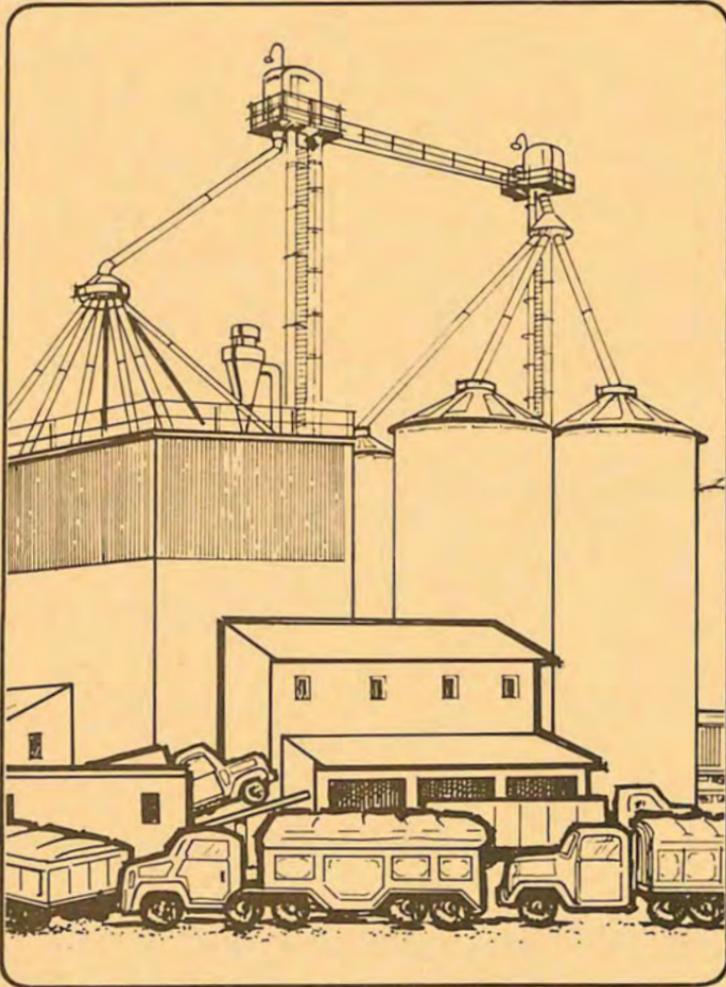


# **NIOSH**

## **HEALTH AND SAFETY GUIDE FOR GRAIN MILLS**



**U.S. DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE**  
**Public Health Service**  
**Center for Disease Control**  
**National Institute for Occupational Safety and Health**

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Cincinnati, Ohio  
April 1975

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## INTRODUCTION

The Williams-Steiger "Occupational Safety and Health Act of 1970" was passed into law "to assure safe and healthful working conditions for working men and women. . ." This Act established the National Institute for Occupational Safety and Health (NIOSH) under the Department of Health, Education, and Welfare (DHEW) and the Occupational Safety and Health Administration (OSHA) under the Department of Labor (DOL). The Act provides for research, information, education, and training in the field of occupational safety and health and authorizes enforcement of the standards. As part of these activities, surveys have been made by NIOSH to determine the most common health and safety problems in small businesses. This Guide includes a "Guidelines" section and a section on "Frequently Violated Regulations"; it is being distributed throughout the industry.

While the aim of this Guide is to assist in providing a safe and healthful workplace by describing safe practices and helping to correct some of the more frequently encountered violations of the safety and health standards, it is not intended to provide total information in all areas of compliance. Additional information can be found in "general industry standards Title 29 Code of Federal Regulations—Part 1910".

Words such as "must", "required", "necessary", etc., appearing in the text, indicate requirements under the Federal Regulations. Procedures indicated by "should", "suggested", etc., constitute generally accepted good practices.

In some states, the federal government has delegated enforcement authority for occupational safety and health to the state government. Although state standards sometimes differ, they must be at least as effective as the federal standards.

On the last few pages of the Guide are listed addresses of NIOSH and OSHA regional offices where additional information and materials can be obtained. Consultation resulting from requests for assistance will not precipitate a compliance visit by OSHA.



## HEALTH AND SAFETY GUIDELINES

### GENERAL PHILOSOPHY REGARDING HEALTH AND SAFETY

Through the use of a health and safety program and actively supported employee training, existing unsafe acts or conditions should become apparent. For many of these there may not be specific standards. Nevertheless, it is important to find a solution to these recognized problems.

During the analysis of the workplace for health and safety problems, it may also become apparent that "the letter of the law" is not being met. This may be particularly noticeable where dimensions are given for ladders, stairs, railings, etc. If it is apparent to all concerned that the "intent" of the law is being met, instead of making changes, a variance may be requested. Considerable discretion must be exercised in this area and the decision not to make changes should be made with the concurrence of OSHA.

When new buildings are being constructed, renovations are being made, or new equipment is obtained, the standards must be followed.

Even where a citation is issued, it is desirable that the employer have demonstrated his willingness to comply with the intent of the law by operating effective, on-going safety and health programs, by correcting imminent dangers in the workplace, by maintaining records of purchases, installations, and other compliance-promoting activities. Therefore, after an OSHA compliance visit and a citation, the manager can substantiate his intent to provide a safe and healthy workplace for his employees by demonstrating records which document his purpose, and may be given the benefit of having shown "good faith" when penalties are being determined.

## HEALTH AND SAFETY GUIDELINES (cont.)

### HEALTH AND SAFETY PROGRAM

Hazardous conditions or practices not covered in the OSHA standards are covered under the general duty clause of the Act which states "Each employer shall furnish to each of his employees employment and a place of employment which are free from recognized hazards that are causing or are likely to cause death or serious physical harm to his employees".

An effective method to assist in providing for a safe working environment is through a health and safety program. The purpose of such a program is to recognize, evaluate, and control hazards and potential hazards in the workplace.

Hazards may be identified by investigating accidents, reviewing injury and illness records, soliciting employee input (interviews, suggestions, and complaints), performing self-inspections, using material in this Guide and other information sources. Typical examples are unsafe walking surfaces, unguarded machinery, electrical hazards, improper lifting, air contaminants, etc. The "Checklist" in the back of this book is of particular importance in identifying hazards. It can be customized to fit the needs of the program.

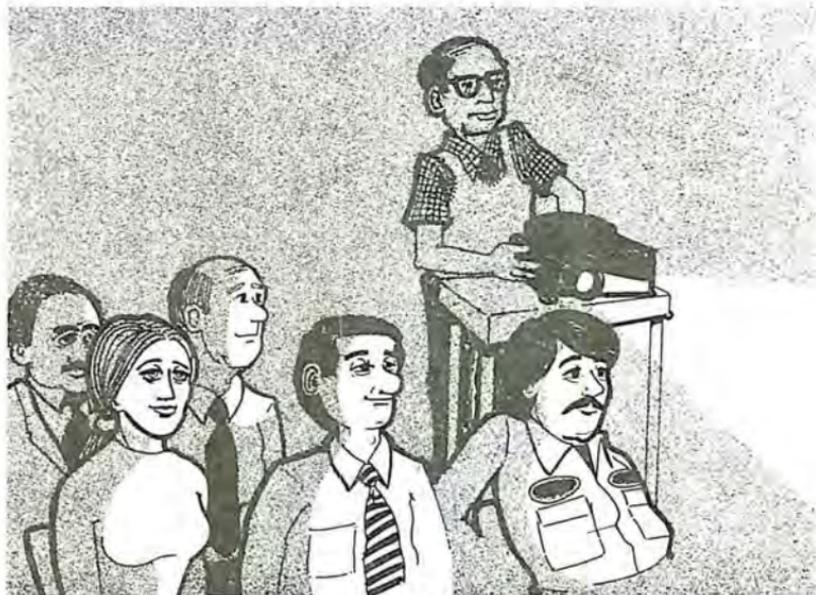
Those situations which tend to occur most frequently or to cause the most severe problems should be given priority for corrective action. This Guide contains many of the requirements and good practices needed to correct the hazards that have been identified.

For more complex problems, such as those requiring engineering controls to reduce noise or airborne contamination, outside consultants may be needed.



## HEALTH AND SAFETY GUIDELINES (cont.)

Management may want to assign responsibilities in the areas of both program development and implementation. Regular meetings or informal discussions can be held to discuss safety promotions, hazards, injury and illness records, etc. To ensure the success and progress of the program, management leadership is necessary. The person assigned responsibility, for instance the foreman, must be delegated the authority and have management support to carry out the part of the program assigned. Likewise, everyone in the establishment should be aware of the activities of the program through a systematic interchange of information. Employees cannot take an interest in the program if they are unaware of what is occurring. Conversely, well informed employees will likely show interest and a desire to participate.



## **HEALTH AND SAFETY GUIDELINES (cont.)**

### **REDUCING UNSAFE ACTS AND PRACTICES**

#### **EMPLOYEE TRAINING**

A safe operation largely depends upon employees who are properly informed and aware of potential hazards. Training needs will vary according to the complexity of the operation. Some suggestions are to:

1. Impress upon the worker the need for constant awareness—even during automatically controlled operations.

2. Be sure all employees know when and how to use appropriate personal protective equipment, if needed.

3. Develop and maintain check points to be observed as a part of the standard and emergency procedures during each shift.

4. Post appropriate warning signs and operating procedures.

5. Instruct employees in the use of portable fire extinguishers. (Refer to fold-out chart in this booklet and post in a conspicuous place.)

6. Have at least one person trained in first aid on each shift.

7. Be sure that employees who are authorized to use motorized equipment are thoroughly instructed in its operation and potential hazards.

8. Develop a "good housekeeping" awareness to reduce accidents and to develop the employees' sense of pride in their surroundings. An individual should be assigned responsibility for clean-up.

9. Instruct employees in safe-lifting practices. Such instructions may prevent many injuries. An easily understood chart, "How to Lift Safely", is included in the back of this book for posting where it may be seen by employees.

**HEALTH AND SAFETY GUIDELINES (cont.)****MACHINE GUARDING**

It is generally recognized that machine guarding is of the utmost importance in protecting the employee. In fact, it could be said that the degree to which machines are guarded in an establishment is a reflection of management's interest in providing a safe workplace.

Personnel cannot always be relied upon to act safely enough around machinery in motion to avoid accidents. From time to time, people will react differently to the same environment because of physical, mental, or emotional changes—sometimes reacting safely, sometimes not. It follows that even the well-coordinated and highly trained individual may at times perform unsafe acts which could lead to injury and death.

## HEALTH AND SAFETY GUIDELINES (cont.)

### OCCUPATIONAL HEALTH AND ENVIRONMENTAL CONTROL

In the occupational environment, persons may be exposed to excessive levels of a variety of harmful materials, including gases, dusts, mists, vapors, fumes, certain liquids and solids, noise, heat, cold, and so forth.

Often health hazards are not recognized because materials used are identified only by trade names; a further complication arises from the fact that materials tend to contain mixtures of substances, making identification still more difficult.

To begin identifying occupational health hazards, a materials analysis (product inventory) is made and all hazardous substances listed and evaluated. If the composition of a material cannot be determined, the information should be requested from the manufacturer or supplier who often will provide **Material Safety Data Sheets** for the product. These Sheets may contain safety information about the material, such as toxicity levels, physical characteristics, and incompatibilities with other substances.

