale gently so that the face-piece collapses slightly, and hold the breath for ten seconds. The design of the inlet opening of some cartridges cannot be effectively covered with the palm of the hand. The test can be performed by covering the inlet opening of the cartridge with a thin latex or nitrile glove. If the face-piece remains in its slightly collapsed condition and no inward leakage of air is detected, the tightness of the respirator is considered satisfactory.
- C. Manufacturer's Recommended User Seal Check Procedures. The respirator manufacturer's recommended procedures for performing a user seal check may be used instead of the positive and/or negative pressure check procedures provided that the employer demonstrates that the manufacturer's procedures are equally effective.

Respirator Cleaning Procedures (Mandatory)

These procedures are provided for employer use when cleaning respirators. They are general in nature, and the employer as an alternative may use the cleaning recommendations provided by the manufacturer of the respirators used by their employees, provided such procedures are as effective as those listed here.

1. Equivalent effectiveness simply means that the procedures used must accomplish the objectives set forth in Appendix B-2, i.e., must ensure that the respirator is properly cleaned and disinfected in a manner that prevents damage to the respirator and does not cause harm to the user.
2. Procedures for Cleaning Respirators.
 - A. Remove filters, cartridges, or canisters. Disassemble face-pieces by removing speaking diaphragms, demand and pressure-demand valve assemblies, hoses, or any components recommended by the manufacturer. Discard or repair any defective parts.
 - B. Wash components in warm (43° C [110° F] maximum) water with a mild detergent or with a cleaner recommended by the manufacturer. A stiff bristle (not wire) brush may be used to facilitate the removal of dirt.
 - C. Rinse components thoroughly in clean, warm (43° C [110° F] maximum), preferably running water. Drain.
 - D. When the cleaner used does not contain a disinfecting agent, respirator components should be immersed for two minutes in one of the following:

3. Hypochlorite solution (50 ppm of chlorine) made by adding approximately one milliliter of laundry bleach to one liter of water at 43° C (110° F); or,
 4. Aqueous solution of iodine (50 ppm iodine) made by adding approximately 0.8 milliliters of tincture of iodine (6-8 grams ammonium and/or potassium iodide/100 cc of 45% alcohol) to one liter of water at 43° C (110° F); or,
 5. Other commercially available cleansers of equivalent disinfectant quality when used as directed, if their use is recommended or approved by the respirator manufacturer.
- E. Rinse components thoroughly in clean, warm (43° C [110° F] maximum), preferably running water. Drain. The importance of thorough rinsing cannot be overemphasized. Detergents or disinfectants that dry on face-pieces may result in dermatitis. In addition, some disinfectants may cause deterioration of rubber or corrosion of metal parts if not completely removed.
 - F. Components should be hand-dried with a clean lint-free cloth or air-dried.
 - G. Reassemble face-piece, replacing filters, cartridges, and canisters.
 - H. Test the respirator to ensure that all components work properly.

Respirator Medical Evaluation Questionnaire (Mandatory)

Administration of the medical questionnaire and examinations

The medical questionnaire and examinations shall be administered confidentially during the employee's normal working hours or at a time and place convenient to the employee. The medical questionnaire shall be administered in a manner that ensures that the employee understands its content. The employer shall provide the employee with an opportunity to discuss the questionnaire and examination results with the PLHCP.

Guide for Employees Using Respirators When Not Required Under the Standard

Respirators are an effective method of protection against designated hazards when properly selected and worn. Respirator use is encouraged even when exposures are below the exposure limit, to provide an additional level of comfort and protection for workers. However, if a respirator is used improperly or not kept clean, the respirator itself can become a hazard to the worker. Sometimes, workers may wear respirators to avoid exposures to hazards, even if the amount of hazardous substance does not exceed the limits set by OSHA standards. If your employer provides respirators for your voluntary use, or if you provide your own respirator, you need to take certain precautions to be sure that the respirator itself does not present a hazard.

You should do the following:

1. Read and heed all instructions provided by the manufacturer on use, maintenance, cleaning and care, and warnings regarding the respirators limitations.
2. Choose respirators certified for use to protect against the contaminant of concern.
NIOSH, the National Institute for Occupational Safety and Health of the U.S. Department of Health and Human Services, certifies respirators. A label or statement of certification should appear on the respirator or respirator packaging. It will tell you what the respirator is designed for and how much it will protect you.
3. Do not wear your respirator into atmospheres containing contaminants for which your respirator is not designated to protect against. For example, a respirator designed to filter dust particles will not protect you against gases, vapors or very small solid particles of fumes or smoke.
4. Keep track of your respirator so that you do not mistakenly use someone else's.

Section Notes:

Respirator Medical Evaluation Questionnaire (Mandatory)

To the Employee:

Can you read (circle)? Yes / No

Your employer must allow you to answer the questionnaire during normal working hours, or at a time and place that is convenient to you. To maintain your confidentiality, your employer or supervisor must not look at or review your answers, and your employer must tell you how to deliver or send this questionnaire to the health care professional who will review it.

Part A. Section 1. (Mandatory) The following information must be provided by every employee who has been selected to use any type of respirator (please print).

1. Today's Date: _____
2. Your Name: _____
3. Your Age: _____
4. Sex (circle one): Male Female
5. Your Height: _____
6. Your Weight: _____ lbs.
7. Your Job Title: _____
8. A phone number where you can be reached by the health care professional who reviews this questionnaire (include the Area Code)?
(_____) _____
9. The best time to phone you at this number? _____ am/pm
10. Has your employer told you how to contact the health care professional who will review this questionnaire (circle one)? Yes / No
11. Check the type of respirator you will use (you can check more than one category)?
 - a. _____ N, R, or P disposable respirator (filter-mask, non-cartridge type only).
 - b. _____ other type (for example, half- or full-face-piece type, powered-air purifying, supplied-air, self-contained breathing apparatus).
12. Have you worn a respirator (circle one)? Yes / No
If "yes," what type(s): _____

Part A. Section 2. (Mandatory) Questions 1 thru 9 below must be answered by every employee selected to use any type of respirator (please circle "yes" or "no").

1. Do you currently smoke tobacco, or smoked tobacco in the last month? Yes / No
2. Have you ever had any of the following conditions?
 - a. Seizures (fits): Yes / No
 - b. Diabetes (sugar disease): Yes / No
 - c. Allergic reactions that interfere with your breathing: Yes / No
 - d. Claustrophobia (fear of closed-in places): Yes / No
 - e. Trouble smelling odors: Yes / No

3. Have you ever had any of the following pulmonary or lung problems?
- a. Asbestosis: Yes / No
 - b. Asthma: Yes / No
 - c. Chronic bronchitis: Yes / No
 - d. Emphysema: Yes / No
 - e. Pneumonia: Yes / No
 - f. Tuberculosis: Yes / No
 - g. Silicosis: Yes / No
 - h. Pneumothorax (collapsed lung): Yes / No
 - i. Lung cancer: Yes / No
 - j. Broken ribs: Yes / No
 - k. Any chest injuries or surgeries: Yes / No
 - l. Any other lung problem that you've been told about: Yes / No
4. Do you currently have any of the following symptoms of pulmonary or lung illness? Yes / No
- a. Shortness of breath: Yes / No
 - b. Shortness of breath when walking fast on level ground or walking up a slight hill or incline: Yes / No
 - c. Shortness of breath when walking with other people at an ordinary pace on level ground: Yes / No
 - d. Have to stop for breath when walking at your own pace on level ground: Yes / No
 - e. Shortness of breath when washing or dressing yourself: Yes / No
 - f. Shortness of breath that interferes with your job: Yes / No
 - g. Coughing that produces phlegm (thick sputum): Yes / No
 - h. Coughing that wakes you early in the morning: Yes / No
 - i. Coughing that occurs mostly when you are lying down: Yes / No
 - j. Coughing up blood in the last month: Yes / No
 - k. Wheezing: Yes / No
 - l. Wheezing that interferes with your job: Yes / No
 - m. Chest pain when you breathe deeply: Yes / No
 - n. Any other symptoms that might be related to lung problems: Yes / No
5. Have you ever had any of the following cardiovascular or heart problems?
- a. Heart attack: Yes / No
 - b. Stroke: Yes / No
 - c. Angina: Yes / No
 - d. Heart failure: Yes / No
 - e. Swelling in your legs or feet (not caused by walking): Yes / No
 - f. Heart arrhythmia (heart beating irregularly): Yes / No
 - g. High blood pressure: Yes / No
 - h. Any other heart problem that you've been told about: Yes / No
6. Have you ever had any of the following cardiovascular or heart symptoms? Yes / No
- a. Frequent pain or tightness in your chest: Yes / No
 - b. Pain or tightness in your chest during physical activity: Yes / No
 - c. Pain or tightness in your chest that interferes with your job: Yes / No

- d. In the past two years, have you noticed your heart skip or miss a beat? Yes / No
- e. Heartburn or indigestion that is not related to eating: Yes / No
- f. Any other symptoms that you think may be related to heart or circulation problems: Yes / No

7. Do you currently take medication for any of the following problems?

- a. Breathing or lung problems: Yes / No
- b. Heart trouble: Yes / No
- c. Blood pressure: Yes / No
- d. Seizures (fits): Yes / No

8. If you've ever used a respirator, have you ever had any of the following problems?

(If you've never used a respirator, check the following space and go to question 9:)

- a. Eye irritation: Yes / No
- b. Skin allergies or rashes: Yes / No
- c. Anxiety: Yes / No
- d. General weakness or fatigue: Yes / No
- e. Any other problem that interferes with your use of a respirator: Yes / No

9. Would you like to talk to the health care professional who will review this questionnaire about your answers to this questionnaire? Yes / No

Questions 10 to 15 below must be answered by every employee who has been selected to use either a full-face-piece respirator or a self-contained breathing apparatus (SCBA). For employees who have been selected to use other types of respirators, answering these questions is voluntary.

10. Have you ever lost vision in either eye (temporarily or permanently)? Yes / No

11. Do you currently have any of the following vision problems?

- a. Wear contact lenses: Yes / No
- b. Wear glasses: Yes / No
- c. Color blind: Yes / No
- d. Any other eye or vision problem: Yes / No

12. Have you ever had an injury to your ears, including a broken ear drum? Yes / No

13. Do you currently have any of the following hearing problems?

- a. Difficulty hearing: Yes / No
- b. Wear a hearing aid: Yes / No
- c. Any other hearing or ear problem: Yes / No

14. Have you ever had a back injury? Yes / No

15. Do you currently have any of the following musculoskeletal problems?

- a. Weakness in any of your arms, hands, legs, or feet: Yes / No
- b. Back pain: Yes / No
- c. Difficulty fully moving your arms and legs: Yes / No
- d. Pain and stiffness when leaning forward or backward at the waist: Yes / No
- e. Difficulty fully moving your head up or down: Yes / No
- f. Difficulty fully moving your head side to side: Yes / No
- g. Difficulty bending at your knees: Yes / No
- h. Difficulty squatting to the ground: Yes / No
- i. Climbing a flight of stairs or a ladder carrying more than 25 lbs: Yes / No
- j. Any other muscle or skeletal problem that interferes with using a respirator: Yes / No

Part B. Any of the following questions, and other questions not listed, may be added to the questionnaire at the discretion of the health care professional who will review the questionnaire.

1. In your present job, are you working at high altitudes (over 5,000 feet) or in a place that has lower than normal amounts of oxygen? Yes / No

If "yes," do you have feelings of dizziness, shortness of breath, pounding in your chest, or other symptoms when you're working under these conditions: Yes / No

2. At work or at home, have you ever been exposed to hazardous solvents, hazardous airborne chemicals (e.g., gases, fumes, or dust), or have you come into skin contact with hazardous chemicals? Yes / No

If "yes," name the chemicals if you know them: _____

3. Have you ever worked with any of the materials, or under any of the conditions, listed below? (e.g., grinding or welding this material):

- | | | | |
|------------------------------------|------------------|------------------------|----------|
| a. Silica (e.g., in sandblasting): | Yes / No | b. Asbestos: | Yes / No |
| c. Any other hazardous exposures: | Yes / No | d. Beryllium: | Yes / No |
| e. Coal (for example, mining): | Yes / No | f. Aluminum: | Yes / No |
| g. Iron: Yes/No | h. Tin: Yes / No | h. Dusty environments: | Yes / No |
| i. Tungsten/cobalt | Yes / No | | |

If "yes," describe these exposures: _____

4. List any second jobs or side businesses you have: _____

5. List your previous occupations: _____

6. List your current and previous hobbies: _____

7. Have you been in the military services? Yes/No

If "yes," were you exposed to biological or chemical agents (either in training or combat)? Yes / No

8. Have you ever worked on a HAZMAT team? Yes / No

9. Other than medications for breathing and lung problems, heart trouble, blood pressure, and seizures mentioned earlier in this questionnaire, are you taking any other medications for any reason (including over-the-counter medications): Yes / No

If "yes," name the medications if you know them: _____

10. Will you be using any of the following items with your respirator(s)?

- | | |
|---|-------------------------|
| a. HEPA Filters: Yes / No | b. Cartridges: Yes / No |
| c. Canisters (for example, gas masks): Yes / No | |

11. How often are you expected to use the respirator(s) (circle "yes" or "no" for all answers that apply to you)?

- a. Escape only (no rescue): Yes / No
- b. Emergency rescue only: Yes / No
- c. Less than 5 hours per week: Yes / No
- d. 2 to 4 hours per day: Yes / No
- e. Less than 2 hours per day: Yes / No
- f. Over 4 hours per day: Yes / No

12. During the period you are using the respirator(s), is your work effort:

a. **Light** (less than 200 kcal per hour)? Yes / No

If "yes," how long does this period last during the average shift: _____ hrs. _____ Min.

Examples of a light work effort are sitting while writing, typing, drafting, or performing light assembly work; or standing while operating a drill press (1-3 lbs.) or controlling machines.

b. **Moderate** (200 to 350 kcal per hour): Yes / No

If "yes," how long does this period last during the average shift: _____ hrs. _____ Min.

Examples of moderate work effort are sitting while nailing or filing; driving a truck or bus in urban traffic; standing while drilling, nailing, performing assembly work, or transferring a moderate load (about 35 lbs.) at trunk level; walking on a level surface about 2 mph or down a 5-degree grade about 3 mph; or pushing a wheelbarrow with a heavy load (about 100 lbs.) on a level surface.

c. **Heavy** (above 350 kcal per hour)? Yes / No

If "yes," how long does this period last during the average shift: _____ hrs. _____ Min.

Examples of heavy work are lifting a heavy load (about 50 lbs.) from the floor to your waist or shoulder; working on a loading dock; shoveling; standing while bricklaying or chipping castings; walking up an 8-degree grade about 2 mph; climbing stairs with a heavy load (about 50 lbs.).

13. Will you be wearing protective clothing and/or equipment (other than the respirator) when you're using the respirator? Yes / No

If "yes," describe this protective clothing and/or equipment: _____

14. Will you be working under hot conditions (temps. exceeding 77° F)? Yes / No

15. Will you be working under humid conditions? Yes / No

16. Describe the work you will be doing while using your respirator(s): _____

17. Describe any special or hazardous conditions you might encounter when you're using your respirator(s) (for example, confined spaces, life-threatening gases): _____

18. Provide the following information, if you know it, for each toxic substance that you'll be exposed to when you're using your respirator(s):

Name of first toxic substance: _____

Estimated maximum exposure level per shift: _____

Duration of exposure per shift: _____

Name of second toxic substance: _____

Estimated maximum exposure level per shift: _____

Duration of exposure per shift: _____

Name of third toxic substance: _____

Estimated maximum exposure level per shift: _____

Duration of exposure per shift: _____

Name of any other toxic substances you will be exposed to while using your respirator:

19. Describe any special responsibilities you'll have while using your respirator(s) that may affect the safety and well-being of others (for example, rescue, and security):

20. Additional Comments: _____

Employee Signature

Date

Chapter 15 Posting Requirements (Federal)

Federal law requires that employers conspicuously display the following posters where they can be read by their employees:

- ① ***Federal Minimum Wage*** — This posting explains the Federal Minimum Wage; Overtime Pay; Child Labor; and Enforcement.
- ② ***Equal Employment Opportunity is the Law*** — Reasons for Taking Leave; Advance Notice & Medical Certification; Jobs Benefit & Protection.
- ③ ***Notice Employee Polygraph Protection Act*** — Prohibitions; Exemptions; Examinee Rights; Enforcement; Additional Information.
- ④ ***You Have A Right to a Safe & Healthful Workplace — "IT'S THE LAW"***— Employers Holding Federal Contracts or Subcontracts; Private Employment State & Local Government Educational Institutions; Programs or Activities Receiving Federal Financial Assistance.
- ⑤ ***Your Rights Family & Medical Leave ACT*** — Reasons for Taking Leave; Advance Notice & Medical Leave; Jobs Benefit & Protection.
- ⑥ ***Your rights under USERRA*** — THE UNIFORMED SERVICES EMPLOYMENT AND REEMPLOYMENT RIGHTS ACT. ***USERRA*** protects the job rights of individuals who voluntarily or involuntarily leave employment positions to undertake military service. ***USERRA*** also prohibits employers from discriminating against past and present members of the uniformed services, and applicants to the uniformed services.

NOTE: Some states require the use of their own posters. Check with your State Labor Department for poster requirements.

§1903.2

Posting of notice; availability of the Act, regulations and applicable standards

(a) (1) Each employer shall post and keep posted a notice or notices, to be furnished by the Occupational Safety and Health Administration, U.S. Department of Labor, informing employees of the protections and obligations provided for in the Act, and that for assistance and information, including copies of the Act and of specific safety and health standards, employees should contact the employer or the nearest office of the Department of Labor. Such notice or notices shall be posted by the employer in each establishment in a conspicuous place or places where notices to employees are customarily posted. Each employer shall take steps to insure that such notices are not altered, defaced, or covered by other material.

(2) Where a State has an approved poster informing employees of their protections and obligations as defined in 1952.10 of this chapter, such poster, when posted by employers covered by the State plan, shall constitute compliance with the posting requirements of section 8(c)(1) of the Act. Employers whose operations are not within the issues covered by the State plan must comply with paragraph (a)(1) of this section.

(3) Reproductions or facsimiles of such Federal or State posters shall constitute compliance with the posting requirements of section 8(c)(1) of the Act where such reproductions or facsimiles are at least 8 ½ inches by 14 inches, and the printing size is at least 10 pt. Whenever the size of the poster increases, the size of the print shall also increase accordingly. The caption or heading on the poster shall be in large type, generally not less than 36 pt.

(b) Establishment means a single physical location where business is conducted or where services or industrial operations are performed. (For example: A factory, mill, store, hotel, restaurant, movie theatre, farm, ranch, bank, sales office, warehouse, or central administrative office.) Where distinctly separate activities are performed at a single physical location (such as contract construction activities from the same physical location as a lumber yard), each activity shall be treated as a separate physical establishment, and a separate notice or notices shall be posted in each such establishment, to the extent that such notices have been furnished by the Occupational Safety and Health Administration, U.S. Department of Labor. Where employers are engaged in activities which are physically dispersed, such as agriculture, construction, transportation, communications, and electric, gas and sanitary services, the notice or notices required by this section shall be posted at the location to which employees report each day. Where employees do not usually work at, or report to, a single establishment, such as longshoremens, traveling salesmen, technicians, engineers, etc., such notice or notices shall be posted at the location from which the employees operate to carry out their activities. In all cases, such notice or notices shall be posted in accordance with the requirements of paragraph (a) of this section.

(c) Copies of the Act, all regulations published in this chapter and all applicable standards will be available at all Area Offices of the Occupational Safety and Health Administration, U.S. Department of Labor. If an employer has obtained copies of these materials, he shall make them available upon request to any employee or his authorized representative for review in the establishment where the employee is employed on the same day the request is made or at the earliest time mutually convenient to the employee or his authorized representative and the employer.

(d) Any employer failing to comply with the provisions of this section shall be subject to citation and penalty in accordance with the provisions of section 17 of the act.

[36 FR 17850, Sept. 4, 1971, as amended at 39 FR 39036, Nov. 5, 1974]

Chapter 16 Stairway & Ladder Safety Plan



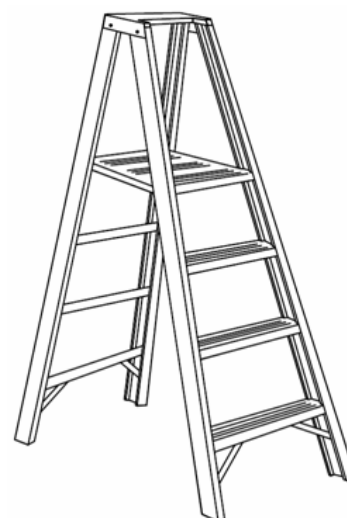
Allen Davidson is responsible for the implementation and enforcement of the following safety rules as they apply to ladder & stairway safety.

Arena Fire Protection, Inc. shall ensure that each employee has been trained by a competent person in the following areas:

- ★ The nature of all fall hazards in the work area.
- ★ The maximum intended load-carrying capacities of ladders and the correct procedures for erecting, maintaining, and disassembling the fall protection systems to be used.
- ★ The proper construction, use, placement, and care in handling of all stairways and ladders.

Contents

| | |
|--|-----------|
| Introduction | 1 |
| Ladder Ratings | 2 |
| Types of Portable Ladders | 2 |
| Selecting Ladders | 4 |
| Using Ladders | 4 |
| Transporting Ladders | 6 |
| Storing Ladders..... | 6 |
| Maintaining and Repairing Ladders | 7 |
| Ladder Hazards Checklist | 7 |
| Ladder Training | 8 |
| Safety Requirements for Stairways | 8 |
| Ladder and Stairway Glossary | 11 |



PLATFORM LADDER

Introduction

Ladders are indispensable tools. We take them for granted in our day-to-day work and use them extensively in virtually all industries. Though they come in many sizes, shapes, and styles, they all serve the same purpose: to help us move vertically.

They are simply built and easy to use, but they are not *always* user friendly. Each year, many workers are seriously injured when they fall from ladders. You do not have to fall far to get hurt; most workers injured in falls from ladders are less than 10 feet above the ladder's base of support.

Why do people fall from ladders if they are so easy to use? In general, most ladder falls involve *portable* ladders that move, tilt, or shift while a worker is climbing or descending. Unstable or slippery base surfaces are the primary reasons ladders fail.

Other reasons include a misstep or a slip of the foot, loss of balance, an overreach, and being struck by a vehicle or other object.

Workers can reduce ladder fall risks by doing the following:

- ★ Frequently inspect & maintain ladders.
- ★ Match tasks to appropriate ladders.
- ★ Set up ladders correctly.
- ★ Climb & descend ladders properly.

Employers, too, have a responsibility for training workers so they understand these safe work practices and can use them effectively. This chapter will help promote safe work practices for portable ladders, and we encourage you to use it as a basic reference.

Ladder Ratings

There are many types of portable ladders, but they all receive one of four ratings, based on their maximum working load (the maximum weight they can safely support). Before you use a ladder, check its rating and be sure not to subject it to a load greater than its rated capacity.

| <i>Rating</i> | <i>Working Load</i> |
|------------------------|----------------------------|
| Extra heavy duty (I-A) | 300 pounds |
| Heavy duty (I) | 250 pounds |
| Medium duty (II) | 225 pounds |
| Light duty (III) | 200 pounds |

Types of Portable Ladders

Workers climb up or down to do all sorts of tasks, so it is not surprising that ladders come in different types to help them accomplish those tasks. Portable ladders are either non-self-supporting (such as the straight ladder) or self-supporting (such as the standard step ladder). Within one of these two categories, you are likely to find the right size, shape, and type of ladder to accomplish your task.

Non-Self-Supporting Ladders

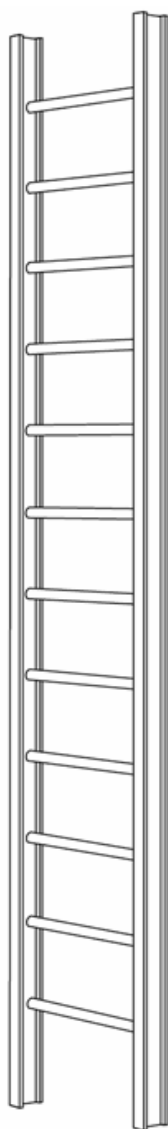
Single Portable or Straight Ladder

The single portable or straight ladder is indispensable for general use. It is the most common type of portable ladder and has the widest range of applications. When used on slippery surfaces, this ladder must have slip-resistant feet or be secured to prevent it from sliding.

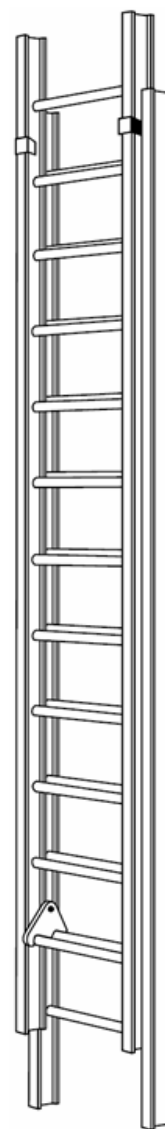
Rubber or neoprene ladder shoes are recommended for smooth, dry surfaces, and spikes are recommended for snow or ice. Single portable ladders must not be longer than 30 feet and are intended for use by only one worker at a time. Such ladders are available in wood, metal, and reinforced fiberglass.

Extension or Section Ladder

Extension ladders offer the greatest length in a general purpose ladder. The ladder consists of two or more sections that travel in guides or brackets, allowing adjustable lengths. The sections must be assembled so that the sliding upper section is on top of the lower section. Each section must overlap its adjacent section a minimum distance, based on the ladder's overall length.



STRAIGHT LADDER



EXTENSION LADDER

The overall length is determined by the lengths of the individual sections, measured along the side rails. The table shows the minimum overlap for ladders up to 60 feet long.

| <i>Ladder Length</i> | <i>Overlap</i> |
|-----------------------------|----------------|
| Up to and including 36 feet | 3 feet |
| Over 36 through 48 feet | 4 feet |
| Over 48 through 60 feet | 5 feet |

Note: Install positive stops on individual ladder sections to ensure the required overlap.

Extension ladders are made of wood, metal, or reinforced fiberglass. Wood ladders cannot have more than two sections and must not exceed 60 feet. Metal and fiberglass ladders can have as many as three sections; however, the overall length must not exceed 72 feet. Individual sections of any extension ladder must not be longer than 30 feet. Extension ladders are for use by only one person at a time.

Make sure extension ladders have non-slip bases if there's a chance the ladder can slip. Cord-face ladder shoes are recommended for wet surfaces, rubber or neoprene ladder shoes for smooth dry floor surfaces, and steel spikes for ice or snow. Be careful if you use an extension ladder on oily, metal, or concrete surfaces. Place the ladder securely and tie it off to prevent it from slipping.

Self-Supporting Ladders

Standard Stepladder

The standard stepladder, a general purpose ladder, has flat steps and a hinged back. It is self-supporting and nonadjustable. An ***industrial*** model, designed for heavy service demands, has oversize back legs, heavy-duty flat steps, and knee braces that increase rigidity and durability.

Standard stepladders should be used only on surfaces that offer firm, level footing such as floors, platforms, and slabs. They are available in metal, wood, or reinforced fiberglass versions, and are intended to support only one worker at a time. Remember not to stand on, or work from, the top step. The ladders must have a metal spreader or locking arms. They can not be longer than 20 feet, measured along the front edge of the side rails.



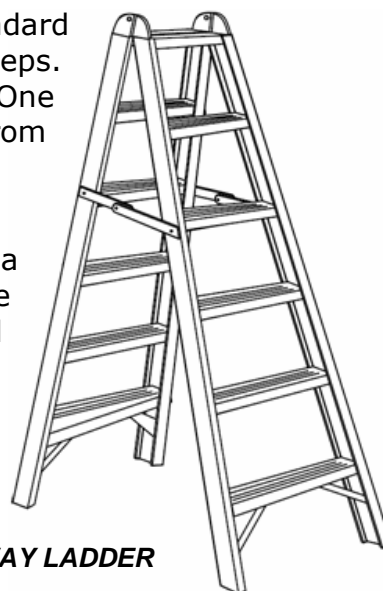
STANDARD STEPLADDER

Two-Way Stepladder

The two-way stepladder is similar to the industrial standard stepladder; however, each side of this ladder has a set of steps. The extra set of steps offers convenience and versatility: One person can work from either side or two people can work from the ladder at the same time — one on each side.

Platform Ladder

The platform ladder is a special-purpose ladder that has a large stable platform from which you can work at the highest standing level. The ladder's length is determined by the length of the front edge of the side rail from the bottom of the ladder to the base of the platform. The length of a platform ladder can not exceed 20 feet.

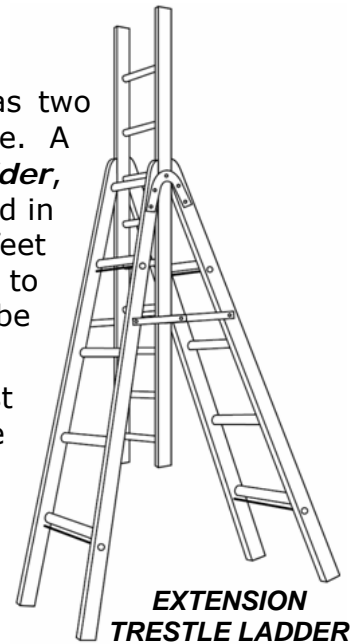


TWO-WAY LADDER

Trestle Ladder

A trestle ladder is a self-supporting portable ladder that has two sections hinged at the top, forming equal angles with the base. A variation of the trestle ladder, the ***extension trestle ladder***, includes a vertically adjustable single ladder that can be locked in place. (The single extension section must lap at least three feet into the base section.) Trestle ladders are used in pairs to support planks or staging. The rungs are not intended to be used as steps.

The angle of spread between open front and back legs must be 5 ½ inches per foot of length. The length can not be more than 20 feet, measured along the front edge of the side rails. Rails must be beveled at the top and have metal hinges to prevent spreading. Metal spreaders or locking devices are also required to keep the rails in place.



**EXTENSION
TRESTLE LADDER**

Selecting Ladders

Ladders come in different types because workers who use them have different needs. In the previous section, major types of portable ladders were identified and the tasks for which they are appropriate. However, many of the special-purpose ladders were omitted, which are usually variations of general purpose ladders, designed to meet a special need.

Examples include: platform, trolley, side-rolling, shaft, and manhole ladders. The important point: You are likely to save time and energy and reduce your risk of injury if you choose the right ladder for your task or job.

Using Ladders

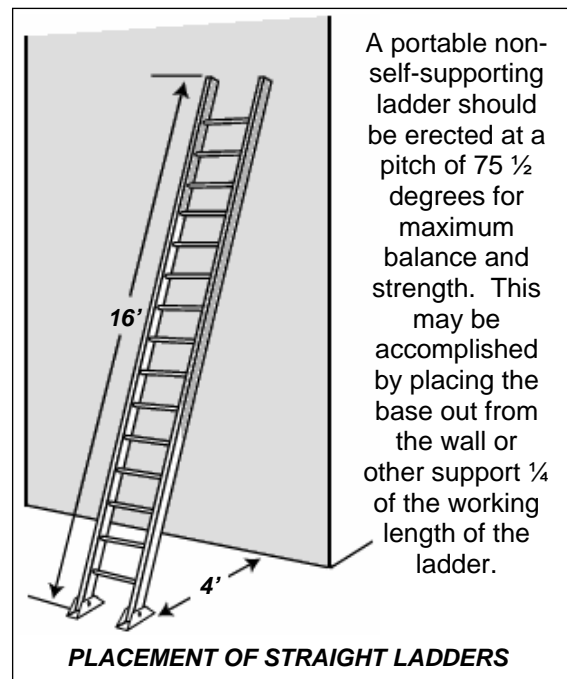
Ladders are easier and safer to use when you match them with the appropriate task. Still, most portable-ladder accidents happen when workers do one or more of the following: fail to inspect ladders regularly, place ladders inappropriately, or ignore safe practices when climbing or descending. The guidelines below address each of these issues.

At the Beginning of Each Job

- ❑ Select the appropriate ladder for your task or job.
- ❑ Inspect the ladder before you use it. Make sure it is in sound condition — clean and undamaged.

Placing a Ladder

- ❑ Move the ladder near the work you are doing.
- ❑ Angle the ladder properly. The base should extend not less than one-fourth the ladder's length. The minimum slope should be 50 degrees.
- ❑ Place a solid rest for the rail tops across window openings.
- ❑ Protect the base of a tall, occupied ladder if it could be struck by vehicles or pedestrians.

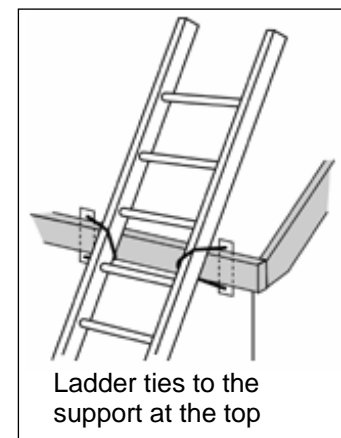
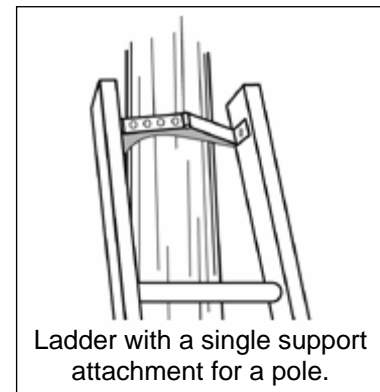
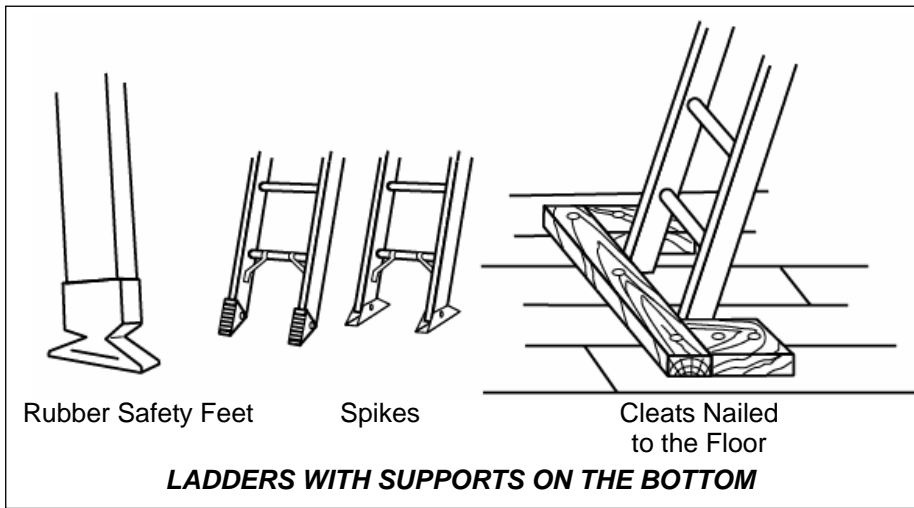


A portable non-self-supporting ladder should be erected at a pitch of 75 ½ degrees for maximum balance and strength. This may be accomplished by placing the base out from the wall or other support ¼ of the working length of the ladder.

PLACEMENT OF STRAIGHT LADDERS

Avoid

- ★ Never place a ladder in front of an unlocked, unguarded door.
- ★ Never place a ladder on boxes, tables, trucks, or other moveable objects.



Securing a Ladder

- ☐ Nail or lash a ladder in place if it will be used repeatedly in the same spot.
- ☐ Select a ladder that will extend at least 36 inches above the access area it is serving.

Avoid

- ★ Working on ladders in exposed areas during a severe storm or strong wind.
- ★ Working on ladders covered with ice or snow.
- ★ Using a portable ladder if an approved stairway could be used instead.

Ascending and Descending

- ☐ Face the ladder at all times.
- ☐ Grasp the side rails with both hands; you have a better chance of avoiding a fall if a rung or step fails.
- ☐ Raise and lower heavy, awkward loads with a hand line or hoist.
- ☐ Attach light, compact tools or materials to the ladder or to yourself.

Avoid

- ★ Sliding down the ladder.
- ★ Climbing when your hands or shoes are slippery.
- ★ Using your hands for carrying items.
- ★ Carrying awkward loads when ascending or descending a ladder.
- ★ Placing tools or materials on a ladder if they could fall off.

Metal Ladders

- ☐ Make sure steps and rungs have a skid-resistant surface that minimizes the risk of slipping. ("Skid resistant" means corrugated, knurled, dimpled, or coated with skid-resistant material.)

Avoid

- ★ Using any ladder with conductive side rails near exposed, energized equipment. (Such ladders must be permanently, legibly marked with the words, ***“WARNING — Do Not Use Around Energized Electrical Equipment.”***)

Precautions

- ☐ Place both feet firmly on the ladder rungs and steps.
- ☐ Make sure only one person stands on, or works from, a standard ladder. (Use a scaffold or a second ladder if two or more people are doing the same task.)
- ☐ Immediately inspect any ladder that has collapsed, tipped over, or been exposed to oil or grease. Clean and repair the ladder if necessary.
- ☐ Remove defective ladders from service. Tag or mark defective ladders with the words: ***“Dangerous, Do Not Use.”***
- ☐ Make sure an extension ladder extends at least 36 inches above an access landing.
- ☐ Keep the area around the top and bottom of a ladder free of debris.
- ☐ Keep the load on the ladder (including yourself) below its maximum load capacity.

Do Not

- ★ Do not paint ladders. Paint conceals defects. Use transparent preservatives instead.
- ★ Do not use ladders with broken, patched, oily, or cracked rails, rungs, or steps.
- ★ Do not reach out over the side rails, lean, or turn excessively on a ladder.
- ★ Do not use a ladder as guy, brace, or skid.
- ★ Do not stand or sit on the top two steps of a stepladder.
- ★ Do not use a self-supporting ladder without first opening it up and securing the metal spreader or locking device.
- ★ Do not load a ladder beyond its maximum load capacity.

Transporting Ladders

Some ladders are easier to move than others. Here are a few guidelines to help you protect ladders and the people who use them.

- ☐ When you hand-carry a ladder, keep the front end elevated, especially around blind corners, in aisles, and through doorways. You will reduce the chance of striking another person with the front of the ladder.
- ☐ When you transport a ladder in a truck or trailer, place it parallel to the bed. Avoid tossing, throwing, or dropping it in the bed.
- ☐ If you transport a long ladder on a short truck bed over long distances, support the ladder so it will not sag or bend.
- ☐ Drive slowly over rough terrain. Tie the ladder securely to eliminate nicking, gouging, chafing, and road shock.

Storing Ladders

Another way to prolong a ladder's life is to store it properly. Here are some useful storage tips:

- ☐ The storage area should be well ventilated.

- ▣ Wood ladders should not be exposed to moisture or excessive heat. Avoid storing ladders near stoves, steam pipes, or radiators.
- ▣ Store straight or extension ladders in flat racks or on wall brackets. Make sure there are enough brackets to support the ladder so that it does not sag. If the ladder rails have a lateral curve, the wall brackets should match the curve.
- ▣ Store stepladders vertically, in a closed position, to reduce the risk of sagging or twisting. Secure stored ladders so that they will not tip over if they are struck.
- ▣ Store ladders, especially wood ladders, promptly after using them. Exposure to moisture and sun will shorten the life of a wood ladder.

Maintaining and Repairing Ladders

Neglected ladders quickly become unsafe ladders. Step bolts slacken, step sockets and other joints work loose, hole sizes increase — eventually the ladder becomes twisted and unstable.

Periodic maintenance extends a ladder's life and saves replacement costs. Maintenance includes regular inspection of the ladder, repairing damage and tightening step bolts and other fastenings.

- ▣ Replace lower steps on wooden ladders when one-fourth of the step surface is worn away. Typically, the center of a step receives the most wear. (Mineral abrasive or other skid-resistant material reduces wear.)
- ▣ Do not use cleats to repair rung ladders.
- ▣ Do not paint a wood ladder — paint conceals defects.
- ▣ Consider stocking repair parts if you use different types of ladders. Typical parts include ladder bolts, related hardware, and lower steps or rungs (which wear out faster than upper steps or rungs).

Improving Slip Resistance

Slip-resistant materials are often used on industrial ladder treads. Notable is the anti-slip treatment on metal platform ladders used in file and parts rooms, tool cribs, and frozen-food lockers. The obvious benefit of slip-resistant material is that it reduces fall risks when a worker is climbing or descending.

Ladder Hazards Checklist

Begin your work with a ladder that will not let you down. Use the checklist below to make sure the ladders you use are hazard free. (Your answers to all checklist questions should be YES!)

- ▣ Are ladders kept in good condition?
- ▣ Are the joints between steps and side rails tight, all hardware and fittings securely attached, and movable parts operating freely without binding or excessive play?
- ▣ Are non-slip safety feet on each single or multiple-section portable rung-type ladder?
- ▣ Are ladder rungs and steps kept free of grease and oil?
- ▣ Are workers instructed to face the ladder when ascending/descending it?
- ▣ Are workers prohibited from using ladders that have missing steps, rungs, cleats, broken side rails, or other faulty parts?
- ▣ Are workers instructed not to stand or step on the top step of any portable ladder?

- ☐ When portable ladders are used to reach elevated platforms and roofs, does the ladder extend at least 36 inches above the elevated surface?
- ☐ Are portable metal ladders legibly marked with signs reading **“CAUTION — Do Not Use Around Electrical Equipment”** or equivalent wording?
- ☐ Are steps, rungs, or cleats of ladders spaced no more than 12 inches apart?
- ☐ Are portable ladders secured or lashed to prevent displacement when they are used?
- ☐ Are wood cleats attached to the side rails of job-made ladders in one of the following ways:
 - ★ By housing the cleats into the side rails by at least one-half inch.
 - ★ By securing wood strips (same thickness as the cleats) to the side rails between each cleat.
 - ★ By securing the cleats to the side rails with bolts.
- ☐ Is there at least seven inches of space behind the cleats to allow secure footing?