A process analysis is now performed noting all chemicals used and all products and by-products formed. When doing such an analysis, allied activities such as maintenance and service operations should be included. Specifics to watch for are:

1. Welding performed as a maintenance procedure around chlorinated materials may cause the formation of toxic gases in addition to welding fumes.
2. If fork lift trucks with internal combustion engines are used for materials handling, then exhaust gases such as carbon monoxide should be included in the analysis.
3. When certain cleaning agents are mixed sometimes poisonous gases, such as chlorine, are formed.

It should be noted that skin conditions, such as chemical burns, skin rashes, dermatitis, etc., constitute over half of all occupational health problems. The use of protective creams or lotions, proper personal protective clothing and other protective equipment, and the practice of good personal hygiene can often prevent skin problems.

## HEALTH AND SAFETY GUIDELINES (cont.)

Various control methods can be used to prevent or reduce employee exposure to air contaminants. They are as follows:

1. Substitution of less toxic materials for more toxic ones—use of methyl chloroform for carbon tetrachloride.

2. Change of a process—for example, a change from gas-operated fork lift trucks to electric lift trucks.

3. Isolation—placing the hazardous process in a separate room or in a corner of the building to reduce the number of persons exposed.

4. Administrative controls—limiting the total amount of time an individual is exposed to a health hazard and rotating two or more workers each day.

5. Training and education of employees—an employee should be told what hazards he/she is exposed to and the ways to reduce or limit exposure (See "Employee Training").

6. Personal hygiene—personal hygiene cannot be over-emphasized. Persons should wash their hands before eating. If chemicals such as caustics, epoxies, resins, etc., get on the skin, they should be washed off immediately. Employees should not be permitted to eat around toxic chemicals or in contaminated areas. Clothing should be changed and washed daily if it becomes contaminated with toxic chemicals, dusts, fumes, liquids, etc.

7. Personal protective equipment—such items as respirators, hearing protection devices, protective clothing, and protective equipment (See "Personal Protective Equipment").

8. Ventilation—includes either local exhaust ventilation, by which contamination is removed at the point of generation, or general mechanical ventilation (See "Occupational Health and Environmental Control").

**AUTOMATIC SPRINKLER SYSTEMS**

When automatic sprinkler systems are provided, they must meet design requirements of the National Fire Protection Association's Standard for the Installation of Sprinkler Systems NFPA No. 13-1969 as well as OSHA requirements.

1. Every automatic sprinkler system must have at least one automatic water supply of adequate pressure, capacity, and reliability.

2. One or more fire department connections through which the fire department can pump water is required. No shut-off valve is allowed in these connections.

3. The employer is responsible for the condition of the sprinkler system and must keep it in good operating order. At least annual functional tests are required.

4. The clearance between sprinkler deflectors and the top of combustible storage must be at least 36 inches unless the material is in solid piles less than 15 feet high or in piles less than 12 feet high with horizontal channels, in which case a minimum clearance of 18 inches is allowed. Commodities containing only small amounts of combustible material may be stored up to 18 inches from the sprinkler deflectors.

5. Alarm systems, audible to all employees, must be provided on all automatic sprinkler installations.

**GOOD HOUSEKEEPING HELPS PREVENT FIRES**

Maintaining a clean and orderly workplace reduces the danger of fires. Combustible material of any type should be kept only in places which are isolated by fire-resistive construction.

Rubbish should be disposed of regularly. If it is necessary to store combustible waste materials, a covered metal receptacle is suggested.

The materials used for cleaning can create hazards. Combustible sweeping compounds such as oil-treated sawdust can be a fire hazard. Floor coatings containing low-flash-point solvents can be dangerous, especially near sources of ignition. All oily mops and rags must be stored in closed metal containers.

Some common causes of fires in all businesses are:

1. Electrical malfunctions
2. Friction
3. Open flames
4. Sparks
5. Hot surfaces
6. Smoking

Proper maintenance and awareness of these conditions through a safety program can reduce these hazards.

## **HEALTH AND SAFETY GUIDELINES (cont.)**

### **THE INDUSTRY AND ITS HAZARDS**

Safety in grain mill operations depends upon recognition of actual and potential hazards, controlling or eliminating these hazards and training employees to work safely.

Employees in grain mills are subject to hazards common to other industries and some that are peculiar only to grain mill operation and maintenance. Specific guidelines for safe operation and maintenance are as follows:

### **RECEIVING AND DUMPING AT THE TRUCK-HOUSE**

When trucks bring grain, a clear access route to the truck-house with an adequate staging area is necessary. Signs should be posted to guide drivers along the most direct route. Personnel working around driveways, ramps, or dump pits should be aware of traffic control. When applicable, reflective tape on outer clothing of all driveway personnel may be desirable.

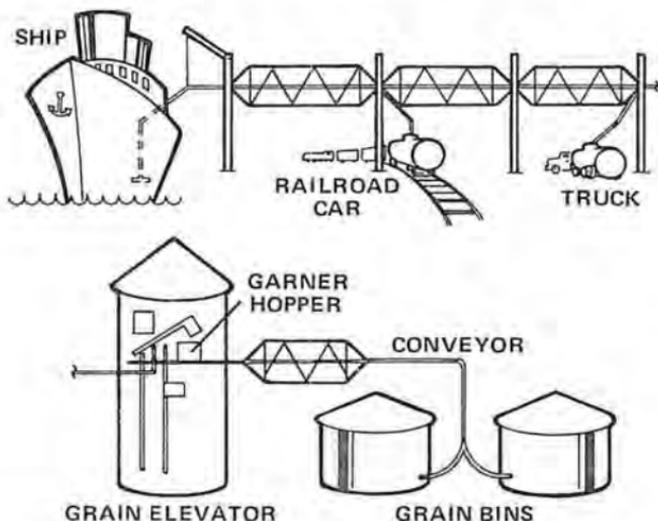
After the rig is staged and chocks are in place, weighing can be accomplished. However, a warning signal should be activated to advise all pit personnel that raising of the hydraulic ramp is about to begin and should remain on during the entire dumping process. This signal calls attention to the open area under the hydraulic lift. A crawl space beneath the supporting structure will provide escape from being crushed to anyone falling into the hydraulic pit.

Dust masks and hard hats should be used by all personnel exposed to the dumping process.

### **ELEVATOR LEG**

Transfer of the product from the dump hopper to the elevator leg must be guarded when the conveyor system is a screw or belt advance (See "Guarding Section"). Some systems are underground or employ pneumatic transfer with no working components exposed to personnel and require guarding only at the pit and delivery gate.

## HEALTH AND SAFETY GUIDELINES (cont.)



Belt or screw type advance creates dust. Therefore, collectors should parallel the length of transfer. Personnel may require dust masks, hard hats and safety glasses for complete protection. Loose clothing can be hazardous around working parts of conveyors, catching and pulling the employee off balance into the system.

Maintenance of grain buckets on belt conveyors is often performed on a temporary platform straddling the elevator shaft. This platform should be substantial enough to perform the most demanding tasks (See "Walking and Working Surfaces Section"). An emergency elevator stop button should be accessible from this level so maintenance personnel can stop the elevator. An emergency conveyor shut-off switch should be provided with means for lock-out to prevent the start of the conveyor while maintenance crews are in a vulnerable position.

Dust explosion and spontaneous combustion of stored grain are ever present dangers. **NO SMOKING** signs must be posted conspicuously and the rule enforced. Non-spark shoes and tools are a preventive measure. Explosion-proof light sockets (with low voltage) and switches should be installed.

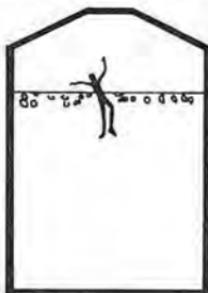
## HEALTH AND SAFETY GUIDELINES (cont.)

Proper fire extinguishers must be available at all levels of operation (See "Section on Fire Protection").

### GRAIN BINS, SILOS, TANKS

The high fatality rate in bins and silos over the years deserves special attention to the properties of grain in storage and maintaining of storage bins.

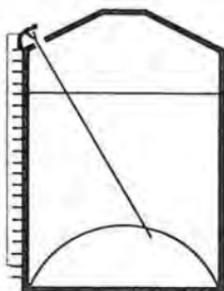
Some grains have the same properties as quicksand. Footing is impossible. A lifeline secured outside the structure and tied around the body just below the armpits or a parachute-type safety belt will insure stability of position, as long as consciousness is maintained.



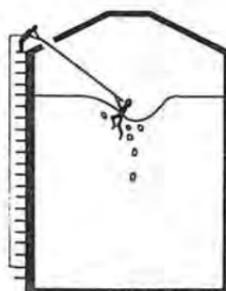
SOME GRAINS ARE LIKE QUICKSAND, FOOTING IS IMPOSSIBLE—SUFFOCATION HAZARD



FLOWING GRAIN CAUSES SUCTION WHEN UNLOADING



USE VIBRATOR OR POLE TO BREAK BRIDGING



USE BUDDY SYSTEM WITH LIFE-LINE IF ENTRY REQUIRED

When grain gates are opened and flow begins, suction can occur pulling a person down. Suffocation can occur within a matter of minutes. A buddy-system is recommended when entry inside a silo is necessary.

A pole or mechanical vibrator should be used to break bridging of grain. Bins with side windows are preferred to reduce the need for going inside.

## HEALTH AND SAFETY GUIDELINES (cont.)

Toxic vapors or gases resulting from recent fumigation, such as phosphine, or oxygen-displacing-gases, such as carbon dioxide, may be present if fermentation has taken place. Composition changes in stored products or rusting of metal walls of the container may, over a period of time, use up oxygen until the oxygen level falls below a safe level. This can occur when the bin is closed for a long period of time with no ventilation.

To prevent harmful exposure, no individual should be permitted to enter any confined space unless another worker supplied with emergency protective equipment is stationed outside to assist the worker and until one of the following conditions have been met:

1. It has been ascertained by air sampling that the atmosphere in the confined space contains an adequate quantity of oxygen and that harmful atmospheric contaminants have been diluted to safe concentrations prior to and during occupancy.

2. The worker is equipped with a supplied-air respirator or self-contained breathing apparatus, a safety harness, a safety line and protective clothing, where necessary (See "Personal Protective Equipment Section").

3. It is ascertained that atmospheric contaminants are known to be asphyxiants and mechanically induced dilution ventilation is utilized before entry and during occupancy to insure an adequate quantity of oxygen in the confined space.

Since overheating can be a problem in bins and tanks products may heat spontaneously and raise air temperatures. Ventilation to remove the heated air is recommended. Personnel working in this condition may suffer heat exhaustion. Drinking plenty of water and being in good physical condition can minimize the risks.

Slide gates, tripper machines, etc., installed to protect openings should be positively locked out when work is to be performed inside a bin. Lock-out will protect workers against stepping into the top opening and prevent material being put in or removed while a worker is in the bin.

## HEALTH AND SAFETY GUIDELINES (cont.)

When maintenance requires hoisting, the hoisting mechanism should be mounted on a frame that can be placed immediately over the bin or tank opening. Enough headroom should be left between the bottom of the hoist and the opening to permit the worker to put on a safety harness while it is attached to the hoisting equipment and, after coming out of the bin or tank, to get safely onto the floor and away from the opening before removing the harness. The hoisting device should be arranged so that a worker can be lowered into and pulled out of the bin or tank by positive manual or mechanical action. . .never by letting a cable run free from the spool and relying on control by a brake.

A power hoist should be equipped with effective over-travel devices and with provision for manual operation in case of electrical- or air-power failure. The cable should be the "non-spin" type.

## HEALTH AND SAFETY GUIDELINES (cont.)

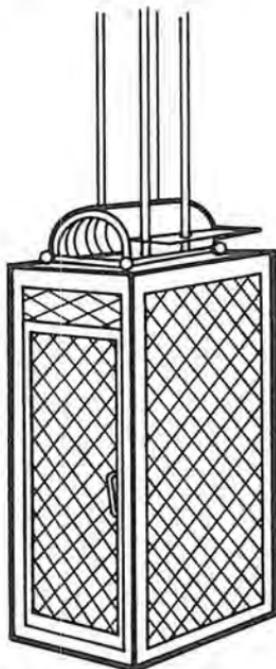
### MANLIFTS

One of the most dangerous ways of transferring personnel from one level to another in grain mills is by a manlift. Should a manlift be in use at your operation, pay close attention to the precautions and safe practices outlined in this booklet, and the regulations OSHA provides to protect personnel subject to the use of, or the maintenance of manlifts (See "Manlifts Section").

### ELEVATORS

Platform elevators serving grain elevators, which require maintenance to be performed at different levels, should be enclosed with a cage. Barricades guarding the shaft must be installed to protect other workers assigned to those areas. Hinged barricades allow access to the elevator and still maintain the safeguard (See "Walking and Working Surfaces").

**NO SMOKING** signs should be posted in the cab or cage because of dust.



ELEVATOR  
CAGE

# NIOSH

## FREQUENTLY VIOLATED REGULATIONS

# WALKING AND WORKING SURFACES



### GENERAL REQUIREMENTS

1. The workplace must be maintained clean, orderly, sanitary, and as far as possible, in a dry condition. Spills should be cleaned up promptly.

2. Areas which are constantly wet should have nonslip surfaces where personnel normally walk or work.

3. Every floor, working place, and passageway must be maintained free from protruding nails, splinters, holes, and loose boards.

4. Where mechanical handling equipment such as lift trucks is used, sufficient safe clearances must be provided for aisles at loading docks, through doorways, and wherever turns or passage must be made. Aisles must not be obstructed.

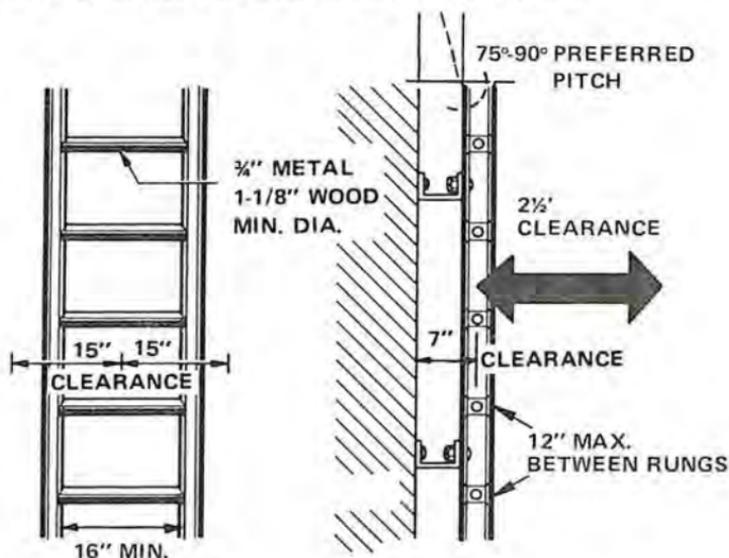
5. All permanent aisles must be easily recognizable. Usually aisles are identified by painting or taping lines on the floor.

6. The floor-load capacity is the maximum weight which can be safely supported by the floor, expressed in pounds per square foot. When this information is not available and when floor-load capacity is in doubt, it is suggested that a competent engineer be consulted. These floor-load capacities must be posted in a readily visible location (except for slab floors with no basements).

## FREQUENTLY VIOLATED REGULATIONS WALKING AND WORKING SURFACES (cont.)

### FIXED LADDERS MUST:

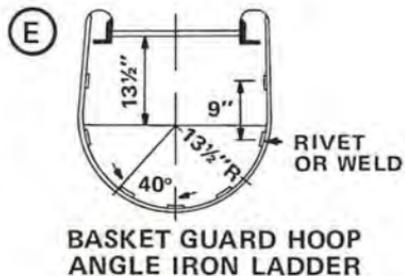
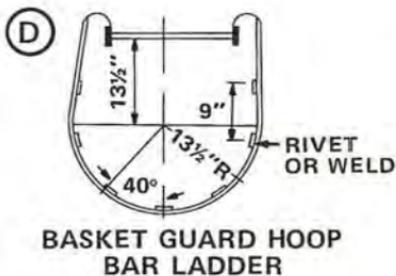
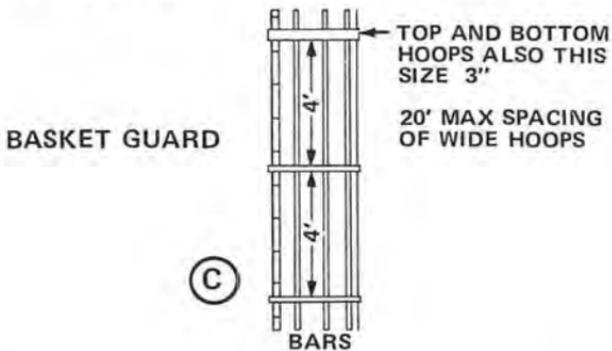
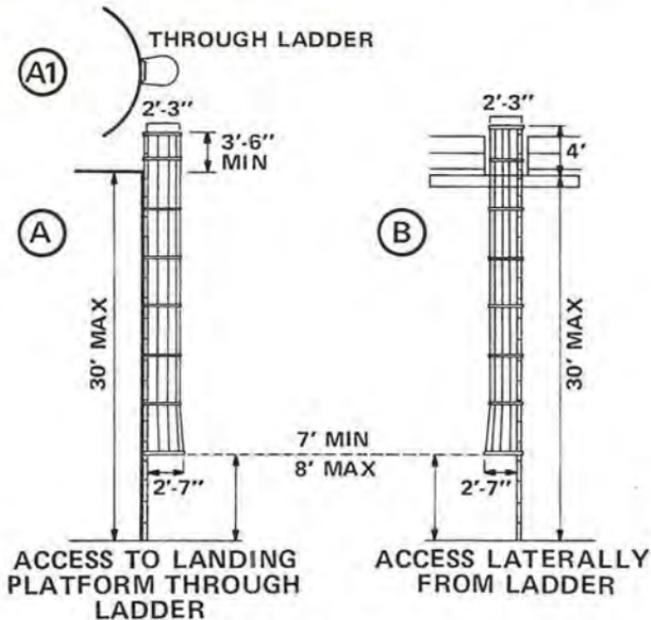
1. Be designed to withstand a single concentrated load of at least 200 pounds.
2. Have rungs with a minimum diameter of  $\frac{3}{4}$  inches for metal ladders, or  $1\frac{1}{8}$  inches for wood ladders.



3. Not have rungs spaced more than 12 inches apart and must be at least 16 inches wide.
4. Be painted (if metal), or otherwise treated to resist deterioration when location demands.
5. Have a preferred pitch of 75°-90° for safe descent.
6. Have 2½ foot clearance for ladders with 90° pitch and 3 feet for 75° pitch on the climbing side of ladder (unless caged).
7. Have at least seven inches clearance in back of the ladder to provide for adequate toe space.
8. Be equipped with cages if they are longer than 20 feet.
9. Have landing platforms if they are more than 30 feet long. A platform every 30 feet for caged ladders and every 20 feet for unprotected ladders is required.
10. Have side rails extend 3½ feet above landings.
11. Have a clear width of 15 inches on each side of the center line of the ladder (unless with cages or wells).

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## FREQUENTLY VIOLATED REGULATIONS WALKING AND WORKING SURFACES (cont.)



## FREQUENTLY VIOLATED REGULATIONS WALKING AND WORKING SURFACES (cont.)

### PORTABLE LADDERS

1. Must be maintained in good condition at all times.
2. Should be kept coated with a suitable protective material. Wood ladders can be painted if carefully inspected prior to painting, providing the ladder is not for resale.
3. Must be inspected frequently. Those which have developed defects must be tagged, "DANGEROUS—DO NOT USE" and be removed from service for repair or destruction.
4. If wooden, should be stored where they will not be exposed to the elements, and where there is good ventilation.
5. Metal ladders should not be used near energized electrical equipment.
6. Must be so placed that the side rails have a secure footing. They may not be placed on boxes, barrels or other unstable bases to obtain additional height. Nonslip bases should be used.

### FIXED INDUSTRIAL STAIRS

1. Rise height and tread width must be uniform throughout any flight of stairs.
2. All treads must be reasonably slip resistant.
3. Vertical clearance above any stair tread to any overhead obstruction must be at least seven feet, measured from the leading edge of the tread.



4. The minimum permissible width is 22 inches (if a means of exit access, at least 28 inches).

## FREQUENTLY VIOLATED REGULATIONS WALKING AND WORKING SURFACES (cont.)

5. The angle to the horizontal made by the stairs must be between  $30^\circ$  and  $50^\circ$ .

6. All stairs should be adequately lighted.

7. If the tread is less than nine inches wide, the risers should be open.

8. If the flight of stairs has four or more risers:

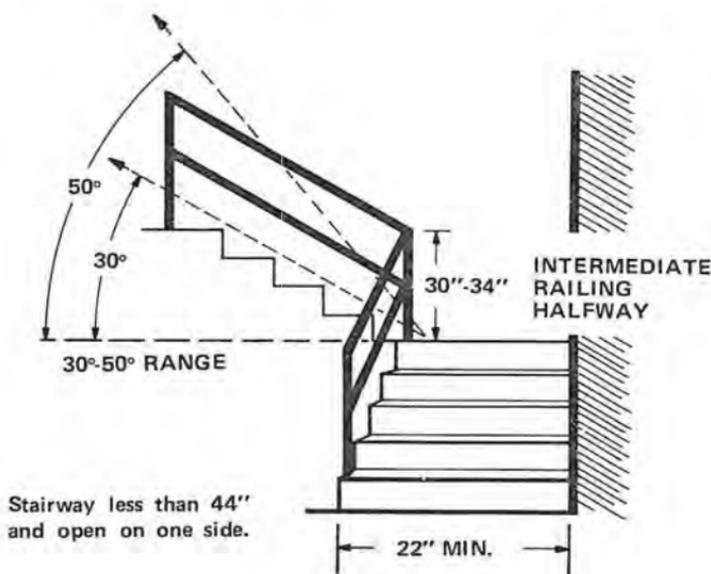
a. a stair railing on each open side is required.

b. a hand rail on each enclosed side is required if greater than 44 inches wide.

c. and both sides are enclosed on a stairway less than 44 inches wide, at least one handrail is required, preferably on the right side descending.

d. and if the stairway is 88 or more inches wide, an intermediate stair railing located midway is required.

9. The vertical height of the railing must be 30 to 34 inches and of construction similar to the standard railing described later in this section.



### **WALKING AND WORKING SURFACES (cont.)**

#### **THE STANDARD RAILING AND TOEBOARD**

A standard railing consists of a top rail, intermediate rail, and posts. The distance from the upper surface of the top rail to the floor, platform runway or ramp must be 42 inches. The intermediate rail must be approximately halfway between the top rail and the floor.

A standard railing can be of any configuration and construction that meets the basic dimension requirements (42 inches high with midrail) and can withstand 200 pounds applied in any direction at any point on the top rail. For wood railings, the rails and posts must be of at least 2" x 4" stock with posts spaced not more than six feet.