Ladder Training

Employers have a responsibility to ensure that their employees understand how to inspect and use ladders correctly. Use the following checklist to evaluate the training employees receive. (Your answers to these checklist questions should be YES!)

- ☐ Have you provided a training program for each employee who uses a ladder?
- ☐ Does the training enable each employee to recognize and minimize ladder hazards?
- ☐ Has each employee been trained by a competent person in the following areas, when applicable?
 - ★ The nature of fall hazards in the work area?
 - ★ How to correctly use, place, handle, and maintain ladders?
 - ★ The maximum load-carrying capacities of ladders used?
 - ★ OSHA requirements for the types of ladders that will be used?

Safety Requirements for Stairways

The rules covering stairways and their components generally depend on how and when stairs are used. Specifically, there are rules for stairs used during construction and stairs used temporarily during construction, as well as rules governing stair rails and handrails.

Stairways Used During Construction

The following requirements apply to all stairways used during construction:

- ☐ Stairways that will not be a permanent part of the building under construction must have landings at least 30 inches deep and 22 inches wide at every 12 feet or less of vertical rise.
- ☐ Stairways must be installed at least 30 degrees —and no more than 50 degrees—from the horizontal.
- ☐ Variations in riser height or stair tread depth must not exceed one-quarter inch in any stairway system, including any foundation structure used as one or more treads of the stairs.

- ▣ Doors and gates opening directly onto a stairway must have a platform that extends at least 20 inches beyond the swing of the door or gate.
- ▣ Metal pan landings and metal pan treads must be secured in place before filling.
- ▣ Stairway parts must be free of dangerous projections such as protruding nails.
- ▣ Slippery conditions on stairways must be corrected.
- ▣ Workers must not use spiral stairways that will not be a permanent part of the structure.

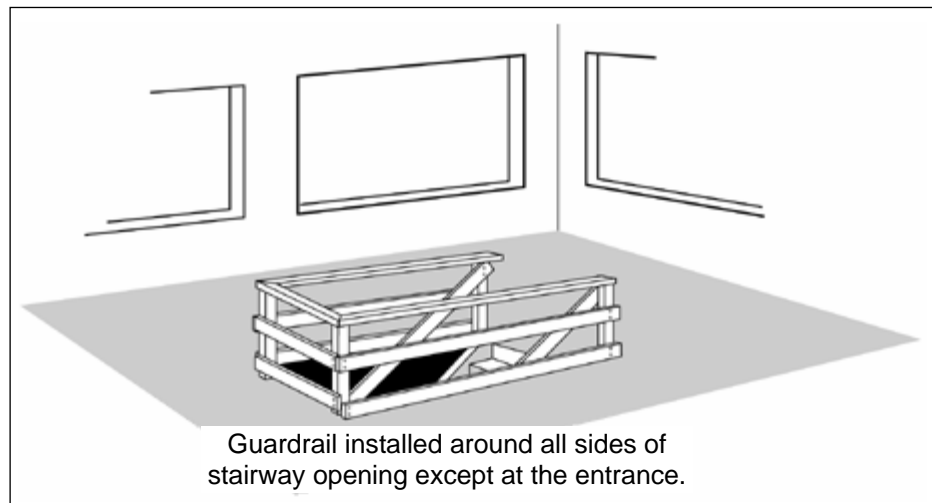
Temporary Stairs

The following requirements apply to stairways used temporarily during construction.

Except during construction of the stairway:

- ▣ Do not use stairways with metal pan landings and treads if the treads and/or landings have not been filled in with concrete or other materials unless the pans of the stairs and/or landings are temporarily filled in with wood or other materials. All treads and landings must be replaced when worn below the top edge of the pan.
- ▣ Do not use skeleton metal frame structures and steps (where treads and/or landings will be installed later) unless the stairs are fitted with secured temporary treads and landings.

Note: Temporary treads must be made of wood or other solid material and installed the full width and depth of the stair.



Stair Rails

The following general requirements apply to all stair rails:

- ▣ Stairways with four or more risers or rising more than 30 inches in height – whichever is less – must be installed along each unprotected side or edge. When the top edge of a stair rail system also serves as a handrail, the height of the top edge must be no more than 37 inches nor less than 36 inches from the upper surface of the stair rail to the surface of the tread.
- ▣ Top edges of stair rail systems used as handrails must not be more than 37 inches high nor less than 36 inches from the upper surface of the stair rail system to the surface of the tread. (If installed before March 15, 1991, not less than 30 inches).
- ▣ Stair rail systems and handrails must be surfaced to prevent injuries such as punctures or lacerations and to keep clothing from snagging.
- ▣ Ends of stair rail systems and handrails must be built to prevent dangerous projections, such as rails protruding beyond the end posts of the system.

In addition:

- ☐ Unprotected sides and edges of stairway landings must have standard 42-inch guardrail systems.
- ☐ Intermediate vertical members, such as balusters used as guardrails, must not be more than 19 inches apart.
- ☐ Other intermediate structural members, when used, must be installed so that no openings are more than 19 inches wide.
- ☐ Screens or mesh, when used, must extend from the top rail to the stairway step and along the opening between top rail supports.

Handrails

Requirements for handrails are as follows:

- ☐ Handrails and top rails of the stair rail systems must be able to withstand, without failure, at least 200 pounds of weight applied within 2 inches of the top edge in any downward or outward direction, at any point along the top edge.
- ☐ Handrails must not be more than 37 inches high nor less than 30 inches from the upper surface of the handrail to the surface of the tread.
- ☐ Handrails must provide an adequate handhold for employees to grasp to prevent falls.
- ☐ Temporary handrails must have a minimum clearance of 3 inches between the handrail and walls, stair rail systems and other objects.
- ☐ Stairways with four or more risers, or that rise more than 30 inches in height – whichever is less – must have at least one handrail.
- ☐ Winding or spiral stairways must have a handrail to prevent use of areas where the tread width is less than 6 inches.

Midrails

Midrails, screens, mesh, intermediate vertical members or equivalent intermediate structural members must be provided between the top rail and stairway steps to the stair rail system. When midrails are used, they must be located midway between the top of the stair rail system and the stairway steps.

Employers must train all employees to recognize hazards related to ladders and stairways, and instruct them to minimize these hazards. For example, employers must ensure that each employee is trained by a competent person in the following areas, as applicable:

- ☐ Nature of fall hazards in the work area;
- ☐ Correct procedures for erecting, maintaining and disassembling the fall protection systems to be used;
- ☐ Proper construction, use, placement and care in handling of all stairways and ladders; and
- ☐ Maximum intended load-carrying capacities of ladders used.

Note: Employers must retrain each employee as necessary to maintain their understanding and knowledge on the safe use and construction of ladders and stairs.

Ladder & Stairway Glossary

Check — A lengthwise separation of the wood that occurs across the rings of annual growth.

Cleat — A rectangular ladder crosspiece placed on edge, upon which a person may step while ascending or descending.

Competent person — A person who can identify existing and predictable hazards in the work environment and who has authorization to take prompt measures to eliminate the hazards.

Decay — Disintegration due to action of wood-destroying fungi. Also known as dote or rot.

Extension ladder — A non-self-supporting portable ladder that is adjustable in length. It consists of two or more sections in guides or brackets that permit length adjustment. Length is designated by the sum of the lengths of each section, measured along the side rails.

Extension trestle ladder — A self-supporting portable ladder that is adjustable in length, consisting of a trestle ladder base and a vertically adjustable single ladder with means for locking the ladders together. Length is designated by the length of the trestle ladder base.

Failure — Load refusal, breakage or separation of components.

Fastening — A device that attaches a ladder to a structure, building, or equipment.

Handrail — A rail used to provide employees with a handhold for support.

Job-made ladder — A ladder that is fabricated by employees, typically at the construction site; non-commercially manufactured.

Load refusal — The point where the structural members lose their ability to carry the load.

Ladder — An appliance usually consisting of two side rails joined at regular intervals by crosspieces called steps, rungs, or cleats on which a person steps when ascending or descending.

Platform ladder — A self-supporting ladder of fixed size with a platform at the working level.

Point of access — All areas used by employees for work-related passage from one area or level to another.

Riser height — The vertical distance from the top of a tread or platform/landing to the top of the next higher tread or platform/landing.

Rungs — Ladder crosspieces of circular or oval cross-section on which a person steps when ascending or descending.

Safety feet means a safety device placed on the foot of the side rails to reduce the likelihood of the base slipping. Safety feet may be flat pads covered with a nonslip material, pointed metal projections, or spur wheels.

Sectional ladder — A non-self-supporting portable ladder, nonadjustable in length, consisting of two or more sections that function as a single ladder. Its length is designated by the overall length of the assembled sections.

Single (or straight) ladder — A single section non-self-supporting portable ladder, nonadjustable in length. Its length is measured along a side rail.

Special-purpose ladder — A general-purpose portable ladder with modified features for specific uses.

Step ladder — A self-supporting portable ladder, nonadjustable in length that has flat steps and a hinged back. Length is measured along the front edge of a side rail.

Steps — The flat crosspieces of a ladder on which a person steps when ascending or descending.

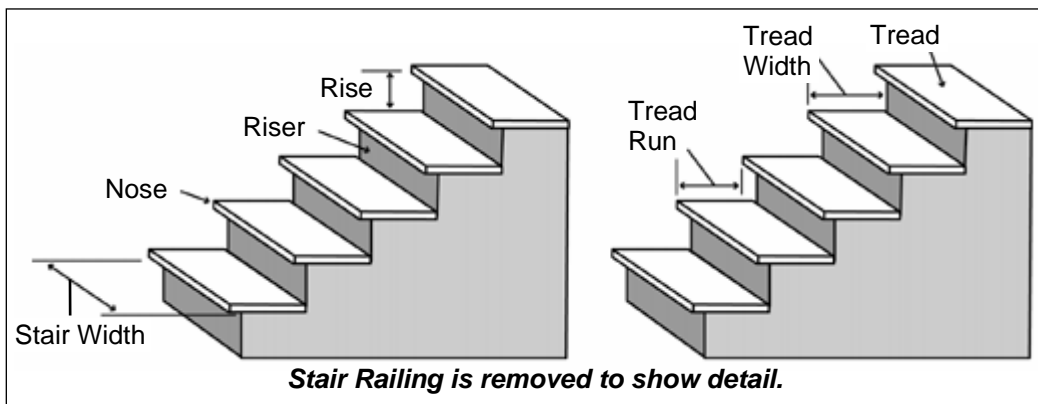
Temporary service stairway — A stairway where permanent treads and/or landings are to be filled in at a later date.

Tread — The horizontal member of a step.

Tread depth — The horizontal distance from front to back of a tread, excluding nosing, if any.

Tread width — The horizontal distance from front to back of the tread, including nosing.

Trestle ladder — A self-supporting portable ladder, nonadjustable in length, which consists of two sections hinged at the top to form equal angles with the base. Length is measured along the front edge of a side rail.



Section Notes:

Chapter 17 Fall Protection in Construction

Allen Davidson is responsible for the implementation and enforcement of the following safety rules as they apply to fall protection. Disciplinary procedures will be enforced.

What is Fall-Protection?

Go to any construction site and watch those who are working above a lower level. Should they be wearing fall protection? Should they be protected by fall-protection systems? Should they be using fall-protection methods? Do they need fall-protection training? Are they following fall-protection rules? Fall protection is a concept that is hard to describe. Ask 10 people what fall protection means and you are likely to get 10 different answers. Is it possible to make sense of fall protection? We think so.

This guide helps you understand fall protection and is intended for construction industry employers, employees, and others who do not have a professional background in fall protection and who want to see the "big picture." Generally, the guide covers the safe practices in Subpart M, the primary fall-protection rules for construction-industry employers.

Why We Need Protection from Falling

We need protection because even those of us with experience working at heights can lose our balance or grip; we can slip, trip, or misstep at any time. We may think that our reflexes will protect us, but we are falling before we know it, and we do not have to fall far to be seriously injured. We have been falling since Day One. Until we get better at landing, we will need protection from falling.

How Should We Protect Ourselves from Falling?

For many in the construction industry, fall-protection equipment is the first thing that comes to mind: personal fall-arrest systems, safety nets, or guardrails, for example. But fall protection means more than equipment. Fall protection is what you do to eliminate fall hazards, to prevent falls, and to ensure that workers who may fall are not injured. You accomplish fall protection by doing the following:

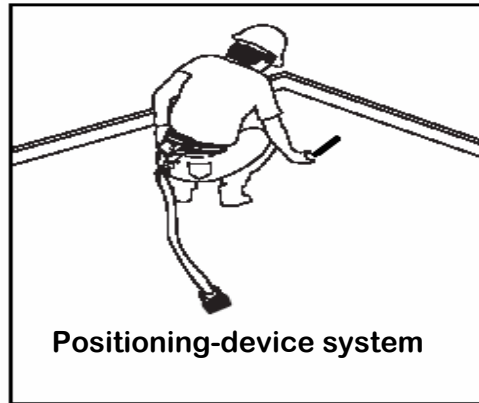
- ▣ Make fall protection part of your workplace-safety-and-health program.
- ▣ Identify and evaluate fall hazards.
- ▣ Eliminate fall hazards, if possible.
- ▣ Train workers to recognize fall hazards.
- ▣ Use appropriate equipment to prevent falls and to protect workers if they do fall.
- ▣ Inspect and maintain fall-protection equipment before and after using it.
- ▣ Become familiar with Subpart M fall-protection rules.



The correct personal fall-protection gear will arrest this man's fall and prevent serious injuries

Preventing and Controlling Falls

- ▣ What is a fall-protection system?
- ▣ What to consider when selecting a fall-protection system
- ▣ Personal fall-arrest systems
- ▣ Personal fall-restraint systems
- ▣ Positioning-device systems
- ▣ Guardrail systems
- ▣ Safety-net systems
- ▣ Warning-line systems for roofing work
- ▣ Safety monitoring for roofing work
- ▣ Catch platforms
- ▣ Covers for holes
- ▣ Fences and barricades
- ▣ Protecting workers from falling objects



What is a Fall-Protection System?

If workers will be exposed to fall hazards that you can't eliminate, you'll need to prevent falls from occurring or ensure that if workers do fall, they aren't injured. A fall-protection system is designed to prevent or arrest falls. The table below shows the fall-protection systems covered in Subpart M.

| Fall-Protection Systems | |
|---------------------------------------|--|
| Type of fall-protection system | What it does |
| Personal fall-arrest system | Arrests a fall |
| Personal fall-restraint system | Prevents a fall |
| Positioning-device system | Positions a worker and limits a fall to two feet |
| Guardrail system | Prevents a fall |
| Safety-net system | Arrests a fall |
| Warning-line system for roofing work | Warns a worker of a fall hazard |
| Slide-guard system for roofing work | Prevents workers from sliding down sloped roofs |

Other Fall-Protection Methods

The following methods may also be appropriate for preventing falls:

- ★ **Safety monitoring for roofing work** — A method in which a person — rather than a mechanical system — warns roofers when they are in danger of falling. The monitor, who must be a competent person, is responsible for recognizing the hazards and warning workers about them.
- ★ **Catch platforms** — Though not covered in Subpart M, catch platforms are an acceptable method of protecting workers from falls.
- ★ **Covers for holes** — Simple and effective when they are properly installed, rigid covers prevent workers from falling through temporary holes, openings, and skylights in walking/working surfaces.
- ★ **Fences and barricades** — Use a fence or similar barricade to keep people away from wells, pits, and shafts.

What to Consider When Selecting a Fall-Protection System

Appropriate fall-protection systems have the following characteristics:

- ▣ They are affordable.
- ▣ They offer the least interference with workers' tasks or activities.
- ▣ They prevent falls or protect workers who do fall.

Wherever possible, eliminate fall hazards. Identify hazards that you can not eliminate and evaluate each one. The evaluation will help you determine appropriate fall-protection systems for your work site. Consider the following:

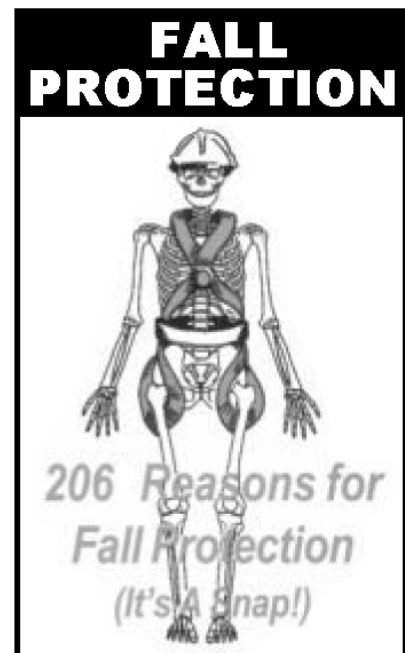
- ▣ What is the fall distance from the walking/working surface to the next lower level?
- ▣ How many workers are exposed to the hazard?
- ▣ What tasks and work areas are associated with the hazard?
- ▣ How will the workers move — horizontally, vertically, or in both directions — to do their tasks?
- ▣ Are secure anchorages available or can they be easily installed near the hazard?
- ▣ Are there other hazards near the work area, such as overhead power lines?
- ▣ How will workers be promptly rescued if they are suspended in a personal fall-arrest system?

Personal Fall-Arrest Systems

A personal fall-arrest system consists of an anchorage, connectors, and a full-body harness that work together to stop a fall and to minimize the arrest force. Other parts of the system may include a lanyard, a deceleration device, and a lifeline. The personal fall-arrest system is effective only if you know how all of the components work together to stop a fall.

Before you use a personal fall-arrest system, you should know the following:

- ★ How to select and install a secure anchorage.
- ★ How to select and use connectors.
- ★ How to put on and use a full-body harness.
- ★ How to correctly attach and use a lanyard.
- ★ When a deceleration device is necessary.
- ★ How to erect and use a lifeline.
- ★ The correct procedures for using retractable devices.
- ★ How to estimate fall distances.
- ★ How to avoid swing falls.
- ★ How to inspect and maintain the system.
- ★ How you will be promptly rescued if you fall.



The Anchorage

An anchorage is a secure point of attachment for lifelines, lanyards, or deceleration devices. How can you be sure that an anchorage is secure? An anchorage for a personal fall-arrest system must support at least 5,000 pounds. Anchorages that can not support 5,000 pounds must be designed and installed under the supervision of a qualified person and must be able to maintain a safety factor of at least two — twice the impact force of a worker free-falling six feet. If you do not know how much weight an anchorage will support, have a qualified person check it before you trust your life to it. Anchorage strength is critical, but is not the only factor to consider. Also important:

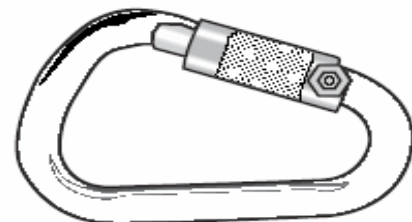
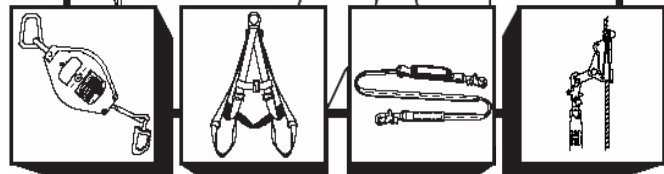
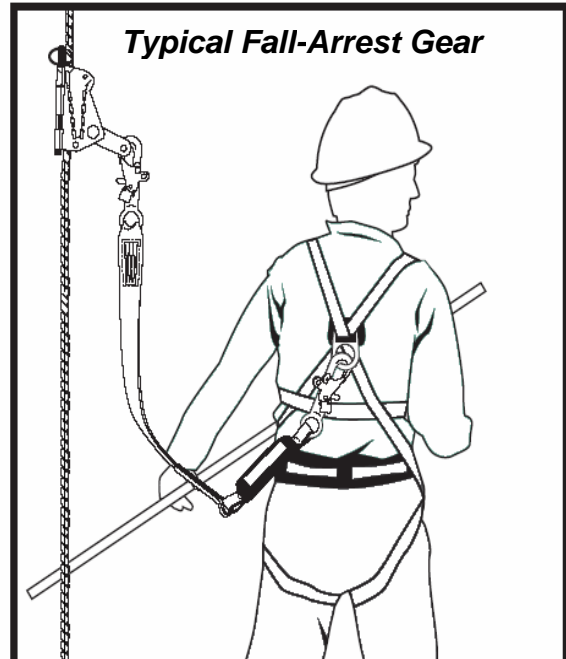
Anchorage connector — Unless an existing anchorage has been designed to accept a lanyard or lifeline, you'll need to attach an anchorage connector — a device that provides a secure attachment point. Examples include tie-off adapters, hook anchors, beam connectors, and beam trolleys. Be sure that the connector is compatible with the lanyard or lifeline and appropriate for the work task.

Attachment point — The anchorage can be used only as the attachment point for a personal fall-arrest system; it can not be used to support or suspend platforms.

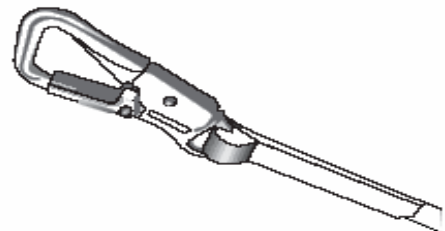
Location — The anchorage should be located directly above the worker, if possible, to reduce the chance of a swing fall.

Fall distance — Because a personal fall-arrest system does not prevent a fall, the anchorage must be high enough above a worker to ensure that the arrest system, and not the next lower level, stops the fall. Consider free-fall distance, lanyard length, shock-absorber elongation, and body-harness stretch in determining the height of an anchorage. Free-fall distance is the distance a worker falls before a personal fall-arrest system begins to stop the fall.

Connectors — An anchorage, a lanyard, and a body harness are not useful until they are linked together. Connectors do the linking; they make the anchorage, the lanyard, and the harness a complete system. Connectors include carabiners, snap hooks, and D-rings.



Carabiner



Snap Hook

Carabiner — This high-tensile alloy steel connector has a locking gate and is used mostly in specialized work such as window cleaning and high-angle rescue. Carabiners must have a minimum tensile strength of 5,000 pounds.

Snap hook — A hook-shaped member with a keeper that opens to receive a connecting component and automatically closes when released. Snap hooks are typically spliced or sewn into lanyards and self-retracting lifelines. Snap hooks must be high-tensile alloy steel and have a minimum tensile strength of 5,000 pounds. Use only locking snap hooks with personal fall-arrest systems; locking snap hooks have self-locking keepers that will not open until they are unlocked.

D-ring — D-rings are the attachment points sewn into a full-body harness. D-rings must have a minimum tensile strength of 5,000 pounds.

The full-body harness — The full-body harness has straps that distribute the impact of a fall over the thighs, waist, chest, shoulders, and pelvis. Full-body harnesses come in different styles, many of which are light and comfortable. Before you purchase harnesses, make sure that they fit those who will use them, that they're comfortable, and that they're easy to adjust. A full-body harness should include a back D-ring for attaching lifelines or lanyards and a back pad for support. Never use a body belt as part of a personal fall-arrest system.

Purchasing a full-body harness for a personal fall-arrest system?

Keep the following in mind:

- ❑ The harness must be made from synthetic fibers.
- ❑ The harness must fit the user. It should be comfortable and easy to adjust.
- ❑ The harness must have an attachment point, usually a D-ring, in the center of the back at about shoulder level. The D-ring should be large enough to easily accept a lanyard snap hook.
- ❑ Chest straps should be easy to adjust and strong enough to withstand a fall without breaking.
- ❑ Use only industrial full-body harnesses (not recreational climbing harnesses).
- ❑ The harness must be safe and reliable. It should meet ANSI and CSA standards and the manufacturer should have ISO 9001 certification, which shows the manufacturer meets international standards for product design, development, production, installation, and service.

Lanyards

A lanyard is a specially designed flexible line that has a snap hook at each end. One snap hook connects to the body harness and the other connects to an anchorage or a lifeline. Lanyards must have a minimum breaking strength of 5,000 pounds. They come in a variety of designs, including self-retracting types that make moving easier and shock absorbing types that reduce fall-arrest forces. Do not combine lanyards to increase length or knot them to make them shorter.

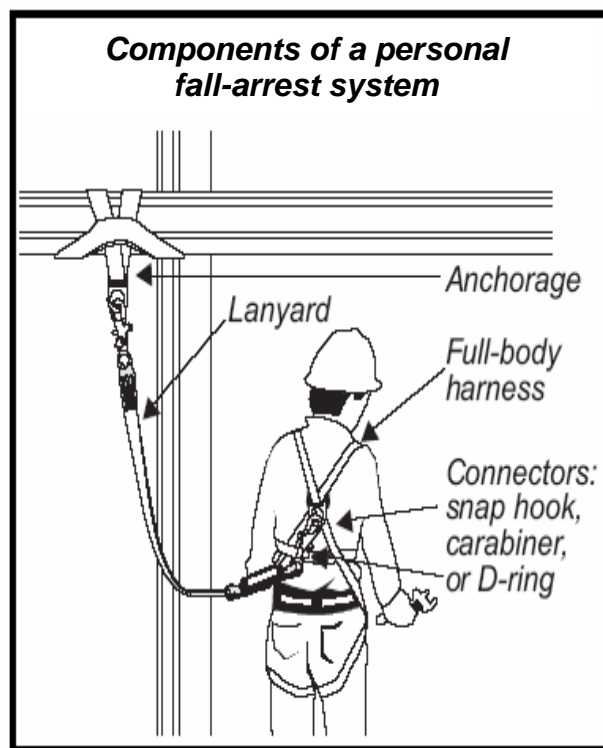
Deceleration Devices

Deceleration devices protect workers from the impact of a fall and include shock-absorbing lanyards, self-retracting lifelines or lanyards, and rope grabs.

Shock-absorbing lanyard — A shock absorber reduces the impact on a worker during fall arrest by extending up to 3.5 feet to absorb the arrest force. Subpart M rules limit the arrest force to 1,800 pounds but a shock-absorbing lanyard can reduce the force even more — to about 900 pounds. Because a shock-absorbing lanyard extends up to 3.5 feet, it's critical that the lanyard stops the worker before the next lower level. Allow about 20 vertical feet between the worker's anchorage point and the level below the working surface. Always estimate the total distance of a possible fall before using a shock-absorbing lanyard.

Example: Lanyard length (6 feet) + deceleration distance (3.5 feet) + worker's height (6 feet) + safety margin (3 feet) = 18.5 vertical feet from anchorage to lower level.

Never use a shock-absorbing lanyard if the shock absorber is even partially extended or if the lanyard has arrested a fall.



Self-retracting lanyard/lifeline — Self-retracting lanyards and lifelines offer more freedom to move than shock-absorbing lanyards. Each has a drum-wound line that unwinds and retracts as the worker moves. If the worker falls, the drum immediately locks, which reduces free-fall distance to about two feet — if the anchorage point is directly above the worker. Some self-retracting lanyards will reduce free-fall distance to less than one foot. Self-retracting lanyards are available in lengths up to 20 feet. Self-retracting lifelines, which offer more freedom, are available in lengths up to 250 feet. Self-retracting lanyards and lifelines that limit free-fall distance to two feet or less must be able to hold at least 3,000 pounds with the lanyard (or lifeline) fully extended. Self-retracting lanyards that do not limit free-fall distance to two feet must be able to hold at least 5,000 pounds with the lanyard (or lifeline) fully extended.

Beware of swing falls! If you use a self-retracting lanyard or lifeline, work below the anchorage to avoid a swing fall. The farther you move away from the anchorage, the farther you will fall and the greater your risk of swinging back into a hard object. Swing falls are hazardous because you can hit an object or a lower level during the pendulum motion.

Rope grab — A rope grab allows a worker to move up a vertical lifeline but automatically engages and locks on the lifeline if the worker falls. When using a rope grab, keep the following in mind:

- ▣ The rope grab must be compatible with the lifeline.
- ▣ The rope grab must be correctly attached to the lifeline (not upside down).
- ▣ Keep the lanyard (between the rope grab and the body harness) as short as possible.
- ▣ Keep the rope grab as high as possible on the lifeline.

Lifelines

A lifeline is a cable or rope that connects to a body harness, lanyard, or deceleration device, and at least one anchorage. There are two types of lifelines, vertical and horizontal.

Vertical lifeline — A vertical lifeline is attached to an overhead anchorage and must be connected directly to a worker's full-body harness, lanyard, retractable device, or rope grab; it must have a minimum breaking strength of 5,000 pounds.

When a worker needs to move horizontally, however, a vertical lifeline can be hazardous due to the potential for a swing fall — the pendulum motion that results when the worker swings back under the anchor point. A swing fall increases a worker's risk of striking an object or a lower level during the pendulum motion.

Horizontal lifeline — Unlike a vertical lifeline, the horizontal lifeline stretches between two anchorages. When you connect a lanyard or rope grab to the horizontal lifeline, you can move about freely, thus reducing the risk of a swing fall. However, horizontal lifelines are subject to much greater loads than vertical lifelines. If horizontal lifelines are not installed correctly, they can fail at the anchorage points. For this reason, horizontal lifelines must be designed, installed, and used under the supervision of a qualified person.

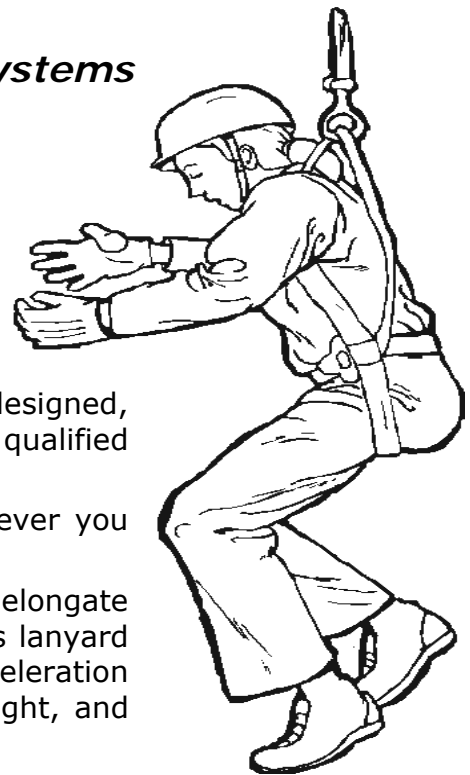
Horizontal lifelines and sag angles — Any load on a horizontal lifeline will cause it to deflect, or sag. The sag angle is a horizontal lifeline's angle of deflection when it is subjected to a load, such as a falling worker. Reducing the sag angle (making a horizontal lifeline too tight) actually increases the force on the line during a fall. As you tighten a horizontal lifeline, you increase the impact load dramatically!

Example: When the sag angle is 15 degrees, the force on the lifeline and anchorages subjected to a load is about 2:1. However, if you decrease the sag angle to five degrees, the force increases to about 6:1.

To reduce loads on a horizontal lifeline, increase the sag angle or connect to the lifeline with a shock-absorbing lanyard.

Safe Practices for Personal Fall-Arrest Systems

- ★ Do not tie knots in rope lanyards and lifelines; knots can reduce strength by 50 percent.
- ★ Do not tie lifelines or lanyards directly to I-beams; the cutting action of beam edges can reduce the rope's strength by 70 percent.
- ★ Know how the "sag angle" of a horizontal lifeline can affect arrest forces on the anchorages.
- ★ Remember that horizontal lifelines must be designed, installed, and used under the supervision of a qualified person.
- ★ Think about the potential for a swing fall whenever you connect a lifeline to a personal fall-arrest system.
- ★ Remember that a shock-absorbing lanyard will elongate before arresting a fall. The fall distance includes lanyard length (before the shock absorber extends), deceleration distance (shock-absorber extension), worker height, and a safety margin (allow three feet).



Personal Fall-Restraint Systems

Unlike the personal fall-arrest system, which is designed to stop a fall, a personal fall-restraint system prevents a worker from reaching an unprotected edge and thus prevents a fall from occurring. The system consists of an anchorage, connectors, and a body harness or a body belt. The attachment point to the body belt or full body harness can be at the back, front, or side D-rings.

The anchorage for a fall-restraint system must support at least 3,000 pounds or be designed and installed with a safety factor of at least two. If you are not sure how much an anchorage will support, have a qualified person evaluate it.

Positioning-Device Systems

Positioning-device systems make it easier to work with both hands free on a vertical surface such as a wall or concrete form. Positioning-device systems are also called Class II work-positioning systems and work-positioning systems. The components of a positioning-device system — anchorage, connectors, and body support — are similar to those of a personal fall-arrest system. However, the systems serve different purposes.

A positioning-device system provides support and must stop a free fall within two feet; a personal fall-arrest system provides no support and must limit free-fall distance to six feet.

- ★ ***Anchorage*** — Positioning-device systems must be secured to an anchorage that can support at least twice the potential impact of a worker's fall or 3,000 pounds, whichever is greater.
- ★ ***Connectors*** — Connectors must have a minimum strength of 5,000 pounds. Snap hooks and D-rings must be proof-tested to a minimum load of 3,600 pounds without deforming or breaking.
- ★ ***Body support*** — A body belt is acceptable as part of a positioning-device system. However, it must limit the arresting force on a worker to 900 pounds and it can only be used for body support. A full-body harness is also acceptable and must limit the arrest force to 1,800 pounds. Belts or harnesses must have side D-rings or a single front D-ring for positioning.

Guardrail Systems

A guardrail system consists of a top rail, mid-rail, and intermediate vertical member. Guardrail systems can also be combined with toe-boards that prevent materials from rolling off the walking/working surface.

Training Workers about Fall-Protection

Workers need to know about workplace hazards to which they may be exposed, how to recognize the hazards, and how to minimize their exposure. The best way for them to learn is through training. Training ensures that they know about the hazards and can demonstrate how to protect themselves from falling. Some employers assume that they can train their employees simply by showing them a fall-protection training video or giving them a safe practice guide (even this one!). But that is not training.

Employers: Your Responsibility

If you are an employer, you are responsible for ensuring that your employees can recognize fall hazards and that they know how to protect themselves before they are exposed to the hazards. You can not assume they know how to protect themselves from falls. If they are starting work on a new site, for example, they might not recognize fall hazards or know how to protect themselves unless you train them.

Required Training for Employees Exposed to Fall Hazards

Workers who could be exposed to fall hazards must be trained to recognize the hazards and to know the procedures that minimize the hazards.

The training format — As an employer, you can determine the training format. What is important is that, through training, your employees can recognize fall hazards and know procedures to minimize the hazards.

Who can do the training — It is important that the trainer knows the hazards at the work site, knows how to eliminate or control the hazards, and knows how to teach workers to protect themselves. That is why the trainer must be a competent person. (Recall that a competent person is one who can identify work-site hazards and who has management authority to control them.) The trainer must know and be able to explain the following:

- ☐ The nature of fall hazards at the work site.
- ☐ Procedures for erecting, maintaining, and disassembling fall protection systems.
- ☐ How to use and operate fall-protection systems.
- ☐ The role of each employee who may be affected by a safety-monitoring system.
- ☐ The restrictions that apply to mechanical equipment used during roofing work.
- ☐ The procedure for handling and storing materials and for erecting protection from falling objects.
- ☐ The requirements of Subpart M.

When to train — Employees must be trained before they begin tasks that could expose them to fall hazards or before they use fall-protection systems. They must be retrained when you have reason to believe they do not recognize fall hazards, when they do not follow safe practices for using fall-protection systems, and when changes in the workplace or in the fall-protection systems used make their previous training obsolete.

What to put in writing — You must keep a written record of each employee's fall-protection training. Include the employee's name, the training date, and the trainer's signature. You can record the information on a simple form like the one in table below.

| <i>Fall-Protection Training Log</i> | | | |
|--|----------------------|----------------------------|---|
| Employee name | Training date | Trainer's signature | Type of training |
| Jim Smith | 12/4/2003 | Frank Jones | Identifying fall hazards (initial training) |
| Bill Smith | 1/4/2004 | Frank Jones | General fall-protection procedures |
| Fred Smith | 1/4/2004 | Frank Jones | General fall-protection procedures |
| Jill Smith | 1/4/2004 | Frank Jones | General fall-protection procedures |
| Jack Smith | 2/5/2004 | Frank Jones | Using personal fall-arrest systems |
| Jim Smith | 2/6/2004 | Frank Jones | Hazard identification (retraining) |

Inspecting and Maintaining Equipment

Caring for Equipment

When you use ladders, scaffolds, aerial lifts, and fall-protection systems you expect to get your job done safely. But do you pay attention to the condition of the equipment? Inspect the equipment frequently, keep it clean, store it properly, and it will not let you down.

Inspecting fall-arrest, fall-restraint, and positioning-device systems — Each time you use a personal fall-arrest, restraint, or positioning-device system, inspect the components for damage or excessive wear. Replace any component that looks damaged. Do not use a personal fall-arrest system that has arrested a fall unless a competent person has determined that the system is safe to use.

Harness, lifeline, and anchorage — Inspect these components regularly. The table below highlights what to look for.

| <i>Inspecting Harness, Lifeline, and Anchorage</i> | |
|---|--|
| <i>Component</i> | <i>What to look for</i> |
| Harness webbing | Frayed edges, broken fibers, pulled stitches, cuts, burns and chemical damage |
| Harness D-rings | Cracks, breaks, and rough or sharp edges; the D-ring should pivot easily |
| Harness buckles | Excessive wear, frayed or cut fibers, broken stitching |
| Harness grommets | Loose, bent, or broken grommets, and punched holes not made by the manufacturer |
| Lifelines | Wear or deterioration |
| Anchorage and anchorage connectors | Look for abrasion and damaged threads or swages. Inspect stitching and loops on synthetic slings for cuts, cracks, or frayed and broken stitching. Look for excessive kinks or damaged steel fibers. |

Snap hooks — Look for cracks, excessive wear, and corrosion. The snap-hooks should open easily and close firmly. Keeper locks must prevent the keeper from opening when it is closed.

Lanyards — Inspect each time before use. The table below shows what to look for.

| <i>Inspecting Lanyards</i> | |
|-----------------------------------|---|
| <i>Type of lanyard</i> | <i>What to look for</i> |
| Wire rope lanyard | Cuts, frayed strands, or excessive wear |
| Web lanyard | Cuts, discoloration, cracks, frayed or broken stitching |
| Rope lanyard | Frayed or cut fibers. The entire length of the rope should have the same diameter. |
| Shock-absorbing lanyard | Cuts, discoloration, cracks, frayed or broken stitching. Remove a lanyard from service if any part of the warning label is exposed. |

Self-retracting lifelines — Look for cuts, frayed strands, or excessive wear in the line and damage to the housing. If the unit needs service, check the manufacturer’s recommendations. Do not try to repair it yourself.

Guardrail systems — Frequently inspect manila, plastic, or synthetic rope used for top rails or mid-rails to ensure that the rope meets the minimum strength and rail height requirements of Subpart M. [See Subpart M, 1926.502(b)]

Summary: *Inspecting, Cleaning, and Storing Equipment*

- ★ Always follow manufacturers’ instructions and warnings.
- ★ Always inspect equipment before using it. Look for damaged or missing parts. Labels, warnings, and other instructions should be readable.
- ★ If equipment looks like it needs repair, remove it from service and have a competent person examine it.
- ★ Have a competent person inspect equipment regularly.
- ★ Mark equipment with a unique code or item number. Identification numbers make it easier to keep track of the equipment and to document maintenance or repair.

Cleaning Equipment

- ★ Wash synthetic rope and body harnesses in soapy water to remove dirt; rinse them with clean water. Air-dry at room temperature.
- ★ Do not use cleaning solvents; solvents can damage synthetic material.

- ★ Do not lubricate moving parts unless the manufacturer requires it; lubricants attract dirt.
- ★ Do not remove information labels and warnings; make sure they are still legible after cleaning.

Storing Equipment

- ★ Follow manufacturer's instruction for storing equipment. Store equipment in an area that is clean, dry, and moisture-free; avoid excessive heat, light, oil, and corrosive chemicals.

Using a Fall-Protection Plan

A fall-protection plan enables workers doing *leading-edge work, pre-cast concrete erection work, or residential-type construction work* to use alternative fall-protection systems or methods when conventional systems are not feasible. Under these special circumstances, properly documented fall-protection plans give employers the flexibility to use more appropriate methods of fall protection. However, employers must be able to show that conventional systems are not practical or that they pose a greater safety hazard to workers than other fall-protection alternatives. In addition, the fall-protection plan must meet the following requirements:

- ☐ A qualified person must prepare the plan specifically for the site where the work will be performed.
- ☐ The plan must document why conventional fall-protection systems are not feasible and show how alternative methods will reduce or eliminate fall hazards.
- ☐ The plan must describe all measures that will be taken to minimize or eliminate fall hazards at the worksite.
- ☐ The employer must designate the work area as a controlled-access zone.
- ☐ Employers who do not use either alternative fall-protection measures or conventional systems must use a safety-monitoring system to protect workers in the controlled-access zone.

OSHA's requirements for fall-protection plans are covered in Subpart M.

An effective fall-protection plan can protect workers from fall hazards and enhance the overall level of safety at a job site. *If you decide to develop a fall protection plan, use the following guidelines to keep your plan in line with OSHA's requirements.*

Explain Why Conventional Systems Can Not Be Used

Before you can use a fall-protection plan, you must explain why conventional protection methods – guardrails, safety nets, personal fall-arrest, or fall-restraint systems – are infeasible or would pose a greater safety hazard to workers than your proposed method. Consider using scaffolds, catch platforms, or aerial lifts. If you can not eliminate the hazard, you must also explain why. Be specific! The following three examples help illustrate the point.

- ① ***If anchors capable*** of holding 5,000 pounds are not available you must also explain why personal fall-arrest systems with 2:1 safety factors or fall restraint systems will not protect workers.
- ② ***If you believe*** that having workers erect guardrails creates a greater hazard than an alternative method, you must explain why. You must demonstrate why erecting and dismantling guardrail systems creates a greater hazard than your alternative method and why you can not use personnel platforms, personal fall-arrest, or fall-restraint systems.

- ③ ***If you feel*** that guardrail systems are not feasible because you can not anchor them in a finished surface, you must also consider free-standing guardrail systems that will not put holes in the finished surface. If you can not use free-standing systems, you must explain why.

Describe How Your Alternative Method Will Protect Workers

Describe specifically how your alternative fall-protection method will reduce or eliminate fall hazards. Include workers’ tasks, the fall hazards they will encounter, the location of hazards, and how you intend to protect them from the hazards. You can list your responses in a table such as the one below.

| <p style="text-align: center;">How “Alternative Fall-Protection Methods” Will Reduce or Eliminate Fall Hazards</p> | | | |
|---|---|---|--|
| <i>The worker’s task</i> | <i>The type of fall hazard (such as a floor opening or unprotected edge)</i> | <i>The location of the fall hazard</i> | <i>Alternative protection (how it will reduce or eliminate the fall hazard)</i> |
| | | | |
| | | | |
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| | | | |

A Sample Fall-Protection Plan

Turchetta Custom Roofing, Inc.
4763 Lake Lane
Lakeside, Arizona 85937



This Fall-Protection Plan is specific for the following project:

Location of Job: 227 W. 2nd Avenue, Mesa, Arizona 85201

Date plan prepared or modified: April 27, 2005

Plan prepared by: Will Ness

Plan approved by: Steve Turchetta

Plan supervised by: John Peterson

Statement of Company Policy: **Turchetta Custom Roofing, Inc.** is dedicated to protecting employees from workplace injuries and illnesses. Company management and supervisors are responsible for identifying and correcting hazards on the job. All employees are responsible for working safely. This plan supplements our existing "Safety and Health Program.

This Plan addresses the use of conventional fall-protection at a number of areas on this project and identifies specific activities that require unconventional means of fall-protection. These activities include:

- Setting and bracing roof trusses and rafters
- Installation of floor sheathing and joists
- Roof sheathing operations
- Erecting exterior walls

Each employee will be trained in these procedures and will strictly adhere to them except when doing so would expose the employee to greater hazards. If, in the employee's opinion, this is the case, the employee is to notify the competent person of his or her concern and have the concern addressed before proceeding.

It is the responsibility of [**Steve Walker, Competent Person**] to implement this Fall Protection Plan. Work operations will be checked frequently and safety policy and procedures will be enforced. The [**Crew Foreman, Paul Thurman, _**] is responsible for correcting unsafe practices or conditions immediately.

It is the responsibility of the employer to ensure that all employees understand and adhere to the procedures of this plan and follow the instruction of the crew supervisor. It is the responsibility of the employee to alert management to unsafe or hazardous conditions or practices that may cause injury to employees. Any changes to the Fall-Protection Plan must be approved by [**David Connor, Qualified Person**].

Appropriate fall-protection systems will be used on this job when the risk of fall exists and during the following operations: Installation of the roof trusses/rafter, exterior wall erection, roof sheathing, floor sheathing, and joist/truss activities. These processes will be conducted by employees trained to do this type of work and trained to recognize the fall hazards.

This plan details how **Turchetta Custom Roofing, Inc.** will minimize these hazards.

Appoint a Qualified Person to Prepare the Plan

A qualified person is one who has extensive knowledge, training, and experience with fall-protection systems. A qualified person must know how to design, use, and install fall-protection systems; the limitations of fall protection systems; and fall hazards associated with work tasks and processes. A qualified person must prepare a site-specific fall-protection plan and approve any changes to the plan. Be sure that the plan identifies the following:

- ☐ ***The construction*** activity (leading-edge, residential, or pre-cast concrete erection)
- ☐ ***The site*** address where you will use the plan
- ☐ ***The name*** of the person who prepared the plan (must be a qualified person)
- ☐ ***The date*** the qualified person prepared the plan

Establish Controlled-Access Zones

Where Conventional Protection Can Not Be Used

Your fall-protection plan must identify each area where you can not use guardrails, safety nets, or personal fall-arrest systems, and you must designate those areas as controlled-access zones. In addition, you must do the following:

- ★ Describe how you will limit access to controlled-access zones, including procedures that authorize workers to enter controlled-access zones.
- ★ Describe how you will identify controlled-access zones and how you will separate them from other work areas.
- ★ Identify all workers who will enter controlled-access zones.

Assign Supervisory Responsibility to a Competent Person

A competent person is someone who can identify hazardous conditions and appropriate applications for a fall-protection system and who has authority to correct hazards. A competent person must know the site-specific fall-protection plan, how to perform work tasks safely, and the hazards associated with those tasks. You must designate a competent person to implement the fall-protection plan.

Document Accountability

Your fall-protection plan must describe how workers and supervisors will comply with its requirements.

Establish a Training Program

Everyone covered by a fall-protection plan must be trained by a competent person. Be sure to document the names of those who receive fall-protection training and their training dates. The training program must cover the following:

- ☐ Fall hazards that workers will encounter.
- ☐ Types of systems that will protect workers from falls.
- ☐ Workers' responsibilities under the fall-protection plan.
- ☐ Procedures for assembling, maintaining, and disassembling personal fall arrest systems.
- ☐ How workers should comply with the plan.
- ☐ Retraining procedures when the plan changes, tasks change, or when workers are not following the plan.

Update the Plan When Site Conditions Change

When worksite conditions change and affect how workers are protected from falling, you must update your fall-protection plan so that it addresses the changes. An on-site qualified person must approve the changed plan. The updated plan must:

- ▣ Describe the site-condition changes that required the update.
- ▣ Include the qualified person's reasons for the update.
- ▣ Include the date the qualified person approved the plan changes and the person's signature.

Investigate Accidents

If a worker covered by the fall-protection plan fell or had a "near miss" incident, you must investigate the accident and, if necessary, change the plan so that similar events will not happen again. The plan must describe near misses or accidents and how to prevent future incidents.

Keep the Plan at the Job Site

You must keep a copy of the fall-protection plan, with all approved changes, at the job site.

Fall-Protection Systems, Criteria, and Practices — 1926.502

The requirements in 1926.502 cover installing, constructing, and using these fall-protection systems and methods:

- ★ Guardrail systems — 1926.502(b)
- ★ Safety-net systems — 1926.502(c)
- ★ Personal fall-arrest systems — 1926.502(d)
- ★ Personal fall-restraint systems — 1926.760
- ★ Positioning-device systems — 1926.502(e)
- ★ Warning-line systems for roofing work — 1926.502(f)
- ★ Covers for holes in walking/working surfaces — 1926.502(i)
- ★ Protection from falling objects — 1926.502(j)



This Fall-Protection Plan is specific for the following project:

Location of Job: _____

Date plan prepared or modified: _____

Plan prepared by: _____

Plan approved by: _____

Plan supervised by: _____

Statement of Company Policy: _____

is dedicated to protecting employees from workplace injuries and illnesses. Company management and supervisors are responsible for identifying and correcting hazards on the job. All employees are responsible for working safely. This plan supplements our existing "Safety and Health Program.

This Plan addresses the use of conventional fall-protection at a number of areas on this project and identifies specific activities that require unconventional means of fall-protection. These activities include:

- Setting and bracing roof trusses and rafters
- Installation of floor sheathing and joists
- Roof sheathing operations
- Erecting exterior walls

Each employee will be trained in these procedures and will strictly adhere to them except when doing so would expose the employee to greater hazards. If, in the employee's opinion, this is the case, the employee is to notify the competent person of his or her concern and have the concern addressed before proceeding.

It is the responsibility of [_____, *Competent Person*] to implement this Fall Protection Plan. Work operations will be checked frequently and safety policy and procedures will be enforced. The [_____, *Crew Foreman*] is responsible for correcting unsafe practices or conditions immediately.

It is the responsibility of the employer to ensure that all employees understand and adhere to the procedures of this plan and follow the instruction of the crew supervisor. It is the responsibility of the employee to alert management to unsafe or hazardous conditions or practices that may cause injury to employees. Any changes to the Fall-Protection Plan must be approved by [_____, *Qualified Person*].

Appropriate fall-protection systems will be used on this job when the risk of fall exists and during the following operations: Installation of the roof trusses/rafter, exterior wall erection, roof sheathing, floor sheathing, and joist/truss activities. These processes will be conducted by employees trained to do this type of work and trained to recognize the fall hazards.

This plan details how _____ will minimize these hazards.

Additional Information: _____

This Fall-Protection Plan must be kept at the jobsite at all times when operations are in progress.

DEFINITIONS OF SELECTED TERMS

Anchor — A secure point of attachment for workers' lifelines, lanyards, or deceleration devices. Anchors must be capable of supporting a minimum load of 5,000 pounds per worker (or designed, installed, and used under the supervision of a qualified person as part of a complete personal fall-arrest system which maintains a safety factor of at least two).

Barricade — An obstruction to deter the passage of persons or vehicles.

Body harness — Straps that an individual wears to distribute fall-arresting forces over the thighs, waist, chest, shoulders, and pelvis. Attaches to other components of a personal fall-arrest system. The maximum safe arresting force for a body harness is 1,800 pounds.

Competent person — A person who is capable of identifying existing and predictable hazards in the work environment and who has authorization to take prompt measures to eliminate the hazards.

Connector — A device used to couple (connect) components of a personal fall-arrest system. The connector may be an independent component (such as a carabiner) or an integral component (such as a buckle or D-ring) of the system. Connectors must be drop-forged or made of equivalent materials; they must have a corrosion-resistant finish and all surfaces and edges must be smooth to prevent damage to other parts of the system.

Controlled-access zone (CAZ) — An area designated for overhand bricklaying operations or leading-edge construction. Conventional fall-protection systems — guardrail systems, personal fall-arrest systems or safety-net systems — are not required in a CAZ; access is restricted to all workers except those performing overhand bricklaying and leading-edge construction tasks.

Conventional fall protection — A guardrail system, safety-net system, or personal fall-arrest system

Cover — A rigid object used to overlay openings in floors, roofs, and other walking and working surfaces.

Deceleration device — Any mechanism that dissipates or limits energy imposed on a person during fall arrest. Examples include rope grabs, rip-stitch lanyards, special woven lanyards, and automatic self-retracting lifelines.

Deceleration distance — The additional vertical distance a worker falls before stopping — excluding lifeline elongation and free-fall distance — from the point at which a deceleration device begins to operate. The distance is measured from the worker's body harness attachment point just before the device activates to the attachment point after the worker comes to a full stop.

D-rings — Attachment points on a body harness for deceleration devices or lanyards. D-rings must be capable of sustaining a minimum tensile load of 5,000 pounds.

Equivalent — Refers to an alternative design, material, or method that an employer can demonstrate will provide an equal or greater degree of safety for workers than the method or item specified in a standard.

Fall-protection plan — Enables workers doing *leading-edge work*, *precast concrete erection work*, or *residential-type construction work* to use alternative fall-protection systems or methods when conventional systems aren't feasible. To implement a fall-protection plan, employers must be able to show that conventional fall-protection systems are not practical or that they add to worker risk.

Fall-restraint system — A fall-protection system designed to physically prevent a worker from free falling. Components include a body harness, a rope or web lanyard, connectors, and an anchor. Fall-restraint systems are not covered in OSHA's Subpart M requirements for fall protection in the construction industry.

Free fall — Falling before fall protection begins to arrest the fall.

Free-fall distance — The vertical distance a worker falls before a personal fall-arrest system stops the fall; measured from the attachment point of the personal fall-arrest system immediately before and after the fall, excluding deceleration distance and lanyard and lifeline elongation, but including deceleration device slide distance or self-retracting lifeline/lanyard extension before fall-arrest forces occur.

Guardrail system — Vertical barriers erected to prevent workers from falling to a lower level.

Hole — Any opening more than two inches wide in a floor, roof, or other walking and working surface.

Horizontal lifeline — A flexible horizontal cable or rope line anchored at both ends to which a worker's body harness or lanyard attaches. Horizontal lifelines must be designed, installed, and used under the supervision of a qualified person, as part of a complete personal fall-arrest system.

Lanyard — A flexible rope, strap, or webbing that connects body harness to a deceleration device, lifeline, or anchor. Lanyards that tie off one worker must have a minimum breaking strength of 5,000 pounds. Lanyards that automatically limit free-fall distance to two feet or less must have components capable of sustaining a minimum static tensile load of 3,000 pounds with the lanyard in the fully extended position.

Leading edge — The edge of a floor, roof, formwork, or other walking and working surface that changes location as additional sections are placed. Leading edges not actively under construction are considered unprotected sides and edges.

Lifeline — A flexible line that attaches directly to a person's body harness, lanyard, or deceleration device at one end and to an anchor at the other end. A lifeline that hangs vertically and is connected to one anchor is a vertical lifeline. A lifeline that stretches horizontally between two anchors is a horizontal lifeline. All lifelines must be protected against cuts or abrasions. They cannot be made of natural fiber rope.

Lower level — Surface to which a worker can fall. Examples: ground levels, floors, ramps, runways, excavations, pits, tanks, material, water, and equipment.

Mid-rail — A rail midway between the guardrail and platform, secured to the uprights erected along the exposed sides and ends of platforms.

Opening — Any space more than 30 inches high and 18 inches wide in a wall or partition, through which workers could fall to a lower level.

Overhand bricklaying — Bricklaying and masonry tasks requiring a mason to work while leaning over a wall.

Personal fall-arrest system — A conventional fall-protection system designed to stop a single worker from free falling to a lower level. Components include an anchor, connectors, a body harness, and may include a lanyard, deceleration device, or lifeline.

Platform — A temporary elevated working surface such as the floor of a scaffold.

Positioning-device system — A personal fall-protection system that supports a person who needs to work with both hands free on surfaces such as walls or window sills. Also used on form work and for placing rebar.

Qualified person — A person who by possession of a recognized degree, certificate, or professional standing, or who by extensive knowledge, training, and experience, has successfully demonstrated the ability to resolve problems relating to a specific subject, operation, or project.

Residential-type construction — Construction work on all types of structures, including commercial buildings, that are framed and covered with materials commonly associated with residential structures. Residential-type construction does not include tilt-up buildings, butler-type buildings, or large commercial structures.

Roof brackets and slide guards — Used in residential construction to prevent workers from sliding off a sloped roof.

Rope grab — A deceleration device that moves along a vertical lifeline; it automatically engages and locks on the lifeline when a worker falls.

Roof — The exterior surface on the top of a building. Does not include floors or form-work which, if a building is not completed, temporarily become the top surface.

Roofing work — Includes hoisting, storing, applying, and removing roofing materials and equipment.

Safety factor — The weight ratio of a breaking load to safe load. For example, the anchor for a personal fall-arrest system must be able to hold at least 5,000 pounds or it must be installed under the supervision of the qualified person and it must maintain a *safety factor* of at least two — two times the impact force of a worker free falling six feet.

Safety-monitoring system — A fall-protection system that requires a monitor (competent person) to be responsible for recognizing fall hazards and warning workers when they are at risk of falling.

Safety-net system — A fall-arrest system of mesh nets, including panels, connectors, and other impact-absorbing components.

Sag angle — A horizontal lifeline's angle of deflection when the line is subjected to a load.

Scaffold — Any temporary elevated platform and its supporting structure used for supporting workers, materials, or both.

Self-retracting lifeline/lanyard — A deceleration device consisting of a drum-wound line that retracts or extends from the drum with normal worker movements; in the event of a fall, the drum automatically locks. Self-retracting lifelines that automatically limit free-fall distance to two feet or less must have components capable of sustaining a minimum static tensile load of 3,000 pounds. Self-retracting lifelines that do not limit free-fall distance to two feet or less must be capable of sustaining a minimum tensile load of 5,000 pounds.

Snap hook — A connector, consisting of a hook-shaped member and a keeper that can be opened to receive an object and, when released, automatically closes to retain the object.

Suspended scaffold — A scaffold supported on wire or other ropes, used for work on, or for providing access to, vertical sides of structures on a temporary basis.

Swing fall — The pendulum motion that results when a worker using a personal fall-arrest system falls and swings back under the system's anchor point.

Tie off — The act of connecting to an anchor; tied-off means being connected to an anchor.

Tie-off adaptor/beam connector — Devices that anchor vertical lifelines or lanyards to I-beams and other objects with rough edges.

Toe-board — A low protective barrier that prevents materials, equipment, and personnel from falling to lower levels.

Vertical lifeline — A flexible vertical cable or rope line anchored at one end; the other end attaches to a worker's body harness, lanyard, or deceleration device. Each worker must be attached to a separate vertical lifeline. Vertical lifelines must have a minimum breaking strength of 5,000 pounds.

Walking and working surface — Any surface (except on ladders, vehicles, or trailers) on which workers perform tasks or jobs.

Warning-line system — A barrier erected on a roof to warn workers they are approaching an unprotected edge; designates an area for roofing work without conventional fall-protection systems (guardrail, safety net, or personal fall-arrest).

Warning/barrier lines and barricades — A warning line or barrier erected or installed on a flat elevated surface to designate a safe work area. Workers are not allowed outside the designated safe work area without adequate fall protection.

Work area — The portion of a walking/working surface where workers perform job tasks.

Note to reader: The fall-protection standards covered in this guide do not to cover all aspects of OSHA's fall-protection requirements. This guide is intended to help employers and employees better understand OSHA's rules for general fall-protection.

Section Notes:

Chapter 18 Scaffolding for Construction

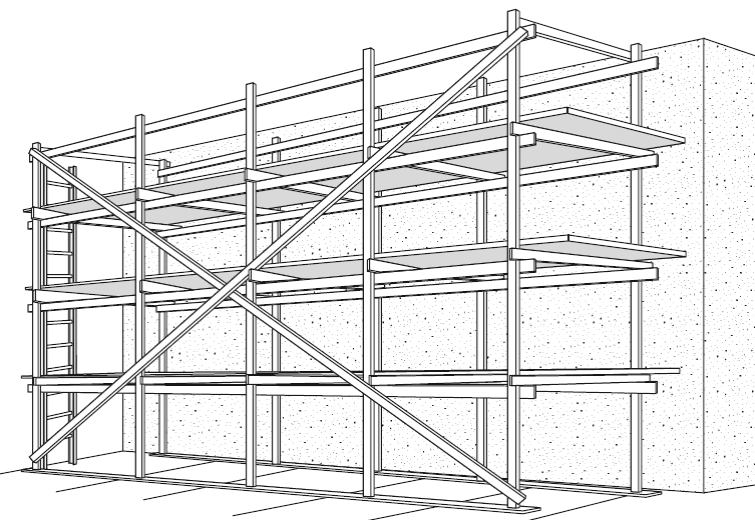
Allen Davidson is responsible for the implementation and enforcement of the following safety policy regarding scaffolding.

General Scaffold Safety Policy

It shall be the responsibility of all users to read and comply with the following common sense guidelines which are designed to promote safety in the erecting, dismantling and use of Scaffolds. These guidelines do not purport to be all-inclusive nor to supplant or replace other additional safety and precautionary measures to cover usual or unusual conditions. If these guidelines in any way conflict with any state, local, federal or other government statute or regulation, said statute or regulations shall supersede these guidelines and it shall be the responsibility of each user to comply therewith.

Introduction

A scaffold is a temporary elevated platform that supports workers and materials, and almost anyone can build a structure that satisfies this definition. Lay a board across whatever is convenient to reach your work and you have a scaffold. Right? Take this definition literally and you could be dead wrong. A scaffold is actually far more than a temporary work platform. It is designed and constructed specifically so that trained workers can do their jobs safely. Unsafe scaffolds endanger workers in many ways.



Components can break, collapse, or give way. Planks, boards, decks, or handrails can fail. In some cases, entire structures have collapsed. Even on sound scaffolds workers can slip or lose their balance, and without appropriate protection, they do not have to fall far to get hurt. More often than not, scaffold accidents can be traced to untrained or improperly trained workers.

Scaffolds can be complex structures. Too often, untrained workers use makeshift staging, overload platforms, fail to inspect supports, or use scaffolds for the wrong tasks. These guidelines OSHA's Subpart L Scaffold rules can help you learn what you need to know so that a temporary work platform will not let you down.

A Quick Tour of Subpart L

Federal OSHA updated its scaffold requirements and made them effective Nov. 30, 1996, and added rules based on the most current American National Standards Institute (ANSI) standards for aerial lifts.

Subpart L requirements identify what workers and employers need to know to use all types of scaffolds safely. Specifically, the requirements:

- ★ Regulate the design, construction, and use of scaffolds.
- ★ Update previous scaffolding standards.
- ★ Set performance-oriented criteria to protect workers from injury.

- ★ Cover specific types of scaffolds.
- ★ Allow employers flexibility in using fall protection systems.
- ★ Extend fall protection to erectors and dismantlers.
- ★ Strengthen training for workers.
- ★ Identify conditions under which workers must be retrained.

Subpart L covers all scaffolds used in construction, alteration, repair, and demolition work. Subpart L does not apply to crane- or derrick-suspended personnel platforms covered in Subpart N. The table on the next page shows how Subpart L is organized and what requirements are covered under each of its major parts.

| How Subpart L is Organized | |
|-----------------------------------|---|
| Sub Paragraph | Requirements Covered |
| 1926.450 | Scope & Application – Definitions |
| 1926.451 | General Requirements |
| | <ul style="list-style-type: none"> ★ Capacity ★ Scaffold platform construction ★ Supported scaffolds ★ Suspension scaffolds ★ Access ★ Use ★ Fall protection ★ Falling object protection |
| 1926.452 | Additional Requirements for Specific Scaffold Types |
| | <ul style="list-style-type: none"> ★ Pole ★ Tube and coupler ★ Fabricated frame ★ Large area ★ Bricklayers' square ★ Horse ★ Form & carpenters' bracket ★ Roof bracket ★ Pump jack ★ Ladder jack ★ Window jack ★ Crawling boards ★ Trestle ladder ★ Single-point adjustable ★ Two-point adjustable ★ Multi-point adjustable ★ Catenary ★ Float ★ Interior hung ★ Needle beam ★ Multi-level suspended ★ Mobile ★ Repair bracket ★ Stilts |
| 1926.453 | Aerial Lifts |
| | <ul style="list-style-type: none"> ★ General requirements ★ Specific requirements ★ Manually propelled elevating aerial platforms ★ Boom supported elevating work platforms ★ Self-propelled elevating work platforms |
| 1926.454 | Training Requirements |
| | <ul style="list-style-type: none"> ★ All workers ★ Erectors & dismantlers ★ Retraining ★ Qualified person ★ Competent person |
| Non-Mandatory Appendices | <ul style="list-style-type: none"> A -Guidelines and tables B -Guidelines for erectors and dismantlers C -National consensus standards D -Training topics, erectors and dismantlers E -Drawings and illustrations |

Subpart L frequently refers to **Competent Persons** and **Qualified Persons**. The terms apply to persons who have special skills and are given specific responsibilities.

Competent Person

A competent person can identify hazardous working conditions and has authorization to take prompt corrective measures to eliminate them.

The competent person, who has primary responsibility for supervising and directing all scaffolding erection, dismantling, and altering work, must:

- ☐ Know Subpart L requirements applicable to the types of scaffolds used.
- ☐ Be able to identify and correct hazards encountered in scaffold work.
- ☐ Be trained in the structural integrity of the types of scaffolds used.
- ☐ Have authority to promptly abate hazardous worksite conditions.

A competent person's duties can be shared as long as each person is qualified to perform the duty and has authority to promptly abate hazards. Subpart L requires that only competent persons:

- ☐ Determine feasible safe access for persons erecting and dismantling scaffolds.
- ☐ Inspect scaffolds and components for hazards before each work shift and after any event that could affect the scaffolds' structural integrity.
- ☐ Supervise and direct all scaffold erection, dismantling, and altering work.
- ☐ Determine the feasibility of providing fall protection for each scaffold erection and dismantling operation.
- ☐ Determine whether it is safe to work on scaffolds during storms or high winds.
- ☐ Determine whether scaffold components made from different metals can be used together.
- ☐ Determine whether scaffold components made by different manufacturers can be used together.
- ☐ Identify the cause and significance of a deteriorated scaffold component and correct the hazard.
- ☐ Inspect ropes used in suspension scaffolds and identify defects.
- ☐ Inspect manila or synthetic rope used for top rails or mid rails to make sure it meets the 200-pound capacity requirements.

NOTE: Many organizations offer training programs on Subpart L scaffolding requirements. However, attending one of these programs does not necessarily make one competent (or a competent person). Competency *must* be demonstrated; it is usually the result of many hours of in-class training and on-the-job experience.

Qualified Person

A qualified person has a recognized degree, certificate, or professional standing - or by extensive knowledge, training, and experience, has successfully demonstrated the ability to solve problems related to the subject, the work, or the project.

Scaffolds must be designed by a qualified person but not necessarily by an engineer. Exceptions: connections for mason's adjustable multi-point suspension scaffolds, pole scaffolds more than 60 feet high, coupler and fabricated-frame scaffolds more than 125 feet high, and outrigger scaffolds must be designed by a registered professional engineer.

Scaffold Capacities

Scaffolds must be able to support their own weight and at least four times the maximum intended load applied to them. Unless otherwise noted in Subpart L, scaffold components have to meet the 4-to-1 safety factor too, but only for that portion of the maximum intended load applied to them. The maximum intended load for a component depends on the scaffold type and its configuration. Note that scaffolds and components must be able to support four times the maximum intended load — not the rated load. The intended load includes workers, equipment, and supply loads. The intended load should never exceed the rated load unless the design is approved by an engineer and the manufacturer.

Direct Connections

Direct connections and counterweights used to balance adjustable suspension scaffolds must resist at least four times the tipping force of the scaffold. A competent person who directs the rigging of the scaffold must calculate the potential loads. Safety factors for the counterweights, riggings, direct connections to roofs, floors, and suspension ropes of adjustable suspension scaffolds should be based on the rated load and the stall load of the hoist, not the maximum intended load.

Suspension Ropes, Hardware, and the Maximum Intended Load

Suspension ropes and connecting hardware on non-adjustable suspension scaffolds must be able to support, without failure, at least six times the maximum intended load applied to them.

Stall Loads

The stall load of any scaffold hoist cannot exceed three times its rated load. This safety factor ensures that suspension scaffold support systems are not overloaded.

Design by a Qualified Person

Scaffolds must be designed by a qualified person and must be constructed and loaded in accordance with that design.

Working Safely on Scaffolds

Platform Construction

All scaffold platforms, except walkways and platforms used by erectors and dismantlers, must be fully decked or planked between the front uprights and the guardrail supports. The opening between the uprights and the planking can not exceed one inch unless the employer demonstrates that a wider opening is necessary. (The maximum opening can not exceed 9½ inches.)

Platform Gaps

Platform units must be placed so that the spaces between the units do not exceed one inch — unless more space is necessary; for example, fitting around uprights with side brackets to extend platform width. The maximum opening cannot exceed 9½ inches.



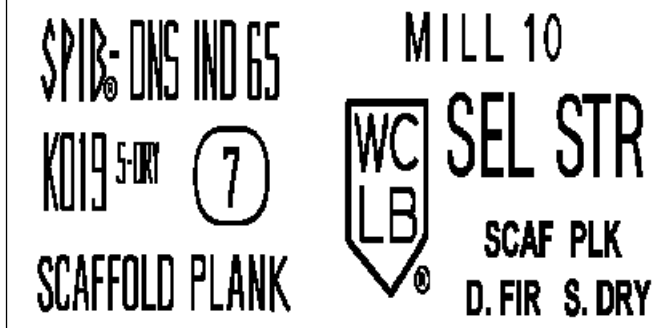
When you are working in enclosed or tight spaces, use appropriate scaffolding frames, platforms, and connecting components. Do not improvise for the sake of convenience. To make sure your scaffold is safe, have it checked by a competent person.



Platform and Walkway Widths

Platforms and walkways must be at least 18 inches wide. If work areas are too narrow for 18-inch platforms or walkways, workers can use narrower platforms but they must be protected from fall hazards by guardrails and/or personal fall arrest systems. OSHA allows 12-inch widths for ladder jack, top-plate bracket, roof bracket, and pump-jack scaffolds.

Typical Mill Stamps for Scaffold-grade Lumber



Front Edge of Platforms

The front edge of a scaffold platform cannot be more than 14 inches from the face of a structure unless guardrails or personal fall arrest systems are used to protect workers from falling between the structure and the platform. There are two exceptions to this requirement:

- ① The front edge distance for outrigger scaffolds must be no more than three inches.
- ② Scaffolds used for plastering and lathing work can be no more than 18 inches from the face of a structure.

Platform Lengths

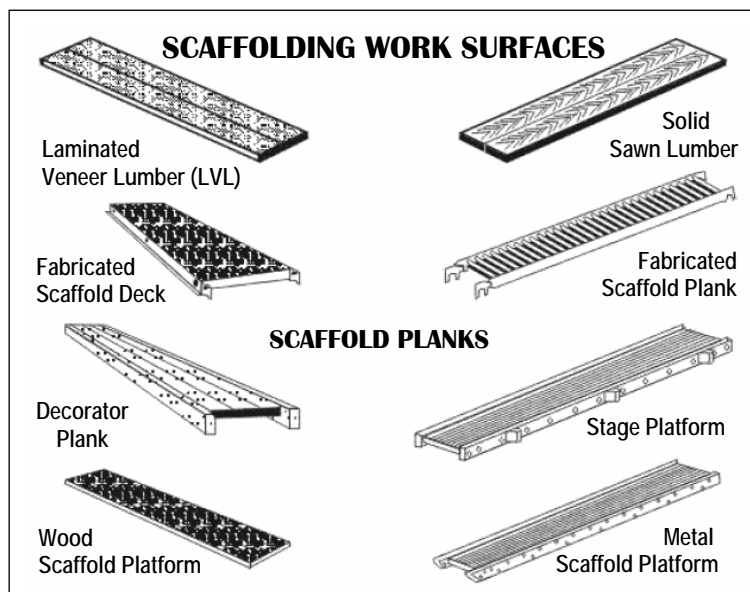
A platform *10 feet or less* in length must extend at least 6 inches, but no more than 12 inches, beyond its support unless the excess length is guarded or can support workers and material without tipping. A platform longer than 10 feet can extend no more than 18 inches beyond a support unless the excess length is guarded or can support workers and material without tipping.

Abutted Planks

When platform planks are abutted to create a long platform, each abutted end must rest on a separate support. Abutted planks touch end to end on separate support surfaces; they do not rest on one another.

Overlapped Planks

Platform planks overlapped to create a long platform must overlap at least 12 inches over supports unless the planks are nailed together or otherwise restrained so they do not move.



Direction Changes

Any platform that rests on a bearer at an angle other than a right angle must be laid first. Platforms that rest at right angles over the same bearer must rest on top of the first platform. Make sure that all platform planks are fully bearing to eliminate potential instability.

Paint (opaque) Finishes

Wood platforms cannot be covered with opaque finishes, because opaque finishes cover defects in wood. Wood platform edges, however, may be marked for identification. Preservatives or slip-resistant and fire-retardant finishes are acceptable as long as the finish does not cover structural defects or make them hard to spot.

Mixed or Modified Components

Scaffold components made by different manufacturers can not be mixed unless they fit together easily and do not change the scaffold's integrity. Components made by different manufacturers cannot be modified to intermix unless a competent person approves.

Components Made From Different Metals

Scaffold components made from different metals can not be used together unless a competent person approves. If a competent person determines that mixing components made from different metals could reduce their strength, the employer must take corrective action. If a competent person can not make the determination, then different metals must not be used.

Access to Scaffolds

Employers must provide all workers with safe access to scaffolds and scaffold platforms. Workers must use ladders or stairways to reach platforms that are more than 2 feet above or below the access point. Do not use cross braces as a means of access. Note that permanent stairways or portable ladders must meet the requirements of Subpart X (Stairways and Ladders) of the construction safety and health code.

Bottom Rung or Step

The bottom step or rung of hook-on ladders, attachable ladders, and stairway-type ladders must be no more than 24 inches above or below the scaffold supporting level.

Rest Platforms

Hook-on and attachable ladders on supported scaffolds more than 35 feet high must have rest platforms at 35-foot intervals; stairway-type ladders must have rest platforms every 12 feet. Integral prefabricated scaffold-access frames must have rest platforms every 35 feet.

Erecting and Dismantling

Erectors and dismantlers must comply with the requirements summarized below:

- ☐ Means of access must be determined by a competent person. The competent person, designated by the employer, must determine if safe access is feasible at each stage of the erecting and dismantling process.
- ☐ Hook-on or attachable ladders must be installed as soon as possible after scaffold erection begins.
- ☐ End frames of tubular welded frame scaffolds that have parallel, level horizontal members may be used for access.
- ☐ Cross bracing is not an acceptable means of access.

Protecting Workers from Falling Objects

Workers on scaffolds must wear hardhats and be protected by toeboards, screens, guardrail systems, debris nets, catch platforms, or canopies when falling objects are a potential hazard.

Hardhats cannot be the only means of protecting workers from falling objects. Be sure to secure all large objects that could fall onto a scaffold. Note that workers must wear hardhats only if falling objects are a potential hazard. If there is no hazard from falling objects, then hardhats are not required.

Persons Working Below

If tools, materials, or equipment could fall from a scaffold and strike persons below, the area below the scaffold must be barricaded or a toeboard must be placed along the edge of the scaffold platform.

When tools, materials, or equipment are piled higher than the top edge of the toeboard, paneling or screening must protect persons below. Alternatively, guardrail systems, canopies, or catch platforms may be installed to retain materials.

Protecting Workers from Falling

Workers on scaffolds more than 10 feet above a lower level must use fall protection. The employer has the option, in many cases, of protecting workers with guardrails or personal fall arrest systems.

On single-point or two-point adjustable suspension scaffolds, however, guardrails and personal fall arrest systems are required. On other types of scaffolds only personal fall arrest systems are allowed. Fall protection requirements for those who install suspension scaffold support systems on floors, roofs, and other elevated surfaces are included in 1926, Subpart M.

Remember, when you work from a scaffold more than 10 feet above a lower level, you must be protected from falling. The table below shows fall protection required by Subpart L for various types of scaffolds.

| Fall-Protection for Scaffolds | |
|--|--|
| FALL PROTECTION REQUIRED | TYPE OF SCAFFOLD |
| Personal Fall-Arrest System | <ul style="list-style-type: none"> ✦ Boatswain’s Chair ✦ Catenary Scaffold ✦ Float Scaffold ✦ Needle Beam Scaffold ✦ Ladder Jack Scaffold |
| Guardrails | <ul style="list-style-type: none"> ✦ Self-contained adjustable scaffold when platform is supported by the frame structure ✦ Walkways located within a scaffold |
| Personal Fall-Arrest System and Guardrails | <ul style="list-style-type: none"> ✦ Single-point adjustable suspension scaffold ✦ Two-point adjustable scaffold ✦ Self-contained adjustable scaffold when platform is supported by ropes |
| Personal Fall-Arrest System, Guardrails, or Grab-line | <ul style="list-style-type: none"> ✦ Crawling Board (chicken ladder) |
| Personal Fall-Arrest System or Guardrails | <ul style="list-style-type: none"> ✦ Overhand bricklaying on a supported scaffold ✦ All other types of types of scaffolds not identified in this table |

Personal Fall-Arrest Systems

A personal fall arrest system consists of an anchorage, connectors, and a body harness. It may also include a lanyard, deceleration device, or lifeline. Persons who work from a boatswain’s chair, catenary scaffold, float scaffold, needle beam scaffold, or ladder jack scaffold must be protected by a personal fall arrest system.

Personal Fall-Arrest Systems and Guardrails

Workers on single-point or two-point adjustable suspension scaffolds must be protected by personal fall arrest systems and guardrail systems. Workers must also use personal fall arrest systems and guardrails on self-contained adjustable scaffolds that are supported only by ropes (with no safety catch to support the platform if the rope fails). The top edge of top rails on supported scaffolds and on all suspended scaffolds where both a guardrail and a personal fall arrest system are required must be between 38 inches and 45 inches above the platform surface.

Cross Bracing

Cross bracing is acceptable in place of a midrail when the crossing point of two braces is between 20 inches and 30 inches above the work platform. Cross bracing can be used as a toprail when the crossing point is between 38 inches and 48 inches above the work platform. The end points at each upright must be no more than 48 inches apart. Cross bracing can be substituted for either the toprail or the midrail on a scaffold system — but not both. The crossing point must be at the appropriate toprail or midrail height.

Personal Fall-Arrest Systems for Erectors and Dismantlers

Workers who erect or dismantle supported scaffolds must, if feasible, use fall protection. A competent person, designated by the employer, must make the feasibility determination at each stage of the erecting and dismantling process.

Aerial Lifts

The fall protection required for persons who work on aerial lifts depends on the type of aerial lift used. The table below shows acceptable fall protection.

| <i>TYPE OF LIFT</i> | <i>FALL-PROTECTON REQUIRED</i> |
|--|---|
| Vehicle-mounted elevating and rotating work platforms (ANSI A92.2 devices) | Platforms other than buckets or baskets must include guardrail systems – guardrails, a midrail, and toeboards. Each person who works on a boom-supported platform must wear a body harness/belt and lanyard attached to the boom or basket. (Body belts may be used only for fall restraint.) |
| Manually propelled elevating aerial platforms (ANSI A92.3 devices) | The platform must have a guardrail at least 42 inches \pm 3 inches above the floor, a midrail, and toeboards at least 4 inches high. |
| Boom-supported elevating work platforms (ANSI A92.5 devices) | The platform must have a guardrail at least 42 inches \pm 3inches above the floor, a midrail, and toeboards at least 4 inches high. Each worker on the platform must wear a body harness/belt and lanyard attached to the boom or platform. |
| Self-propelled elevating work platforms (ANSI A92.6 devices) | The platform must have a guardrail 42 inches \pm 3 inches above the floor, a midrail, and toeboards at least 4 inches high. |

Lanyards and Personal Fall-Arrest Systems

Personal fall arrest systems used on scaffolds must be attached by a lanyard to a vertical lifeline, horizontal lifeline, or structural member that will hold at least 5,000 pounds. A competent person should decide the most appropriate connection. All personal fall arrest systems must meet the requirements specified in Subpart L. When a lanyard is connected to a horizontal lifeline on a single-point or two-point adjustable suspension scaffold, the scaffold must have independent support lines and automatic locking devices that can stop the scaffold if the suspension ropes fail.

Safe Work Practices

Damaged Scaffolds and Components

Any part of a damaged scaffold or component must be removed from service until it is repaired or replaced.

Erecting, Moving, Dismantling

Scaffolds must be erected, moved, dismantled, or altered only under the supervision of a competent person. The competent person must be on the worksite to direct and supervise all scaffold erecting, dismantling, altering, and moving operations. Work must be performed only by trained, experienced persons selected by the competent person.

Horizontal Movement

A scaffold cannot be moved horizontally when a worker is on it unless it has been designed by a registered professional engineer specifically for horizontal movement.

Load Capacities

Scaffolds and scaffold components must not be loaded over their maximum intended loads or rated capacities. Remember that the maximum intended load for a component depends on the scaffold type and configuration. Scaffolds and components must be able to support four times their maximum intended load — not the rated load. The intended load includes workers, equipment, and supply loads. The intended load should never exceed the rated load unless the design is approved by an engineer and the manufacturer.

Ladders and Large Area Scaffolds

Ladders can be used only on large area scaffolds; they cannot be used on other types of platforms to increase the working height. Large area scaffolds include pole scaffolds, tube and coupler scaffolds, systems scaffolds, or fabricated frame scaffolds erected over an entire work area.

Power Lines

Workers must stay clear of power lines and any conductive material on the scaffold. The minimum clearance is 10 feet for all uninsulated lines and insulated lines more than 300 volts. The minimum clearance for insulated lines less than 300 volts is three feet.

Scaffold Inspection

Scaffolds and components must be inspected by a competent person before each work day and after any incident that could weaken them.

Shore or Lean-To Scaffolds

Shore or lean-to scaffolds are prohibited. They are not properly designed and are a potential safety hazard for anyone who works on them.

Slippery Scaffolds

Working on a scaffold coated with snow, ice, or other slippery material is prohibited unless it is necessary to remove the slippery material.

Storms and High Winds

Working on a scaffold is prohibited during storms or high winds unless a competent person has determined that it is safe to be on the scaffold and workers are protected by personal fall arrest systems or wind screens.

Suspension Ropes

Suspension ropes must be protected from heat and acids or other corrosive substances or be made from material that will not be damaged by corrosive substances.

Tag Lines

When a scaffold might be struck by a swinging load, tag lines or equivalent means must be used to control the load.

| Safe Practice Checklist | |
|--|--|
| Access | <ul style="list-style-type: none"> ★ Maintain a safe access to scaffolds and scaffold platforms. ★ Do not climb cross braces to reach a scaffold platform. ★ Use ladders or stairways to reach platforms that are more than 2 feet above or below the access point. |
| Components and Connections | <ul style="list-style-type: none"> ★ Never use damaged scaffold components. Repair or replace them immediately. Make sure a competent person inspects the components before each work shift. ★ Do not modify components. ★ Do not mix components made by different manufacturers. ★ Never use damaged wire rope. |
| Environment | <ul style="list-style-type: none"> ★ Watch for electrical hazards, slippery platforms, and strong winds. |
| Erecting, Dismantling, and Moving | <ul style="list-style-type: none"> ★ Have only trained and experienced workers erect suspension scaffolds. ★ Never roll a scaffold by yourself while you are on it. ★ Never use wood outrigger systems. |
| Fall-Protection and Falling Objects | <ul style="list-style-type: none"> ★ Match fall protection systems with the appropriate type of scaffold. ★ Make sure platforms are guarded to keep workers and equipment from falling. ★ Do not drop anything from a scaffold. |
| Inspection | <ul style="list-style-type: none"> ★ Inspect components, connections, planks, and structures regularly for hazards. |
| Ladders | <ul style="list-style-type: none"> ★ Do not use ladders for any reason on a standard scaffold platform. |
| Leveling | <ul style="list-style-type: none"> ★ Keep the scaffold level, plumb, and square. ★ Do not use bricks, blocks, barrels or other unstable objects to level a scaffold. |
| Platforms | <ul style="list-style-type: none"> ★ Do not work on slippery platforms. ★ Never use a stage that is too long or too short for the job. ★ Planking must be sound and meet OSHA requirements. ★ Do not use makeshift methods to increase the working height of a scaffold platform. |

Supported Scaffolds

OSHA defines a supported scaffold as one or more platforms supported by outrigger beams, brackets, poles, legs, uprights, posts, frames, or similar rigid support.