For pipe railings, rails and posts must be at least 1½-inch outside diameter pipe with posts spaced not more than eight feet.

For structural steel railings, posts and rails must be of 2 x 2 x 3/8-inch angles or other metal shapes of equivalent strength with posts spaced not more than 8 feet apart.

The standard toeboard must be approximately four inches in height from the floor to its top edge, with no more than a quarter inch gap between the toeboard and the floor. It may be constructed of any substantial material either solid or perforated, as long as the openings are smaller than one inch.

#### **WHERE A STANDARD RAILING IS REQUIRED**

1. Every open-sided floor or platform four feet or more above the adjacent floor or ground level must be railed on all open sides except where there is entrance to a ramp, stairway or fixed ladder.

2. Every stairway floor opening must be guarded on all exposed sides except the entrance to the stairway.

3. Every ladderway floor opening must be guarded by a standard railing and toeboard on all sides, with passage through the railing so constructed as to prevent a person from walking directly into the opening.

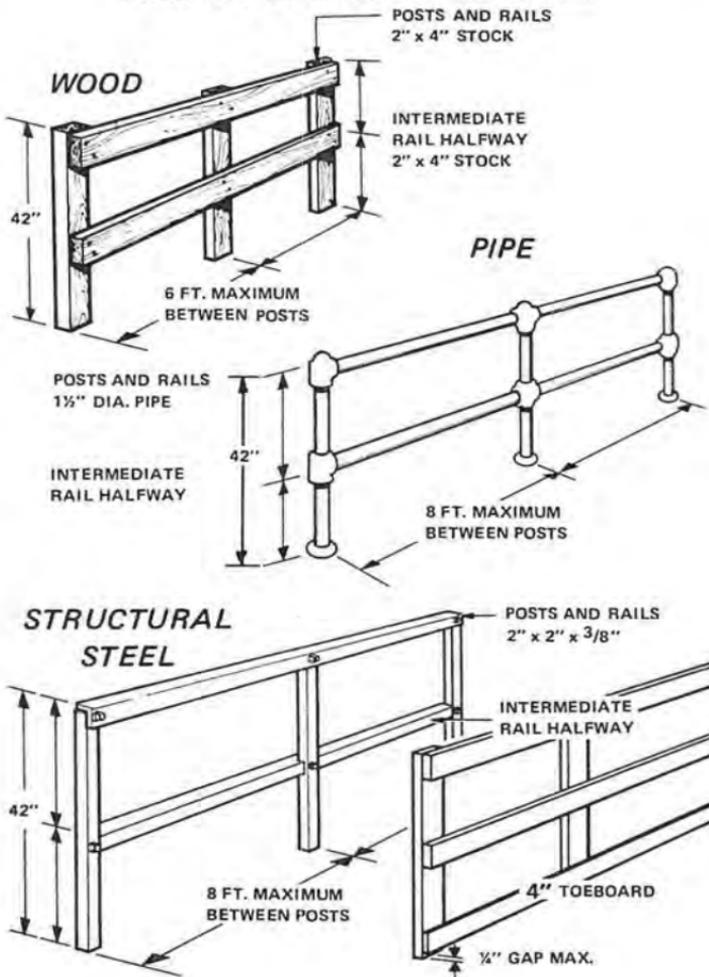
4. Every runway or catwalk must have railings on all open sides four feet or more above ground or floor level.

# **NIOSH**

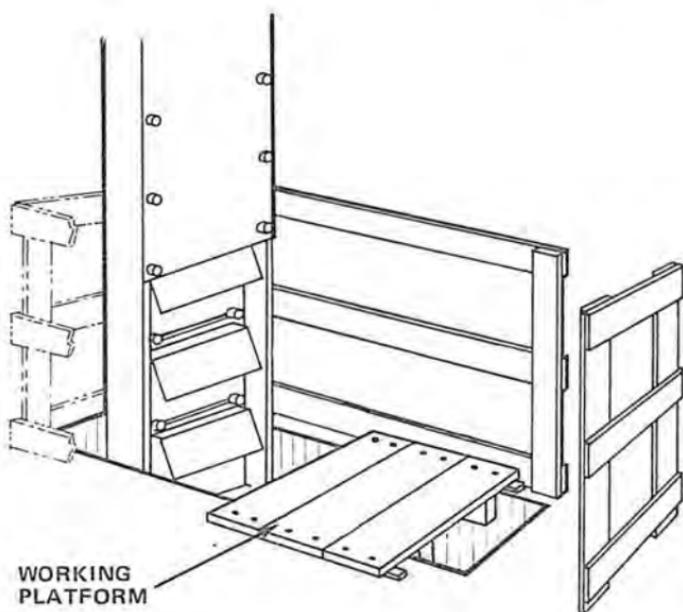
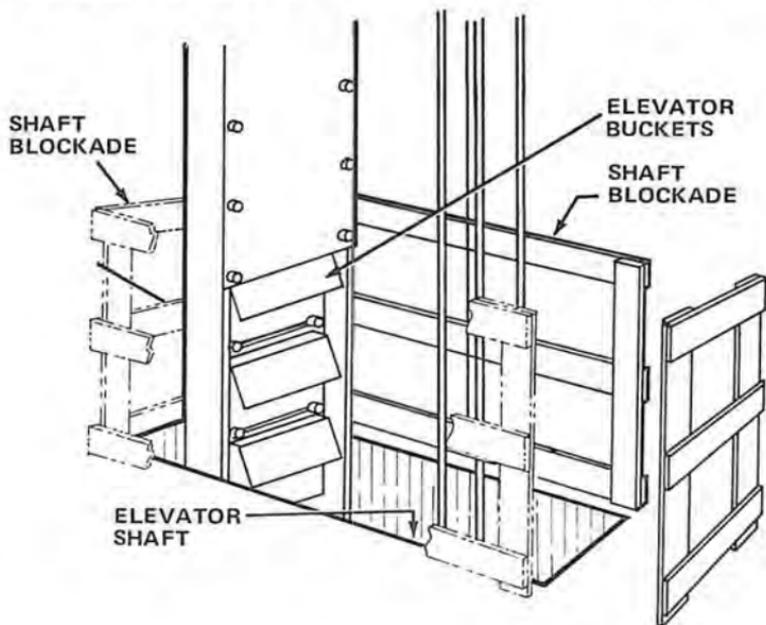
## **FREQUENTLY VIOLATED REGULATIONS WALKING AND WORKING SURFACES (cont.)**

As a general condition: A standard toeboard and railing are required wherever people walk beneath the open sides of a platform or under similar structures or where things could fall from the structure (for example, into machinery below).

### **STANDARD RAILINGS AND TOEBOARDS**



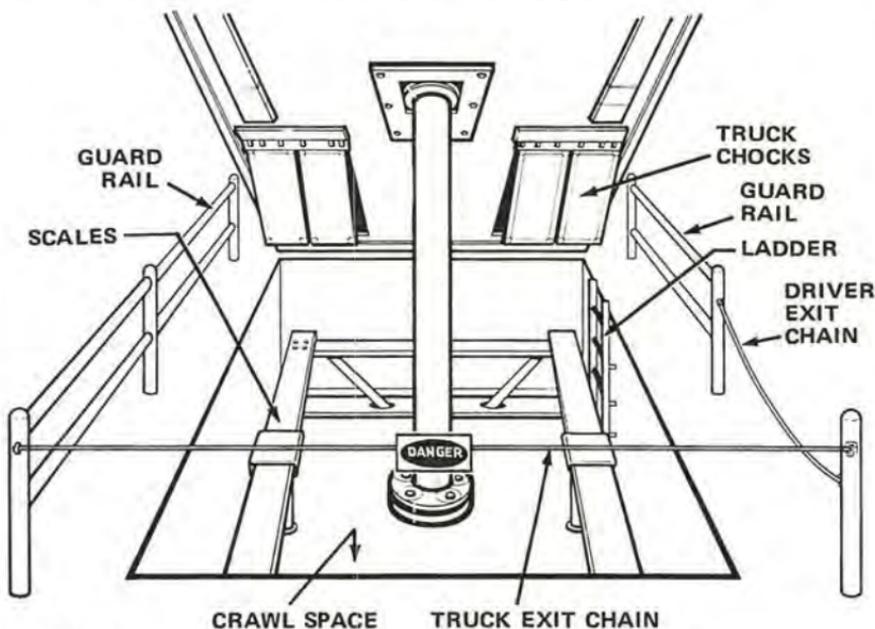
## FREQUENTLY VIOLATED REGULATIONS WALKING AND WORKING SURFACES (cont.)



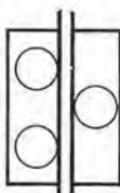
# NIOSH

## FREQUENTLY VIOLATED REGULATIONS WALKING AND WORKING SURFACES (cont.)

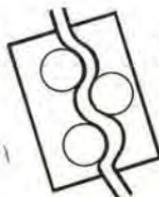
Railings should protect both sides of the grain dump pit, with enough clearance for drivers to climb in and out of the cab from either side in case of emergency.



All fixed ladders, longer than 20 feet, must have cages or safety devices to protect climber.



NORMAL  
ASCEND  
DESCEND



LOCK-IN  
DURING  
FALL

## FREQUENTLY VIOLATED REGULATIONS EXITS AND EXIT MARKING

### EXITS AND EXIT MARKINGS

1. Every exit must have the word "EXIT" in plain legible letters not less than 6 inches high with the strokes of the letters not less than  $\frac{3}{4}$  inches wide.

2. Doors, passageways, or stairways which are neither exits nor ways to an exit, but may be mistaken for an exit, must be clearly marked "NOT AN EXIT" or must be marked by a sign indicating their actual use e.g., "STORAGE ROOM", "TO BASEMENT", etc.



3. When the direction to the nearest exit may not be apparent to an occupant, an exit sign with an arrow indicating direction must be used.

4. Exit access must be arranged so that it is unnecessary to travel toward any area of high hazard potential in order to reach the nearest exit (unless the path of travel is effectively shielded by suitable partitions or other physical barriers).

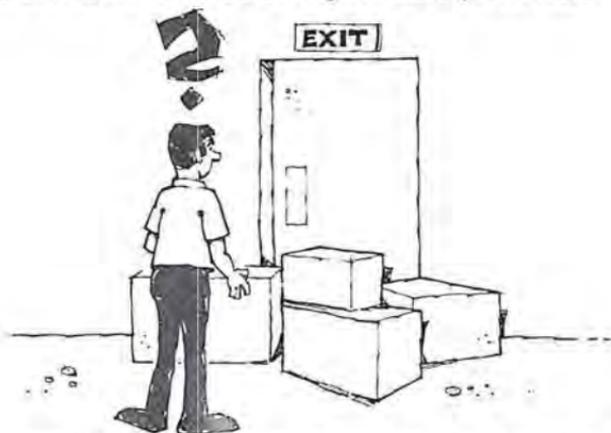
5. Nothing may impair the visibility of the exit sign, such as decorations, furnishings, or other signs.

## FREQUENTLY VIOLATED REGULATIONS EXITS AND EXIT MARKING (cont)



6. A door from a room to an exit or to a way of exit access must be of the side-hinged swinging type. It must swing out in the direction of travel if:

- a. 50 or more persons occupy a room or
- b. the exit is for an area of high hazard potential.



7. Areas around exit doors and passageways leading to and from the exit must be free of obstructions. The exit route must lead to a public way.

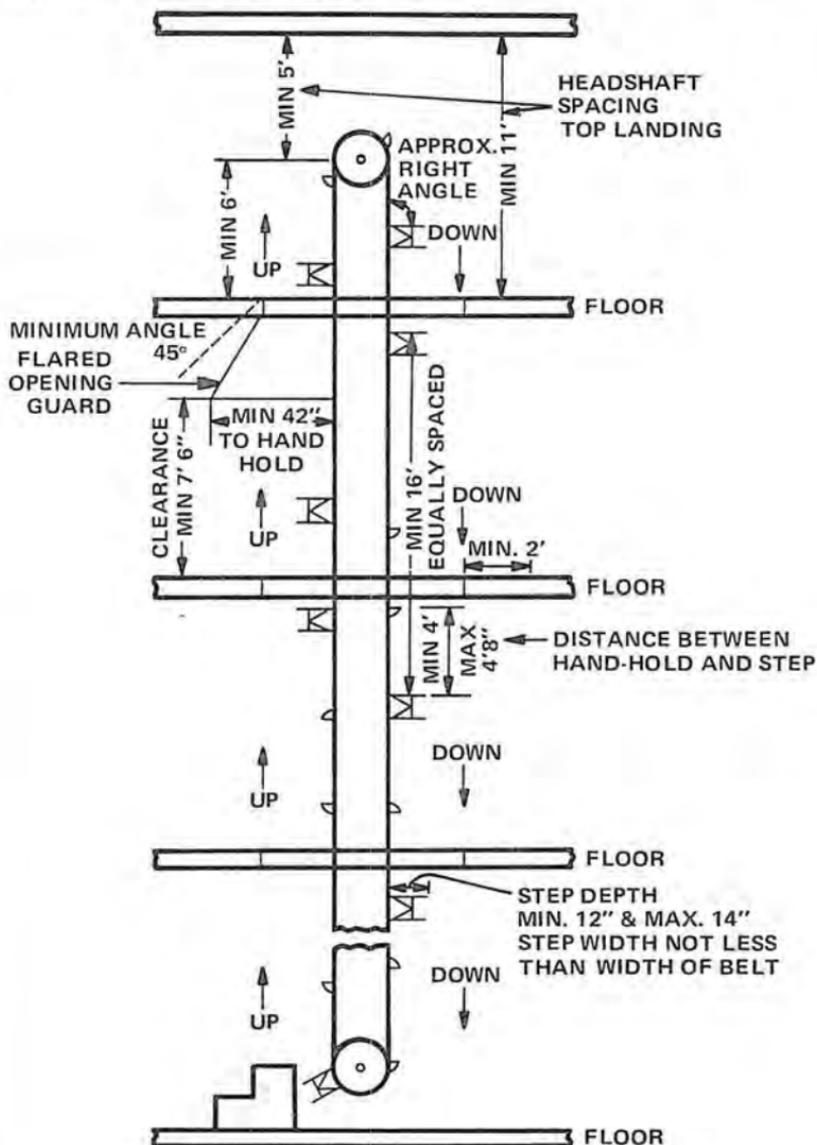
8. If occupancy is permitted at night, or if normal lighting levels are reduced at times during working hours, exit signs must be suitably illuminated by a reliable light source.

9. No lock or fastening may be used to prevent escape from inside the building.

10. Where occupants may be endangered by the blocking of any single exit due to fire or smoke, there must be at least two means of exit remote from each other.

### MANLIFTS

The following items including those contained in the illustrations are required for manlifts:



**MANLIFTS (cont.)**

1. The floor opening at each landing must be guarded on sides not used for entrance or exit by a wall, a railing and toeboard or by panels of strong wire mesh with the underside provided with a level guard or cone of suitable strength.

2. Emergency landings must be provided for every 25 feet or less of manlift travel where there is travel of 50 feet or more between floor landings. Emergency landings must be accessible from both the "up" and "down" rungs of the manlift, give access to the fixed emergency exit ladder, and be completely enclosed with a standard railing and toeboard.

3. Entrances and exits at all floor landings affording access to the manlift must be guarded by a maze (staggered railing) or a handrail equipped with self-closing gates.

4. The clear area at the bottom landing must not be smaller than the area enclosed by the guardrails on the floor above, and any wall in front of the down-running side of the belt must not be less than 48 inches from the face of the belt. Stairs or ladders must not occupy this space.

5. A fixed metal ladder accessible from both the "up" and "down" run of the manlift must be provided for the entire travel of the manlift.

6. Both runs of the manlift must be illuminated at all times when the lift is in operation to an intensity of one foot-candle at all points with at least five foot candles at each landing. Lighting of manlift runways must be by means of circuits (no switches) or be controlled by switches at each landing by which any switch will turn on all lights necessary to illuminate the entire runway.

7. The entire manlift and its driving mechanism must be protected from the weather at all times.

8. Brakes provided for stopping and holding a manlift must be inherently self engaging, electrically released, applied to the motor shaft or input shaft, and capable of stopping and holding 250 pounds on each step.

9. Belts must be hand woven canvas, leather, or other material strong enough to meet the above brake requirements. A belt that has become torn must not be spliced nor put back in service.

## FREQUENTLY VIOLATED REGULATIONS MANLIFTS (cont.)

10. The upper or working surfaces of the step must be of a material having non-slip characteristics.

11. An emergency stop-means must be provided by two separate automatic stop-devices to cut off the power and apply the brake when a loaded step passes the upper terminal landing.

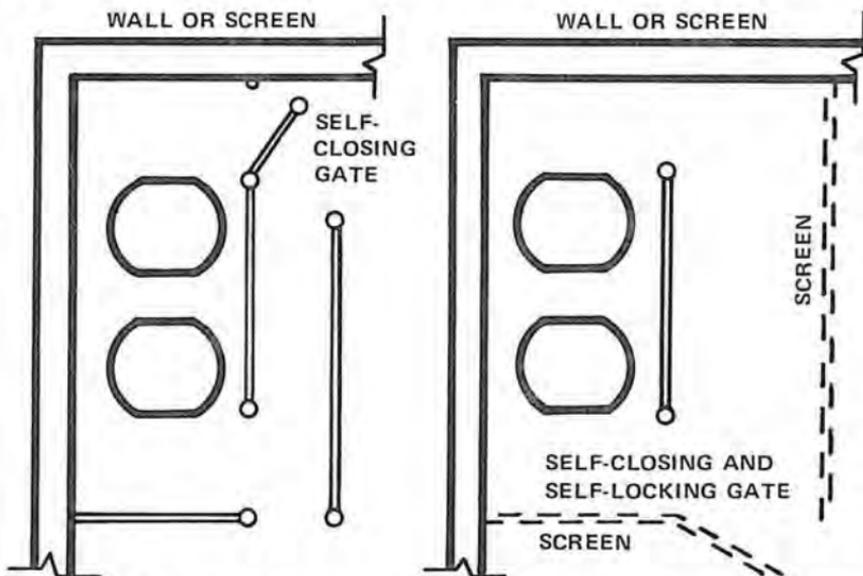
12. Signs giving instructions for the use of the manlift must be posted at each landing or stenciled on the belt.

At the top floor, an illuminated sign must be displayed with the following wording: "Top Floor—Get Off". A red warning light positioned to shine in the passenger's face must be provided immediately below the upper landing terminal.

A conspicuous sign stating "Authorized Personnel Only" must be displayed at each landing.

13. No freight, packaged goods, lumber, pipe or construction materials of any kind may be handled on any manlift.

14. All manlifts must be inspected at least every 30 days and a record made of the findings.



Guardrails (left) and screen enclosures (right) for manlift floor openings.

**OCCUPATIONAL HEALTH  
AND ENVIRONMENTAL CONTROL****AIR CONTAMINANTS**

An employee's exposure to grain dust must not exceed the 8-hour time weighted average limit of 5 milligrams of respirable dust in one cubic meter of air or 15 milligrams of total dust in one cubic meter of air in any 8-hour work shift of a 40-hour work week. Good housekeeping will help reduce the dust problem by reducing the potential for resuspension. However, a technique should be used that will not itself create a dust problem (e.g., vacuuming). Increased ventilation in specific areas would improve the situation.

There are a number of inexpensive dust respirators on the market which would reduce the exposure problem to employees.

Another important group of air contaminants which may be present in grain mill operations is the grain fumigants used to kill pests that infest grain in trucks, rail cars, and elevators. Some of these fumigant compounds and the major health effects are as follows:

1. Methyl bromide is a colorless, transparent liquid or gas, with chloroform-like odor. It is a central nervous system depressant and is toxic to the liver.

2. Carbon tetrachloride is a colorless liquid with a heavy ethereal odor. It has a narcotic action and may produce unconsciousness in employees exposed to high concentrations.

3. Ethylene dichloride is a colorless liquid with a sweetish odor. It is a central nervous system depressant and produces injury to the lungs, liver, and kidneys from high concentrations.

4. Phosphine is a colorless gas released from moist phosphide fumigants. It is odorless at safe concentrations but has an odor similar to decayed fish at high concentrations. Chronic poisoning may produce intestinal upset, jaundice, and loss of appetite.

Employee exposure to air contaminants must be controlled as completely as possible by limiting the time of exposure or instituting engineering controls. If these controls fail to produce complete results, personal protective equipment or other protective measures must be utilized to control employee exposures.

**FREQUENTLY VIOLATED REGULATIONS  
OCCUPATIONAL HEALTH  
AND ENVIRONMENTAL CONTROL (Cont.)****OCCUPATIONAL NOISE EXPOSURE**

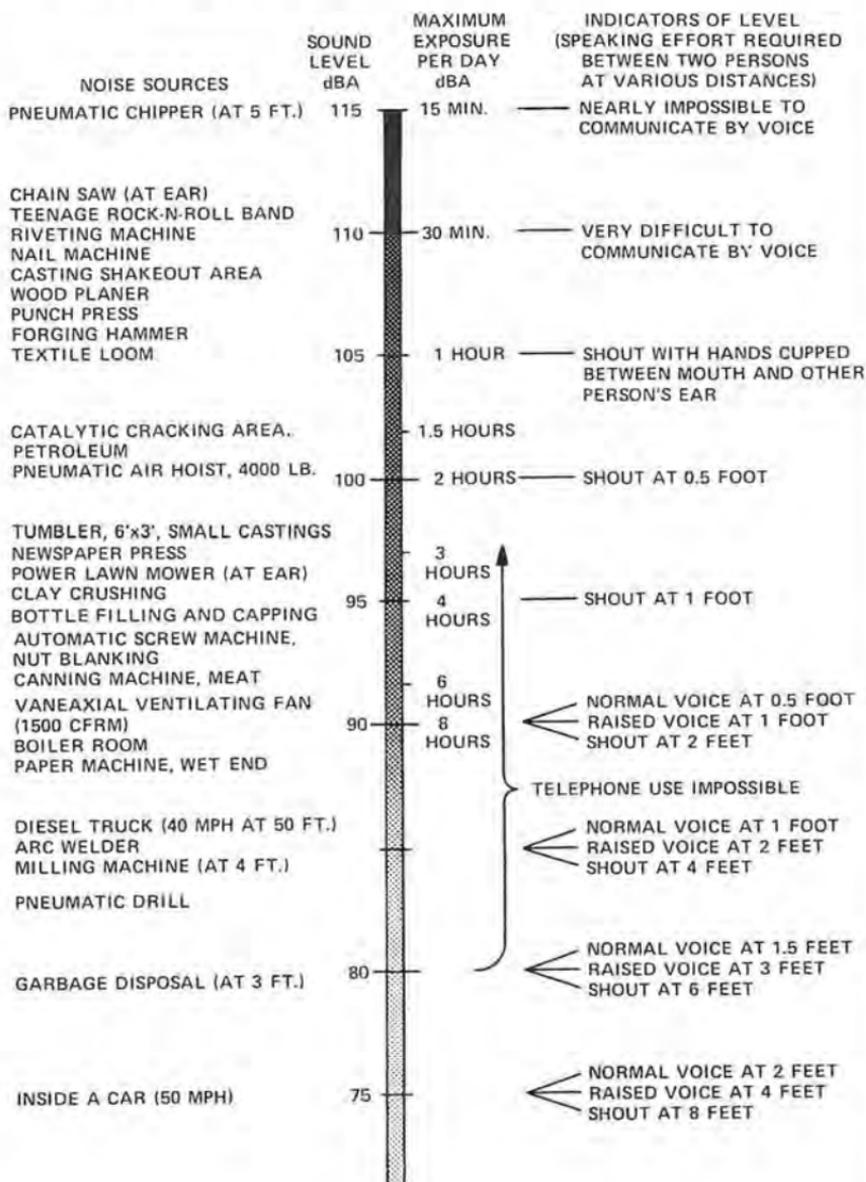
Excessive noise is one of the most commonly violated standards and can cause permanent hearing damage. To protect employees it is management's responsibility to make sure they are not exposed to noise levels in excess of the standards. The current standard is 90 decibels A-weighted (dBA) for an 8-hour exposure. Even at this noise level, hearing damage can be expected in some individuals. It may soon be a requirement, and it is considered good practice, to have hearing checked (audiometric testing) on an annual basis, for all employees exposed to 85-90 dBA noise levels for 8 hours daily. If no hearing loss is observed, ear protection is not required.