Height to Smallest Base Dimension

Supported scaffolds with a height-to-smallest base-width ratio of more than 4-to-1 (including outrigger supports) must be restrained from tipping by ties, guys, braces, or equivalent means. "Equivalent means" refers to other designs, materials, or methods that provide an equal or greater degree of safety for workers.

Guys, Ties, and Braces

Guys, ties, and braces must be installed where horizontal members support both inner and outer legs. They must be installed according to the manufacturer's recommendations or at the closest horizontal member to the 4-to-1 height and repeated vertically at least every 20 feet if the scaffold is up to 3 feet wide; every 26 feet if the scaffold is greater than 3 feet wide.

Be sure to use vertical and horizontal tie-ins to keep the scaffold from falling into or away from a structure. A qualified person must design the tie-ins.

Support Surface

Poles, legs, posts, frames, and uprights must bear on base plates and mud sills or a firm foundation. The scaffold structure must be plumb and braced so that it does not sway. Footings must offer full support without settling. Base plates are always required on supported scaffolds; however, a concrete slab is considered a firm foundation and can be substituted for mudsills.

Forklifts and Front-End Loaders

Do not use a front-end loader to support a scaffold platform unless the vehicle has been designed by the manufacturer specifically for that purpose.

You can use a forklift to support a platform only if the entire platform is attached to the forks and the vehicle is not moved when someone is on the platform.

Attached means the platform is fastened to the forks with bolts or by an equally safe method. All scaffold capacity, construction, access, use, and fall protection requirements apply.

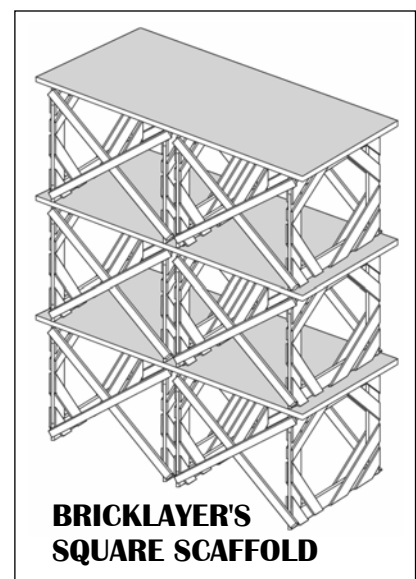
Types of Supported Scaffolds

Bricklayer's Square Scaffolds

- ❑ Wood bricklayer's scaffolds must be reinforced with gussets on both sides of each corner.
- ❑ Install diagonal braces on all sides of each square.
- ❑ Install diagonal braces between squares on the rear and front sides of the scaffold.
- ❑ Do not exceed three tiers in height. One square must rest directly above the other.

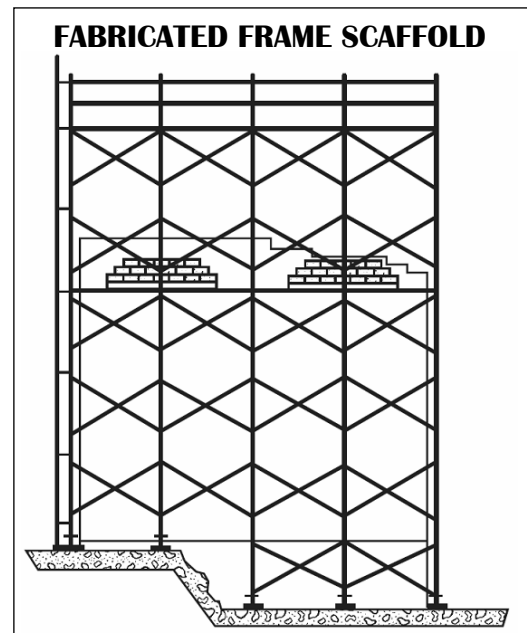
Crawling Boards (chicken ladders)

- ❑ Crawling boards must extend from the roof peak to the eaves when used for roof construction, repair, or maintenance.
- ❑ Crawling boards must be secured to the roof by ridge hooks or other means that meet equivalent strength and durability criteria.



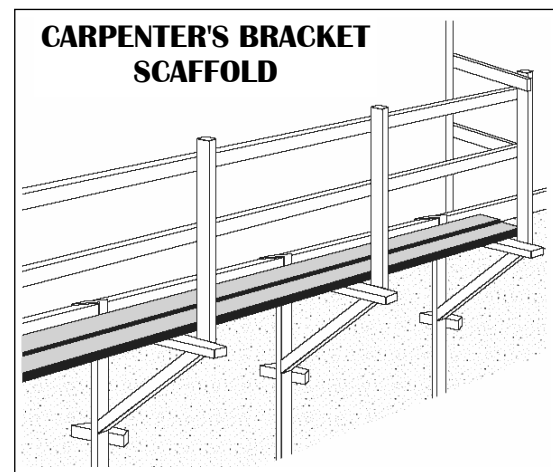
Fabricated Frame Scaffolds

- ❑ When you move platforms to the next level, leave the existing platform undisturbed until the new end frames have been set in place and braced.
- ❑ Frames and panels must be braced by cross, horizontal, or diagonal braces that secure vertical members together laterally.
- ❑ Join frames and panels together vertically by coupling or stacking pins.
- ❑ If uplift could displace scaffold end frames or panels, the frames or panels must be locked together vertically.
- ❑ Scaffolds more than 125 feet above their base plates must be designed by a registered professional engineer.



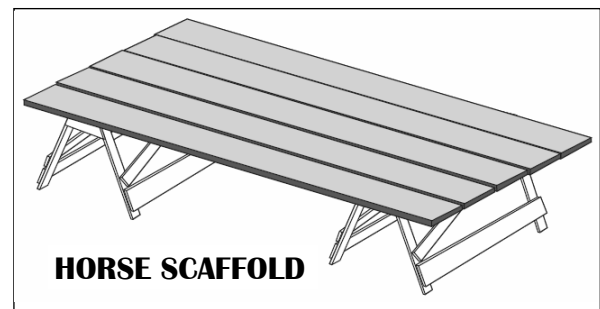
Form Scaffolds and Carpenter's Bracket Scaffolds

- ❑ Brackets, except those for wooden bracket-form scaffolds, must be attached to the supporting formwork or structure by: nails; a metal stud attachment device; welding; hooking over a secured structural supporting member; or, for carpenter's bracket scaffolds, by a bolt extending through to the opposite side of the structure's wall.
- ❑ Wooden bracket-form scaffolds must be an integral part of the form panel.
- ❑ Folding type metal brackets, when extended, must be either bolted or secured with a locking-type pin.



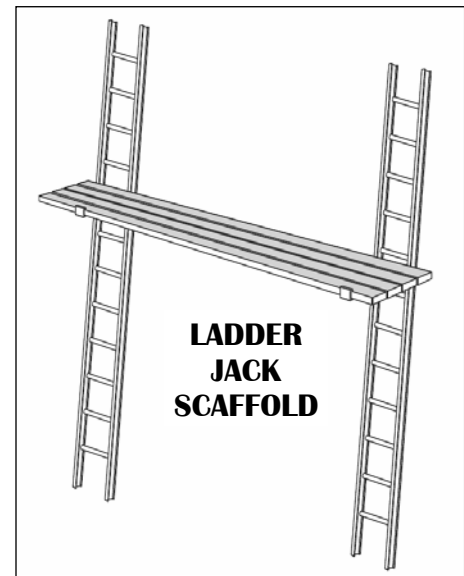
Horse Scaffolds

- ❑ Scaffolds must not be constructed more than two tiers or 10 feet high, whichever is less.
- ❑ When you arrange horses in tiers, place each horse directly over the horse in the tier below. The legs of each horse must be nailed down or otherwise secured to prevent displacement. Each tier must be cross braced.



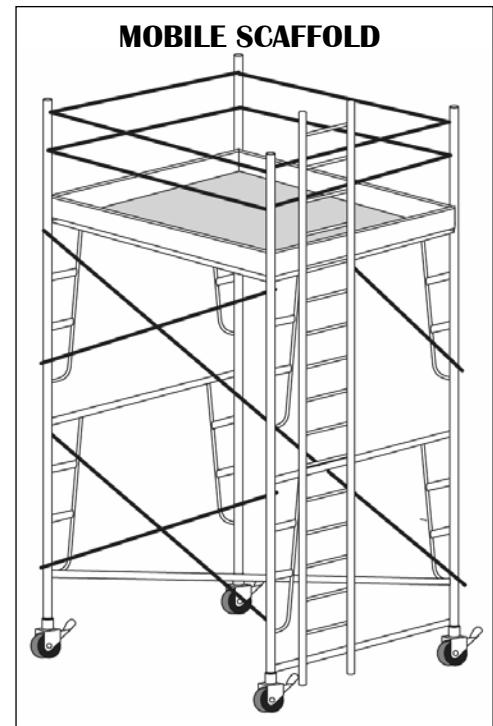
Ladder Jack Scaffolds

- ❑ Platforms must not exceed 20 feet in height.
- ❑ All ladders used to support ladder jack scaffolds must meet the requirements of Subpart X, Stairways and Ladders.
- ❑ Job-made ladders cannot be used to support ladder jack scaffolds.
- ❑ The ladder jack must be designed and constructed to bear on the side rails and ladder rungs or on the ladder rungs alone.
- ❑ Ladders that support ladder jacks must be placed, fastened, or equipped with devices to prevent slipping.
- ❑ Scaffold platforms must not be bridged one to another.



Mobile Scaffolds

- ❑ Use cross, horizontal, or diagonal braces to prevent scaffolds from collapsing and to secure vertical members.
- ❑ Scaffolds must be plumb, level, and squared.
- ❑ All brace connections must be secured.
- ❑ Lock casters and wheels to prevent scaffold movement.
- ❑ When you use manual force to move a scaffold, apply the force as close to the base as practicable, but not more than 5 feet above the supporting surface.
- ❑ Do not use forklifts, trucks, similar motor vehicles, or add-on motors to propel a scaffold unless the scaffold is specifically designed to be used with them.
- ❑ Make sure to stabilize scaffolds so they do not tip when they are moved.
- ❑ Platforms cannot extend outward beyond the scaffold base supports without outrigger frames or equivalent devices.
- ❑ Use screw jacks or equivalent means to level the scaffold.
- ❑ Caster stems and wheel stems must be secured in scaffold legs.
- ❑ Before moving a scaffold, make sure each worker on the scaffold is aware of the move.



Outrigger Scaffolds

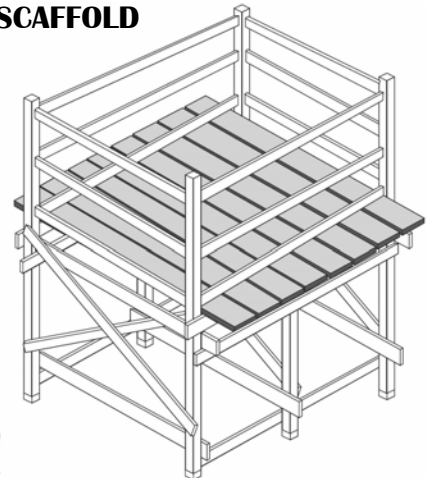
- ❑ The inboard end of outrigger beams, measured from the fulcrum point to the extreme point of anchorage, must be not less than 1.5 times the outboard end in length.

- ❑ Outrigger beams fabricated in the shape of an I-beam or channel must be placed so that the web section is vertical.
- ❑ The fulcrum point of outrigger beams must rest on secure bearings at least 6 inches in each horizontal dimension.
- ❑ Outrigger beams must be secured in place and braced at the fulcrum point against tipping.
- ❑ Securely anchor the inboard ends of outrigger beams. Use braced struts bearing against sills that contact the overhead beams or ceiling, or use tension members secured to the floor joists underfoot.
- ❑ The entire supporting structure must be securely braced to prevent horizontal movement.
- ❑ Platform units must be secured to outriggers.
- ❑ Scaffolds and scaffold components must be designed by a registered professional engineer.

Plasterer's, Decorator's, and Large Area Scaffolds

- ❑ These scaffolds must be constructed in accordance with the requirements for pole scaffolds, tube-and-coupler scaffolds, or fabricated frame scaffolds.

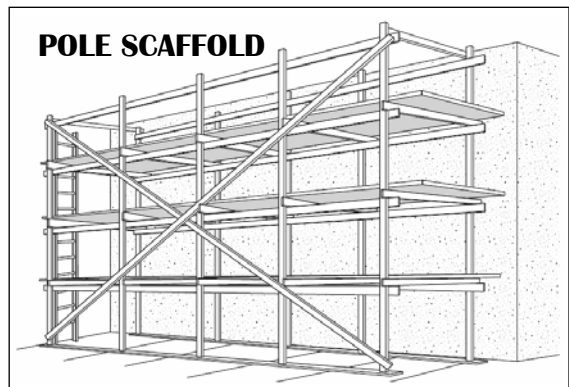
PLASTERER'S & DECORATOR'S SCAFFOLD



Pole Scaffolds

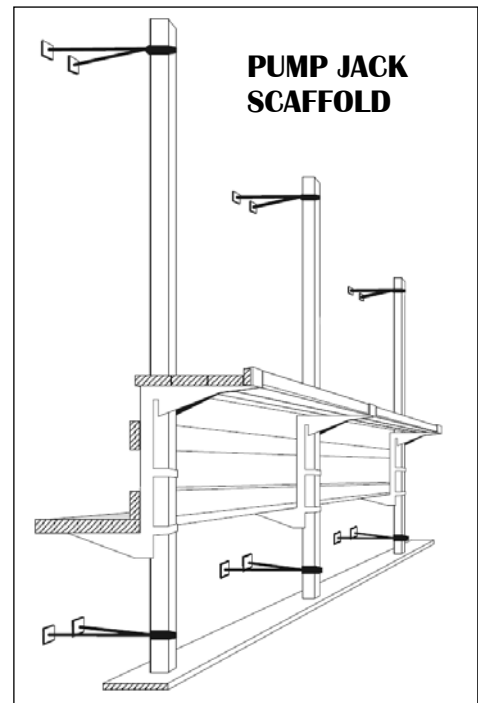
- ❑ When you move platforms to the next level, leave the existing platform undisturbed until new bearers are set and braced.
- ❑ Install cross bracing between the inner and outer sets of poles on double pole scaffolds.
- ❑ Install diagonal bracing in both directions across the entire inside face of double-pole scaffolds that support loads of 50 pounds or more per square foot.
- ❑ Install diagonal bracing in both directions across the entire outside face of double- and single-pole scaffolds.
- ❑ Install runners and bearers on edge.
- ❑ Extend bearers a minimum of 3 inches beyond the outside edges of runners.
- ❑ Extend runners over a minimum of two poles. Support by bearing blocks securely attached to the poles.
- ❑ Do not splice braces, bearers, and runners between poles.
- ❑ Where you splice wooden poles, square the ends. Make sure that wood splice plates are on at least two adjacent sides and that they extend at least 2 feet on either side of the splice.
- ❑ Pole scaffolds more than 60 feet in height must be designed by a registered professional engineer.

POLE SCAFFOLD



Pump Jack Scaffolds

- ❑ Pump jack brackets, braces, and accessories must be fabricated from metal plates and angles. Each pump jack bracket must have two positive gripping mechanisms.
- ❑ Secure poles to the structure with rigid triangular bracing.
- ❑ Workbenches must not be used as scaffold platforms.
- ❑ Wood poles must be straight-grained and free of shakes, large loose (or dead) knots, and other defects.
- ❑ Wood poles constructed in two continuous lengths must be joined together with the seam parallel to the bracket.
- ❑ If two-by-fours are spliced to make a pole, mending plates must be installed at all splices to maintain the full strength of the member.

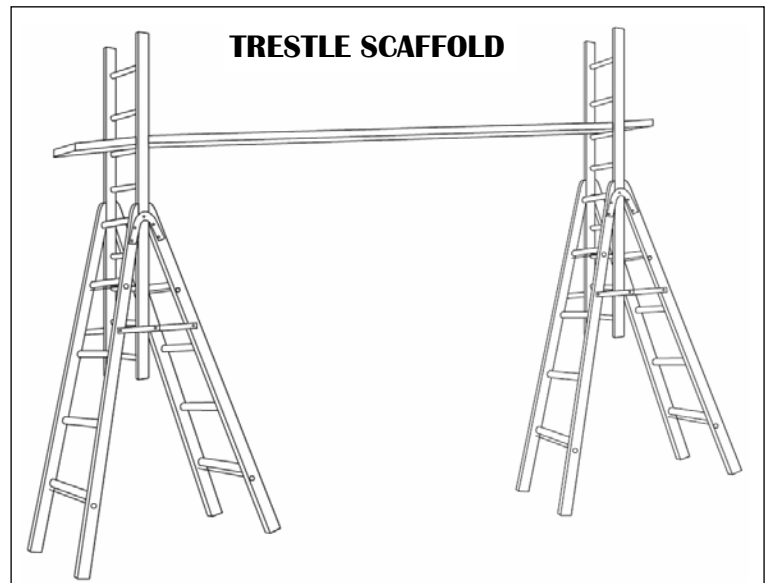


Roof Bracket Scaffolds

- ❑ Scaffold brackets must fit the pitch of the roof and provide a level support for the platform.
- ❑ Anchor brackets with nails or secure with first-grade manila rope at least $\frac{3}{4}$ inch diameter.

Step, Platform, and Trestle Ladder Scaffolds

- ❑ Scaffold platforms must not be any higher than the second-highest rung or step of the ladder supporting the platform.
- ❑ All ladders used in conjunction with step, platform, and trestle ladder scaffolds must meet the pertinent requirements of Subpart X, Stairways and Ladders. Do not use job-made ladders.
- ❑ Ladders that support step, platform, and trestle ladder scaffolds must be placed, fastened, or equipped with devices to prevent slipping.
- ❑ Scaffolds must not be bridged one to another.

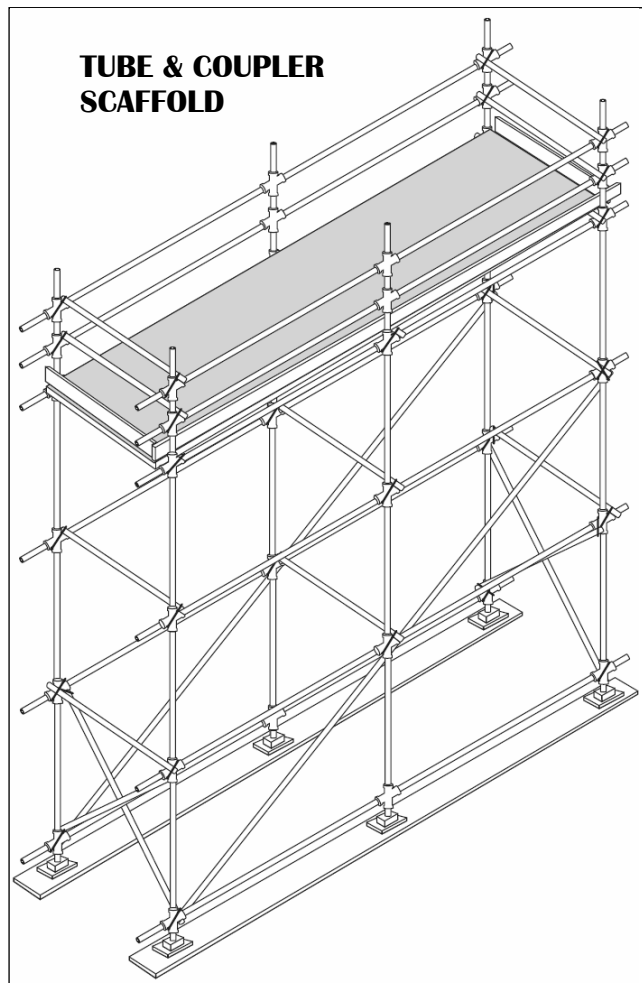


Stilts

- ❑ A worker may wear stilts only on a large-area scaffold.
- ❑ When a worker is using stilts on a large-area scaffold protected by guardrails, the guardrails must be increased in height by an amount equal to the height of the stilts.
- ❑ Stilts can be used only on surfaces that are flat and free of pits, holes, and other obstructions.
- ❑ Keep stilts properly maintained. Any alteration of the original equipment must be approved by the manufacturer.

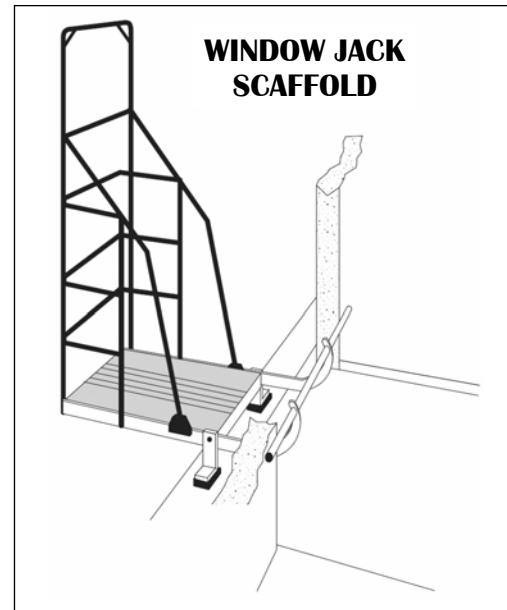
Tube and Coupler Scaffolds

- ❑ When you move platforms to the next level, leave the existing platform undisturbed until new bearers are set and braced.
- ❑ Install transverse bracing forming an "X" across the width of the scaffold, at every third set of posts horizontally, and every fourth runner vertically.
- ❑ On straight-run scaffolds, make sure longitudinal bracing across the inner and outer rows of posts is installed diagonally in both directions. The bracing must extend from the base of the end posts upward to the top of the scaffold at approximately a 45-degree angle.
- ❑ When you cannot attach bracing to posts, attach it to the runners as close to the post as possible.
- ❑ Install bearers transversely between posts.
- ❑ Extend bearers beyond the posts and runners. They must have full contact with the coupler.
- ❑ Install runners along the length of the scaffold on both the inside and outside posts at level heights.
- ❑ Interlock runners on straight runs in continuous lengths and couple them to each post. The bottom runners and bearers must be located as close to the base as possible.
- ❑ Couplers must be made from a structural metal such as drop-forged steel, malleable iron, or structural-grade aluminum.
- ❑ Tube and coupler scaffolds more than 125 feet in height must be designed by a registered professional engineer.



Window Jack Scaffolds

- ▣ Scaffolds must be securely attached to the window opening.
- ▣ Use the scaffold to work only at the window opening through which the jack is placed.
- ▣ Do not use window jacks to support planks placed between one window jack and another.



Suspension Scaffolds

OSHA defines a suspension scaffold as one or more platforms suspended by ropes or other non-rigid means from an overhead structure.

Support Device Load Requirements

Support devices such as outrigger beams, cornice hooks, and parapet clamps must rest on surfaces that can support at least four times the scaffold's load when the scaffold operates at the rated load of the hoist (or at least 1.5 times the scaffold load at the stall capacity of the hoist, whichever is greater).

Outrigger Beams

Outrigger beams must be made of structural metal or material of equivalent strength and must be restrained. The outrigger beams must be secured directly to the supporting surface or stabilized by counterweights. Because masons' multi-point adjustable suspension scaffolds bear heavy loads, their supporting outrigger beams can not be stabilized by counterweights; the supporting surface could become dangerously overloaded.

Outrigger beams must have stop bolts or shackles at both ends and be securely fastened with the flanges turned out when channel iron beams are used in place of I-beams. Bearing supports must be perpendicular to the beam center line. Outrigger beams must be set and maintained with the web vertically. The shackle that attaches the rope to the outrigger beam must be placed directly over the center line of the stirrup.

Direct Connections

A competent person must evaluate all direct connections and confirm that scaffold-supporting surfaces can support the imposed loads. An engineer must design masons' multi-point adjustable suspension scaffold connections.

Counterweights

Counterweights must be used only for their intended purpose and must not be changed or moved until the scaffold is dismantled. Sand and other flowable material cannot be used as a counterweight. Solid materials such as large concrete or lead blocks designed to be used as counterweight are acceptable, however.

Hoists and Related Equipment

Winding drum hoists must have at least four wraps of the suspension rope at the lowest point of scaffold travel. When other types of hoists are used, the suspension ropes must be long enough so the scaffold can be lowered without the rope end passing through the hoist.

Gasoline-powered equipment and hoists cannot be used on suspension scaffolds.

Suspension scaffold hoists must have an operating brake and an automatic braking device or locking pawl that engages when a hoist makes a sudden change in momentum or an accelerated over-speed.

Manually operated hoists must descend with a positive crank force.

Suspension Wire Rope

Repaired wire rope cannot be used for suspension rope. The load end of wire suspension ropes must be fitted with properly sized thimbles and secured by eye splicing or equivalent means. A competent person must check wire ropes for defects before each work-shift. Damaged rope must be replaced. Swaged attachments or spliced eyes on wire suspension ropes cannot be used unless they are made by a rope manufacturer or a qualified person.

Securing Scaffolds

Two-point and multi-point suspension scaffolds must be secured if they could sway; a competent person must make the determination. Window cleaners' anchors cannot be used to secure suspension scaffolds.

Safety Devices

Emergency escape and rescue devices cannot be used as working platforms. This requirement does not apply to systems that function as suspension scaffolds and as emergency/rescue devices.

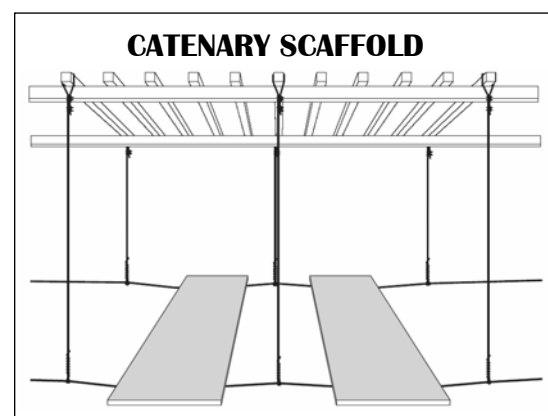
Tiebacks

Tiebacks must be at least as strong as suspension ropes and must be secured to a structurally sound anchorage on the building or structure. Do not use standpipes, vents, other piping systems, or electrical conduit for anchorages. Be sure to install tiebacks perpendicular to the face of the building or structure or use opposing angle tiebacks. Do not install single tiebacks at an angle to the face of a building or structure. Support devices such as cornice hooks, roof hooks, or parapet clamps must also be secured by properly installed tiebacks.

Types of Suspension Scaffolds

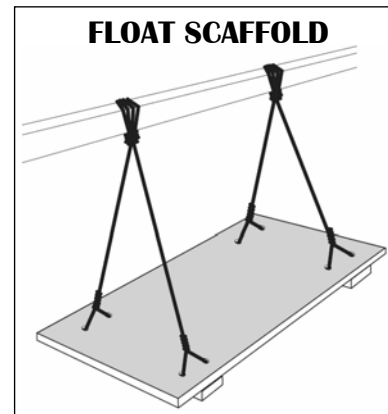
Catenary Scaffolds

- ❑ No more than one platform can be placed between consecutive vertical pickups and no more than two platforms must be used on a catenary scaffold.
- ❑ Platforms supported by wire ropes must have hook-shaped stops on each end to prevent them from slipping off the wire ropes. These hooks must be placed so that they will prevent the platform from falling if one of the horizontal wire ropes breaks.
- ❑ Wire ropes must not be tightened so much that a scaffold load will overstress them.
- ❑ Wire ropes must be continuous, without splices between anchors.



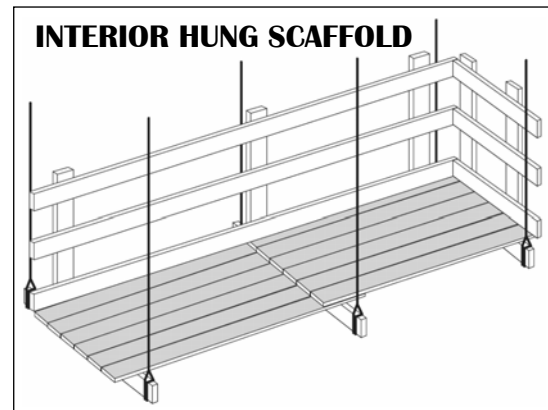
Float Scaffolds

- ❑ The platform must be supported by at least two bearers, each of which must project 6 or more inches beyond the platform on both sides. Each bearer must be securely fastened to the platform.
- ❑ Rope connections must keep the platform from shifting or slipping.



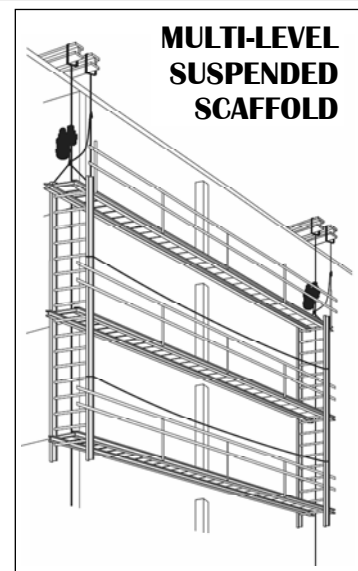
Interior Hung Scaffolds

- ❑ Scaffolds must be suspended only from a roof or other structural members such as ceiling beams.
- ❑ Inspect overhead supporting members such as roofs or ceiling beams before erecting the scaffold.
- ❑ Connect suspension ropes and cables to overhead supporting members by shackles, clips, or thimbles.



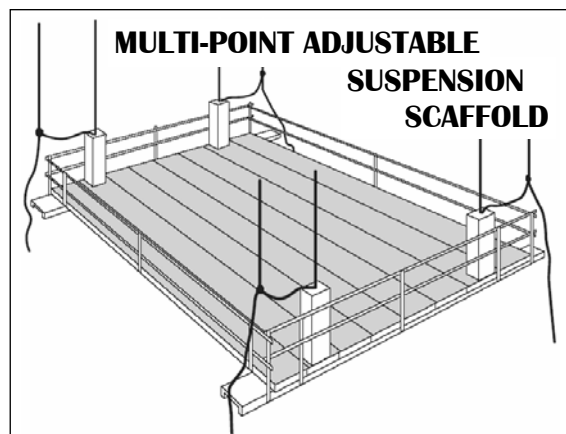
Multi-Level Suspended Scaffolds

- ❑ Scaffolds must be equipped with additional independent support lines equal to the number of supported points, as strong as the suspension ropes, and rigged to support the scaffold if the suspension rope(s) fail.
- ❑ Independent support lines and suspension ropes must not be attached to the same anchorage points.
- ❑ Supports for platforms must be attached directly to the support stirrup and not to any other platform.



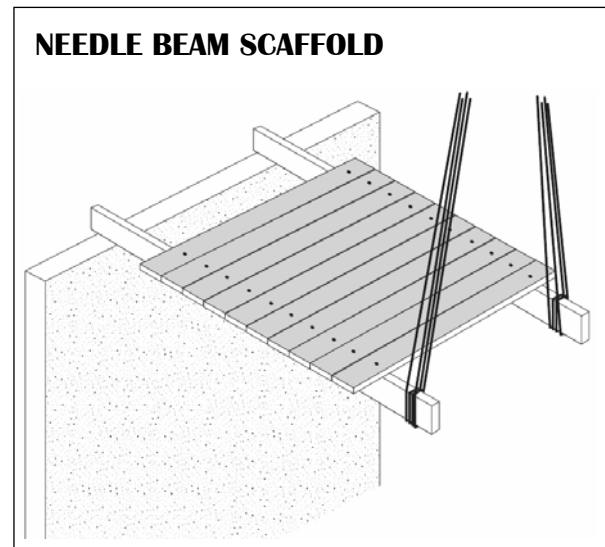
Multi-Point Adjustable Suspension Scaffolds

- ❑ When you use two or more scaffolds, they must not be bridged to one another unless they are designed to be bridged, the bridge connections are articulated, and the hoists are properly sized.
- ❑ If bridges are not used, you can go from one platform to another only when the platforms are the same height and are abutting.
- ❑ Scaffolds must be suspended from metal outriggers, brackets, wire rope slings, or hooks.



Needle Beam Scaffolds

- ❑ Scaffold support beams must be installed on edge.
- ❑ Use ropes or hangers for supports. One end of a needle beam scaffold, however, may be supported by a permanent structural member.
- ❑ Ropes must be securely attached to the needle beams.
- ❑ The support connection must prevent the needle beam from rolling or becoming displaced.
- ❑ Platform units must be securely attached to the needle beams. Cleats and overhang are not acceptable.



Repair Bracket Scaffolds

- ❑ Brackets must be secured by one or more wire ropes at least ½-inch in diameter.
- ❑ Attach each bracket to the securing wire rope (or ropes) by a locking device that will keep the bracket and the rope from separating.
- ❑ Each bracket, at the contact point between the supporting structure and the bottom of the bracket, must have a shoe (heel block or foot) that will prevent the bracket from moving laterally.
- ❑ Platforms must be secured to the brackets so they do not move or separate from the brackets.
- ❑ If you place a wire rope around a structure to anchor a personal fall arrest system for workers erecting or dismantling a scaffold, the wire rope must meet Subpart M and must be of at least $\frac{5}{16}$ -inch diameter.
- ❑ Each wire rope used to secure brackets in place or as a personal fall arrest system anchorage must be protected from damage.
- ❑ Use a turnbuckle at least 1 inch in diameter to tension wire ropes that secure brackets in place or that anchor personal fall arrest systems.
- ❑ Each turnbuckle must be connected to the other end of its rope by an appropriately sized eye-splice thimble.
- ❑ Do not use U-bolt wire rope clips on any wire rope to secure brackets or to anchor personal fall arrest systems.
- ❑ Do not drop materials over the outside of the supporting structure.
- ❑ Erect scaffolds only one direction around a structure.

Single-Point Adjustable Suspension Scaffolds

- ❑ If two single-point adjustable suspension scaffolds are combined to form a two-point adjustable suspension scaffold, the scaffold must comply with the requirements for two-point adjustable suspension scaffolds.
- ❑ Under most circumstances, the supporting rope between the scaffold and the suspension device must be kept vertical.

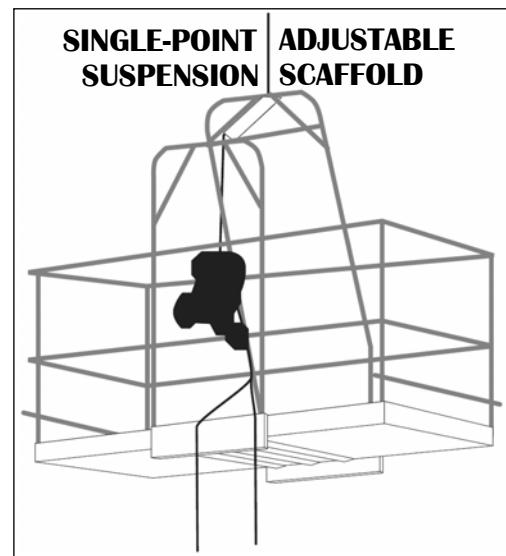
❑ Boatswain's chair tackle must consist of correctly sized ball bearings or bushed blocks containing safety hooks and properly "eye-spliced" minimum 5/8-inch diameter first-grade manila rope.

❑ Boatswain's chair seat slings must be reeved through four corner holes in the seat, must cross each other on the underside of the seat, and must be rigged to prevent slippage which could cause an out-of-level condition.

❑ Boatswain's chair seat slings must be a minimum of 5/8-inch diameter rope that will satisfy the strength, slip resistance, and durability of first-grade manila rope.

❑ When workers use a heat-producing process such as gas or arc welding, boatswain's chair seat slings must be a minimum of 3/8-inch wire rope.

❑ Non-cross-laminated wood boatswain's chairs must be reinforced on their undersides by cleats securely fastened to prevent the boards from splitting.



Two-Point Adjustable Suspension Scaffolds

❑ Platforms must not be more than 36 inches wide unless they are designed by a qualified person.

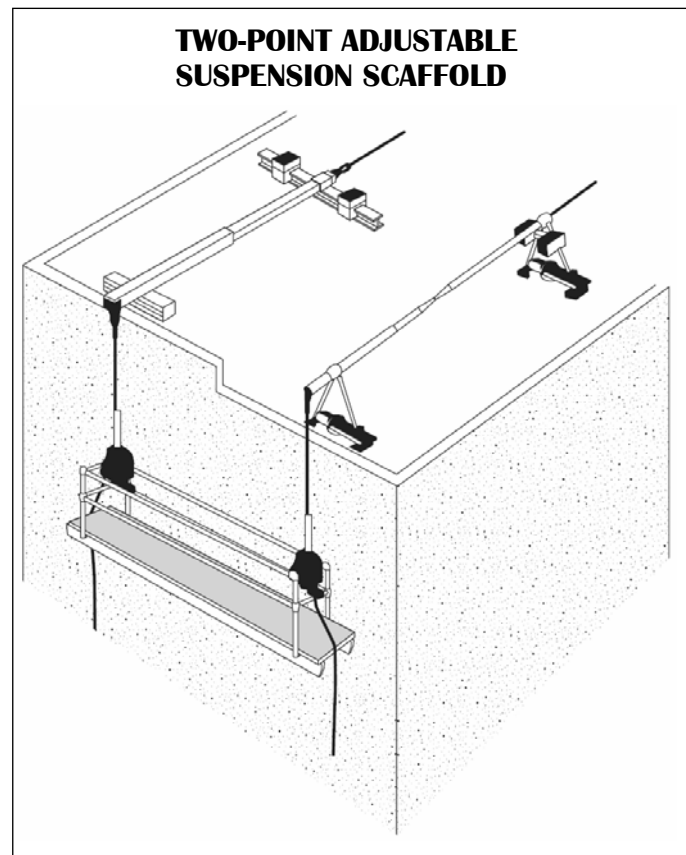
❑ Platforms must be securely fastened to hangers.

❑ The blocks for fiber or synthetic ropes must consist of at least one double and one single block. The sheaves of all blocks must fit the size of the rope used.

❑ Platforms must be ladder-type, plank-type, beam-type, or light-metal-type.

❑ Do not bridge or connect two-point scaffolds to one another when raising or lowering them unless the bridge connections are attached and the hoists are properly sized.

❑ You can go from one platform to another only when the platforms are at the same height, are abutting, and you use walk-through stirrups specifically designed for this purpose.

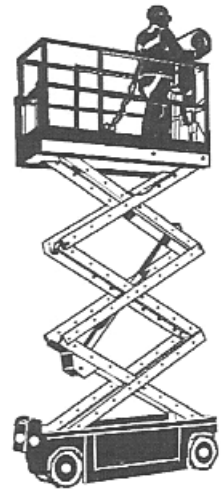


Aerial Lifts

An aerial lift is an extensible or articulating device designed to position workers and handle materials. Aerial lifts can be powered or manually operated and do not necessarily have to rotate about a vertical axis.

Subpart L covers only vehicle-mounted elevation and rotating aerial lifts (ANSI A92.2 device). However, ANSI has additional rules covering three other types of aerial lifts:

- ▣ Manually propelled elevating aerial platforms (ANSI A92.3 device).
- ▣ Boom-supported elevating work platforms (ANSI A92.5 device).
- ▣ Self-propelled elevating work platforms and scissor lifts (ANSI A92.6 device).



These additional rules require workers to have the manufacturer's operation manual with the lifts when they use them and to follow all operating and maintenance instructions.

Field Modifications

Aerial lifts may be "field modified" provided the manufacturer certifies in writing that modifications conform to all applicable provisions of ANSI A92.2 and OSHA requirements.

Ladder and Tower Trucks

Aerial ladders must be secured in the lower traveling position before they can be transported on highways.

Extensible and Articulating Boom Platforms

Lift controls must be tested before platforms are used. Workers must stand firmly on the floor of the basket and must wear a body belt and a lanyard attached to the boom or basket.

Body belts are acceptable in this case, as part of a tether system. However, body belts are not acceptable as part of a personal fall arrest system.

Electrical Tests

All electrical tests must conform to ANSI A92.2-1969 section 5.

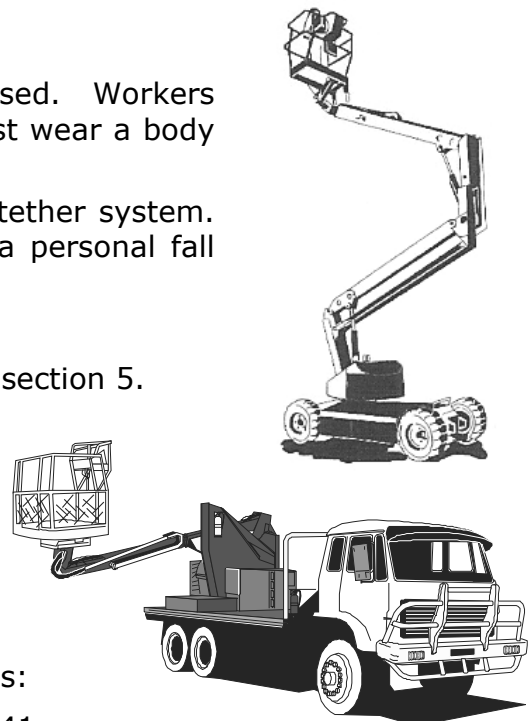
Bursting Safety Factor

ANSI A92.2-1969, section 4.9, applies to all critical hydraulic and pneumatic components. Critical components are those in which a failure would result in a free fall or free rotation of the boom.