At greater than 90 dBA exposures (8 hours per day) or for higher noise levels in excess of the allowable time (e.g. 100 dBA for more than 2 hours) a continuing, effective hearing conservation program must be administered. Reference to the following table gives estimates of noise levels and the maximum allowable exposure times. It is required that either engineering controls such as enclosing noisy equipment, or administrative controls, such as limiting time of exposure, be utilized to reduce noise level or the exposure time to comply with the standard. If these control measures are not feasible, then effective personal protective equipment is required. There are many forms and types of ear protection that can be considered from ear muffs to ear plugs. Some are more useful than others, depending on the noise level, the frequency of the noise, and how well they fit the individual. It is necessary to provide protection that is effective and reasonably comfortable to the wearer.

The following table is provided to assist in the evaluation of the noise levels in the workplace. If referral to the table indicates that levels and time of exposure are such that corrective action is needed, it is recommended that professional help be sought to correct the problem. A noise survey by adequately equipped and trained personnel should be made before implementing engineering and administrative controls, and/or setting up a hearing conservation program.

## FREQUENTLY VIOLATED REGULATIONS OCCUPATIONAL HEALTH AND ENVIRONMENTAL CONTROL (cont.)

### PERMISSIBLE NOISE EXPOSURES



### **PERSONAL PROTECTIVE EQUIPMENT**

Personal protective equipment is required whenever substances can do bodily harm through absorption, inhalation, or physical contact. Various processes, environments, chemicals, or mechanical irritants—even radiologic procedures—constitute hazards for which personal protective equipment must be provided. This equipment includes protective devices for the eyes, face, head, and extremities, as well as protective clothing and respiratory devices.

It is required that all personal protective equipment provided and used be maintained in a sanitary and reliable condition.

#### **EYE PROTECTION**

Eye protection is required where there is a possibility of an eye injury from flying particles, chips, grain dust, etc. Employees must wear eye protection when using grinders, power drills, etc.

#### **HEARING PROTECTION**

Appropriate hearing protection (ear plugs or ear muffs) must be available to personnel, and used, where noise levels are in excess of 90 dBA. (See section on "Occupational Health and Environmental Controls".)

#### **HEAD PROTECTION**

Hard hats are required in a situation where workers may be subjected to impact or penetration from falling or flying objects.

#### **FOOT PROTECTION**

Foot protection is required to prevent injury from falling objects. Experience has shown that particularly in receiving and transferring inventory, precautions are needed against falling items.

## **FREQUENTLY VIOLATED REGULATIONS PERSONAL PROTECTIVE EQUIPMENT (cont.)**

### **RESPIRATORY PROTECTION**

NIOSH-approved respirators must be provided by the employer when air is contaminated with harmful dusts, fumes, mists, gases, or vapors. When respirators are used a respirator program must be established and include the following requirements:

1. Respirators designed to protect against the specific hazards to which the worker is exposed must be selected.

2. Written instructions covering selection and use of respirators must be available.

3. Employees must be trained in the use of respirators, their limitation, proper fitting and maintenance.

4. Respirators should be cleaned at the end of each day's use. They are taken apart, washed, dried, and defective parts replaced.

5. Two people never wear the same respirator unless it has been cleaned and disinfected between uses.

6. All straps are tied and adjusted.

7. A good face seal—beards, sideburns, glasses may interfere.

8. Filters are replaced when an employee can smell vapors in the mask, when breathing becomes difficult, or when the respirator has been used for the specified lifetime of the cartridge.

## FREQUENTLY VIOLATED REGULATIONS GENERAL ENVIRONMENTAL CONTROLS

### SANITATION

1. Safe drinking water must be provided in all places of employment. The use of a common drinking cup is forbidden.
2. Receptacles for waste food are to be covered and kept in a clean and sanitary condition.
3. Restrooms are to be kept in a clean and sanitary condition, including covered containers for sanitary napkins.



4. Separate toilet facilities must be provided for each sex. The exception to this is if only one person at a time uses a toilet room and the door can be locked.

### REST ROOMS



## FREQUENTLY VIOLATED REGULATIONS

### GENERAL ENVIRONMENTAL CONTROLS (cont.)

5. One toilet and one lavatory must be provided for approximately every 15 employees.

6. Each lavatory must have hot and cold or tepid running water, hand soap, individual hand towels, or warm air blowers.



7. No employee is allowed to eat or drink in a toilet room or in any area exposed to toxic materials.



8. No food or beverages are to be stored in a toilet room or in an area exposed to toxic materials.

9. Employees working with toxic substances should wash and remove contaminated clothing before eating, drinking, or smoking.

## FREQUENTLY VIOLATED REGULATIONS MEDICAL AND FIRST AID

The employer interested in maintaining production, preventing loss of work time, receiving efficient employee performance, and achieving good morale should adopt ways of preserving employees' health. A good practice is to require replacement medical examinations to insure that prospective employees are physically able to do the specific work. Periodic health evaluations for hazardous jobs and early treatment of any illness or injury should also be encouraged. On matters of health, medical personnel must be readily available by phone or on-site for advice and consultation.

Emergency phone numbers should be posted near telephones (See "Emergency Information Chart" on the back cover). Stretchers and warm blankets should be available for prompt transportation of injured or ill employees to a hospital.



In the absence of an infirmary, clinic, or hospital in near proximity to the workplace (usually interpreted to be within 10 minutes under worse conditions) which is used for treatment of injured or ill employees the following are required:

1. At least one and preferably two employees on each shift must be adequately trained to render first aid. The American Red Cross, the U.S. Bureau of Mines, some insurance carriers, local safety councils and others provide acceptable training.

## FREQUENTLY VIOLATED REGULATIONS MEDICAL AND FIRST AID (cont.)

2. First aid supplies must be readily available and approved by a consulting physician. These supplies should be in sanitary containers with individually sealed packages for material such as gauze, bandages, and dressings that must be sterile. Other items often needed are adhesive tape, triangular bandages (to be used as slings), inflatable plastic splints, scissors and mild soap for cleansing of wounds or cuts.

Suitable facilities for quick drenching or flushing of the eyes and body must be provided within the work area when a person may be exposed to injurious corrosive materials.

**Note:** First aid is immediate, temporary treatment given in the event of accident or illness—before the doctor arrives.

Some states have laws concerning first aid requirements including supplies (kits), training, and instructions on first aid given by the lay person. Trained employees should understand where first aid ends and treatment by a physician begins.

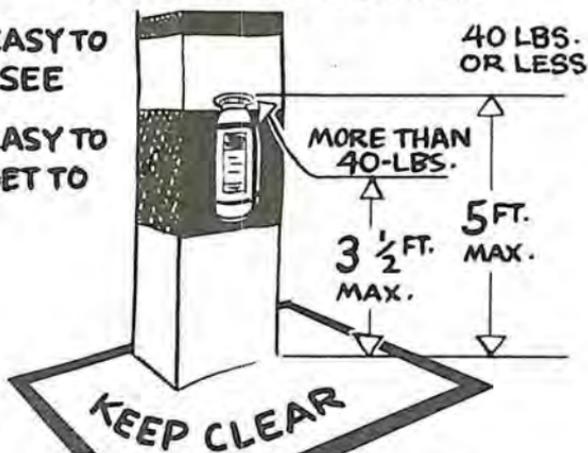
Reference to "Recordkeeping Requirements" toward the back of this Guide gives a discussion of records which must be maintained for occupational injuries and illnesses.



### FIRE PROTECTION

• EASY TO SEE

• EASY TO GET TO



#### PORTABLE FIRE EXTINGUISHERS MUST:

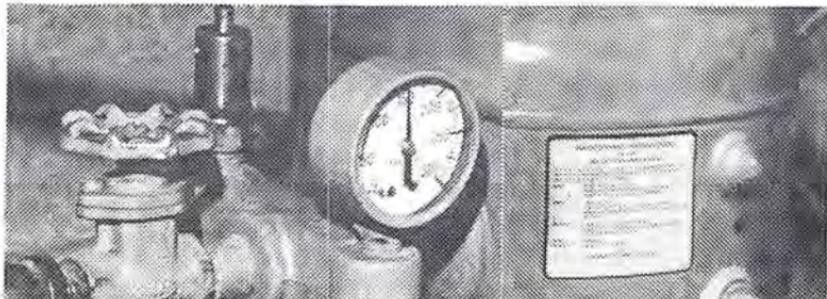
1. Be kept fully charged and in their designated places.
2. Be located along normal paths of travel.
3. Not be obstructed or obscured from view.
4. Not be mounted higher than 5 feet (to the top of the extinguisher) if 40 pounds or less, or 3½ feet if heavier.
5. Be inspected by management or a designated employee at least monthly to insure that they:
  - a. Are in their designated places.
  - b. Have not been tampered with or actuated.
  - c. Do not have corrosion or other impairment.
6. Be inspected at least yearly and/or recharged or repaired to insure operability and safety; a tag must be attached to show the maintenance or recharge date and signature or initials of the person performing the service.
7. Be hydrostatically tested. The extinguisher sales representative usually will perform this service at appropriate intervals.
8. Be selected on the basis of type of hazard, degree of hazard, and area to be protected.
9. Be placed so that the maximum travel distances, unless there are extremely hazardous conditions, do not exceed 75 feet for Class A or 50 feet for Class B.

A chart showing fire extinguishers by class and how to use them, is located in the back of this booklet.

## FREQUENTLY VIOLATED REGULATIONS COMPRESSED AIR EQUIPMENT

Employees should be familiar with the air compressor operating and maintenance instructions.

1. New air tanks must be constructed in accordance with the American Society of Mechanical Engineers (A.S.M.E.) Boiler and Pressure Vessel Code, Section VIII. The A.S.M.E. Code requires this information to be permanently stamped on the air tank.



2. The drain valve on the air tank should be opened frequently to prevent excessive accumulation of liquid.

3. Air tanks must be protected by adequate safety-relief valve(s). These valves must be tested at regular intervals to be sure they are in good operating condition.