Welding Standards

Welding work must conform to the following standards:

- ▣ Standard Qualification Procedure, AWS B3.0-41
- ▣ Recommended Practices for Automotive Welding Design, AWS D8.4-61
- ▣ Standard Qualification of Welding Procedures and Welders for Piping and Tubing, AWS D10.9-69
- ▣ Specifications for Welding Highway and Railway Bridges, AWS D2.0-69



Training Requirements

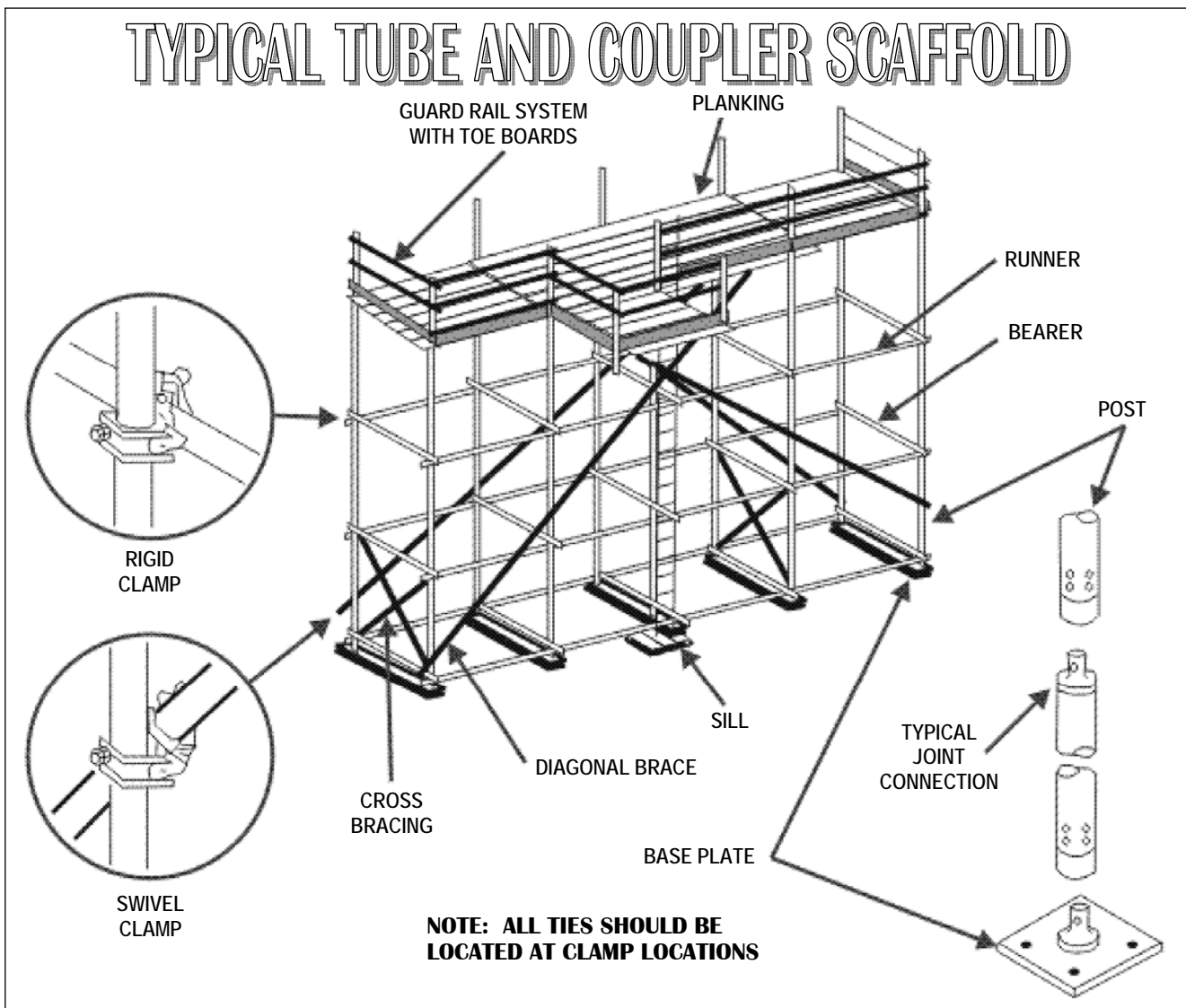
Each person who works from a scaffold must be trained to recognize hazards associated with that scaffold and to control or minimize the hazards. Training must cover:

- ▣ Electrical hazards, such as overhead power transmission lines.
- ▣ Fall hazards and methods to control the hazards.
- ▣ Falling object hazards and methods to protect persons from falling objects.
- ▣ How to use the scaffold's walkways, platform components, and access areas.
- ▣ The scaffold's load capacity and the types of loads appropriate for the scaffold.
- ▣ The requirements of Subpart L that apply to the Scaffold.

Workers Who Erect or Dismantle Scaffolds

Workers who erect, disassemble, move, or maintain a scaffold must be trained by a competent person. Training must cover:

- ▣ Scaffold hazards.
- ▣ Erecting, disassembling, moving, and maintenance procedures.
- ▣ Design criteria, maximum intended load-carrying capacity, and use.



Retraining

When an employer has reason to believe a worker lacks the skill or knowledge to safely use, erect, or dismantle a scaffold, the employer must retrain the worker. Other reasons for retraining include worksite changes that create new hazards and changes in the types of scaffolds, fall protection, or falling object protection used.

The following table summarizes the training requirements for persons who work from scaffolds and persons who erect or dismantle scaffolds.

| Summary of Training Requirements for Scaffold Users | | |
|--|--|---|
| Those Who Work from Scaffolds | | Those Who Erect and Dismantle Scaffolds |
| Critical Scaffold Issues | <ul style="list-style-type: none"> ★ Falling objects ★ Fall protection ★ Material handling on scaffolds ★ Scaffold load capacities | <ul style="list-style-type: none"> ★ Scaffold design criteria ★ Scaffold erecting, disassembling, moving, and maintenance procedures ★ Scaffold erecting, disassembling and, moving hazards ★ Scaffold load capacities |
| What They Need to Know | <ul style="list-style-type: none"> ★ How to use appropriate fall protection systems ★ How to control scaffold hazards ★ How to use scaffold walkways, platform components, and access areas ★ Maximum-intended and load-carrying capacities of scaffolds ★ Subpart L requirements | <ul style="list-style-type: none"> ★ Hazards involved in erecting/dismantling ★ Erection/dismantling planning procedures ★ How to deal with electrical hazards ★ How to inspect components ★ Appropriate design criteria ★ Maximum-intended and load-carrying capacities of scaffolds ★ Subpart L requirements |
| Who Can Train Them | Any person who has training and experience in the critical scaffold issues (above) and who can teach the issues to scaffold users. Subpart L refers to a person with these skills as a qualified person. See Page 3 in this guide for more information on the qualified person. | Any person who has training and experience in the critical scaffold issues (above), who can teach the issues to erectors/dismantlers, and who has authority to control scaffold hazards. Subpart L refers to a person with these skills as a competent person. See Page 3 in this guide for more information on the competent person. |
| How Often to Train Them | <ul style="list-style-type: none"> ★ Before they begin a new job ★ Whenever changes at the worksite present new hazards ★ Whenever they fail to demonstrate skills related to any of the critical scaffold issues | <ul style="list-style-type: none"> ★ Before they begin a new job ★ Whenever changes at the worksite present new hazards ★ Whenever they fail to demonstrate skills related to any of the critical scaffold issues |

Effective training programs do not just happen. They require careful planning, explicit goals and objectives, dedicated instructors, and motivated students. It does not matter whether the activity is athletics, academics, or occupational safety and health.

The underlying training concepts are similar:

- | | | | |
|---|---------------------------|---|-----------------------------------|
| ① | Design a training program | ③ | Evaluate training effectiveness |
| ② | Conduct training, | ④ | Improve training through feedback |

① ***Design a Training Program***

Determine whether a worksite problem can be solved by training.

Will training solve the problem or are hazards or engineering problems causing injuries? Training is most effective when it focuses on what workers need to know to do their jobs safely. Training is especially helpful for inexperienced workers, new workers, and workers unfamiliar with special processes and equipment.

Identify training needs.

Establish what the worker is expected to do and identify hazardous tasks. Analyze each task to determine what the worker must learn to do a job safely.

Design learning activities.

Learning activities enable workers to demonstrate that they have acquired desired skills and knowledge. The activities should simulate actual job tasks as closely as possible. Learning activities can be group-oriented, with lectures, role playing, and demonstrations. Or they can be designed as self-paced activities for individual workers. Ultimately, the design depends on the employer's creativity and training resources.

② ***Conduct the Training***

Plan the training structure and format. Consider the number, frequency, and length of sessions. Determine instructional techniques and who will do the training. Make sure the training is well-organized and has clearly defined objectives. Give workers an overview of what they will learn. Relate training materials to tasks and jobs. Include hands-on experience and role-playing activities, if possible. Reinforce learning by summarizing objectives and key concepts. Be sure to let workers participate in discussions and ask questions.

③ ***Evaluate Training Effectiveness***

How do you know training is accomplishing your objectives? Develop a plan to objectively evaluate training effectiveness. Ask workers what they've learned through training. Ask supervisors if workers are accomplishing training goals. Examine trends in your injury or illness statistics for changes that training may have influenced.

④ ***Improve Training through Feedback***

Collect and evaluate feedback from workers, supervisors, and others affected by the training. When you are sifting through what people had to say about the training, consider these questions:

- ★ Did the training focus on critical elements of the job?
- ★ Were major gaps in workers' knowledge or skills covered?
- ★ Were the training objectives presented clearly?
- ★ Did the objectives state the performance levels expected of workers?
- ★ Did learning activities simulate actual work tasks?

- ★ Were learning activities appropriate for the knowledge and skills the jobs required?
- ★ Were training materials organized and presented clearly?
- ★ Were workers motivated to learn?
- ★ Were workers encouraged to participate and to ask questions?

Adjust the training program if the feedback warrants a change.

Handling Emergencies

Employers must establish procedures to ensure that a worker who falls from a scaffold receives immediate attention. Emergency procedures should be fully documented before workers begin work or use fall arrest or restraint systems. Emergency procedures should identify key rescue and medical personnel, equipment available for rescue, communications procedures, retrieval methods, and first-aid requirements.

The following lists identify safe practice guidelines for developing emergency response planning procedures, responding to emergencies, and investigating accidents.

Planning Guidelines

Before On-Site Work Begins

- ☐ Make the fire department or emergency responders aware of the job specifications at the site and any factors that may slow response time.
- ☐ Create one or more joint training sessions between key onsite personnel and emergency responders.
- ☐ Document the rescue plan and make sure it is posted at the worksite.
- ☐ Mark the job site with signs and note the easiest access routes into and out of the site.

As On-Site Work Progresses

- ☐ Identify on-site equipment that can be used for rescue and retrieval. Examples: boom-lifts, ladders, and forklifts.
- ☐ Maintain a current equipment inventory at the site. Equipment may change frequently as the job progresses.
- ☐ Reevaluate and update the emergency response plan if onsite work tasks change.

Emergency Response Actions

- ☐ Call 9-1-1 or other emergency numbers indicated on the emergency response plan. Use 9-1-1 for ambulance service but remember that most 9-1-1 responders are not trained to rescue an injured worker suspended in a personal fall-arrest system. Rescue procedures must ensure prompt response to a suspended worker. The 9-1-1 number does not ensure prompt response. First responders should clear a path to the victim. Others should be sent to direct emergency personnel to the scene.
- ☐ Make sure only qualified personnel attempt a technical rescue.
- ☐ Prohibit all non-essential personnel from the rescue area.
- ☐ Talk to the victim; determine the victim's condition, if possible.

- ❑ If the victim is accessible: Comfort and check vital signs. If necessary: Administer CPR, attempt to stop bleeding.
- ❑ Do not attempt a solo rescue if the victim is suspended. Wait for trained emergency responders.

Accident investigation guidelines

- ❑ Report fatalities and catastrophes to OSHA within eight hours.
- ❑ Report injuries requiring overnight hospitalization to OSHA within 24 hours.
- ❑ Identify all equipment associated with the accident and put it out of service until the accident investigation is complete.
- ❑ Document what went wrong, step by step.
- ❑ Review the fall protection plan; determine how the plan could be changed to prevent similar accidents; revise the plan accordingly.
- ❑ Have a qualified person examine equipment associated with the accident; if damaged, repair or replace it. If it contributed to the accident, determine how and why, then replace it.
- ❑ Do not disturb the scene of a fatality or catastrophe.

DEFINITIONS AND IMPORTANT TERMS

Subpart L uses many special terms and words. Some of them may be new to you or might be confusing in the context of a requirement, so we have included all important terms here in alphabetical order. On Page 3 you will find detailed information on two particularly important terms, the "**Competent Person**" and the "**Qualified Person.**"

Adjustable suspension scaffold: A suspension scaffold with a hoist (or hoists) operated by workers on the scaffold.

Bearer: A horizontal transverse scaffold member, upon which the scaffold platform rests, that joins scaffold uprights, posts, and poles.

Boatswain's chair: A single-point adjustable suspension scaffold consisting of a seat or sling that supports one person in a sitting position.

Body harness: Straps that can be secured about the worker to distribute fall-arrest forces over the thighs, pelvis, waist, chest, and shoulders.

Brace: A rigid connection that holds one scaffold member in a fixed position with respect to another member, building, or structure.

Bricklayer's square scaffold: A supported scaffold made of framed squares that support a platform.

Carpenter's bracket scaffold: A supported scaffold consisting of a platform supported by brackets attached to a building or structural walls.

Catenary scaffold: A suspension scaffold consisting of a platform supported by two horizontal and parallel ropes attached to structural members of a building or other structure.

Chimney hoist: A multi-point adjustable suspension scaffold that provides access for working inside chimneys. See "multi-point adjustable suspension scaffold."

Cleat: A structural block used at the end of a platform to prevent the platform from slipping off its supports. Cleats also provide footing on sloped surfaces such as crawling boards.

Competent person: One who can identify hazardous working conditions and who has authorization to take prompt corrective measures to eliminate them. For more information on the competent person, see page 3.

Continuous-run scaffold (run scaffold): A two-point or multi-point adjustable suspension scaffold made from braced scaffold members or supporting structures that form a continuous scaffold.

Coupler: A device that locks together the tubes of a tube-and coupler scaffold.

Crawling board (chicken ladder): A supported scaffold consisting of a plank with cleats spaced and secured to provide footing.

Deceleration device: Any mechanism that dissipates energy during a fall arrest or limits the energy imposed on a worker during fall arrest.

Double pole (independent pole) scaffold: A supported scaffold consisting of a platform resting on bearers supported by ledgers and a double row of uprights not supported (except with ties, guys, braces) by any other structure.

Equivalent: Alternative designs, materials, or methods that the employer can demonstrate will provide an equal or greater degree of safety for workers than the methods, materials, or designs specified in a standard.

Exposed power lines: Unshielded electrical power lines that could contact workers. Exposed power lines do not include extension cords or power tool cords.

Eye or eye splice: A loop with or without a thimble at the end of a wire rope.

Fabricated decking and planking: Manufactured platforms made of wood (including laminated wood and solid sawn-wood planks), metal, or other materials.

Fabricated frame scaffold (tubular-welded frame scaffold): A scaffold consisting of a platform supported on fabricated end-frames with integral posts, horizontal bearers, and intermediate members.

Failure: Breakage or separation of component parts.

Float (ship) scaffold: A suspension scaffold consisting of a braced platform resting on two parallel bearers and hung from overhead supports by fixed-length ropes.

Form scaffold: A supported scaffold consisting of a platform supported by brackets attached to formwork.

Guardrail system: A vertical barrier consisting of toprails, midrails, and posts. Prevents workers from falling to lower levels.

Hoist: A manual or power-operated mechanical device that raises or lowers a suspended scaffold.

Horse scaffold: A supported scaffold consisting of a platform supported by construction horses (sawhorses). Horse scaffolds made of metal are also called trestle scaffolds.

Independent pole scaffold: See "double pole scaffold."

Interior hung scaffold: A suspension scaffold consisting of a platform suspended from a ceiling or roof structure by fixed length supports.

Ladder jack scaffold: A supported scaffold consisting of a platform resting on brackets attached to ladders.

Ladder stand: A mobile, fixed-size, self-supporting ladder consisting of a wide, flat tread ladder in the form of stairs.

Landing: A platform at the end of a flight of stairs.

Large area scaffold: A pole scaffold, tube and coupler scaffold, systems scaffold, or fabricated frame scaffold erected over an entire work area.

Lean-to scaffold: A supported scaffold that is kept erect by tilting toward and resting against a building or structure.

Lifeline: A flexible line that connects to an anchorage at one end and hangs vertically (vertical lifeline), or that connects to anchorages at both ends and stretches horizontally (horizontal lifeline); it connects other components of a personal fall arrest system to the anchorage.

Lower levels: Areas below the working level. Examples: ground levels, floors, roofs, ramps, runways, excavations, pits, tanks, materials, water, and equipment.

Mason's adjustable supported scaffold: See "Self-contained adjustable scaffold."

Mason's multi-point adjustable suspension scaffold: A continuous-run suspension scaffold designed and used for masonry work.

Maximum intended load: The total load of all persons, equipment, tools, materials, transmitted loads, and other loads applied to a scaffold or scaffold component.

Mobile scaffold: A portable caster or wheel-mounted supported scaffold.

Multi-level suspended scaffold: A two-point or multi-point adjustable suspension scaffold with platforms at various levels that rest on common stirrups.

Multi-point adjustable suspension scaffold: A suspension scaffold consisting of a platform suspended by more than two ropes from overhead supports that can be raised and lowered to desired work levels. Includes chimney hoists.

Needle beam scaffold: A platform suspended from needle beams.

Open sides and ends: The edges of a platform that are more than 14 inches away from a sturdy, continuous, vertical surface (such as a building wall) or a sturdy, continuous horizontal surface (such as a floor), or a point of access. Exception: For plastering and lathing operations, the horizontal distance is 18 inches.

Outrigger: The structural member of a supported scaffold that increases the scaffold's base width, increasing support and stability.

Outrigger beam (thrust-out): The structural member of a suspension scaffold or outrigger scaffold that supports the scaffold by extending the attachment point out and away from a structure.

Outrigger scaffold: A supported scaffold consisting of a platform resting on outrigger beams projecting beyond the wall or face of a structure; the inboard ends are secured inside the structure.

Overhand bricklaying: Laying bricks and masonry units so that the surface of the wall to be jointed requires the mason to lean over the wall to complete the work.

Personal fall arrest system: An anchorage, connectors, and a body harness used to arrest a worker's fall. May also include a lanyard, deceleration device, or lifeline.

Platform: A work surface raised above lower levels. Platforms are made of individual wood planks, fabricated planks, fabricated decks, and fabricated platforms.

Pole scaffold: See "single-pole scaffold" and "double (independent) pole scaffold."

Power-operated hoist: A hoist powered by other than human energy.

Pump jack scaffold: A supported scaffold consisting of a platform supported by vertical poles and movable support brackets.

Qualified person: One who, by possession of a recognized degree, certificate, or professional standing, or who by extensive knowledge, training, and experience, has successfully demonstrated the ability to solve problems related to the subject, the work, or the project. See Page 3 for more information on the qualified person.

Rated load: The manufacturer's specified maximum load to be lifted by a hoist or to be applied to a scaffold or scaffold component.

Repair bracket scaffold: A supported scaffold consisting of a platform supported by brackets secured around the circumference or perimeter of a chimney, stack, tank, or other supporting structure.

Roof bracket scaffold: A rooftop-supported scaffold consisting of a platform resting on angular-shaped supports.

Runner (ledger or ribbon): The lengthwise horizontal spacing or bracing member that supports the bearers.

Scaffold: Any temporary elevated platform (supported or suspended) and its supporting structure (including points of anchorage), that supports workers and materials.

Self-contained adjustable scaffold: A combination supported and suspension scaffold consisting of an adjustable platform mounted on an independent supporting frame not a part of the object worked on. Examples: rolling roof rigs, rolling outrigger systems, and some mason's adjustable supported scaffolds.

Shore scaffold: A supported scaffold placed against a structure and held in place with props.

Single-point adjustable suspension scaffold: A suspension scaffold consisting of a platform suspended by one rope from an overhead support and equipped to move the platform to desired work levels.

Single-pole scaffold: A supported scaffold consisting of a platform resting on bearers. The outside ends are supported on runners secured to a single row of posts or uprights and the inner ends are supported by a structure.

Stair tower (scaffold stairway/tower): A tower that contains internal stairways and rest platforms. Used to provide access to scaffold platforms and other elevated points such as floors and roofs.

Stall load: The load at which a power-operated hoist stalls or the power is automatically disconnected.

Step, platform, and trestle ladder scaffold: A platform resting directly on the rungs of stepladders or trestle ladders.

Stilts: A pair of poles or supports with raised footrests, used to walk above the ground or working surface.

Stonesetter's multi-point adjustable suspension scaffold: A continuous-run suspension scaffold designed and used for stonemason's work.

Supported scaffold: One or more platforms supported by outrigger beams, brackets, poles, legs, uprights, posts, frames, or similar rigid support.

Suspension scaffold: One or more platforms suspended by ropes or other non-rigid means from an overhead structure(s).

System scaffold: A scaffold consisting of posts with fixed connection points that accept runners, bearers, and diagonals interconnected at predetermined levels.

Tank builder's scaffold: A supported scaffold consisting of a platform resting on brackets directly attached to a cylindrical tank or attached to devices that are attached a tank.

Top-plate bracket scaffold: A scaffold supported by brackets that hook over or are attached to the top of a wall. Similar to carpenter's bracket scaffolds and form scaffolds and used in residential construction for setting trusses.

Tube and coupler scaffold: A supported or suspended scaffold consisting of a platform(s) supported by tubing, erected with coupling devices connecting uprights, braces, bearers, and runners.

Tubular welded-frame scaffold: See “fabricated frame scaffold.”

Two-point suspension scaffold (swing stage): A suspension scaffold consisting of a platform supported by hangers (stirrups) suspended by two ropes from overhead supports and equipped to raise and lower the platform to desired work levels.

Unstable objects: Objects that could become dislocated, shift, and not support the loads imposed on them. Unstable objects do not constitute a safe base support for scaffolds, platforms, or workers. Examples: barrels, boxes, loose brick, and concrete blocks.

Vertical pickup: A rope used to support the horizontal rope in catenary scaffolds.

Walkway: A portion of a scaffold platform used only for access and not as a work level.

Window jack scaffold: A platform resting on a bracket or jack that projects through a window opening.

Section Notes:

SCAFFOLD SAFETY RULES

The following are common sense rules designed to promote safety when using scaffolding. These rules are based on OSHA Standards and are intended to deal with some of the many practices and conditions encountered in the use of scaffolding. The rules do not purport to be all-inclusive or to supplant or replace other additional safety and precautionary measures to cover usual or unusual conditions. They are not intended to conflict with, or supersede, any statute or regulation; reference to specific provisions should be made by the user.

- ① Post these scaffolding safety rules in a conspicuous place and be sure that all persons who erect, dismantle, or use scaffolding are aware of them.
 - ② Follow all state, local, and federal codes, ordinances, and regulations pertaining to scaffolding.
 - ③ Inspect all equipment before using – Never use any equipment that is damaged or deteriorated in any way.
 - ④ Keep all equipment in good repair. Avoid using rusted equipment – the strength of rusted equipment is not known.
 - ⑤ Inspect erected scaffolds regularly to be sure that they are maintained in safe condition.
 - ⑥ Consult your scaffolding supplier when in doubt – scaffolding is his business, **NEVER TAKE CHANCES.**
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| <ol style="list-style-type: none">Ⓐ Provide adequate sills for scaffold posts and use base plates.Ⓑ Use adjusting screws instead of blocking to adjust to uneven grade conditions.Ⓒ Plumb and level all scaffolds as the erection proceeds. Do not force braces to fit – level the scaffold until proper fit can be made easily.Ⓓ Fasten all braces securely.Ⓔ DO NOT climb cross braces. An access (climbing) ladder, access steps, frame designed to be climbed or equivalent safe access to the scaffold shall be used.Ⓕ On wall scaffolds, place and maintain anchors securely between structure and scaffold at least every 30' of length and 25' of height.Ⓖ When scaffolds are to be partially or fully enclosed, specific precautions must be taken to assure frequency and adequacy of ties attaching the scaffolding to the building due to increased load conditions resulting from effects of wind and weather. The scaffolding components to which the ties are attached must also be checked for additional loads.Ⓗ Free standing scaffold towers must be restrained from tipping by guying or other means.Ⓘ Equip all planked or staged areas with proper guardrails, midrail, and toeboards along all open side and ends of scaffold platforms.Ⓢ Power lines near scaffolds are dangerous – use caution and consult the power service company for advice.Ⓚ DO NOT use ladders or makeshift devices on top of scaffolds to increase the height.Ⓛ DO NOT overload scaffolds.Ⓜ Planking:<ol style="list-style-type: none">① Use only lumber that is properly inspected and graded as scaffold plank.② Planking shall have at least 12" of overlap and extend 6" beyond center of support, or be cleated at both ends to prevent sliding off supports.③ Fabricated scaffold planks and platforms unless cleated or restrained by hooks shall extend over their end supports not less than 6" not more than 12".④ Secure plank to scaffold when necessary. | <ol style="list-style-type: none">Ⓝ For rolling scaffold, the following additional rules apply:<ol style="list-style-type: none">① DO NOT ride rolling scaffolds.② Secure or remove all material and equipment from platform before moving scaffold.③ Caster brakes must be applied at all times when scaffolds are not being moved.④ Casters with plain stems shall be attached to the panel or adjustment screw by pins or other suitable means.⑤ DO NOT attempt to move a rolling scaffold without sufficient help – watch out for holes in floor and overhead obstructions.⑥ DO NOT extend adjusting screws on rolling scaffolds more than 12".⑦ Use Horizontal diagonal bracing near the bottom and at 20' intervals measured from the rolling surface.⑧ DO NOT use brackets on rolling scaffolds without consideration of overturning effect.⑨ The working platform height of a rolling scaffold must not exceed four times the smallest base dimension unless guyed or otherwise stabilized.Ⓞ For "Putlogs" and "Trusses" the following additional rules apply:<ol style="list-style-type: none">① DO NOT cantilever or extend putlogs/trusses as side brackets without thorough consideration for loads to be applied.② Putlogs/trusses should extend at least 6" beyond point of support.③ Place proper bracing between putlogs/trusses when the span of putlog/truss is more than 12".Ⓟ All brackets shall be seated correctly with side brackets parallel to the frames and end brackets at 90 degrees to the frames. Brackets shall not be bent or twisted from normal position. Brackets (except mobile brackets designed to carry materials) are to be used as work platforms only and shall not be used for storage of material or equipment.Ⓠ All scaffolding accessories shall be used and installed in accordance with the manufacturers recommended procedure. Accessories shall not be altered in the field. Scaffolds, frames, and their components, manufactured by different companies shall not be intermixed. |
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Chapter 19 Excavation Procedures

General Policy for Trenching and Excavation

Arena Fire Protection, Inc. has adopted the following safety guidelines for safe "Excavation and Trenching" practices.

The qualified subcontractor is the person responsible for safe excavation procedures. Disciplinary procedures shall be enforced as needed.

Excavating is recognized as one of the most hazardous construction operations. Cave-ins are perhaps the most feared trenching hazard. But other potentially fatal hazards exist, including asphyxiation due to lack of oxygen in a confined space, inhalation of toxic fumes, drowning, etc. Electrocution or explosions can occur when workers contact underground utilities.



The following rules are to be followed at all times by all employees working on, in, or near excavations, as applicable:

- ❑ **Before temporary removal** of individual members begins, additional precautions shall be taken to ensure the safety of employees, such as installing other structural members to carry the loads imposed on the support system.
- ❑ **Exposure to falling loads.** No employee shall be permitted underneath loads handled by lifting or digging equipment. Employees shall be required to stand away from any vehicle being loaded or unloaded to avoid being struck by any spillage or falling materials. Operators may remain in the cabs of vehicles being loaded or unloaded when the vehicles are equipped to provide adequate protection for the operator during loading and unloading operations.
- ❑ **Warning system for mobile equipment.** When mobile equipment is operated adjacent to an excavation, or when such equipment is required to approach the edge of an excavation, and the operator does not have a clear and direct view of the edge of the excavation, a warning system shall be utilized such as barricades, hand or mechanical signals, or stop logs. If possible, the grade should be away from the excavation.
- ❑ **Exposure to vehicular traffic.** Employees exposed to public vehicular traffic shall be provided with, and shall wear; warning vests or other suitable garments marked with or made of reflectorized or high-visibility material.
- ❑ **Employees shall not work** in excavations in which there is accumulated water, or in excavations in which water is accumulating, unless adequate precautions have been taken to protect employees against the hazards posed by water accumulation. The precautions necessary to protect employees adequately vary with each situation, but could include special support or shield systems to protect from cave-ins, water removal to control the level of accumulating water, or use of a safety harness and lifeline.

- ❑ **Employees are not permitted** under loads that are handled by lifting or digging equipment. Employees are not allowed to work in the excavation above other employees unless the lower level employees are adequately protected.
- ❑ **Where oxygen deficiency** (atmospheres containing less than 19.5 percent oxygen) or a hazardous atmosphere exists, or could reasonably be expected to exist, such as in excavations in landfill areas or excavations in areas where hazardous substances are stored nearby, the atmospheres in the excavation shall be tested before employees enter excavations greater than 4 feet (1.22 m) in depth.
- ❑ **Adequate precautions** shall be taken to prevent employee exposure to atmospheres containing less than 19.5 percent oxygen and other hazardous atmospheres. These precautions include providing proper respiratory protection or ventilation in accordance with subparts D and E of this part respectively.
- ❑ **When controls are used** that are intended to reduce the level of atmospheric contaminants to acceptable levels, testing shall be conducted as often as necessary to ensure that the atmosphere remains safe.
- ❑ **At least one copy** of the design shall be maintained at the jobsite during construction of the protective system. After that time, the design may be stored off the jobsite, but a copy of the design shall be made available to the Secretary upon request.
- ❑ **Guardrails are provided** if there are walkways or bridges crossing over an excavation.

Scope and Application of the Policy

This excavation policy applies to all open excavations made in the earth's surface.

- ★ **A trench** is a narrow excavation made below the surface of the ground in which the depth is greater than the width — the width not exceeding 15 feet.
- ★ **An excavation** is any man-made cut, cavity, trench, or depression in the earth's surface formed by earth removal. This can include excavations for anything from cellars to highways.

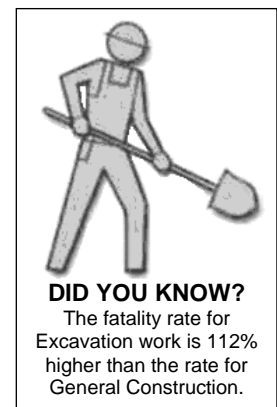
General Requirements

OSHA requires that workers in trenches and excavations be protected, and that safety and health programs address the variety of hazards they face. The following hazards cause the most trenching and excavation injuries:

- ★ No Protective System
- ★ Failure to Inspect Trench and Protective Systems
- ★ Unsafe Spoil-Pile Placement
- ★ Unsafe Access/Egress

No Protective System

All excavations are hazardous because they are inherently unstable. If they are restricted spaces they present the additional risks of oxygen depletion, toxic fumes, and water accumulation. If you are not using protective systems or equipment while working in trenches or excavations at your site, you are in danger of suffocating, inhaling toxic materials, fire, drowning, or being crushed by a cave-in.



Methods to Avoid Hazards

Pre-job planning is vital to accident-free trenching; safety cannot be improvised as work progresses. The following concerns must be addressed by a competent person:

- ☐ Evaluate soil conditions and select appropriate protective systems.
- ☐ Construct protective systems in accordance with the standard requirements.
- ☐ Preplan; contact utilities (gas, electric) to locate underground lines, plan for traffic control if necessary, and determine proximity to structures that could affect choice of protective system.
- ☐ Test for low oxygen, hazardous fumes and toxic gases, especially when gasoline engine-driven equipment is running, or the dirt has been contaminated by leaking lines or storage tanks. Insure adequate ventilation or respiratory protection if necessary.
- ☐ Provide safe access into and out of the excavation.
- ☐ Provide appropriate protections if water accumulation is a problem.
- ☐ Inspect the site daily at the start of each shift, following a rainstorm, or after any other hazard-increasing event.
- ☐ Keep excavations open the minimum amount of time needed to complete operations.

Failure to Inspect Trench and Protective System

If trenches and excavations at your site are not inspected daily for evidence of possible cave-ins, hazardous atmospheres, failure of protective systems, or other unsafe conditions, you are in danger.

Methods to Avoid Hazards

Inspect excavations:

- ☐ Before construction begins.
- ☐ Daily before each shift.
- ☐ As needed throughout the shift.
- ☐ Following rainstorms or other hazard-increasing events (such as a vehicle or other equipment approaching the edge of an excavation).
- ☐ Inspections must be conducted by a competent person who:
 - ☐ Has training in soil analysis.
 - ☐ Has training in the use of protective systems.
 - ☐ Is knowledgeable about the OSHA requirements.
 - ☐ Has authority to immediately eliminate hazards.

Unsafe Spoil-Pile Placement

Excavated materials (spoils) at your site are hazardous if they are set too close to the edge of a trench/excavation. The weight of the spoils can cause a cave-in, or spoils and equipment can roll back on top of workers, causing serious injuries or death.



Methods to Avoid Hazards

Provide protection by one or more of the following:

- ❑ Set spoils and equipment at least 2 feet back from the excavation.
- ❑ Use retaining devices, such as a trench box, which will extend above the top of the trench to prevent equipment and spoils from falling back into the excavation.
- ❑ Where the site does not permit a 2-foot set back, spoils may need to be temporarily hauled to another location.

Unsafe Access/Egress

To avoid fall injuries during normal entry and exit of a trench or excavation at your job site, ladders, stairways, or ramps are required. In some circumstances, when conditions in a trench or excavation become hazardous, survival may even depend on how quickly you can climb out.

Methods to Avoid Hazards

- ❑ Provide stairways, ladders, ramps, or other safe means of egress in all trenches that are 4 feet deep or more.
- ❑ Position means of egress within 25 lateral feet of workers.
- ❑ Structural ramps that are used solely for access or egress from excavations must be designed by a competent person.
- ❑ When two or more components form a ramp or runway, they must be connected to prevent displacement, and be of uniform thickness.
- ❑ Cleats or other means of connecting runway components must be attached in a way that would not cause tripping (e.g., to the bottom of the structure).
- ❑ Structural ramps used in place of steps must have a non-slip surface.
- ❑ Use earthen ramps as a means of egress only if a worker can walk them in an upright position, and only if they have been evaluated by a competent person.

Planning for Safety

Many on-the-job accidents are a direct result of inadequate initial planning. Correcting mistakes in shoring or sloping after work has begun slows the operation, adds to costs, and increases the possibility of an excavation failure (cave-in). Contractors must build safety into pre-bid planning. Developing safety checklists specific to each job will help accomplish this.

The following specific site conditions should be considered before preparing a bid:

- | | |
|-------------------|--|
| ★ Traffic | ★ Surface and Groundwater |
| ★ The Water Table | ★ Nearness of Structures and their Condition |
| ★ Soil | ★ Overhead and Underground Utilities |

The standard requires employers to determine the estimated location of utility installations (sewer, telephone, fuel, electric, water lines, or any other underground installations) that may be encountered during digging before opening an excavation. Allow two business days in advance of digging for locates. To find the exact location of underground installations, workers must use safe and acceptable means. If such installations are exposed, OSHA regulations require that they be removed, protected, or properly supported. When all necessary, specific information about the job site is assembled, the contractor can determine the amount, kind, and cost of the safety equipment needed.

A careful inventory of safety items on hand should be made before deciding what additional material must be acquired. No matter how many trenching, shoring, and backfilling jobs have been done in the past, each job must be approached with great care and preparation.

Before Starting the Job

Before beginning work, employers must provide employees exposed to vehicular traffic with warning vests or other suitable garments marked with or made of reflectorized or high-visibility material and ensure that they wear them. Workers must also be instructed to remove or neutralize surface obstacles that may create hazards.

No employee should operate equipment without being properly trained and alert to potential hazards. In training and in the worksite safety and health program, it also is important to include procedures for fast notification and investigation of accidents.

On-the-Job Evaluation

The OSHA Standard requires that a competent person inspect excavations and adjacent areas at least daily for possible cave-ins, failures of protective systems and equipment, hazardous atmospheres, or other hazardous conditions. If these conditions are encountered, exposed employees must be removed from the hazardous area until necessary safety precautions have been taken. Inspections are also required after heavy rains or man-made events such as blasting that may increase the potential for hazards.

Larger and more complex operations should have a full-time safety person who makes recommendations to improve implementation of the safety plan. In smaller operations, the safety person may be part-time and will usually be a supervisor.

Supervisors are the contractor's representatives on the job. They should conduct inspections, investigate accidents, anticipate hazards, and ensure that employees receive on-the-job safety and health training. They must also review and strengthen overall safety and health precautions to guard against potential hazards, get necessary worker cooperation in safety matters, and report frequently to the contractor.

Managers and supervisors must set the example for safety at the job site. When visiting job sites, *all* managers must wear prescribed personal protective equipment such as safety shoes, safety glasses, hardhats, and other necessary gear.

Employees must also take an active role in job safety. The contractor and supervisor must make certain that workers have been properly trained in the use and fit of protective gear and equipment, that they are wearing and using the equipment correctly, and that they are using safe work practices.

Cave-Ins and Protective Support Systems

Support systems

Excavation workers are exposed to many hazards, but the chief hazard is cave-ins. Employees must be protected by sloping or benching the sides of the excavation, supporting the sides of the excavation, or placing a shield between the side of the excavation and the work area.

All deep excavations must be protected by a system designed by a registered professional engineer. Before any sloping, benching, or support system is selected, the excavation soil type must be classified by a competent person.

Designing or selecting a protective system can be complex because of the number of factors involved — soil classification, depth of cut, water content of soil, changes due to weather and climate, or other operations in the vicinity.

The OSHA Standard, however, provides four methods each for sloping and shoring, including the use of shields to provide the required level of protection against cave-ins.

One method of ensuring the safety and health of workers in an excavation is to slope the sides to an angle not steeper than 1½ H: 1V (34 degrees measured from the horizontal). These slopes must be excavated to form configurations that are in accordance with those for Type C soil. A slope of this gradation or less is considered safe for any type of soil.

A second design method, which can be applied for both sloping and shoring, involves using tabulated data such as tables and charts approved by a registered professional engineer. The data, its limitations, and the selection criteria must be in writing.

At least one copy of the information that includes the identity of the registered professional engineer who approved the data must be kept at the worksite during construction of the protective system. Upon completion of the system, the data may be stored away from the site, but a copy must be made available, upon request, to OSHA.

Contractors may also use a trench box or shield designed or approved by a registered professional engineer or based on tabulated data prepared or approved by such an engineer. Timber, aluminum, or other suitable materials may also be used. OSHA permits the use of a trench shield as long as the protection it provides is equal to or greater than the protection that would be provided by the appropriate shoring system.

Employers are free to choose the most practical option for the circumstances. Once an option has been selected, however, that system must meet required performance criteria.

Safety Precautions

OSHA requires employers to provide support systems such as shoring, bracing, or underpinning to ensure the stability of nearby structures such as buildings, walls, sidewalks, or pavements.

The Standard also prohibits excavation below the level of the base or footing of any foundation or retaining wall unless a support system such as underpinning is provided, the excavation is in stable rock, or a registered professional engineer determines that the structure is far enough away from the excavation that the excavation will not pose a hazard to employees.

Excavations under sidewalks and pavements are also prohibited unless an appropriately designed support system is provided, or another effective method is used.

Installation and Removal of Protective Systems

OSHA requires the following procedures for the protection of employees when installing support systems:

- ▣ Connect support system members securely
- ▣ Install support systems safely
- ▣ Never overload support system members
- ▣ Install other structural members to carry loads imposed on the support system when temporary removal of individual members is necessary



As soon as work is completed, the excavation should be backfilled as the protective system is dismantled. After the excavation has been cleared, workers should slowly remove the protective system from the bottom up, taking care to release members slowly.

Materials and Equipment

The employer is responsible for the safe condition of materials and equipment used for protective systems. Defective and damaged materials and equipment can result in the failure of a protective system and cause excavation hazards.

To avoid possible failure of a protective system, the employer must ensure that:

- ☐ Materials and equipment are free from damage or defect.
- ☐ Manufactured materials and equipment are used and maintained consistent with manufacturers' recommendations and in a way that prevents employee exposure to hazards.
- ☐ Materials and equipment damaged while in operation are examined by a competent person.

If materials and equipment are not safe for use, they must be removed from service. These materials cannot be returned to service without the evaluation and approval of a registered professional engineer.

Other Hazards

Falls and Equipment

In addition to cave-in hazards and secondary hazards related to cave-ins, workers must be protected from other hazards during excavation-related work. These include exposure to falls, falling loads, and mobile equipment.

To protect employees, OSHA requires employers to take the following precautions:

- ☐ Keep materials or equipment that might fall or roll into an excavation at least two feet from the edge of excavations or use retaining devices, or both.
- ☐ Provide warning systems such as mobile equipment, barricades, hand or mechanical signals, or stop logs, to alert operators of the edge of an excavation. If possible, keep the grade away from the excavation.
- ☐ Provide scaling to remove loose rock or soil, or install protective barricades and other equivalent protection to protect employees from falling rock, soil, or materials.
- ☐ Prohibit employees from working on faces of sloped or benched excavations at levels above other employees unless employees at lower levels are properly protected from falling, rolling, or sliding material or equipment hazards.
- ☐ Prohibit employees under loads handled by lifting or digging equipment. To avoid being struck by any spillage or falling materials, require employees to stand away from a vehicle being loaded or unloaded. Operators may remain inside a vehicle if the cab of the vehicle provides adequate protection from falling loads during loading and unloading operation.

Water Accumulation

Employees shall not be permitted to work in excavations where water has built up or is building. If water removal equipment is used to control or prevent water from accumulating equipment operations must be monitored by a competent person to ensure proper use.

Diversion ditches, dikes, or other suitable means shall be used to prevent surface water from entering an excavation and to provide adequate drainage of the area adjacent to the excavation. A competent person must inspect excavations subject to runoffs from heavy rains.

Hazardous Atmospheres

A competent person must test excavations, or excavations where oxygen deficiency or a hazardous atmosphere exists or could reasonably be expected to exist, before employees may enter. If hazardous conditions exist, proper respiratory protection or ventilation must be provided. Controls used to reduce atmospheric contaminants to acceptable levels must be tested regularly.

Where adverse atmospheric conditions may exist or develop in an excavation, the employer must provide and ensure that emergency rescue equipment (e.g., breathing apparatus, a safety harness and line, basket stretcher, etc.) is readily available.

When an employee enters bell-bottom pier holes and similar deep and confined footing excavations, the employee must wear a harness with a lifeline. The lifeline must be securely attached to the harness and must be separate from any line used to handle materials. While the employee wearing the lifeline is in the excavation, an observer must ensure that the lifeline is working properly and maintain communication with the employee.

Access and Egress

Employers must provide safe access and egress to all excavations. When employees are in trench excavations the Standard requires adequate means of entry and exit (ladders, steps, ramps, or other safe means of access and egress) within 25 feet of lateral travel. Structural ramps used for employee access or egress must be designed by a competent person. If the ramps are used by vehicles, they must be designed by a competent person qualified in structural design. Also, structural members used for ramps or runways must be uniform in thickness and joined in a manner to prevent tripping or displacement.

Inspections

Daily inspections of excavations, the adjacent areas, and protective systems shall be made by a competent person for evidence of a situation that could result in possible cave-ins, indications of failure of protective systems, hazardous atmospheres, or other hazardous conditions. An inspection shall be conducted by the competent person prior to the start of work and as needed throughout the shift. Inspections shall also be made after every rainstorm or other hazard increasing occurrence. These inspections are only required when employee exposure can be reasonably anticipated.

Where the competent person finds evidence of a situation that could result in a possible cave-in, indications of failure of protective systems, hazardous atmospheres, or other hazardous conditions, exposed employees shall be removed from the hazardous area until the necessary precautions have been taken to ensure their safety.

An Overview of Soil Mechanics

The following information is intended to provide options when classifying soil, selecting employee protection methods, and recognition of trenching and shoring hazards and their prevention.

A number of stresses and deformations can occur in an open cut or trench. For example, increases or decreases in moisture content can adversely affect the stability of a trench or excavation. The following diagrams show some of the more frequently identified causes of trench failure.

Tension Cracks

Tension cracks usually form at a horizontal distance of 0.5 to 0.75 times the depth of the trench, measured from the top of the vertical face of the trench. See the drawing for additional details.

Sliding

Sliding or sluffing may occur as a result of tension cracks.

The illustration shows sliding.

Toppling

In addition to sliding, tension cracks can cause toppling. Toppling occurs when the trench's vertical face shears along the tension crack line and topples into the excavation.

Subsidence and Bulging

An unsupported excavation can create an unbalanced stress in the soil, which, in turn, causes subsidence at the surface and bulging of the vertical face of the trench. If uncorrected, this condition can cause face failure and entrapment of workers in the trench.

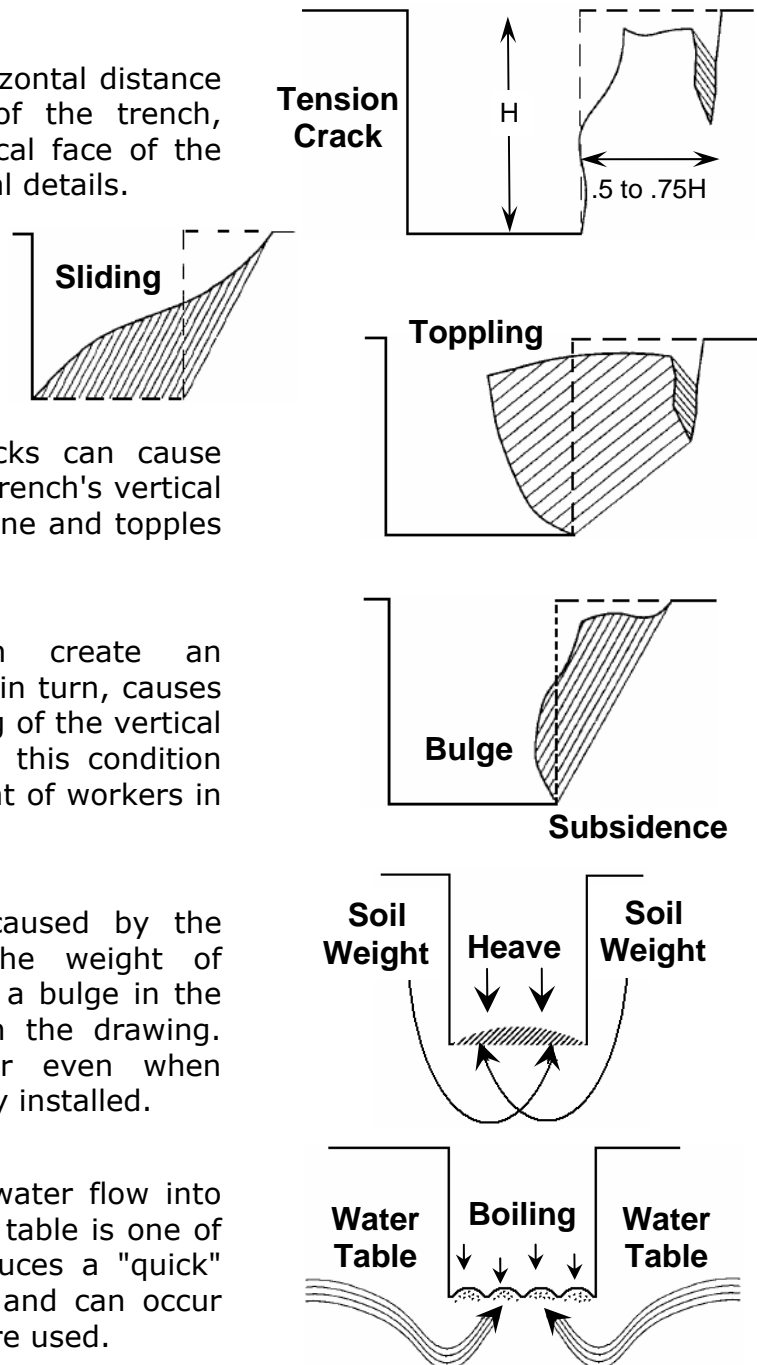
Heaving or Squeezing

Bottom heaving or squeezing is caused by the downward pressure created by the weight of adjoining soil. This pressure causes a bulge in the bottom of the cut, as illustrated in the drawing. Heaving and squeezing can occur even when shoring or shielding has been properly installed.

Boiling

Boiling is evidenced by an upward water flow into the bottom of the cut. A high water table is one of the causes of boiling. Boiling produces a "quick" condition in the bottom of the cut, and can occur even when shoring or trench boxes are used.

Unit Weight of Soils refers to the weight of one unit of a particular soil. The weight of soil varies with type and moisture content. One cubic foot of soil can weigh from 110 pounds to 140 pounds or more, and one cubic meter (35.3 cubic feet) of soil can weigh more than 3000 pounds.



Determination of Soil Type

OSHA categorizes soil and rock deposits into four types.

Stable Rock

Stable rock is natural solid mineral matter that can be excavated with vertical sides and remain intact while exposed. It is usually identified by a rock name such as granite or sandstone. Determining whether a deposit is of this type may be difficult unless it is known whether cracks exist and whether or not the cracks run into or away from the excavation.

Type A Soils

Type A soils are cohesive soils with an unconfined compressive strength of 1.5 tons per square foot (tsf) (144 kPa) or greater. Examples of Type A cohesive soils are often: clay, silty clay, sandy clay, clay loam and, in some cases, silty clay loam and sandy clay loam. (No soil is Type A if it is fissured, is subject to vibration of any type, has previously been disturbed, is part of a sloped, layered system where the layers dip into the excavation on a slope of 4 horizontal to 1 vertical (4H:1V) or greater, or has seeping water.

Type B Soils

Type B soils are cohesive soils with an unconfined compressive strength greater than 0.5 tsf (48 kPa) but less than 1.5 tsf (144 kPa). Examples of other Type B soils are: angular gravel; silt; silt loam; previously disturbed soils unless otherwise classified as Type C; soils that meet the unconfined compressive strength or cementation requirements of Type A soils but are fissured or subject to vibration; dry unstable rock; layered systems sloping into the trench at a slope less than 4H:1V (only if the material would be classified as a Type B soil).

Type C Soils

Type C soils are cohesive soils with an unconfined compressive strength of 0.5 tsf (48 kPa) or less. Other Type C soils include granular soils such as gravel, sand and loamy sand, submerged soil, soil from which water is freely seeping, and submerged rock that is not stable. Also included in this classification is material in a sloped, layered system where the layers dip into the excavation or have a slope of four horizontal to one vertical (4H:1V) or greater.

Layered Geological Strata

Where soils are configured in layers, i.e., where a layered geologic structure exists, the soil must be classified on the basis of the soil classification of the weakest soil layer. Each layer may be classified individually if a more stable layer lies below a less stable layer, i.e., where a Type C soil rests on top of stable rock.

Test Equipment and Methods for Evaluating Soil Type

Many kinds of equipment and methods are used to determine the type of soil prevailing in an area. These are described below.

Pocket Penetrometer

Penetrometers are direct-reading, spring-operated instruments used to determine the unconfined compressive strength of saturated cohesive soils. Once pushed into the soil, an indicator sleeve displays the reading. The instrument is calibrated in either tons per square foot (tsf) or kilograms per square centimeter (kPa). However, penetrometers have error rates in the range of + 20-40%.

Shearvane (Torvane)

To determine the unconfined compressive strength of the soil with a shearvane, the blades of the vane are pressed into a level section of undisturbed soil, and the torsional knob is slowly turned until soil failure occurs. The direct instrument reading must be multiplied by 2 to provide results in tons per square foot (tsf) or kilograms per square centimeter (kPa).

Thumb Penetration Test

The thumb penetration procedure involves an attempt to press the thumb firmly into the soil in question. If the thumb makes an indentation in the soil only with great difficulty, the soil is probably Type A. If the thumb penetrates no further than the length of the thumb nail, it is probably Type B soil, and if the thumb penetrates the full length of the thumb, it is Type C soil. The thumb test is subjective and is therefore the least accurate of the three methods.

Dry Strength Test

Dry soil that crumbles freely or with moderate pressure into individual grains is granular. Dry soil that falls into clumps that subsequently break into smaller clumps (and the smaller clumps can be broken only with difficulty) is probably clay in combination with gravel, sand, or silt. If the soil breaks into clumps that do not break into smaller clumps (and the soil can be broken only with difficulty), the soil is considered unfissured unless there is visual indication of fissuring.

Plasticity or Wet Thread Test

This test is conducted by molding a moist sample of the soil into a ball and attempting to roll it into a thin thread approximately 1/8 inch (3 mm) in diameter (thick) by two inches (50 mm) in length. The soil sample is held by one end. If the sample does not break or tear, the soil is considered cohesive.

Visual Test

A visual test is a qualitative evaluation of conditions around the site. In a visual test, the entire excavation site is observed, including the soil adjacent to the site and the soil being excavated. If the soil remains in clumps, it is cohesive; if it appears to be coarse-grained sand or gravel, it is considered granular. The evaluator also checks for any signs of vibration. During a visual test, the evaluator should check for crack-line openings along the failure zone that would indicate tension cracks, look for existing utilities that indicate that the soil has previously been disturbed, and observe the open side of the excavation for indications of layered geologic structuring.

The evaluator should also look for signs of bulging, boiling, or sluffing, as well as for signs of surface water seeping from the sides of the excavation or from the water table. If there is standing water in the cut, the evaluator should check for "quick" conditions.

In addition, the area adjacent to the excavation should be checked for signs of foundations or other intrusions into the failure zone, and the evaluator should check for surcharging and the spoil distance from the edge of the excavation.

Shoring Types

Shoring is the provision of a support system for trench faces used to prevent movement of soil, underground utilities, roadways, and foundations. Shoring or shielding is used when the location or depth of the cut makes sloping back to the maximum allowable slope impractical. There are two basic types of shoring, timber and aluminum hydraulic.

Shoring systems consist of posts, wales, struts, and sheeting. The trend today is toward the use of hydraulic shoring, a prefabricated strut and/or wale system manufactured of aluminum or steel. Hydraulic shoring provides a critical safety advantage over timber shoring because workers do not have to enter the trench to install or remove hydraulic shoring. Other advantages of most hydraulic systems are that they:

- ▣ Are light enough to be installed by one worker.
- ▣ Are gauge-regulated to ensure even distribution of pressure along the trench line.
- ▣ Can have their trench faces "preloaded," to use the soil's natural cohesion to prevent movement.
- ▣ Can be adapted easily to various trench depths and widths.

All shoring should be installed from the top down and removed from the bottom up. Hydraulic shoring should be checked at least once per shift for leaking hoses and/or cylinders, broken connections, cracked nipples, bent bases, and any other damaged or defective parts.

Pneumatic Shoring

Pneumatic shoring works in a manner similar to hydraulic shoring. The primary difference is that pneumatic shoring uses air pressure in place of hydraulic pressure. A disadvantage to the use of pneumatic shoring is that an air compressor must be on site.

Screw Jacks

Screw jack systems differ from hydraulic and pneumatic systems in that the struts of a screw jack system must be adjusted manually. This creates a hazard because the worker is required to be in the trench in order to adjust the strut. In addition, uniform "preloading" cannot be achieved with screw jacks, and their weight creates handling difficulties.

Single-Cylinder Hydraulic Shores

Shores of this type are generally used in a waler system, as an assist to timber shoring systems, and in shallow trenches where face stability is required.

Underpinning

This process involves stabilizing adjacent structures, foundations, and other intrusions that may have an impact on the excavation. As the term indicates, underpinning is a procedure in which the foundation is physically reinforced. Underpinning should be conducted only under the direction and with the approval of a registered professional engineer.

Shielding Types

Trench boxes are different from shoring because, instead of shoring up or otherwise supporting the trench face, they are intended primarily to protect workers from cave-ins and similar incidents.

The excavated area between the outside of the trench box and the face of the trench should be as small as possible. The space between the trench boxes and the excavation side are backfilled to prevent lateral movement of the box. Shields may not be subjected to loads exceeding those which the system was designed to withstand.

Trench boxes are generally used in open areas, but they also may be used in combination with sloping and benching. The box should extend at least 18 inches above the surrounding area if there is sloping toward excavation. This can be accomplished by providing a benched area adjacent to the box.

Earth excavation to a depth of 2 feet below the shield is permitted, but only if the shield is designed to resist the forces calculated for the full depth of the trench and there are no indications while the trench is open of possible loss of soil from behind or below the bottom of the support system.

Conditions of this type require observation on the effects of bulging, heaving, and boiling as well as surcharging, vibration, adjacent structures, etc., on excavating below the bottom of a shield.

Careful visual inspection of the conditions mentioned above is the primary and most prudent approach to hazard identification and control.

Sloping and Benching

Sloping

Maximum allowable slopes for excavations less than 20 feet based on soil type and angle to the horizontal are on the following table:

Benching

There are two basic types of benching, simple and multiple. The type of soil determines the horizontal to vertical ratio of the benched side.

| <i>Soil Type</i> | <i>Height to Depth Ratio</i> | <i>Slope Angle</i> |
|---|-------------------------------------|---------------------------|
| Stable Rock | Vertical | 90° |
| Type A | ¾:1 | 53° |
| Type B | 1:1 | 45° |
| Type C | 1½:1 | 34° |
| Type A (short-term) | ½:1 | 63° |
| (For a maximum excavation depth of 12 feet) | | |

As a general rule, the bottom vertical height of the trench must not exceed 4 feet for the first bench. Subsequent benches may be up to a maximum of 5 feet vertical in Type A soil and 4 feet in Type B soil to a total trench depth of 20 feet. All subsequent benches must be below the maximum allowable slope for that soil type. For Type B soil the trench excavation is permitted in cohesive soil only.

Spoil

Temporary Spoil

Temporary spoil must be placed no closer than 2 feet from the surface edge of the excavation, measured from the nearest base of the spoil to the cut. This distance should not be measured from the crown of the spoil deposit. This distance requirement ensures that loose rock or soil from the temporary spoil will not fall on employees in the trench.

Spoil should be placed so that it channels rainwater and other run-off water away from the excavation. Spoil should be placed so that it cannot accidentally run, slide, or fall back into the excavation.

Permanent Spoil

Permanent spoil should be placed some distance from the excavation. Permanent spoil is often created where underpasses are built or utilities are buried.

The improper placement of permanent spoil, i.e., insufficient distance from the working excavation, can cause an excavation to be out of compliance with the horizontal to vertical ratio requirement for a particular excavation. This can usually be determined through visual observation. Permanent spoil can change undisturbed soil to disturbed soil and dramatically alter slope requirements.

Special Health and Safety Considerations

Competent Person

The designated competent person should have and be able to demonstrate the following:

- ☐ Training, experience, and knowledge of:
 - ☆ Soil analysis
 - ☆ Use of protective systems
 - ☆ Requirements of 29 CFR Part 1926 Subpart P
- ☐ Ability to detect:
 - ☆ Conditions that could result in cave-ins
 - ☆ Failures in protective systems
 - ☆ Hazardous atmospheres
 - ☆ Other hazards including those associated with confined spaces
- ☐ Authority to take prompt corrective measures to eliminate existing and predictable hazards and to stop work when required.

Surface Crossing of Trenches

Surface crossing of trenches should be discouraged; however, if trenches must be crossed, such crossings are permitted only under the following conditions:

- ☐ Vehicle crossings must be designed by and installed under the supervision of a registered professional engineer.
- ☐ Walkways or bridges must be provided for foot traffic. These structures shall:
 - ☆ Have a safety factor of 4
 - ☆ Have a minimum clear width of 20 inches
 - ☆ Be fitted with standard rails
 - ☆ Extend a minimum of 24 inches past the surface edge of the trench

Ingress and Egress

Access to and exit from the trench require:

- ☐ Trenches 4 feet or more in depth should be provided with a fixed means of egress.
- ☐ Spacing between ladders or other means of egress must be such that a worker will not have to travel more than 25 feet laterally to the nearest means of egress.
- ☐ Ladders must be secured and extend a minimum of 36 inches above the landing.
- ☐ Metal ladders should be used with caution, particularly when electric utilities are present.

Exposure to Vehicles

Procedures to protect employees from being injured or killed by vehicle traffic include:

- ☐ Providing employees with and requiring them to wear warning vests or other suitable garments marked with or made of reflectorized or high-visibility materials.
- ☐ Requiring a designated, trained flagperson along with signs, signals, and barricades when necessary.

Exposure to Falling Loads

Employees must be protected from loads or objects falling from lifting or digging equipment. Procedures designed to ensure their protection include:

- ☐ Employees are not permitted to work under raised loads.
- ☐ Employees are required to stand away from equipment that is being loaded or unloaded.
- ☐ Equipment operators or truck drivers may stay in their equipment during loading and unloading if the equipment is properly equipped with a cab shield or adequate canopy.

Warning Systems for Mobile Equipment

The following steps should be taken to prevent vehicles from accidentally falling into the trench:

- ☐ Barricades must be installed where necessary.
- ☐ Hand or mechanical signals must be used as required.
- ☐ Stop logs must be installed if there is a danger of vehicles falling into the trench.
- ☐ Soil should be graded away from the excavation; this will assist in vehicle control and channeling of run-off water.

Hazardous Atmospheres and Confined Spaces

Employees shall not be permitted to work in hazardous and/or toxic atmospheres. Such atmospheres include those with:

- ☐ Less than 19.5% or more than 23.5% oxygen.
- ☐ A combustible gas concentration greater than 20% of the lower flammable limit.
- ☐ Concentrations of hazardous substances that exceed those specified in the Threshold Limit Values for airborne contaminants established by the ACGIH (American Conference of Governmental Industrial Hygienists).

All operations involving such atmospheres must be conducted in accordance with OSHA requirements for occupational health and environmental controls (see Subpart D of 29 CFR 1926) for personal protective equipment and for lifesaving equipment (see Subpart E, 29 CFR 1926).

Engineering controls (e.g., ventilation) and respiratory protection may be required.

Testing for Atmospheric Contaminants

- ☐ Testing should be conducted before employees enter the trench and should be done regularly to ensure that the trench remains safe. The frequency of testing should be increased if equipment is operating in the trench.
- ☐ Testing frequency should also be increased if welding, cutting, or burning is done in the trench.

Employees required to wear respiratory protection must be trained, fit-tested, and enrolled in a respiratory protection program.

Some trenches qualify as confined spaces. When this occurs, compliance with the Confined Space Standard is also required.

Emergency Rescue Equipment

Emergency rescue equipment is required when a hazardous atmosphere exists or can reasonably be expected to exist.

Requirements are as follows:

- ☐ Respirators must be of the type suitable for the exposure. Employees must be trained in their use and a respirator program must be instituted.
- ☐ Attended (at all times) lifelines must be provided when employees enter bell-bottom pier holes, deep confined spaces, or other similar hazards.
- ☐ Employees who enter confined spaces must be trained.

Standing Water and Water Accumulation

Methods for controlling standing water and water accumulation must be provided and should consist of the following if employees are permitted to work in the excavation:

- ☐ Use of special support or shield systems approved by a registered professional engineer.
- ☐ Water removal equipment, i.e., well pointing, used and monitored by a competent person.
- ☐ Safety harnesses and lifelines used in conformance with 29 CFR 1926.104.
- ☐ Surface water diverted away from the trench.
- ☐ Employees removed from the trench during rain storms.
- ☐ Trenches carefully inspected by a competent person after each rain and before employees are permitted to re-enter the trench.

Inspections

Inspections shall be made by a competent person and should be documented. The following guide specifies the frequency and conditions requiring inspections:

- ☐ Daily and before the start of each shift.
- ☐ As dictated by the work being done in the trench.
- ☐ After every rain storm.
- ☐ After other events that could increase hazards, e.g., snowstorm, windstorm, thaw, earthquake, etc.
- ☐ When fissures, tension cracks, sloughing, undercutting, water seepage, bulging at the bottom, or other similar conditions occur.
- ☐ When there is a change in the size, location, or placement of the spoil pile.
- ☐ When there is any indication of change or movement in adjacent structures.

Inquiries for Excavation Operations Daily Site Assessment

- ★ Is the cut, cavity, or depression a "Trench" or an "Excavation"?
- ★ Is the cut, cavity, or depression more than 4 feet in *DEPTH*?
- ★ Is there "Water" in the cut, cavity, or depression?
- ★ Are there adequate means of "Access" and "Egress"?
- ★ Are there any "Surface Encumbrances"?
- ★ Is there exposure to "Vehicular Traffic"?
- ★ Are "Adjacent Structures" stabilized?
- ★ Does "Mobile Equipment" have a "Warning System"?

- ★ Is a "Competent Person In Charge" of the operation?
- ★ Is "Equipment Operating" in or around the cut, cavity, or depression?
- ★ Are procedures required to monitor, test, and "Control Hazardous Atmospheres"?
- ★ Does a competent person "Determine Soil Type"?
- ★ Was a *SOIL TESTING DEVICE* used to determine soil type?
- ★ Is the "Spoil" placed "2 Feet or More from the Edge" of the cut, cavity, or depression?
- ★ Is the "Depth 20 Feet or More" for the cut, cavity, or depression?
- ★ Has a "Registered Professional Engineer" approved the procedure if the depth is more than 20 feet?
- ★ Does the procedure require "Benching, Multiple Benching, Shoring, or Shielding"?
- ★ If provided, do "Shields Extend at Least 18 Inches Above" the surrounding area if it is sloped toward the excavation?
- ★ If shields are used, is the "Depth of the Cut More Than 2 Feet Below" the bottom of the "Shield"?
- ★ Are any "Required Surface Crossings" of the cut, cavity, or depression the "Proper Width" and "Fitted with Hand Rails"?
- ★ Are means of "Egress" from the cut, cavity, or depression "No More Than 25 Feet from the Work"?
- ★ Is "Emergency Rescue Equipment" required?
- ★ Is there "Documentation" of the "Minimum Daily Excavation Inspection"?

In Conclusion

Trenching and excavation work presents serious risks to all workers involved. The greatest risk is that of a cave-in. When cave-ins occur, they are more likely to result in worker fatalities than other excavation-related accidents. Strict compliance with all sections of the standard will prevent or greatly reduce the risk of cave-ins as well as other excavation-related accidents.

Definitions of Relevant Terms

Accepted Engineering Practices are procedures compatible with the standards of practice required of a registered professional engineer.

Adjacent Structure Stability refers to the stability of the foundation(s) of adjacent structures whose location may create surcharges, changes in soil conditions, or other disruptions that have the potential to extend into the failure zone of the excavation or trench.

Aluminum Hydraulic Shoring is a pre-engineered shoring system comprised of aluminum hydraulic cylinders (cross-braces) used in conjunction with vertical rails (uprights) or horizontal rails (walers). Such system is designed specifically to support the sidewalls of an excavation and prevent cave-ins.

Bell-bottom Pier Hole is a type of shaft or footing excavation, the bottom of which is made larger than the cross section above to form a belled shape.

Benching (Benching system) is a method of protecting employees from cave-ins by excavating the sides of an excavation to form one or a series of horizontal levels or steps, usually with vertical or near-vertical surfaces between levels.

Competent Person is an individual who is capable of identifying existing and predictable hazards or working conditions that are hazardous, unsanitary, or dangerous to employees, and who has authorization to take prompt corrective measures to eliminate or control these hazards and conditions.

Confined Space is a space that, by design and/or configuration, has limited openings for entry and exit, unfavorable natural ventilation, may contain or produce hazardous substances, and is not intended for continuous employee occupancy.

Cave-In is the separation of a mass of soil or rock material from the side of an excavation, or the loss of soil from under a trench shield or support system, and its sudden movement into the excavation, either by falling or sliding, in sufficient quantity so that it could entrap, bury, or otherwise injure and immobilize a person.

Cross-Braces are the horizontal members of a shoring system installed perpendicular to the sides of the excavation, the ends of which bear against either uprights or wales.

Excavations are any man-made cut, cavity, trench, or depression in an earth surface that is formed by earth removal. A Trench is a narrow excavation (in relation to its length) made below the surface of the ground. In general, the depth of a trench is greater than its width, and the width (measured at the bottom) is not greater than 15 feet. If a form or other structure installed or constructed in an excavation reduces the distance between the form and the side of the excavation to 15 feet or less (measured at the bottom of the excavation), the excavation is also considered to be a trench.

Faces or Sides are the vertical or inclined earth surfaces formed as a result of excavation work.

Failure is the breakage, displacement, or permanent deformation of a structural member or connection so as to reduce its structural integrity and its supportive capabilities.

Kick-out is the accidental release or failure of a cross brace.

Hazardous Atmosphere is an atmosphere that by reason of being explosive, flammable, poisonous, corrosive, oxidizing, irritating, oxygen-deficient, toxic, or otherwise harmful may cause death, illness, or injury to persons exposed to it.

Ingress and Egress mean "entry" and "exit," respectively. In trenching and excavation operations, they refer to the provision of safe means for employees to enter or exit an excavation or trench.

Protective System refers to a method of protecting employees from cave-ins, from material that could fall or roll from an excavation face or into an excavation, and from the collapse of adjacent structures. Protective systems include support systems, sloping and benching systems, shield systems, and other systems that provide the necessary protection.

Registered Professional Engineer is a person who is registered as a professional engineer in the state where the work is to be performed. However, a professional engineer who is registered in any state is deemed to be a "registered professional engineer" within the meaning of Subpart P when approving designs for "manufactured protective systems" or "tabulated data" to be used in interstate commerce.

Sheeting is the members of a shoring system that retain the earth in position and in turn are supported by other members of the shoring system.

Shield (Shield system) is a structure that is able to withstand the forces imposed on it by a cave-in and thereby protect employees within the structure. Shields can be permanent structures or can be designed to be portable and moved along as work progresses. Additionally, shields can be either pre-manufactured or job-built. Shields used in trenches are usually referred to as "trench boxes" or "trench shields."

Shoring (Shoring system) is a structure such as a metal hydraulic, mechanical or timber shoring system that supports the sides of an excavation and which is designed to prevent cave-ins.

Sloping (Sloping system) is a method of protecting employees from cave-ins by excavating to form sides of an excavation that are inclined away from the excavation so as to prevent cave-ins. The angle of incline required to prevent a cave-in varies with differences in such factors as the soil type, environmental conditions of exposure, and application of surcharge loads.

Stable Rock is the natural solid mineral material that can be excavated with vertical sides and will remain intact while exposed. Unstable rock is considered to be stable when the rock material on the side or sides of the excavation is secured against caving-in or movement by rock bolts or by another protective system that has been designed by a registered professional engineer.

Subsurface Encumbrances include underground utilities, foundations, streams, water tables, transformer vaults, and geological anomalies.

Support System refers to structures such as underpinning, bracing, and shoring that provide support to an adjacent structure or underground installation or to the sides of an excavation or trench.

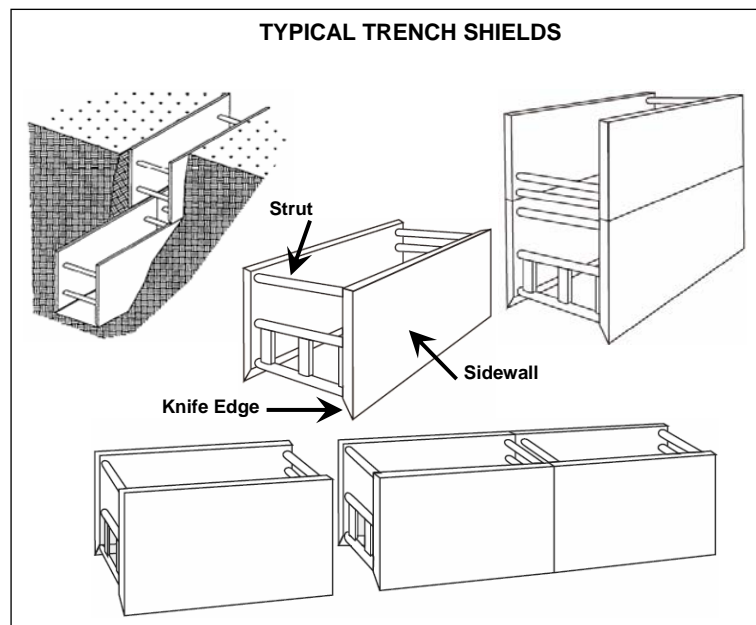
Tabulated Data are tables and charts approved by a registered professional engineer and used to design and construct a protective system.

Underground Installations include, but are not limited to, utilities (sewer, telephone, fuel, electric, water, and other product lines), tunnels, shafts, vaults, foundations, and other underground fixtures or equipment that may be encountered during excavation or trenching work.

Unconfined Compressive Strength is the load per unit area at which soil will fail in compression. This measure can be determined by laboratory testing, or it can be estimated in the field using a pocket penetrometer, by thumb penetration tests, or by other methods.

Uprights are the vertical members of a trench shoring system placed in contact with the earth and usually positioned so that individual members do not contact each other. Uprights placed so that individual members are closely spaced, in contact with or interconnected to each other, are often called "sheeting."

Wales are the horizontal members of a shoring system placed parallel to the excavation face whose sides bear against the vertical members of the shoring system or earth.



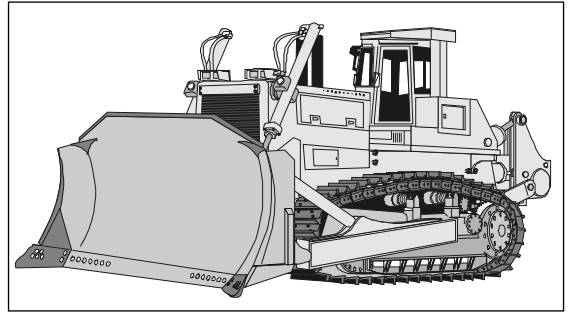
DAILY INSPECTION OF TRENCHES & EXCAVATIONS

| | | | |
|--|--------------------------|--------------------------|---|
| Company: | | | |
| Project: | | Date: | Weather: |
| Soil Type: | | | |
| Trench Depth: | Length: | Width: | Type of Protective System: |
| Project Supervisor: | | | |
| Assigned Competent Person : | | | |
| Crew Members: | | | |
| | | | |
| Excavation equipment type(s): | | | |
| Equipment Operator(s): | | | |
| Excavation | | | |
| Yes | No | N/A | |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Excavations and Protective Systems inspected by Competent Person daily, before start of work. |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Competent Person has authority to remove workers from excavation immediately. |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Surface encumbrances supported or removed. |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Employees protected from loose rock or soil. |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Hard hats worn by all employees. |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Spoils, materials, and equipment set back a minimum of 2' from edge of excavation. |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Barriers provided at all remote excavations, wells, pits, shafts, etc. |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Ingress/egress within excavation provided at 25' intervals. |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Walkways and bridges over excavations 6' or more in depth equipped with guardrails. |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Warning vests, or other highly visible PPE provided and worn by all employees exposed to vehicular traffic. |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Employees prohibited from working or walking under suspended loads. |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Employees prohibited from working on faces of sloped or benched excavations above other employees. |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Warning system established and used when mobile equipment is operating near edge of excavation. |
| Utilities | | | |
| Yes | No | N/A | |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Utility companies contacted and/or utilities located. |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Exact location of utilities marked when near excavation. |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Underground installations protected, supported, or removed when excavation is open. |
| Wet Conditions | | | |
| Yes | No | N/A | |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Precautions taken to protect employees from accumulation of water. |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Water removal equipment monitored by Competent Person . |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Surface water controlled or diverted. |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Inspection made after each rainstorm. |
| Hazardous Atmosphere | | | |
| Yes | No | N/A | |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Atmosphere tested when there is a possibility of oxygen deficiency or build-up of hazardous gases. |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Oxygen content is between 19.5% and 21%. |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Ventilation provided to prevent flammable gas build-up to 20% of lower explosive limit of the gas. |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Testing conducted to ensure that atmosphere remains safe. |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Emergency Response Equipment readily available where a hazardous atmosphere could or does exist. |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Employees trained in the use of Personal Protective and Emergency Response Equipment. |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Safety harness and life line individually attended when employees enter deep confined excavation. |
| Comments: | | | |
| | | | |
| Signature of Competent Person : | | | Date: |

Heavy Equipment Operations

Introduction

OSHA has general requirements which pertain to all mechanized equipment used in construction and industry. Safety guidelines for specific pieces of heavy equipment will be discussed later in this chapter. All earth moving, material handling, and mobile industrial equipment have certain aspects which will necessitate the same safety requirements regardless of the specific intended purpose or configuration of the equipment. Following are OSHA's general safety requirements for mechanized vehicle equipment:

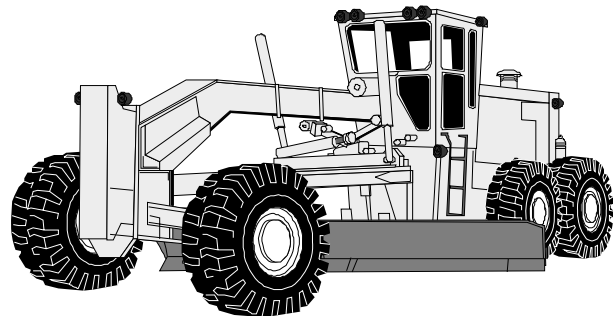


General Requirements

- ▣ All vehicles must have a service brake system, an emergency brake system, and a parking brake system. These systems may use common components, and must be maintained in operable condition.
- ▣ Whenever visibility conditions warrant additional light, all vehicles in use must be equipped with at least two headlights and two taillights in operable condition.
- ▣ All vehicles, or combination of vehicles, must have brake lights in operable condition regardless of light conditions.
- ▣ All vehicles must be equipped with an adequate audible warning device at the operator's station (horn) in an operable condition.
- ▣ No employer may use any motor vehicle equipment having an obstructed view to the rear unless:
 - ☆ The vehicle has a reverse signal audible above surrounding noise level.
 - ☆ The vehicle backs up only when an observer signals it is safe to do so.
 - ☆ All vehicles with cabs must be equipped with windshields and powered wipers. Cracked and broken glass must be replaced. Vehicles operating in areas or under conditions that cause fogging or frosting of the windshields must be equipped with operable defrosting devices.
- ▣ All haulage vehicles, whose pay load is loaded by means of cranes, power shovels, loaders, or similar equipment, must have a cab shield and/or canopy adequate to protect the operator from shifting or falling materials.
- ▣ Tools and material shall be secured to prevent movement when transported in the same compartment with employees.
- ▣ Vehicles used to transport employees must have seats firmly secured and adequate for the number of employees to be carried.
- ▣ Seat belts and anchorages meeting the requirements of 49 CFR Part 571 (Department of Transportation, Federal Motor Vehicle Safety Standards) must be installed in all motor vehicles, and used by the operator.
- ▣ Trucks with dump bodies must be equipped with positive means of support, permanently attached, and capable of being locked in position to prevent accidental lowering of the body while maintenance or inspection work is being done.

- ▣ Operating levers controlling hoisting or dumping devices on haulage bodies must be equipped with a latch or other device which will prevent accidental starting or tripping of the mechanism.
- ▣ Trip handles for tailgates of dump trucks shall be so arranged that, in dumping, the operator will be in the clear.
- ▣ All rubber-tired motor vehicle equipment manufactured on or after May 1, 1972, must be equipped with fenders.
 - ★ Mud flaps may be used in lieu of fenders whenever motor vehicle equipment is not designed for fenders (such as dump trucks where the dump bed forms an effective fender).
- ▣ All vehicles in use must be checked at the beginning of each shift to assure that the following parts, equipment, and accessories are in safe operating condition and free of apparent damage that could cause failure while in use:
 - ★ Service Brakes (including any trailer brake connections)
 - ★ Parking System (hand brake)
 - ★ Emergency Stopping System (brakes)
 - ★ Tires
 - ★ Horn
 - ★ Steering Mechanism
 - ★ Coupling Devices
 - ★ Seat Belts
 - ★ Operating Controls
 - ★ Safety Devices
- ▣ All defects shall be corrected before the vehicle is placed in service. These requirements also apply to equipment such as lights, reflectors, windshield wipers, defrosters, fire extinguishers, etc., where such equipment is necessary.

Always use three point climbing when mounting or dismounting equipment.



General Safety Requirements for Earthmoving Equipment

These OSHA rules apply to the following types of earthmoving equipment: scrapers, loaders, crawler (track) or wheel tractors, bulldozers, off-highway trucks, graders, agricultural and industrial tractors, and similar equipment. Following are OSHA's general requirements for earth moving equipment:

Seat Belts

Seat belts must be provided on all equipment listed above, and must meet the requirements of the Society of Automotive Engineers (SAE).

Tractors listed above must have seat belts as required for the operators when seated in the normal seating arrangement for tractor operation, even though back-hoes, breakers, or other similar attachments are used on these machines for excavating or other work.

Access Roadways and Grades

No employer may move or cause to be moved construction equipment or vehicles upon any access roadway or grade unless the access roadway or grade is constructed and maintained to accommodate safely the movement of the equipment and vehicles involved.

Every emergency access ramp and berm used by an employer shall be constructed to restrain and control runaway vehicles.

Brakes

All earthmoving equipment must have a service braking system capable of stopping and holding the equipment fully loaded.

Fenders

Pneumatic-tired earth-moving haulage equipment (trucks, scrapers, tractors, and trailing units) whose maximum speed exceeds 15 miles per hour must be equipped with fenders on all wheels.

Rollover Protective Structures (ROPS)

Rollover protective structures must meet the requirements of 29 CFR §1926.1001 Minimum performance criteria for rollover protective structures for designated scrapers, loaders, dozers, graders, and crawler tractors.

Audible Alarms

All bidirectional machines, such as rollers, compacters, front-end loaders, bulldozers, and similar equipment, must be equipped with a horn, distinguishable from the surrounding noise level, which can be operated as needed when the machine is moving in either direction. The horn must be maintained in an operating condition.

No employer shall permit earthmoving or compacting equipment which has an obstructed view to the rear to be used in reverse gear unless the equipment has in operation a reverse signal alarm distinguishable from the surrounding noise level or a ground guide signals that it is safe to do so.

Scissor Points

Scissor points on all front-end loaders or articulating equipment, which constitute a hazard to the operator during normal operation, must be guarded.

Lift trucks, Stackers, etc.

Equipment of this type must have the rated capacity clearly posted on the vehicle so as to be clearly visible to the operator. When auxiliary removable counterweights are provided by the manufacturer, corresponding alternate rated capacities also must be clearly shown on the vehicle. These ratings shall not be exceeded.

Modifications or Additions

No modifications or additions which affect the capacity or safe operation of the equipment may be made without the manufacturer's written approval. If such modifications or changes are made, the capacity, operation, and maintenance instruction plates, tags, or decals shall be changed accordingly. In no case shall the original safety factor of the equipment be reduced.

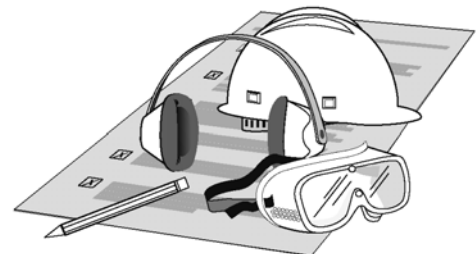
Steering or Spinner Knobs

Steering or spinner knobs must not be attached to the steering wheel unless the steering mechanism is of a type that prevents road reactions from causing the steering wheel to spin. The steering knob must be mounted within the periphery of the wheel.

Operator Training

Safe Operation

The employer must ensure that each heavy equipment operator is competent to operate the equipment safely, as demonstrated by the successful completion of the training and evaluation specified in this section.



Prior to permitting an employee to operate heavy equipment (except for training purposes), the employer must ensure that each operator has successfully completed the training required by this section.

Training Program Implementation

Trainees may operate heavy equipment only:

- ❑ Under the direct supervision of persons who have the knowledge, training, and experience to train operators and evaluate their competence.
- ❑ Where such operation does not endanger the trainee or other employees.

Training shall consist of a combination of formal instruction (e.g., lecture, discussion, interactive computer learning, video tape, written material), practical training (demonstrations performed by the trainer and practical exercises performed by the trainee), and evaluation of the operator's performance on the job-site.