4. The pressure controller and gauge must be maintained in good operating condition.

5. There must be no valves between the air tank and safety valve.

**MATERIALS HANDLING AND STORAGE****GENERAL REQUIREMENTS**

If mechanical handling equipment is used, enough space must be available to allow safe clearances. All aisles, loading docks, doorways, and turns must have sufficient space to allow safe operation.

All aisles and passageways must be kept clear and in good repair. Permanent aisles must be marked or easily identified. Caution signs must be posted to warn of clearance limits.

Storage of materials must not create a hazard. Bags, bundles and other containers that are placed in rows one above the other, must be stacked, blocked, interlocked and limited in height so that they can't slide or collapse. Materials that produce hazards from tripping, fire, explosion or provide a hiding place for pests, must not be allowed to accumulate. Proper drainage must be provided so that water cannot accumulate.

Spur railroad tracks must be equipped with either derail or bumper blocks to prevent injury to personnel in the area from rolling railroad cars.

Either covers or guard rails must be provided to protect employees from the hazards of open pits, tanks, vats, ditches, etc.

## FREQUENTLY VIOLATED REGULATIONS MATERIALS HANDLING AND STORAGE (cont.)

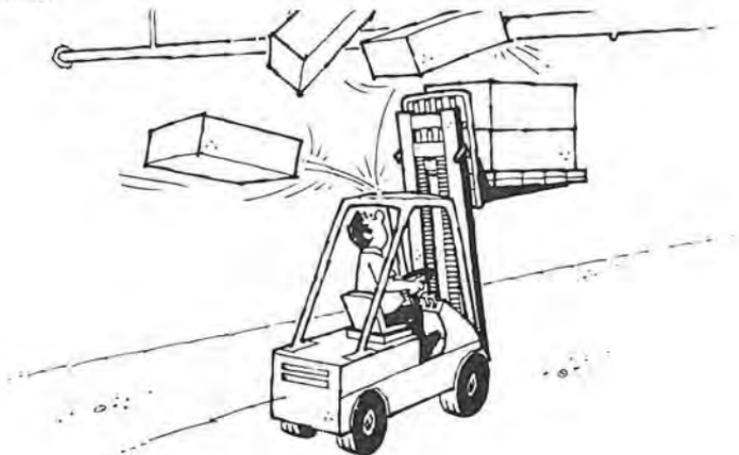
### POWERED INDUSTRIAL TRUCKS

Powered industrial trucks are classified into categories for the purpose of determining what type of truck may be used in a certain location. The type of hazard in a location determines whether diesel, electric, gasoline, or LP-gas powered trucks may be used and what additional safeguards must be present. Suppliers can assist in the proper selection.

Only approved power-operated (electric) industrial trucks designated as EX may be used in atmospheres in which combustible dust is in suspension in quantities sufficient to produce explosive or ignitable mixtures.

The EX classification usually includes the working areas and all dust producing machinery and equipment in grain mills.

1. High-lift-rider trucks must be fitted with an overhead guard.

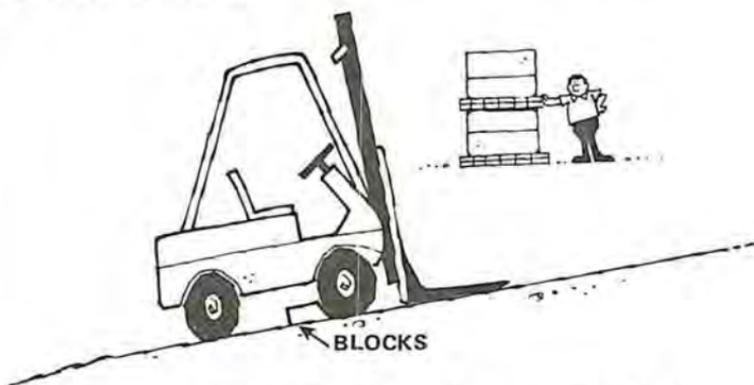


# NIOSH

## FREQUENTLY VIOLATED REGULATIONS MATERIALS HANDLING AND STORAGE (cont.)



2. Methods must be developed and used to effectively train operators in the safe operation of powered industrial trucks, and only trained and authorized operators may operate the truck.



3. When a powered industrial truck is left unattended (operator more than 25 feet from the truck), the forks must be fully lowered, the control lever positioned in neutral, the power shut off and the brakes set. The wheel must be blocked if parked on an incline.

4. Industrial trucks must be examined daily for any conditions adversely affecting the safety of the vehicle before being placed into service. If the truck is used around the clock, it must be inspected after each shift.

# NIOSH

## FREQUENTLY VIOLATED REGULATIONS MATERIALS HANDLING AND STORAGE (cont.)



5. If the load being carried obstructs forward view, the operator is required to travel with the load trailing.

6. When unloading or loading from trucks, trailers, or railroad cars with forklift trucks, provision must be made for securing the truck, trailer or railroad car by setting the brakes and placing wheel chocks under the rear wheels. Portable dock boards must be secured in position with devices which will prevent their slipping during loading and unloading.

7. If battery-operated equipment is used, the battery charging area is to be designated with a "NO SMOKING" sign due to the hydrogen gas emitted during the charging process.

### HOISTS

Although the information provided in this section on hoists pertains specifically to cranes, these requirements should be applied to all hoisting equipment.

1. The rated load must be legibly marked on each side of the hoist. Employees should be made aware of the weight of the load.

2. The hoist must be equipped with a self-setting brake, applied to the motor shaft or some part of the gear train.

3. For powered hoists, holding brakes must be applied automatically when the power is off.

4. Hooks, chains, and all functional operating mechanisms must be inspected daily for the indication of damage and wear, and monthly records maintained.

5. Loads must not be carried over the heads of people.

6. The operator must test the brakes each time a near-capacity load is handled. This test is done by raising the load a few inches and applying the brakes.

7. The hoist rope or chain must be free from kinks or twists and not be wrapped around the load.

# **MACHINERY AND MACHINE GUARDING**

Machines designed for fixed locations must be securely anchored to prevent "walking" or tipping. One or more methods of machine guarding must be provided to protect the operator and other employees in the machine area from hazards such as those created by point of operation, in-running nip points, rotating parts and flying chips and sparks.

Guarding devices must prevent the operator from having any part of the body in the danger zone during the operating cycle. A booklet entitled "The Principles and Techniques of Mechanical Guarding", OSHA 2057, can be obtained by writing to a OSHA Regional Office listed in the back of this book. Many equipment representatives can assist in obtaining the necessary protective devices.

The most common methods of guarding a hazard or hazardous machine operation are:

1. Enclosing the operation (preferred)
2. Interlocking devices
3. Moving barriers
4. Removal devices
5. Remote control
6. Two-hand tripping devices
7. Electronic safety devices

The following pages contain examples of specific equipment that must be guarded. This listing is not intended to include all equipment that may require guarding.

## FREQUENTLY VIOLATED REGULATIONS MACHINERY AND MACHINE GUARDING (cont.)

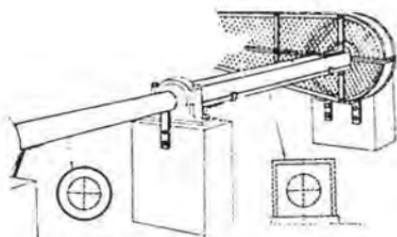
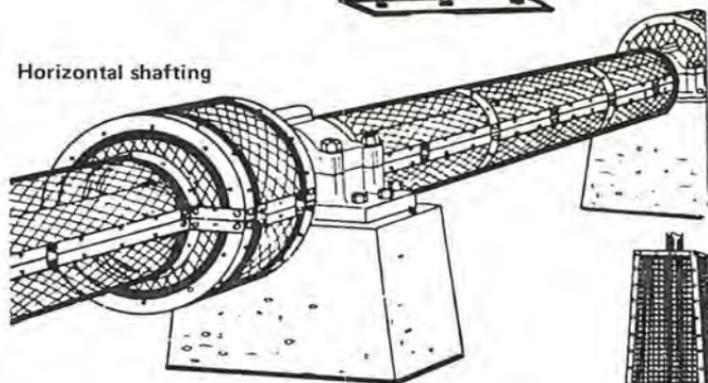
### GUARDING ROTATING MOTION BY ENCLOSURE GUARDS