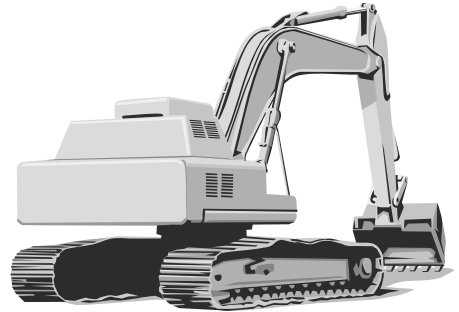
All operator training and evaluation shall be conducted by persons who have the knowledge, training, and experience to train heavy equipment operators and evaluate their competence.

Training Program Content

Heavy equipment operators must receive initial training in the following topics, except in topics which the employer can demonstrate are not applicable to safe operation of the equipment in the employer's workplace.

Equipment-Related Topics

- ★ Operating instructions, warnings, and precautions for the types of equipment the operator will be authorized to operate.
- ★ Differences between the equipment and an automobile.
- ★ Equipment controls and instrumentation: where they are located, what they do, and how they work.
- ★ Engine or motor operation.
- ★ Steering and maneuvering.
- ★ Visibility (including restrictions due to loading).
- ★ Implement and attachment adaptation, operation, and use limitations.
- ★ Equipment capacity.
- ★ Vehicle stability.
- ★ Any equipment inspection and maintenance that the operator will be required to perform.
- ★ Refueling and/or charging and recharging of batteries.
- ★ Operating limitations.
- ★ Any other operating instructions, warnings, or precautions listed in the operator's manual for the types of equipment that the employee is being trained to operate.



Workplace-Related Topics

- ★ Surface conditions where the equipment will be operated.
- ★ Composition of loads to be carried and load stability.
- ★ Load maneuvering, loading, and unloading. (Includes trucks, hoppers, etc.)
- ★ Pedestrian traffic in areas where the equipment will be operated.
- ★ Confined areas and other restricted places where equipment will be operated.
- ★ Hazardous (classified) locations where the equipment will be operated.
- ★ Ramps and other sloped surfaces that could affect the vehicle's stability.
- ★ Closed environments and other areas where insufficient ventilation or poor vehicle maintenance could cause buildup of carbon monoxide or diesel exhaust.
- ★ Other unique or potentially hazardous environmental conditions in the workplace that could affect safe operation.

Refresher Training and Evaluation

Refresher training, including an evaluation of the effectiveness of that training, must be conducted as required below to ensure that the operator has the knowledge and skills needed to operate the powered industrial truck safely. Refresher training in relevant topics shall be provided to the operator when:

- ☐ The operator has been observed to operate the equipment in an unsafe manner.
- ☐ The operator has been involved in an accident or near-miss incident.
- ☐ The operator has received an evaluation that reveals that the operator is not operating the equipment safely.
- ☐ The operator is assigned to operate a different type of equipment.
- ☐ A condition on the job-site changes in a manner that could affect safe operation of the equipment.

An evaluation of each powered industrial truck operator's performance shall be conducted at least once every three years.

Avoidance of Duplicative Training

If an operator has previously received training in a topic specified in this section, and such training is appropriate to the equipment and working conditions encountered, additional training in that topic is not required if the operator has been evaluated and found competent to operate the equipment safely.

Certification

The employer shall certify that each operator has been trained and evaluated as required by this section. The certification shall include the name of the operator, the date of the training, the date of the evaluation, and the identity of the person(s) performing the training or evaluation.

Equipment Operations

OSHA has listed safety rules for the operation of equipment. These rules are general in nature and are not intended as a comprehensive guide to the safe operations of specific pieces of heavy equipment:

- ☐ Equipment shall not be driven up to anyone standing in front of an excavation or a fixed object.
- ☐ No person shall be allowed to stand or pass under the elevated portion of any equipment, whether loaded or empty.

- ▣ Unauthorized personnel shall not be permitted to ride on heavy equipment. A safe place to ride shall be provided where riding of equipment is authorized.
- ▣ The employer shall prohibit arms or legs from being placed between the moving parts of the equipment, or outside the running lines of the vehicle.
- ▣ When heavy equipment is left unattended, implements shall be fully lowered, controls shall be neutralized, power shall be shut off, and brakes set. Wheels shall be blocked if the vehicle is parked on an incline.
- ▣ Heavy equipment is considered unattended when the operator is 25 ft. or more away from the vehicle which remains in his view, or whenever the operator leaves the vehicle and it is not in his view.
- ▣ When the equipment operator is dismounted and within 25 ft. of the machine still in his view, the implements shall be fully lowered, controls neutralized, and the brakes set to prevent movement.
- ▣ A safe distance shall be maintained from the edge of ramps or platforms while on any elevated surface, and from the edge of any excavation.
- ▣ Brakes shall be set and wheel blocks shall be in place to prevent movement of trucks, trailers, or railroad cars while loading or unloading. Fixed jacks may be necessary to support a semi-trailer during loading or unloading when the trailer is not coupled to a tractor. The flooring of trucks, trailers, and railroad cars shall be checked for breaks and weakness before they are driven onto.
- ▣ There must be sufficient headroom under overhead installations, lights, pipes, sprinkler system, etc. for the safe passage of equipment.
- ▣ An overhead guard shall be used as protection against falling objects. It should be noted that an overhead guard is intended to offer protection from the impact of small objects, representative of the job application, but not to withstand the impact of a falling capacity load.
- ▣ A load backrest extension shall be used whenever necessary to minimize the possibility of the load or part of it from falling rearward.
- ▣ Only approved heavy equipment shall be used in hazardous locations.

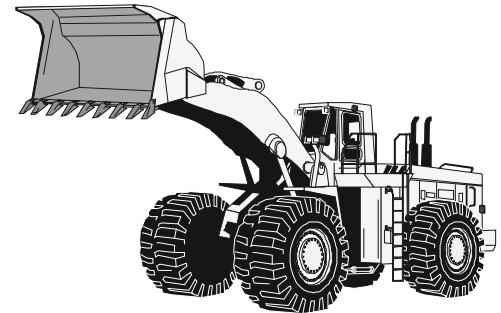
Traveling (Roading) Heavy Equipment

- ▣ All traffic regulations must be observed, including authorized site speed limits. A safe distance must be maintained approximately three vehicle lengths from the vehicle ahead, and the equipment must be kept under control at all times.
- ▣ The right of way shall be yielded to ambulances, fire trucks, or other vehicles in emergency situations.
- ▣ Other vehicles traveling in the same direction at intersections, blind spots, or other dangerous locations may not be passed.
- ▣ The operator shall be required to slow down and sound the horn at cross intersections of roadways, paths, and other locations where vision is obstructed. If the load being carried obstructs forward view, the operator shall be required to travel with the load trailing (to the rear).
- ▣ Railroad tracks must be crossed diagonally wherever possible. Parking closer than 8 feet from the center of railroad tracks is prohibited.
- ▣ The operator is required to look in the direction of, and keep a clear view of the path of travel.
- ▣ Grades must be ascended or descended slowly.

- ▣ When ascending or descending grades in excess of 10 percent, loaded equipment shall be driven with the load upgrade.
- ▣ On all grades the load and load carrying implement must be tilted back if applicable, and raised only as far as necessary to clear the road surface.
- ▣ Under all travel conditions the equipment must be operated at a speed that will permit it to be brought to a stop in a safe manner.
- ▣ Stunt driving and horseplay shall not be permitted.
- ▣ The operator shall be required to slow down for wet and slippery surfaces.
- ▣ Ramps or bridge plates, shall be properly secured before they are driven over. Ramps or bridge plates shall be driven over carefully and slowly and their rated capacity never exceeded.
- ▣ Running over loose objects on the roadway surface shall be avoided.
- ▣ While negotiating turns, speed shall be reduced to a safe level by means of turning the hand steering wheel in a smooth, sweeping motion. Except when maneuvering at a very low speed, the hand steering wheel shall be turned at a moderate, even rate.

Loading

- ▣ Only stable or safely arranged loads shall be handled. Caution shall be exercised when handling off-center loads which cannot be centered. The bucket should be struck to avoid scattering loads before traveling with equipment.
- ▣ Only loads within the rated capacity of the equipment shall be handled.
- ▣ Long or high (including multiple-tiered) loads which may affect capacity shall be adjusted.
- ▣ A load must be securely within the bucket or hopper as far as possible; the bucket must be carefully tilted backward to stabilize the load.
- ▣ Extreme care must be used when tilting the load forward or backward when the load is elevated. Tilting forward with the bucket elevated shall be prohibited except to pick up a load. An elevated load shall not be tilted forward except when the load is in a deposit position over a hopper or stack.
- ▣ All personnel not within a guarded enclosure must stay clear of loading operations. Drivers of trucks being loaded must remain in the cab, if it is equipped with overhead protection, or remain well clear of the operation.



Servicing and Maintenance of Heavy Equipment

If at any time heavy equipment is found to be in need of repair, defective, or in any way unsafe, the machine shall be taken out of service until it has been restored to safe operating condition.

- ▣ Fuel tanks must not be filled while the engine is running.
- ▣ Spillage of oil or fuel must be carefully washed away or completely evaporated and the fuel tank cap replaced before restarting engine.
- ▣ No equipment shall be operated with a leak in the fuel system until the leak has been repaired.

- ❑ Open flames must not be used for checking electrolyte level in storage batteries or gasoline level in fuel tanks.
- ❑ All repairs shall be made by authorized personnel.
- ❑ No repairs shall be made in Class I, II, and III locations.

| <i>Class 1 locations</i> | <i>Class 2 locations</i> | <i>Class 3 locations</i> |
|---|--|--|
| Locations in which flammable gases or vapors are, or may be present in the air in quantities sufficient to produce explosive or ignitable mixtures. | Locations which are hazardous because of the presence of combustible dust. | Locations where easily ignitable fibers are present but not likely to be in suspension in quantities sufficient to produce ignitable mixtures. |

- ❑ Those repairs to the fuel and ignition systems of equipment which involve fire hazards shall be conducted only in locations designated for such repairs.
- ❑ Equipment in need of repairs to the electrical system shall have the battery disconnected prior to such repairs.
- ❑ All parts of any heavy equipment requiring replacement shall be replaced only by parts equivalent as to safety with those used in the original design.
- ❑ Equipment shall not be altered so that the relative positions of the various parts are different from what they were when originally received from the manufacturer, nor shall they be altered either by the addition of extra parts not provided by the manufacturer or by the elimination of any parts, except for fuel system conversions.
- ❑ Equipment shall be examined before being placed in service, and shall not be placed in service if the examination shows any condition adversely affecting the safety of the vehicle. Inspections shall be made at least daily.
Where heavy equipment is used on a round-the-clock basis, it shall be examined after each shift. Defects when found shall be immediately reported and corrected.
- ❑ Water mufflers must be filled daily or as frequently as is necessary to prevent depletion of the supply of water below 75 percent of the filled capacity. Vehicles with mufflers having screens or other parts that may become clogged shall not be operated while such screens or parts are clogged. Any vehicle that emits hazardous sparks or flames from the exhaust system shall immediately be removed from service and not returned to service until the cause for the emission of such sparks and flames has been eliminated.
- ❑ When the temperature of any part of any equipment is found to be in excess of its normal operating temperature, thus creating a hazardous condition, the equipment shall be removed from service and not returned to service until the cause for such overheating has been eliminated.
- ❑ Heavy equipment shall be kept in a clean condition, free excess oil, and grease. Noncombustible agents should be used for cleaning equipment. Low flash point (below 100° F.) solvents must not be used. High flash point (at or above 100° F.) solvents may be used. Precautions regarding toxicity, ventilation, and fire hazard shall be in agreement with the agent or solvent used.
- ❑ Heavy equipment originally approved for the use of gasoline for fuel may be converted to liquefied petroleum gas fuel provided the complete conversion results in a vehicle which embodies the features specified for LP or LPS designated equipment. Such conversion equipment shall be approved.

OSHA's General Requirements for Heavy Equipment Use

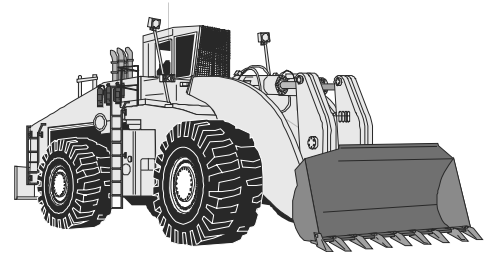
- ▣ All equipment left unattended at night, adjacent to a highway in normal use, or adjacent to construction areas where work is in progress, shall have appropriate lights or reflectors, or barricades equipped with appropriate lights or reflectors, to identify the location of the equipment.
- ▣ A safety tire rack, cage, or equivalent protection shall be provided and used when inflating, mounting, or dismounting tires installed on split rims, or rims equipped with locking rings or similar devices.
- ▣ Heavy machinery, equipment, or parts thereof, which are suspended or held aloft by use of slings, hoists, or jacks shall be substantially blocked or cribbed to prevent falling or shifting before employees are permitted to work under or between them. Bulldozer and scraper blades, end-loader buckets, dump bodies, etc., shall be either fully lowered or blocked when being repaired or when not in use. All controls shall be in a neutral position, with motors stopped, and brakes set unless work being performed requires otherwise.
- ▣ Whenever the equipment is parked, the parking brake shall be set. Equipment parked on inclines shall have the wheels chocked and the parking brake set.
- ▣ The use, care and charging of all batteries shall conform to the following:
 - ★ Ventilation shall be provided to ensure diffusion of the gases from the battery and to prevent the accumulation of an explosive mixture.
 - ★ Face shields, aprons, and rubber gloves shall be provided for workers handling acids or batteries.
 - ★ Facilities for quick drenching of the eyes and body shall be provided within 25 feet of battery handling areas.
 - ★ Facilities shall be provided for flushing and neutralizing spilled electrolyte and for fire protection.
- ▣ All cab glass shall be safety glass, or equivalent, that introduces no visible distortion affecting the safe operation of any machine covered by this section.
- ▣ All equipment shall comply with the OSHA requirements when working or being moved in the vicinity of power lines or energized transmitters.

General Requirements for Site Clearing

- ▣ Employees engaged in site clearing shall be protected from hazards of irritant and toxic plants and suitably instructed in the first aid treatment available.
- ▣ All equipment used in site clearing operations must be equipped with rollover guards. In addition, rider-operated equipment shall be equipped with an overhead and rear canopy guard meeting the following requirements:
 - ★ The overhead covering on this canopy structure shall be of not less than 1/8-inch steel plate or 1/4-inch woven wire mesh with openings no greater than 1 inch, or equivalent.
 - ★ The opening in the rear of the canopy structure shall be covered with not less than 1/4-inch woven wire mesh with openings no greater than 1 inch.

Additional Heavy Equipment Safety Guidelines

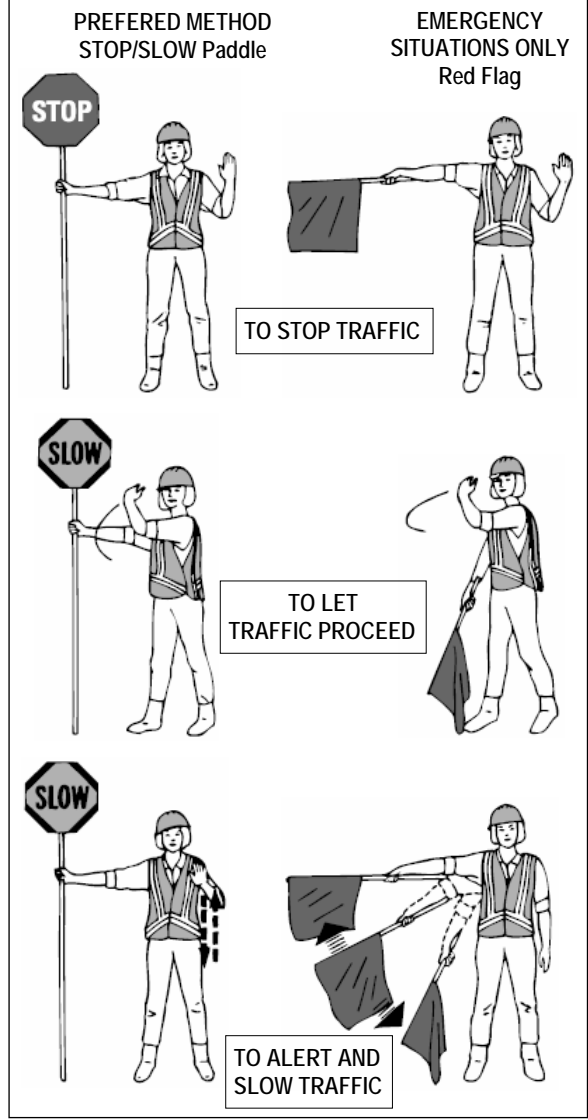
Many injuries involving heavy equipment do not occur to the operator, but are inflicted on ground personnel working in or around the vicinity of moving machines. Always be aware of the location of personnel working near your machine. Heavy equipment operations frequently require the aid of ground personnel who should be thoroughly familiar with the procedures of your operation and the capabilities of the machine; usual operating procedures should not be changed without first notifying ground personnel. Never assume that your assigned ground workers will watch out for themselves. Always know your ground personnel's location, if they are not visible to you, ***DO NOT MOVE THE MACHINE OR ANY IMPLEMENTS!*** When working in conjunction with ground personnel, never operate equipment at speeds which would necessitate ground personnel to work in a careless manner. ***REMEMBER***, they are depending on your skill and judgment, as are all personnel in your immediate work area.



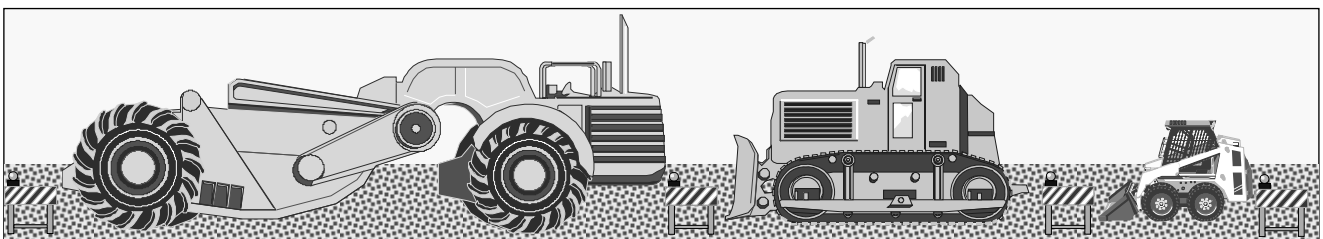
- ▣ Read the operators manual and operate the machine only if trained and considered competent to do so.
- ▣ Wear appropriate clothing and personal protective equipment for the job. Hearing protection is recommended for operating many types of heavy equipment.
- ▣ Do a walk around to make sure the area is clear before moving the machine.
- ▣ Do not climb on the machine where hand and foot holds have not been provided. Use a three point climbing technique whenever entering, exiting, or servicing the machine.
- ▣ Start machine only while sitting in the operator's seat and all personnel are clear.
- ▣ Ensure all controls are in the neutral position before starting the machine.
- ▣ Keep tires properly inflated, improper inflation may cause the machine to tip over under load.
- ▣ Heavy equipment machines are required to have a seat belt and rollover protection (ROPS). Always use the seat belt. OSHA takes the position that seat belts are personal protective equipment, and failure to use them is grounds for a citation.
- ▣ Keep the load as low as possible while traveling; always reduce speed when making a turn. Keep speeds low on rough terrain. Bouncing, bucking, or side hopping because of excessive speed may cause loss of control of the machine.
- ▣ Check for overhead lines or obstructions before raising any overhead implement.
- ▣ Do not allow the tires to spin when picking up or pushing a load.
- ▣ Do not walk, work, or allow personnel under any raised part of heavy equipment.
- ▣ Do not use heavy equipment for demolition of structures which are taller than the machine without overhead protection sufficient to withstand the debris likely to impact the cab.
- ▣ Do not under-cut a bank which is higher than the machine.
- ▣ Use extreme caution when approaching or operating near excavations, the weight of the machine or vibration may cause the edges to collapse.

- ▣ Dust suppression and control is required where dust seriously limits visibility. Wear breathing protection when needed.
- ▣ Pre-wet soil to make loading easier and to aid in dust control.
- ▣ Rip tight soil before scraping or excavating to improve speed and efficiency.
- ▣ Always load buckets or hoppers down grade to increase the speed of operation, lessen wear on equipment, and reduce the need for a push tractor.
- ▣ Do not use heavy equipment as a battering ram.
- ▣ In tight turns, make sure the machine has clearance in front and rear if equipped with rear implements.
- ▣ Do not place any part of your body under any raised implement at any time unless it is properly blocked.
- ▣ Keep operator's compartment free of clutter and all controls free of oil and grease. Personal tools or equipment must be secured.
- ▣ All underground utilities in the work area must be located prior to digging. Utility companies must be notified of your intention to excavate within established, or customary, response times. (Check local codes)
- ▣ When excavations approach the estimated location of underground utilities, the exact location must be determined and marked.
- ▣ Wherever equipment operations encroach on a public thoroughfare, a system of traffic controls must be used.
- ▣ Flaggers are required at all locations where barricades or warning signs cannot control moving traffic.
- ▣ Never use an elevating part of heavy equipment as a man-lift.

Use of Hand-Signaling Devices by Flaggers



The productivity and safety of heavy equipment operations are increased by using well trained employees, along with properly maintained and serviced equipment. A well laid out worksite and work-plan always improves efficiency and safety on the jobsite.

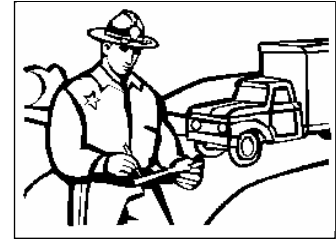


Section Notes:

Chapter 20 Driver Safety Policy

Motor Vehicle Safety

The safety of employees at **Arena Fire Protection, Inc.** is of utmost importance. The selection of employees who will be required to drive full or part-time will be done with care. Drivers of company vehicles can be considered qualified when they meet the following criteria:



- ★ Possess a valid state driver's license of the proper class.
- ★ A review of MVD record shows that they do not pose an unreasonable risk.

Driver Training

All employees driving company owned vehicles for **Arena Fire Protection, Inc.** will be trained in safe operation of assigned vehicle.

- | | |
|--------------------------------|---|
| ▣ Defensive driving | ▣ Safe distances |
| ▣ Split-second decision making | ▣ Intersection driving |
| ▣ Backing-up rules | ▣ Poor condition driving in dust storms, rain, etc. |

Preventive Maintenance

Establishment of a preventive maintenance program for all COMPANY vehicles is essential. Record jackets will be maintained on all vehicles so that a log can be maintained on all planned maintenance, as well as repairs made from noted defects.

Vehicle Inspection

Each vehicle or piece of equipment shall be inspected on a daily basis by the operator before and after operation. Each operator is responsible for the safe condition of the equipment. Any vehicle having steering, brake, or other safety problems is not to be operated until repairs have been made by a mechanic. Any other unsafe conditions are to be reported to the operator's supervisor as soon as possible.

Vehicle Operation

All COMPANY vehicles and equipment are to be operated in a safe manner and operators will adhere to all applicable laws. The operator is fully and totally responsible for the safe operation of the equipment. The operator shall report any accidents, or damage, to the Vehicle Operations Supervisor.

Driver Safety Program

Introduction

The operation of vehicles is indispensable in conducting company business. The way in which each vehicle is handled will directly affect the loss picture of the entire company. Fleet losses are potentially one of the most costly losses that an operation can incur.

The types of exposure that involve the fleet program include: property damage, bodily injury, fatalities, liability suits and Workers' Compensation claims.

The insurance and other claims costs that result from vehicle accidents can be substantial and would adversely affect successful accomplishment of COMPANY objectives. To help prevent vehicle accidents and the type of loss exposures associated with them, the following guidelines have been established:

Policy

The success and the safety of Company employees depends on the mutual cooperation of each employee who has been entrusted with the responsibility of driving a company vehicle, or their own vehicle, while conducting company business.

In order to reduce vehicle accidents and limit liability because of driver negligence, our Company has adopted a Driver Safety Program.

Procedure

The procedures set forth in the Driver Safety Program will be the guidelines for management adherence to this policy.

Responsibility

The supervisors at ***Arena Fire Protection, Inc.*** have the primary responsibility for management of the Driver Safety Program.

Allen Davidson will appoint a responsible representative to report all driver information requested by our insurance broker.

Monitoring

Allen Davidson is also responsible for the records of the Driver Safety Program. Duties will include, but are not limited to:

- ★ Be responsible for monitoring the driving record of those persons who operate the company vehicles or their own "personal" vehicle while on company business.
- ★ Monitor the Driver's Safety Program and report to management any suggestions for improvement or needed changes.
- ★ Monitor the maintenance policy of fleet vehicles so that they are kept in safe condition
- ★ Review each vehicle accident report or infraction with management.
- ★ Monitor renewals of insurance records.

Drivers

Drivers of vehicles that are owned, rented or leased by The Company will be required to follow defensive driving techniques and practices. The basic defensive driving practice is to plan ahead and do everything that one can reasonably do to prevent an accident. This is to include the use of seat belts.

The following guidelines will be followed:

Drivers for our Company must possess a valid driver's license in order to operate any company vehicle or their own personal vehicle on company business. The duties of drivers will be reviewed. The requirement will be noted by the employee's supervisor or personnel staff at the time of hire.

The driver should be physically and mentally capable of driving the vehicle he/she is assigned to drive, whether the vehicle is a car, van, or truck.

Pre-operation of Vehicles

Prior to the assignment of any vehicle to any employee or prior to allowing an employee to drive "Their Own Personal Vehicle" on company business, the following minimum standards will be implemented and records maintained to ensure that the driver is qualified to drive the vehicle and minimize the risk of liability to our Company.

Initial Assignment

Verification and recording of date any type of driver's license held and renewal date noted. A review of the driver's state Motor Vehicle Record for the most recent three-year period to include the following:

- ☐ Review of the accident report history showing the dates and types of accident regardless who was at fault.
- ☐ Review of the traffic violations for the last three years, with evaluation of acceptable driving records according to Company guidelines.
- ☐ Confirmation of personal insurance for those driving their personal vehicle while on company business.
- ☐ Physical examinations when required by the state for the driving of specified vehicles or by funding and licensing contract.
- ☐ The driver with a major conviction shall be immediately suspended from driving any company vehicle or their personal vehicle on company business.
- ☐ Driving a company vehicle while under the influence of drugs or alcohol will subject the employee to disciplinary action up to and including dismissal.

Annual Review

Once each year, a request for current license information will be sent to each Company employee. Employees who drive a company vehicle, or if they request mileage reimbursement for driving their personal vehicle on company business, will have their personal driving record reviewed. It will be the responsibility of the employee to respond in a timely manner. Failure to respond to the request for information by personal vehicle drivers may result in the delay of mileage reimbursements.

A review of each driver's file and record will be made annually and will include all of the criteria above as appropriate for each employee. This will not preclude request of driver's records for review by ***Allen Davidson*** as deemed necessary.

Definitions

Major Convictions — Major convictions include, but are not limited to:

- ★ Driving while intoxicated or under the influence of alcohol or drugs; failure to stop and report an accident.
- ★ Homicide, manslaughter or assault arising out of the operation of a vehicle.
- ★ Driving during a period when license is suspended or revoked; reckless driving.
- ★ Possession of an open container of alcoholic beverage; drag or highway racing.
- ★ Attempting to elude a Peace Officer.

Minor Convictions — Any moving traffic violation other than a major conviction except the following:

- ★ Motor vehicle equipment, load or size requirements.
- ★ Improper display or failure to display license plates provided such plates exist.
- ★ Failure to have a valid driver's license in possession.

Preventable Accident — A preventable accident is defined by the National Safety Council as "Any vehicle accident involving a vehicle which results in property damage and/or personal injury regardless of who was injured, what property was damaged, to what extent or where it occurred in which the driver in question failed to exercise reasonable precaution to prevent the accident."

Vehicle Accident — Any accident occurring between a company vehicle (or private car when employee is on official company business and has been formerly authorized mileage) and another vehicle, pedestrian, animal or fixed object.

SPECIAL NOTE: Police shall be called to investigate all vehicle accidents for ***Arena Fire Protection, Inc.*** It is vehicle operator's immediate supervisor's responsibility ensure that all facts are obtained with respect to the driver. Under no circumstances should any employee make any statement relative to liability or draw any conclusions as to the facts asserted at the scene. The occurrence of a vehicle accident may or may not be the fault of the employee. It is important to investigate and determine the cause of the accident and any necessary corrective action that may taken by the employee's immediate supervisor.

Questions to Help Determine if a Vehicle Accident was Preventable

One basic question in determining preventability is: "Did our employee take every reasonable precaution to avoid the auto accident?" If "No," our driver was not driving defensively therefore, the accident should be judged "preventable." Please note that legal liability or any citations should never influence the decision of determining preventability of an accident.

Answer the following questions which adhere to the given situation(s):

Intersection Accidents

YES NO

- Did our employee approach the intersection at a controlled speed that was reasonable for conditions?
- Was our driver prepared to stop before entering the intersection regardless of right of way?
- Did our driver avoid entering an intersection on the amber signal?
- Did our driver avoid overtaking or passing at the intersection?
- At a blind corner, did our driver approach slowly, with a foot on the brake pedal?
- Did our driver make certain all other drivers were stopping for a traffic light or stop sign?
- Was our driver alert for the turns of other vehicles?
- Did our driver signal his/her change in direction well in advance?
- Did our driver allow oncoming traffic to clear before making a left turn?
- Did our driver turn from the proper lane?

We Were Hit by another Vehicle While Stopped or Parked

- Did our driver properly signal his/her intention to stop?
- Did our driver avoid coming to a sudden stop?
- Was our driver parked on the proper side of the road?

We Pulled from Parked Position

- Did our driver look to the front and rear for approaching traffic immediately before pulling out?
- Did our driver look back, rather than depending upon the rear vision mirrors?
- Did our driver signal before pulling away from the curb?
- Did our driver start out only when an action would not require traffic to change its speed or direction in order to avoid our vehicle?
- Did our driver continue to glance back while pulling out?

We Hit the Other Vehicle in Rear

YES NO

- Did our driver adjust speed to the conditions of the road, visibility and traffic?
- Was our driver maintaining a safe following distance for conditions?
- If a vehicle pulled in front of our vehicle, did our driver drop back and reestablish the proper following distance?
- Did our driver approach the green traffic light cautiously, expecting the driver ahead to stop suddenly on a signal change?
- Did our driver look ahead of the vehicle in front for possible emergencies?

We Were Backing

- Was it necessary to back?
- Did our driver have to park so close to the vehicle or obstacle ahead that backing was necessary when leaving the parking space?
- If our driver could not see where to back:
 - Did the driver try to get someone as a guide?
 - Did the driver walk around the vehicle before getting in?
 - Did the driver back immediately after walking around?
- If applicable, did the driver use the cone policy correctly?
- Did the driver use the horn while backing?
- Did the driver look to the rear without depending on the rear vision mirrors?
- Did the driver back slowly?

We Skidded

- Did our driver travel at a speed safe for the conditions of weather and road?
- Was our driver keeping a safe following distance?
- Was our driver alert for loose gravel, sand, ruts, etc.?

Pedestrians

- Did our driver tap the horn to alert pedestrians of our vehicle approach?
- Did our driver pass through congested section anticipating that pedestrians might step in front of the car?
- Did our driver keep as much clearance between our vehicle and parked cars as conditions permitted?
- Did our driver interpret the pedestrian's next action or intention?
- Did our driver check the location of pedestrians before starting at a green signal?
- Did our driver give all pedestrians right of way?
- Did our driver refrain from passing a stopped school bus?
- Was our driver alert for signs of children who might run into the path (balls rolling into street, etc.)?

Safe Operating Guide for Company Vehicles

Preventing Collision with a Vehicle Ahead

An extremely frequent and costly accident is the collision with the vehicle ahead. There are five steps that can be taken that will help you avoid being involved in a collision with the vehicle ahead:

Be Alert — Watch for signs from the driver or drivers ahead as to what they intend to do. Are their turn signals on? Are their brake lights lit?

Drive Ahead of the Situation — Look beyond the vehicle ahead to see situations that may force him to act quickly and thereby become a threat to you.

Stay Back — Allow plenty of following distance. Allow one car length (using your own vehicle as a measure) for every 10 miles of speed and allow even more distance in adverse weather or road conditions.

Stopping Ability — This is the distance necessary to bring your vehicle to a stop that depends on a number of factors. The first is "driver reaction time". This is the time it takes for the driver to see the need to stop, take his foot from the accelerator to the brake pedal and begin to apply the brake. "Driver reaction distance" is based on an average driver reaction time of $\frac{3}{4}$ of a second for a typical driver under normal driving conditions. The distance traveled during the reaction time of $\frac{3}{4}$ of a second will depend upon the speed of the vehicle.

The second ingredient involves "braking distance". This is the distance traveled from the time the brake is applied until the vehicle is brought to a stop. This distance will also vary based on the speed of the vehicle. The type and condition of the pavement surface will also affect the braking distance, the type and condition of tires, and the condition of the brakes.

Begin to Stop Sooner — Slow down and touch your brakes the instant you see a hazard developing. The situation may require you to stop. Failure to do this is known as "delayed braking" – a serious flaw in good defensive driving techniques. A defensive driver should not have to make a true "panic" stop more than once a year. Stopping ability can be expressed as a formula:

$$\begin{array}{c} \text{REACTION} \\ \text{DISTANCE} \end{array} + \begin{array}{c} \text{BRAKING} \\ \text{DISTANCE} \end{array} = \begin{array}{c} \text{TOTAL} \\ \text{STOPPING} \\ \text{DISTANCE} \end{array}$$

Remember, moving at 55 mph produces a travel distance of 81 feet for each second of delay.

How to Avoid Backing Accidents

Backing can be a "dangerous maneuver". Because of the hazards of backing, the defensive driver avoids backing whenever possible by planning an alternative maneuver or choosing another route.

The defensive driver does not back out of parking lots, driveways, or alleys when he can avoid it. Instead, he drives in and turns around so he comes out front first. When this is not possible, he backs in so that he can drive forwards to come out. He knows it is safer to back out of traffic into a quiet area than to back into a heavy traffic stream.

When backing is unavoidable, follow these rules:

- ❑ ***"Size up the situation"*** thoroughly and completely, even if you have to get out of your vehicle to do so. Then start backing promptly before the backing situation changes.
- ❑ ***Back slowly.***
- ❑ ***Check both sides as you back.*** Check your mirrors often during the backing movement.
- ❑ ***Do not depend entirely*** on your mirrors to judge distance to the rear. Mirrors help you to spot pedestrians who may unexpectedly move into the path of your backing vehicle, but mirrors can be deceiving in estimating or measuring distances and clearances.

Avoid a Collision with a Following Vehicle

There are measures you can take to avoid being hit from behind:

- ❑ ***Signal Your Intentions*** — Use your directional signals and your brake lights.
- ❑ ***Stop smoothly*** — if you follow the rule for avoiding a collision with a vehicle ahead, you will also reduce the chances for a collision of the vehicle following.
- ❑ ***Keep Clear of Tailgaters*** — Do not let a tailgater rile you. Just slow down. Increase the following distance between your vehicle and the vehicle ahead, so you do not have to brake suddenly if a tailgater hits you.

Avoid a Rear-End Collision When Stopped

- ❑ ***Keep a foot*** on the brake pedal to activate lights.
- ❑ ***Stay at least*** 6 feet away from any stopped car ahead to avoid the "domino", multi-collision chain reaction effect.
- ❑ ***Keep your lights*** on at dusk or in the rain or other poor visibility conditions.

The Technique of Passing

Any passing maneuver often entails risk. The following twelve points will help to reduce that risk:

1. Decide if the Pass maneuver is necessary.
2. Make certain there is a safe following distance between you and the vehicle ahead.
3. Check the traffic ahead if you are moving in the oncoming traffic lane. If your vehicle and the oncoming vehicle are both traveling at 55 miles per hour, you are closing the gap between you at the rate of 161 feet per second. Since it takes 10 seconds to complete the task, the oncoming car should be at least 1/3 mile away.
4. Check the traffic behind you before changing lanes. First check your mirrors and then your blind spot.
5. Signal with your left turn signal before you change lanes.
6. Move into the left lane.
7. Accelerate as you move alongside the vehicle you are passing.
8. Signal the vehicle you are passing by tapping your horn or flashing your lights if you deem this necessary – especially at night.
9. Signal your intention to return to the right lane by the use of directional signal.
10. Return to the right lane when you can see all of the passed vehicle(s) in the right rear-view mirror.
11. Do not forget to cancel your directional signal.
12. Resume your proper cruising speed as soon as you have completed your passing maneuver.

Driving Emergencies

Your Brakes Fail — If there is any resistance, pump the pedal. You may be able to work up enough pressure to help somewhat.

Most vehicles are equipped with a dual brake system. If one system fails, the back-up system should work. If pumping the brake pedal does not help, coast in "drive" gear and use the parking or hand brake.

If you want to slow faster, shift to lower gears which will permit engine compression to help you slow your vehicle. Use your horn or lights to warn other drivers and pedestrians that you are in trouble and out of control.

You Go Into a Skid — If the rear of the vehicle starts to slide, take your foot off the gas at once. Your first instinct may be to turn hard away from the direction of skid. Do not! That will really spin you.

Turn your wheels in the same direction of the skid – but be careful, do not over-steer. You will be able to feel when the vehicle regains rolling action, and then straighten the wheel.

"Never hit the brakes as a side skid correction". For fast stopping with the least chance of causing a side skid, pump your brakes hard with a rapid jabbing and releasing pressure on the brake pedal. Disc brakes require slower pumping.

You Have a Blow-Out — Keep a firm and steady grip on the steering wheel and do not over-steer to correct swerve or pull.

If a front tire fails, there will be a strong pull to the side of the blow-out. A rear blow-out tends to cause weaving of the rear end. Do not slam on the brakes. Brake smoothly - but easily.

Day or night, set out flares or other warning devices such as reflectors and turn on your light flashers.

You Must Stop on the Freeway — On a freeway with paved shoulders, signal and pull off the road at near traffic speed, then slow down. Do not obscure your taillights by standing or working behind your vehicle. Day or night, place a flare or reflector warning device about 15 feet behind the vehicle and another at about 300 feet further back.

Seat Belts

Seat belts have been provided for your safety. They should be worn and properly adjusted at all times when your vehicle is in motion.

Accident Reporting

When reporting a vehicle accident involving other vehicles and persons, be certain that you have all pertinent information regarding other vehicles or equipment, any persons involved, and specific circumstances of the mishap.

Become familiar with the COMPANY reporting form and procedures. Know where to obtain copies of the form and keep them in your assigned vehicle at all times.

Accident Scene:

- Secure the scene to prevent other accidents from occurring.
- Place warning cones, flashers, reflectors or flares to protect the scene.
- Report injuries to emergency response services.

Accident Data:

- ☐ Date, time and location of the accident – list streets and known landmarks.
- ☐ Describe in detail what & how it happened - use a diagram to illustrate the scene.
- ☐ Road surface, weather and light conditions.
- ☐ Names, addresses and telephone numbers of parties involved.
- ☐ Determine who was injured, extent of injury and report their role in the accident.
- ☐ If injured persons on scene, where were they taken and by what means of transportation (drove self, by friend, by ambulance).
- ☐ Names, addresses and telephone numbers of witnesses and their statements.
- ☐ License numbers of vehicles and description of the damage.
- ☐ Name and badge number of responding police officer, if available.
- ☐ Take pictures of the accident scene, paying attention to injured persons and property damage. Take picture close up as well as far away that indicate cross streets, background landmarks that can document the accident location.
- ☐ In accidents not involving other vehicles or people, record the information outlined in your accident report kit and submit it to your fleet supervisor.

Accident Review

Determining Preventability

When a driver reports an accident, a COMPANY accident review committee must determine whether the accident was preventable by the driver involved. The board should consist of the vice president of operations, the fleet supervisor, the company safety director and any other person deemed necessary. Once preventability is determined, the committee should decide the disciplinary actions to be assigned to the driver involved.

Preventable Accidents

A preventable accident is any occurrence involving an owned or operated vehicle that results in property damage and/or personal injury. This applies regardless of who was injured, what property was damaged, to what extent or where it occurred, and whether or not the driver in question failed to do everything possible to prevent it. The following paragraphs are offered as a guide in determining the preventability of these accidents.

Guidelines to Determining the Preventability of Accidents

Accidents involve so many different factors that it is impossible to set hard and fast rules to classify them as preventable or non-preventable. The accident review board will make this determination. In making these decisions, the board will answer the question "What standard of safe driving performance do we expect from our drivers in this company?" Drivers respect a strict interpretation of the rules so long as the company takes the time and effort to ensure that these interpretations are made consistently and fairly.

Intersections

It is the responsibility of all drivers to approach, enter, and cross intersections prepared to avoid accidents that might occur through the action of other drivers. Complex traffic movement, blind intersections, or failure of the other driver to conform to law or traffic control devices will not automatically discharge an accident as "non-preventable".

Intersection accidents are preventable even though the driver has not violated traffic regulations. The vehicle operator's failure to take precautionary measures prior to entering intersections is a factor to be studied in making a decision. When a driver crosses an intersection and the obvious actions of the other driver indicate possible involvement, either by reason of excess speed, crossing a lane in turning, or coming from behind a blind spot, the decision should still be a preventable accident.

Practically any backing accident is preventable. A driver is not relieved of the responsibility to back safely, even when a spotter is involved in the maneuver. The spotter cannot control the movement of the vehicle; therefore, a driver must make sure all backing zones are clear.

Front-End Collisions

Regardless of the abrupt or unexpected stop of the vehicle ahead, your driver can prevent accidents of this nature by maintaining a safe following distance, knowing the conditions of the road and the load. This includes being prepared for possible obstructions on the roadway, either in plain or hidden view. Overdriving headlights at night is a common cause of front-end collisions. Night speed should not be greater than that which will permit the vehicle to come to a stop within the distance illuminated by the vehicle's headlights.

Rear-End Collisions

Investigation will often disclose that a driver risked being struck from behind by failing to maintain a margin of safety in his/her own following distances or making abrupt lane changes. Rear-end collisions preceded by a rollback, an abrupt stop at an intersection, when a traffic signal changes, or when your driver fails to signal a turn or slow down gradually should be charged as preventable.

Passing

Failure to pass another vehicle safely indicates faulty judgment and possibly failure to follow the important factors a driver must implement before attempting to pass. Unusual actions of the driver being passed or of oncoming traffic might appear to exonerate a driver involved in a passing accident; however, the entire passing maneuver is voluntary and your driver is responsible for a safe pass.

Being Passed

Sideswipes and cutoffs involving a driver while being passed are preventable when the driver fails to yield to the passing vehicle by slowing down or moving to the right where possible.

Lane Encroachment

A safe driver is rarely a victim of entrapment by another driver when changing lanes. Similarly, entrapment in merging traffic is an indication of unwillingness to yield to other vehicles or to wait for a break in traffic. Blind spots are not valid excuses for lane encroachment accidents.

Drivers must make extra allowances to protect themselves in areas of limited sight distances. Squeeze plays causing involvement with parked cars, pillars, and other road structures can be prevented by dropping back when it is apparent that the other driver is forcing the issue or contesting space on the road.

Grade Crossings

Preventing collisions with rail track vehicles, such as trains, occurring at grade crossings, in traffic, or on private property is the responsibility of the driver. When a vehicle is parked across a rail siding, the driver must first determine if it is safe and permissible.

He/she must stand by in case conditions change by the movement of railcars. Common grade crossing accidents occur on county/country roads that lack crossing indicators, barriers and flashing lights. At these crossings, it is important for the driver to have clear sight, up and down the tracks in both directions, prior to crossing.

Oncoming Vehicles

It is important to check the action of the driver when involved in a head-on or sideswipe accident with a vehicle approaching from the opposite directions. Exact location of the vehicles, prior to and at the point of impact, must be fully clarified during the accident review process. Even though an opposing vehicle enters a driver's traffic lane, it may be possible for your driver to avoid the collision. Your driver can take actions to make their presence known such as flashing lights or sounding the horn.

Turning

Turning movements require the most exacting care by a professional driver. Squeeze plays on left or right turns involving other vehicles or pedestrians are the responsibility of the driver making the turn. Failure to signal, to properly position the vehicle for the turn, to check the rear-view mirrors, to check pedestrian lanes or to take other defensive actions should be considered during the accident review.

You may find that your driver failed to take precautionary actions from indicators given by the other driver immediately preceding the incident. U-turns by your driver that result in a collision are considered preventable accidents.

Passenger Accidents

Passenger accidents in any type of vehicle are preventable when they are caused by the faulty operation of the vehicle. Even though the incident did not involve a collision, it must be considered preventable when your driver stops, turns, or accelerates abruptly, resulting in an injury to a passenger. Emergency actions taken by your driver to avoid a collision should be reviewed to determine that the action would/did eliminate a vehicle collision. In such cases, injury to the passenger would be considered non-preventable.

Pedestrians

Traffic regulations and court decisions generally favor the pedestrian hit by a vehicle. Unusual route of a pedestrian at mid-block or from between parked vehicles does not necessarily relieve the driver from accident preventability. Whether speed limits are posted or the area is placarded with warning signs, speed too fast for conditions may be involved as contributing factors.

Weather

Adverse weather conditions are not a valid excuse for being involved in an accident. Rain, snow, fog, or icy pavements have never caused an accident. These conditions increase the hazards but do not cause accidents. Failure to adjust driving habits to prevailing weather conditions or to "call it a day" when necessary, should be cause for deciding such accidents are preventable. Failure to use safety devices, such as snow chains when required, contributes to accident preventability.

Alleys, Driveways, and Entrances

Accidents involving traffic originating from alleys, driveways, entrances, and other special intersecting roadways should be carefully analyzed to determine what the driver might have done to avoid the accident. Failure to slow down, sound the horn, look for hazards, or yield to others can be considered reasons to call an accident preventable.

Fixed Objects

Collisions with fixed objects are preventable. They usually involve failure to check clearances to the side and overhead. The driver is responsible to be on the lookout for such obstacles, to proceed slowly in unfamiliar locations, and use ground-guides if necessary.

Parking

Unconventional parking locations, including double parking, failure to put out warning devices, etc. generally constitute evidence for judging an accident preventable.

Rollaway accidents from parked positions normally are considered preventable. This includes unauthorized entry into an unlocked and unattended vehicle, failure to properly block wheels, turn them to the curb, or otherwise secure the vehicle from movement.

Mechanical Failure

Any accident caused by mechanical failure that reasonably could have been detected by the driver, should be considered preventable. It is the driver's responsibility to report unsafe vehicle conditions for repairs and make sure the vehicle is in safe operating condition at all times. When mechanical difficulties occur unexpectedly during a trip, the driver is responsible to report this condition to the company, seeking advice for emergency service. Failure to take precautionary action that results in an accident should be considered a preventable accident. An accident caused by mechanical failure that results from abusive driving should be considered preventable.

Pulling Away from Curbs/Parking

Particular attention should be paid to driver's actions when leaving a parking space or position. Many drivers do not take sufficient time to check for clearances in all directions. This type of accident is considered preventable.

Why a Company Should Do Fleet Safety

Moral Aspect

★ Employee Image

★ Public Image

Financial Aspect

- Direct Costs (worker's comp premiums, medical expenses)
- Indirect Costs (lost time, productive down time, property damage)
- Higher Workers' Compensation premiums
- Litigation?
- Customer relationships and loss of sales

Legal Aspect

★ Compliance with OSHA, DOT, Police, etc.

★ Litigation

The total cost of a vehicle accident usually exceeds the amount recovered from the insurance company. Accident control in a large motor vehicle fleet is critical because increased insurance premiums (among other factors) reduce profits. This impact can be as devastating, if not more, to smaller fleets! Safe vehicle operation is the result of training, skill, planning, and action, not chance. Unfortunately, many companies fail to pay enough attention to the safe operation of motor vehicles. The reason for this lapse may be the difficulties of organizing an adequate safety program and providing good driver and fleet supervision.

The majority of all motor vehicle accidents are caused by driver error or poor operating practices including fatigue, inadequate training/retention, and alcohol/drugs use. Only a small percentage of accidents are due to mechanical failure of vehicles or to improper maintenance or equipment. As a result, an organization's vehicle accident prevention efforts should focus on both these principal accident factors - driver error and vehicle failure - because both can be controlled.

Companies can control driver error by implementing a program of driver selection, appropriate scheduling, effective practical training and evaluation, adequate supervision, and alcohol/drug screening; while vehicle failure can be reduced by a systematic preventive maintenance program. As experience has shown, the unsupervised fleet usually has higher accident costs than the supervised one.

Look at past incidences and/or other similar companies for a predictor of future problems!

What Is A Vehicle Safety Program?

A written safety policy, developed, supported, and enforced by management, including a person designated to create and administer the safety program and to advise management. This person should be responsible for advising management on accident prevention and safety matters; developing and promoting safety activities and work-injury prevention measures throughout the fleet; studying and recommending fleet safety programs regarding equipment and facilities, personnel selection and training, and other phases of fleet operation; evaluating driver performance and skill requirements; conducting or arranging for effective safety training and prepare and disseminate safety educational material; reviewing incidences/accidents to determine their causes and recommending corrective actions to management; compiling and distributing statistics on accident-cause analyses and experience; identifying problem persons, operations, and locations; and maintaining individual driver-safety records and administering the safe-driver award incentive program.

A driver safety program including:

- Driver selection procedures
- Driver training
- Records of driver safety performances
- Safety-motivational activities
- Proper supervision and implementation
- Accountability
- Recognizing safe driving!

An efficient system for accident investigation including:

- Fact-Finding Mission!
- Effective interviewing
- Detailed reporting and analysis
- Determination and application of appropriate corrective actions
- Follow-up procedures to help prevent future accidents

A vehicle preventative maintenance program.

Driver Safety Program

- Initiate a driver training program
- Proper and effective supervision
- Establish performance goals to management
- Establish competency and skills levels by setting objectives

- ☐ Periodic evaluations/reviews of performance
- ☐ Establish and communicate appropriate consequences
- ☐ Develop standards to determine ways accidents can be prevented
- ☐ Require immediate reporting of every accident
- ☐ Compute and publish the fleet accident record
- ☐ Maintain a performance record for each driver
- ☐ Safety motivational activities/incentives
- ☐ Initiate defensive driving training

Selecting Drivers

- | | |
|--------------|--------------|
| ☆ Interview | ☆ References |
| ☆ Experience | ☆ MVR |

Personal Traits

- | | |
|-----------------|------------------------------------|
| ☐ Dependability | ☐ Pleasant personality |
| ☐ Good judgment | ☐ Ability to get along with others |
| ☐ Courtesy | |

HAZMAT transporters must abide by other regulations including OSHA, DOT, RCRA, etc. Training is much more involved!

What Else Can Be Done?

- ☐ Continually communicate with the drivers!
- ☐ Involve the safety committee to establish and monitor the communication channel!
- ☐ Establish incentive activities/programs.
- ☐ Ensure drivers are immediately reporting problems/concerns. Delayed or unreported maintenance issues eventually cause more expense and can increase the possibility of accident or injury to the driver.
- ☐ Include accident packs in fleet vehicles (insurance proof, camera, forms, etc.)
- ☐ Maintain and carry fire extinguishers and first aid kits.
- ☐ Ensure vehicle safety devices are provided and maintained (i.e. signals, wipers, markings, placards, flares, blankets, radios, phones, etc.)
- ☐ Continually monitor and evaluate the preventative maintenance program. Don't forget maintenance shop safety! Service and maintain equipment, jacks, chemicals (HAZCOM), PPE, tire/rim servicing, fire protection, lubrication and washing operations, battery charging, flammables, traffic control in the area, etc.
- ☐ Injuries also occur during loading, unloading, and handling materials. Consider stability and weight capacities; shifting loads; fall protection; setting brakes and chocking wheels; avoiding exposure from falling loads; prohibiting unapproved riders; avoiding pinch points, crush areas, etc. Provide effective training in the safe work practices when utilizing material handling equipment such as slings, forklifts, tiebacks, etc.

Company Driver Qualifications

Establishing effective and realistic driver qualification standards is vitally important to the successful operation of any fleet, whether it is a coast to coast interstate operation or a small incidental fleet. Driver qualifications should exist for both the professional and incidental driver. Incidental drivers are those who do not drive as a primary job function, but do, however, use a vehicle to perform that job. Examples of incidental drivers are delivery persons, public utility drivers, salespeople, and field service personnel.

By placing sufficient emphasis on selecting the best available driver, a company helps to avoid future financial losses resulting from accidents and abuse of the equipment.

Selecting the right driver for the position will depend on how well the selection measures match the skills necessary for satisfactory job performance.

Depending on the type of commerce and size of the vehicles used, there are effectively three levels of driver qualification regulations to be considered:

- ① State mandated driver qualifications
- ② Drivers of vehicles with a gross vehicle weight rating (GVWR) of 26,001 pounds or more; designed to transport 16 or more passengers, including the driver; or used in the transportation of hazardous materials in a quantity requiring placarding under the Department of Transportation's (DOT) Hazardous Materials Regulations (HMR), must have a single, state issued Commercial Driver's License meeting minimum Federal requirements.
- ③ Drivers involved in interstate or foreign commerce in vehicles with a GVWR of 10,001 pounds or more; designed to transport 16 or more passengers, including a driver, or used in the transportation of hazardous materials in a quantity requiring placarding under the DOT HMR, are subject to the requirements of the DOT Federal Highway Administration's Federal Motor Carrier Safety Regulations (FMCSR).

A "driver qualification file" should be maintained, for persons hired, to permit review of the driver's record and provide future reference to the driver's qualifications. This file should contain all the documents completed during the hiring process and annual updates as required. Motor carriers subject to the FMCSR must have certificates indicating successful completion of the physical examination and road test. A written exam and certificate are no longer required to be administered and placed in the DQ file. The sections pertaining to the written exam (Sec.391.35 and 391.37) have since been removed from the regulations. You may wish to keep a separate confidential file containing drug test results and related information unless the regulations stipulate differently.

The driver selection process includes several steps including:

- | | |
|---------------------------------|------------------------------------|
| ① Application Form | ⑥ Physical Examination |
| ② Interview | ⑦ Road Test |
| ③ Driver's License Verification | ⑧ Written Test (Optional) |
| ④ Reference Check | ⑨ Substance Abuse and Drug Testing |
| ⑤ Motor Vehicle Driving Record | |

If these steps are consistently followed, you should know which applicant is the most qualified to fill the position. Applicants who have shown consistently poor results in the selection process are more likely to be problems later. The following suggestions should help you select a driver who will be a valuable asset to your business.

1. Application Form

The application form should provide information on the applicant's driver's license(s), driving experience, accident record, and traffic violation convictions and forfeitures for the past 3 years, past employment (previous 3 years; 10 years for drivers required to have a Commercial Drivers License), education, and physical history. Motor carriers subject to the **Federal Motor Carrier Safety Regulations** (FMCSR) are required to obtain specific information on the application form.

For incidental fleets, you may want to suggest to the human resources department that applications for incidental drivers include the following:

- Driving Experience** — Applicant's past driving experience and the type of driving license held and in which state.
- Familiarity with specific equipment** — The type of equipment the applicant has driven.
- Past driving record** — Past driving record, including convictions.

2. Interview

Personally interview the applicant to review job requirements and qualifications in detail. The interview should be used to resolve any questions regarding the information obtained or omitted on the application form.

3. Driver's License Verification

Personally check and review the applicant's driver's license to determine if he/she is qualified and licensed to operate the type of vehicles you have.

4. Reference Check

A check should be made with previous employers to develop information about the driver's general character and professional ability. Factors such as length of employment; job performed including operation of vehicles; accident record; ability to get along with others; and whether the previous employer would re-hire the individual should be included.

This check can be accomplished by a telephone interview, a letter, or a personal visit. The driver's file should verify that these checks were made with record of the responses received. Motor carriers subject to the FMCSR are required to investigate the driver's employment record for the preceding 3 years.

5. Motor Vehicle Record

A copy of the Motor Vehicle Record (MVR) should be obtained from each state where a driver holds a license, to ascertain that the applicant has a valid license and to review the driver's past record. A driver required to have a CDL can only be licensed in one state. A history of accidents and/or moving traffic violations could indicate a major problem with the applicant.

A MVR should also be obtained annually for each driver and reviewed to determine whether remedial training is necessary. The review is conducted with the driver and becomes part of his/her file. If you operate under the FMCSR, an annual review must be completed in accordance with Section 391.25 of the regulations.

6. Physical Examination

The physical fitness of the driver must be considered before hiring. Your company should arrange for physical examinations. In addition to checking a driver's physical condition before hiring, periodic physical examinations should be required and arranged for by your company. Re-examinations may indicate the onset of a problem and allow appropriate corrective measures to be taken.

Motor carriers subject to the FMCSR are required to have their drivers successfully complete a required medical examination initially and at least every 24 months thereafter, as well as submit to testing for the use of certain controlled substances.

7. Road Test

A road test is one of the ways to find out whether drivers can do the job expected of them. The same type of equipment to be assigned the driver should be used in the test and the test should be sufficiently long to cover a variety of situations. The test should not establish a passing or failing grade, but should indicate the driver's competent areas and weak points. This will allow you to provide needed training prior to dispatching the driver. Motor carriers subject to the FMCSR are required to verify that each driver has been given a road test.

8. Written Test (Optional)

Some companies make use of tests to evaluate a driver's knowledge of driving rules and defensive driving practices. Extreme care must be taken to assure that the tests are non-discriminatory and clearly associated with the knowledge and skills necessary to successfully fill the position. Motor carriers subject to the FMCSR are no longer required to administer a written test to prospective drivers. Even though this is the case, companies still have the obligation to instruct drivers and employees about the FMCS Regulations. A written exam could be used as part of your training program. Under the Regulations, drivers must be familiar and up to date with the regulations and the employer must require driver compliance.

9. Substance Abuse Programs and Drug Testing

Substance abuse is a serious workplace problem. The National Institute on Drug Abuse reports that approximately 68 percent of all illegal drug users are employed either full or part time. The National Institute on Alcohol Abuse and Alcoholism reports that 1 in every 10 people in this country has an alcohol problem. Drivers with substance abuse problems are especially a concern due to the increased likelihood of accidents and injuries to others.

Fleets operating with drivers having Commercial Drivers Licenses (CDL) operating commercial motor vehicles meeting the following definition are subject to the Federal Highway Administration's regulations on alcohol misuse and drug use prevention and testing programs:

- ① Has a gross combination weight rating of 26,001 or more pounds inclusive of a towed unit with a gross vehicle weight rating of more than 10,000 pounds.
- ② Has a gross vehicle weight rating of 26,001 or more pounds.
- ③ Is any size transporting hazardous materials requiring placards.

Drug testing should not be performed until a drug free workplace policy and supporting procedures are in place and communicated to all employees. The rule requires pre-employment, reasonable suspicion, random, post-accident, return-to-duty and follow-up testing. For details on the program, refer to the FMCSR, Title 49, Part 382.

Driver Training

Regular training must supplement the driver's selection program. The amount of training that is needed varies directly with the complexity of the job as well as with the knowledge and experience of the new employee. Proper training reduces operational disruptions and minimizes unnecessary costs due to accidents and equipment abuse.

Your company's driver training program should be divided into several levels:

- ① Initial Training — new employee indoctrination.
- ② Refresher Training — updates on routes, cargo, equipment, and regulations.
- ③ Remedial Training — used when there is a problem of substandard performance.

Your company's driver training program should include the following areas:

- | | |
|---|---|
| <input type="checkbox"/> Company rules and policies | <input type="checkbox"/> Cargo handling |
| <input type="checkbox"/> Equipment familiarization | <input type="checkbox"/> Emergency procedures and warning devices |
| <input type="checkbox"/> Routes and schedules | <input type="checkbox"/> Specific concerns or loss patterns |
| <input type="checkbox"/> Defensive driving techniques | |
| <input type="checkbox"/> Government regulations | |

There are two approaches to training: classroom and in-vehicle. Classroom training can be accomplished using either a one-on-one or group approach. This method is useful for company rules, government regulations, routes and schedules, accident and emergency procedures, basic cargo handling methods, and basic defensive driving techniques. In-vehicle training is most effective for equipment familiarization, vehicle inspections, cargo handling and defensive driving. In-vehicle training provides one of the best methods of giving practical instruction to a driver under closely controlled conditions.

Driver Selection:

- ★ Does a definite program for driver selection exist?
- ★ Is it as good as it should be and is it adhered to, or is it mostly on paper and frequently forgotten when busy or short of drivers?

Driver Training:

- ★ Is there a definite training program or is it on a "hit or miss" basis?
- ★ Is the driver's past record checked carefully to determine whether reported experience and knowledge are factual?
- ★ Does the program provide for retraining as necessary when unsatisfactory performance or accidents are identified?

Driver Supervision:

- ★ Are supervisory responsibilities adequately handled, or is there overlapping and occasional friction?
- ★ Are there areas where no one is clearly responsible?
- ★ Can relations with drivers be improved?
- ★ Can routing and scheduling procedures be improved for greater efficiency of operation and greater safety?

Company Driver Safety Audit

Driver Qualification

- Y N N/A
- Job Analysis
 - Physical Qualifications
 - Recruiting System
 - Driver Qualification Files
 - Application Form
 - Interview
 - Reference Check
 - Road Test
 - Motor Vehicle Record Review

Driver Training & Motivation

- Initial Training Program
- Company Rules and Policies
- Equipment Familiarization
- Routes and Schedules
- Emergency Procedures
- Accident Reporting
- Defensive Driving Techniques
- Regulations
- Cargo Handling/Securement
- Ongoing Training Program
- Incentive Program

Driver Supervision

- Vehicle Location Check
- Trip Recorder Checks
- Road Observation System
- Logs Checked

APPLICANT ROAD TEST

Driver's Name: _____ SSN: _____

Motor Vehicle Operator's License No. _____

Type of License: _____ Issuing State: _____

Type of Vehicle: _____

INSTRUCTIONS TO EXAMINER:

Place a check mark in the appropriate box: Y N N/A

PRE-TRIP INSPECTION

- Y N N/A
- Checks general condition of vehicle
 - Checks for proper operation of parking and service brake systems
 - Checks steering mechanism
 - Checks all lighting devices and reflectors
 - Checks condition of tires
 - Checks horn and windshield wipers
 - Checks and adjusts rear view mirrors
 - Checks emergency equipment

PLACING VEHICLE IN OPERATION

- Uses seat belt
- Starts vehicle properly
- Checks air pressure in brake system
- Shifts gears properly
- Checks traffic conditions
- Does not allow vehicle to roll while stopped
- Drives with both hands on wheel
- Steers smoothly
- Maintains proper speed for conditions, within speed limit

COUPLING AND UNCOUPLING COMBINATION UNIT

- Checks that fifth wheel jaws are open
- Lines up properly with the trailer
- Connects brake and electrical lines
- Charges trailer brakes
- Backs slowly
- Visually checks for proper coupling of fifth wheel
- Assures that fifth wheel handle is in locked position
- Raises landing gear and removes wheel chocks
- Applies trailer brakes and gently tries to pull away from trailer

BACKING AND PARKING

Y N N/A

- Stops in correct position
- Avoids backing from blindside
- Gets out of vehicle and checks entire area, including overhead, before backing
- Uses mirrors properly

INTERSECTIONS

- Prepares to stop vehicle if necessary, even if traffic signal is green
- Checks in all directions for traffic conditions
- Stops vehicle in proper location when required
- Does not allow vehicle to roll when stopped

TURNING

- Makes sure vehicle is in proper lane for turn
- Signals intention to turn well in advance
- Approaches at proper speed
- Checks traffic conditions and turns only when intersection is clear
- Keeps vehicle in proper lane during turn
- Does not shift gears during turn

RAILROAD CROSSING

- Checks in all directions when approaching crossing
- Comes to complete stop when necessary or required by law
- Stops at a safe distance when necessary
- Does not shift gears when crossing tracks

PASSING

- Only passes in safe location, where legally allowed
- Checks ahead and behind to make sure passing room is adequate
- Warns vehicle ahead of intention to pass
- Uses directional signals properly
- Leaves sufficient space before cutting back into lane
- Does not exceed speed limit

REMARKS:

QUALIFIED: **YES** **NO**

Examiner's Name (please print)

Title

Signature of Examiner

Date

MOTOR VEHICLE ACCIDENT REPORT

Company:

AFTER AN ACCIDENT: ① Stay Calm ② If the vehicles are drivable and it is safe to do so, move them safely out of traffic ③ Apply first aid (if properly trained) ④ Call police, and if necessary, ambulance ⑤ Take brief notes

| | | | |
|-----------------------------------|-------------------------|---|-------------------------|
| <i>Vehicle Driver Name</i> | | <i>Other Vehicle Driver Name</i> | |
| <i>Address</i> | | <i>Address</i> | |
| <i>Phone</i> | <i>Driver License #</i> | <i>Phone</i> | <i>Driver License #</i> |
| <i>Vehicle Type</i> | | <i>Other Vehicle Type</i> | |
| <i>Vehicle license Plate #</i> | | <i>Vehicle license Plate #</i> | |
| <i>Owner's Name</i> | | <i>Owner's Name</i> | |
| <i>Address</i> | | <i>Address</i> | |
| <i>Vehicle Insurance Co. Name</i> | | <i>Other Vehicle Insurance Co. Name</i> | |
| <i>Name Policy is Under</i> | <i>Policy #</i> | <i>Name Policy is Under</i> | <i>Policy #</i> |
| <i>Passenger Info</i> | <i>Passenger Info</i> | <i>Passenger Info</i> | <i>Passenger Info</i> |
| | | | |
| | | | |

ACCIDENT DETAILS

| | |
|---|--|
| <i>Date of Accident</i> | <i>Explain how the accident happened</i> |
| <i>Time of Accident</i> <input type="checkbox"/> am <input type="checkbox"/> pm | |
| <i>Street</i> | |
| <i>City</i> | |
| <i>State</i> | |
| <i>Approx Speed: Your MPH: Other MPH:</i> | <i>Describe your vehicle's damage</i> |
| <i>Describe any Injuries</i> | |
| | |
| | <i>Describe other vehicle's damage</i> |
| | |

| | |
|-----------------------------------|--|
| <i>Investigating Officer Name</i> | |
| <i>Phone Badge No.</i> | |
| <i>Police Department</i> | |
| | |
| <i>Investigating Officer Name</i> | |
| <i>Phone Badge No.</i> | |
| <i>Police Department</i> | |
| <i>Witness Info</i> | |
| | |
| <i>Witness Info</i> | |
| | |
| <i>Report Completed By</i> | |
| <i>Signature</i> | |

Chapter 21 Contracts

Arena Fire Protection, Inc. New Hire Orientation Checklist

- 1) I have read or have had explained the Safety Policy & Program Summary. I have no further questions regarding:
- ☆ The company's Safety Philosophy.
 - ☆ My safety responsibilities as an employee.
 - ☆ The disciplinary procedures.
- _____ ***Initial***
- 2) I have read or have had explained the Safety Committee portion of the Safety Program:
- ☆ I am aware of who is in charge of safety if I have questions.
 - ☆ I am aware of my ability to report my safety concerns to the Safety Coordinator.
 - ☆ I am aware that this company is striving to provide a safe working environment and is committed to my safety and ability to inform the company of unsafe working environments with out fear of reprisal.
- _____ ***Initial***
- 3) I have read or have had explained the General Safety Rules as pertain to the Safety Program:
- ☆ I am aware of all safety rules and general codes of safe practice.
- _____ ***Initial***
- 4) I have read or have had explained the safety policy regarding Machine & Equipment:
- ☆ I am aware that all guards are to be kept in place on all appropriate equipment.
 - ☆ I am aware that I am to report missing guards or equipment that needs repaired or could potentially pose a hazard to myself or others.
 - ☆ I am aware that I am required to inspect all tools and machines before I operate the equipment.
 - ☆ I am aware that I can request training from my supervisor on any piece for equipment that I do not know how to operate safely.
 - ☆ I am aware that if I am unsure of how to operate my equipment, tools, or machine safely I am to not operate the equipment until I receive proper training and feel that I can operate the equipment safely.
 - ☆ I am aware that any equipment in need of repair or out of compliance is to be reported to my supervisor.
- _____ ***Initial***

5) I have read or have had explained the process for Accident Reporting & Investigation:

- ★ I understand that I am to immediately report an accident to my supervisor.
- ★ I understand that I am to immediately stop working.
- ★ I understand that if I need medical attention I am to see the clinic or hospital that is affiliated with this company.
- ★ I understand that if I go to a different doctor or medical facility the company may have a right to deny or not pay my medical bill.
- ★ I understand that I will be cooperative in any accident investigation.
- ★ I understand that upon any accident I may be tested for drugs and alcohol.
- ★ I understand that if I am present at my place of employment under the influence of drugs and or alcohol that I automatically self-terminate my employment with or without notice of termination by the company.

_____ **Initial**

6) I have read or have had explained the Emergency Action Plan:

- ★ I understand where my emergency evacuation routes are located.
- ★ I understand that we are to gather at a specific determined place in order to conduct a head count.

_____ **Initial**

7) I have read and or have had explained the Fire Prevention Plan:

- ★ I understand that I am to report any potential fire hazards.
- ★ I am to keep all exits clear and free of obstacles.
- ★ I know where the nearest fire extinguisher is to my workstation.

_____ **Initial**

8) I am aware of the CPR & First Aid portion of the Safety Program:

- ★ I am aware of where the first aid kits are located.
- ★ I am aware that I am to report to management if the first aid kit needs restocked.
- ★ I am aware of who is trained in First Aid and CPR
- ★ I am aware of where the nearest Eye Wash Station is located (if appropriate).
- ★ I am aware that I am to report all injuries immediately to my supervisor.
- ★ I am aware of where our clinic is located and will have someone drive me there in the event of an emergency (or by ambulance if appropriate).

_____ **Initial**

- 9) I have read or have had explained the Hazard Evaluation portion of the Safety Program:
- ★ I understand that I am to be familiar with the hazards that surround my workstation.
 - ★ I understand that I am to report any hazard that may be present in my workstation.
 - ★ I understand that it is my responsibility to assist in providing a safe working environment for myself and my co-workers.

_____ ***Initial***

- 10) I have read or have had explained the Bloodborne Pathogens portion of the Safety Program:
- ★ I understand that I am to wear personal protective equipment when dealing with blood or body fluids.
 - ★ I understand that I am to properly dispose of any blood, body fluids, or material that has been touched by the blood or fluid.
 - ★ I understand that in the event of dealing with a Bloodborne Pathogen situation it is my responsibility to receive post exposure care by the company's clinic.
 - ★ I am aware of where my hand-washing facilities and/or disinfectant are located.

_____ ***Initial***

- 11) I have read or have had explained and understand the Workplace Violence & Harassment policy of the Safety Program:
- ★ I understand The Company has ZERO TOLERANCE for workplace Violence & Harassment.
 - ★ Workplace Violence & Harassment includes but is not limited to: intimidation, threats, physical attack, property damage, and includes acts of violence committed by employees, customers, relatives, acquaintances, or strangers against company employees in the workplace.
 - ★ Dangerous weapons are prohibited on company property or in Company vehicles.
 - ★ All employees are encouraged to report to a supervisor any possibility of workplace Violence & Harassment. All reports will be confidential.

_____ ***Initial***

- 12) I have read or have had explained the Electrical Safety portion and the Lockout/Tagout portion of the Company Safety Program:
- ★ I understand that only authorized persons are allowed to deal with electrical repairs and or issues.
 - ★ I understand that I am to not touch or in any way use any equipment that is locked out or tagged out.
 - ★ I understand that it is my responsibility to report any electrical hazards to a supervisor immediately.

_____ ***Initial***

13) I have read or have had explained the Hazard Communication & Material Safety Data Sheet (MSDS) portion of the Safety Program:

- ★ I understand what a Material Safety Data Sheet is.
- ★ I have been given an orientation on how to read a MSDS.
- ★ I understand that I am to report any Chemical or Hazardous Substance that does not have a label.
- ★ I understand that I can request further training on MSDSs.

_____ **Initial**

14) I have read or have had explained the Personal Protective Equipment portion of the Safety Program:

- ★ I understand that I am to wear my personal protective equipment as required by this company.
- ★ I am aware of what I am required to wear for personal protective equipment at this company.

_____ **Initial**

15) I am aware of where my company displays all of the required Employee Rights Postings.

_____ **Initial**

16) I am aware of where my Company "Designated Medical Provider" is located.

_____ **Initial**

17) I am aware that the Safety Program may contain additional written safety Programs in place which require additional training (i.e. Confined Spaces, Fall-Protection, Excavation, Ladders, Scaffolding, Lock-Out/Tag-Out, etc.):

- ★ I understand that I may receive or request further training on any safety issues that may be appropriate for my particular job.
- ★ If I have not received adequate training or feel that I can not conduct my job safely it is my responsibility to notify my supervisor.

_____ **Initial**

My signature certifies and verifies that I have received an orientation and have received or have read the material mentioned in the Company Safety Program. I understand completely the program and have no questions in regards to Company safety policy. I fully understand and am aware that if I have questions regarding the Company Safety Program or my personal safety, I may inquire of my supervisor for additional information and explanation.

New Hire Name

Signature

Date

Supervisor Name

Signature

Date

Orientación Y Lista De Verificación

1) He leído o me han explicado la Póliza de Seguridad y el Resumen del Programa. No tengo mas preguntas en cuanto a:

- ★ La Filosofía de Seguridad de la compañía.
- ★ Mis responsabilidades de seguridad como un empleado.
- ★ El procedimiento de disciplina.

_____ ***Inicial***

2) He leído o me han explicado la porción del Comité de Seguridad del Programa de Prevención de Lesiones y Enfermedad:

- ★ Estoy consciente de quien esta a cargo de seguridad si tengo preguntas.
- ★ Estoy consciente de mi habilidad de reportar mis preocupaciones de seguridad al Comité de Seguridad.
- ★ Estoy consciente que la compañía se esfuerza para proveer un ambiente seguro para el trabajo y esta cometido a mi seguridad y habilidad de informar a la compañía de ambientes inseguros para el trabajo sin temor de represalia.

_____ ***Inicial***

3) He leído o me han explicado las Reglas Generales de Seguridad como pertenecen al Programa de Prevención de Lesiones y Enfermedad:

- ★ Estoy consciente de todas las reglas de seguridad.

_____ ***Inicial***

4) He leído o me han explicado los Códigos de Seguridad y Practica para las Maquinas y Equipo:

- ★ Estoy consciente que todos los dispositivos de protección deben mantenerse en lugar en el equipo apropiado.
- ★ Estoy consciente que debo reportar escudos ausentes o equipo que necesita reparación o que puede causar un daño a mi u otros.
- ★ Estoy consciente que estoy requerido de inspeccionar todas las herramientas y maquinas antes de usar el equipo.
- ★ Estoy consciente que puedo pedir entrenamiento de parte de mi supervisor en cualquier equipo que no se como operar cuidadosamente.
- ★ Estoy consciente que si estoy inseguro de como operar mi equipo,
- ★ herramientas, o maquina seguramente no debo operarla hasta que recibo el entrenamiento apropiado y siento que puedo operar el equipo seguramente.
- ★ Estoy consciente que cualquier equipo que necesita reparaciones o que no este conforme a las reglas de seguridad debe estar reportado.

_____ ***Inicial***

- 5) He leído o me han explicado el proceso de Reportar y Investigar Accidentes.
- ★ Entiendo que debo reportar un accidente inmediatamente a mi supervisor.
 - ★ Entiendo que debo parar de trabajar inmediatamente.
 - ★ Entiendo que si necesito tensión medica debo ir a una clínica o hospital afiliado con esta compañía.
 - ★ Entiendo que si voy ha un diferente doctor o clínica medica la compañía tiene el derecho de negar o no pagar mi cuenta medica.
 - ★ Entiendo que debo cooperar con cualquier investigación de accidente.
 - ★ Entiendo que me examinaran por drogas o alcohol por cualquier accidente.
 - ★ Entiendo que si estoy presente en mi lugar de empleo bajo la influencia de drogas o alcohol puedo ser despedido automáticamente con o sin aviso de terminación por la compañía.
- _____ ***Inicial***
- 6) He leído o me han explicado el Plan de Hacino de Emergencia.
- ★ Entiendo donde las rutas de evaluación de emergencia están localizadas.
 - ★ Entiendo que debemos reunirnos en un determinado lugar especifico para poder conducir una cuenta de personas.
- _____ ***Inicial***
- 7) He leído o me han explicado el Plan de Prevención de Incendio.
- ★ Entiendo que debo reportar cualquier peligro de incendio.
 - ★ Debo mantener todas las salidas libres de obstáculo.
 - ★ Yo se donde el extinguidor de incendio mas cercano esta en mi área de trabajo.
- _____ ***Inicial***
- 8) Estoy consciente de la porción de Primeros Auxilios y Resucitación Cardiopulmonar CPR del Plan de Prevención de Lesiones y Enfermedad.
- ★ Estoy consciente de donde los botiquines de primeros auxilios están localizados.
 - ★ Estoy consciente que debo reportar si el botiquín de primeros auxilios necesita materiales.
 - ★ Estoy consciente de quien esta entrenado en Primeros Auxilios y Resucitación Cardiopulmonar CPR.
 - ★ Estoy consciente de donde la Estación para Lavar los Ojos esta localizada (si es apropiado).
 - ★ Estoy consciente que debo reportar todas las heridas de inmediato a mi supervisor.
 - ★ Estoy consciente de donde nuestra clínica esta localizada y TENDRÉ A ALGUIEN TRANSPORTARME ALLÍ EN EL EVENTO DE UNA EMERGENCIA (o en una ambulancia si es apropiado).
- _____ ***Inicial***

- 9) He leído o me han explicado la porción de la Evacuación de Peligro en el Programa de Prevención de Lesiones y Enfermedad.
- ★ Entiendo que me debo familiarizar con los peligros que esta alrededor de mi estaciona de trabajo.
 - ★ Entiendo que debo reportar cualquier peligro que puede estar presente en mi estación de trabajo.
 - ★ Entiendo que es mi responsabilidad para asistir en proveyendo un ambiente seguro de trabajo para yo mismo u otros.

_____ ***Inicial***

- 10) He leído o me han explicado la porción del Patógenos Sanguíneos en el Programa de Prevención de Lesiones y Enfermedad.
- ★ Entiendo que debo traer puesto equipo protector personal cuando se trata de sangre o fluidos del cuerpo.
 - ★ Entiendo que debo apropiadamente desechar de cualquier sangre, fluidos del cuerpo o materiales que han sido tocados por sangre o fluidos.
 - ★ Entiendo que en evento de tratar con una situación donde hay Patógenos Sanguíneos es mi responsabilidad de recibir cuidado de exposición posterior por la clónica de la compañía.
 - ★ Estoy consciente de donde estar las facilidades para lavar las manos.

_____ ***Inicial***

- 11) He leído o me han explicado y entiendo la porción de Seguridad en el Lugar de Empleo y la porción de la Póliza de Violencia en el Lugar de Empleo del Programa de Prevención de Lesiones y Enfermedad.
- ★ Entiendo que esta compañía tiene CERO TOLERANCIA para la violencia en el lugar de empleo.
 - ★ Violencia en Lugar de Empleo incluye pero no se limita a: intimidación, amenazas, ataques físicos, violencia domestica, daño a propiedad e incluye actos de violencia cometidos por empleados, clientes, familiares, conocidos o extraños contra los empleados en lugar de empleo.
 - ★ Armas peligrosas están prohibidos en la propiedad de la compañía o en los vehículos de la compañía.
 - ★ Todos los empleados están animados en reportar a un supervisor o cualquier posibilidad de la violencia en el lugar de empleo. Todos los reportes se consideraran confidenciales.

_____ ***Inicial***

- 12) He leído o me han explicado la porción de Seguridad Eléctrica y la porción de Lock-Out/Tag-Out en el Programa de Prevención de Lesiones y Enfermedad.
- ★ Entiendo que solamente personas autorizadas están permitidos en tratar con las reparaciones eléctricas y/o problemas.
 - ★ Entiendo que no debo tocar o de ninguna manera usar cualquier equipo que esta restringido.
 - ★ Entiendo que es mi responsabilidad de reportar cualquier peligro eléctrico a un supervisor inmediatamente.

_____ ***Inicial***

13) He leído o me han explicado las porciones de Comunicación de Peligro y la Hoja Informativa de Seguridad de Material del Programa de Prevención de Lesiones y Enfermedad.

- ★ Entiendo lo que es una Hoja Informativa de Seguridad de Material.
- ★ He recibido una orientación en como leer la hoja Informativa de seguridad de Material.
- ★ Entiendo que debo reportar cualquier sustancia peligrosa o química que no tiene etiqueta. Entiendo que puedo recibir entrenamiento adicional en la Hoja Informativa de Seguridad de Material.

_____ ***Inicial***

14) He leído o me han explicado la porción del Equipo Protector Personal del Programa de Prevención de Lesiones y Enfermedad.

- ★ Entiendo que debo tener puesto mi Equipo Protector Personal como es requerido por esta compañía.
- ★ Estoy consciente del Equipo Protector Personal (EPP) que esta requerido en este compañía.

_____ ***Inicial***

15) Estoy consciente en donde mi compañía despliega todos los Letreros Requeridos de los Derechos de Empleados.

_____ ***Inicial***

16) Estoy consciente de donde esta la clínica de mi compañía.

_____ ***Inicial***

17) Estoy consciente que el Programa de Prevención de Lesiones y Enfermedades puede incluir programas adicionales por escrito que están puesto que requiere entrenamiento adicional (Respecto de: Espacios limitados, Protección de caídas, Excavación, Escaleras, Andamios, Lock-out/Tag-out, etc.).

- ★ Entiendo que debo recibir o puedo pedir entrenamiento adicional en cualquier asunto de seguridad avanzado que pueda ser apropiado para mi trabajo en particular.
- ★ Si no he recibido adecuado entrenamiento o siento que no puedo hacer mi trabajo en una manera seguro es mi responsabilidad notificar mi supervisor.

_____ ***Inicial***

Yo certifico que he recibido una orientación o he leído el material mencionado y el Programa de Prevención de Lesiones y Enfermedad. Entiendo completamente el programa y no tengo mas preguntas tocante a la seguridad. En caso de que tenga una pregunta acerca de nuestro programa de seguridad o de mi seguridad personal estoy consciente que puedo pedir a mi supervisor para explicación adicional.

Escriba Nombre

Firma

Fecha

Testigo de la Compañía

Titulo

Fecha

DISCLAIMER

OSHA's "Safety and Health Regulations" are continuously being reinterpreted. Therefore, Safety Services Company is unable to completely guarantee the exactness of the information conveyed in this publication. Safety Services Company assumes no responsibility and shall be held harmless for any inaccuracies or omissions contained within this manual and shall not be held liable to any extent or form for any injury or loss resulting from the manner in which this information is interpreted and/or applied.

Careful effort has been dedicated in order to provide a simplified, understandable explanation of OSHA regulations based on currently available information. This "Safety and Health Manual" is distributed with the agreement that Safety Services Company is not employed in providing legal or other specialized business services. Should expert assistance be required, retain the services of a competent professional.

SAFETY SERVICES COMPANY

P.O. Box 6408 Yuma, Arizona 85366-6408

Toll Free (866) 204-4786 Toll Free FAX (866) 556-0004

Toll Free Customer Service (866) 644-9630

e-Mail: ssc@safetyservicescompany.com www.safety2U.com

***Chapter 22* Safety Meeting Minutes**

Other Safety Training Documents for:

Arena Fire Protection, Inc.

This section is designed to hold all Company Safety Training Documents. Any paperwork related to Company Safety Training should be 3-ring hole-punched and stored in this section.