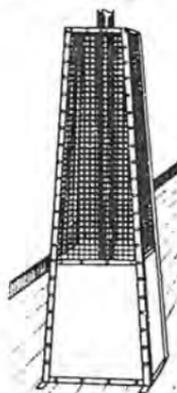
Horizontal shafting



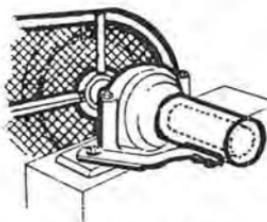
Horizontal shafting



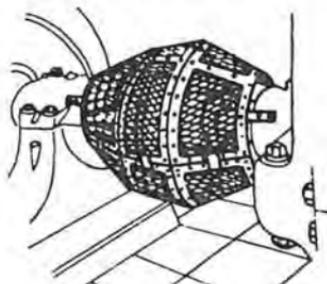
Horizontal shafting and belt and pulley



Vertical shafting



Sleeve for shaft end

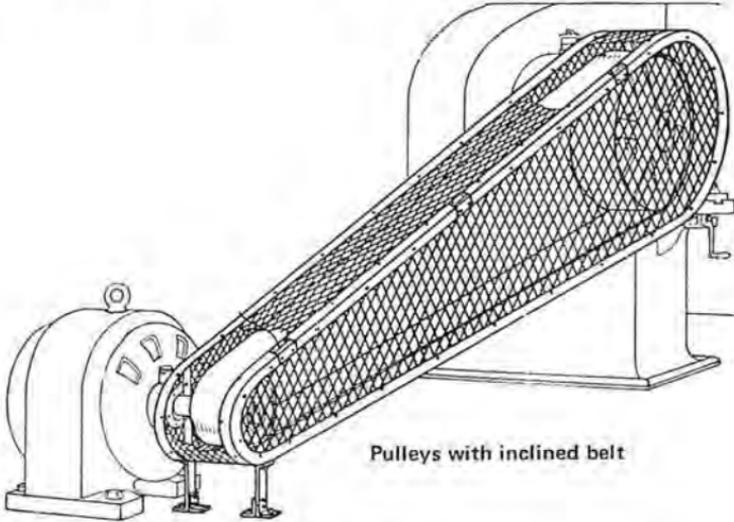


Coupling

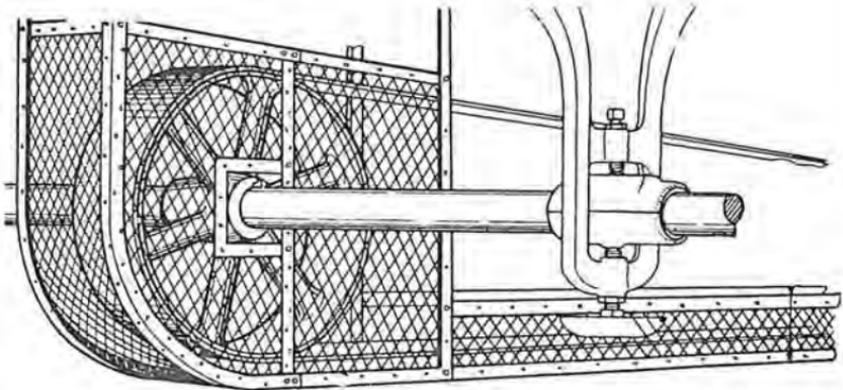
## **FREQUENTLY VIOLATED REGULATIONS**

### **MACHINERY AND MACHINE GUARDING (cont.)**

**GUARDING ROTATING AND TRANSVERSE MOTIONS  
BY ENCLOSURE GUARDS**



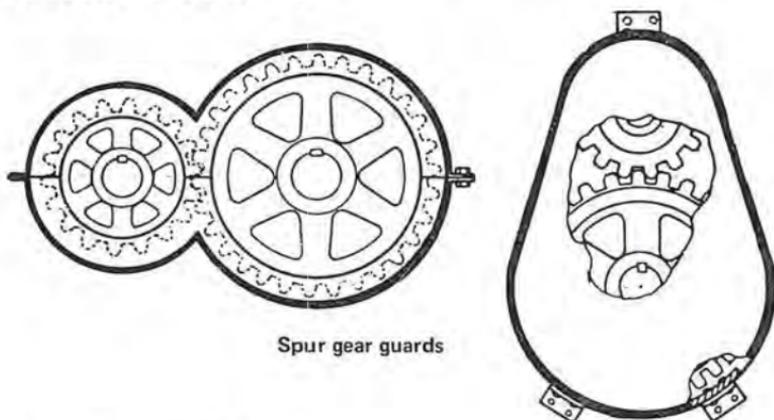
**Pulleys with inclined belt**



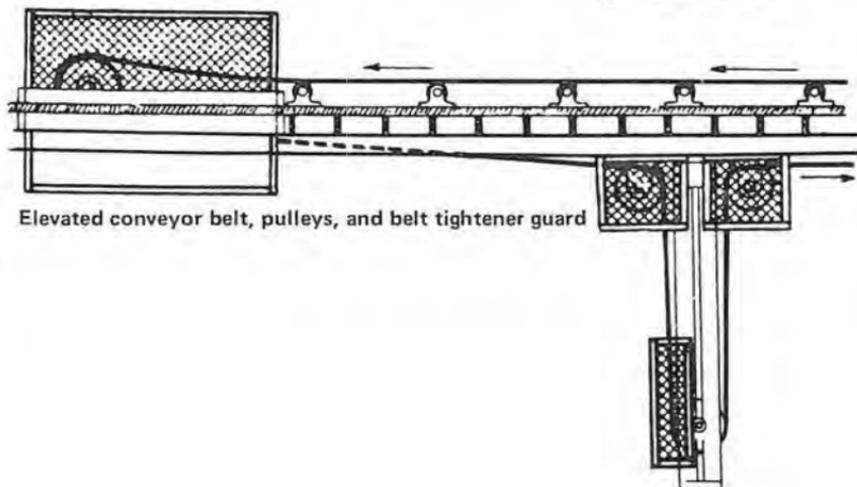
**Overhead horizontal belt and pulley**

## FREQUENTLY VIOLATED REGULATIONS MACHINERY AND MACHINE GUARDING (cont.)

### GUARDING IN-RUNNING NIP POINTS BY ENCLOSURE GUARDS



Spur gear guards



Elevated conveyor belt, pulleys, and belt tightener guard

## FREQUENTLY VIOLATED REGULATIONS MACHINERY AND MACHINE GUARDING (cont.)

### SPECIFIC EXAMPLES FOR MACHINE GUARDING

#### GRINDERS

1. Wheel Guard—Safety guards must cover the spindle end, nut, and flange projections.

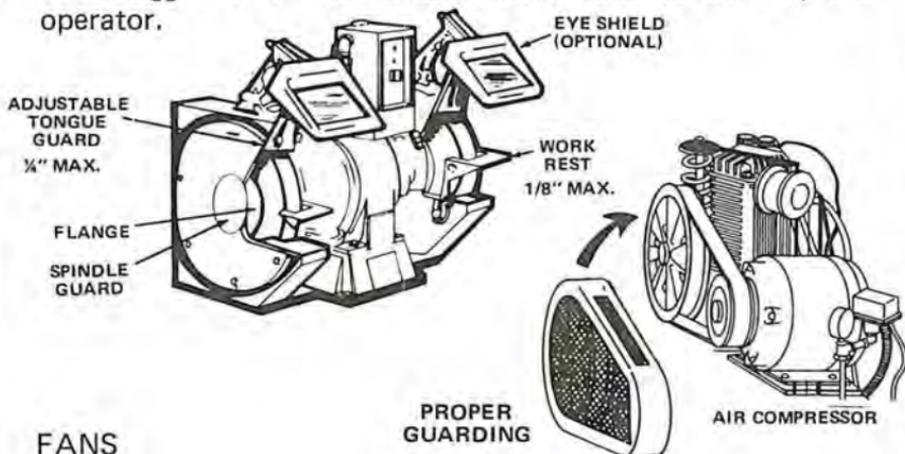
The exposed area of the grinding wheel and sides for the safety guards should not exceed more than one-fourth of the entire wheel.

When measuring the guard opening, the visors or other accessory equipment is not included as a part of the guard unless this accessory equipment is as strong as the guard.

2. Work or Tool Rests—These rests must be of strong construction and designed to be adjustable to compensate for wheel wear. Work rests must be closely adjusted to the wheel, with a maximum clearance of  $1/8$  inch, to prevent the work from becoming jammed between the wheel and the work rest.

3. Exposure Adjustment or Tongue Guards—This safety guard must be constructed so that the tongue guard can be adjusted to the constantly decreasing diameter of the wheel. The distance between the tongue guard and the wheel must never be more than  $1/4$  inch.

4. Goggles or a Face Shield—These must be worn by the operator.



#### FANS

If fans are located within seven feet of the floor, they must be guarded with grille or mesh, limiting openings to not more than  $1/2$  inch.

#### AIR COMPRESSORS

Must have their flywheel and drive pulley fully enclosed.

# HAND AND PORTABLE POWERED TOOLS

The following is a partial list of regulations governing use of hand tools.

1. Each employer is responsible for the safe condition of tools and equipment used by employees, including tools and equipment which may be furnished by employees. Hammers with broken or cracked handles, chisels and punches with mushroomed heads, or bent or broken wrenches should not be used.

2. Most hand-held powered tools must be equipped with a dead-man control so that the power is automatically shut off whenever the operator releases the control.

3. Portable circular saws must be equipped with guards above and below the base plate or shoe. The lower guard must retract when the blade is in use, and automatically return when the tool is withdrawn from the work.

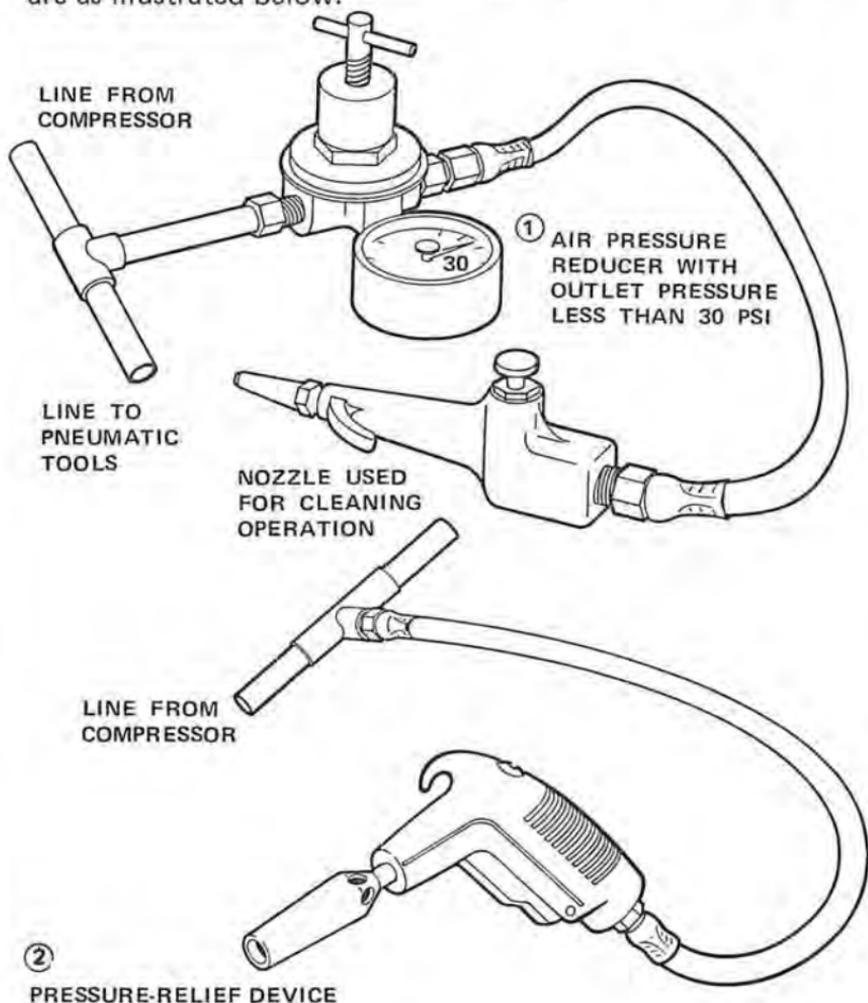
4. All hand-held portable electrical equipment must have its frame grounded by means of a separate ground wire or be doubly insulated and identified as such.



## FREQUENTLY VIOLATED REGULATIONS

### HAND AND PORTABLE POWERED TOOLS (cont.)

*Beware of compressed air, it can be dangerous.* Alternate methods of cleaning surfaces should be sought. Compressed air should never be used to blow debris from a person. Compressed air may be used if no alternate method of cleaning surfaces is acceptable. The downstream pressure of compressed air must remain at a pressure level below 30 psi whenever the nozzle is dead ended and then only when effective chip guarding and personal protective equipment are used. Two acceptable methods of meeting the 30 psi requirement are as illustrated below.



# NIOSH

FREQUENTLY VIOLATED REGULATIONS

## WELDING, CUTTING, AND BRAZING

COMPRESSED GAS



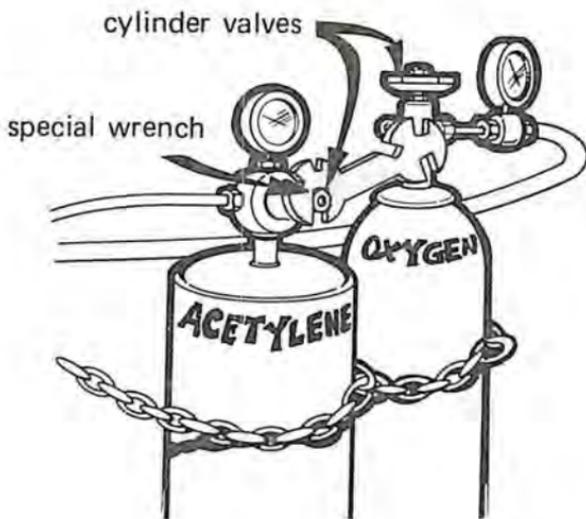
It is required that:

1. All cylinders be kept away from radiators and other sources of heat.
2. All cylinders stored inside buildings are located in a well-protected, well-ventilated, dry location at least 20 feet from highly combustible materials and away from elevators, stairs, or gangways. They are not to be kept in unventilated enclosures such as lockers and cupboards.
3. Valve protection caps are utilized where the cylinder is designed to accept a cap except when cylinders are in use or connected for use.



4. Stored oxygen cylinders are separated from stored fuel gas cylinders or combustible materials (especially oil or grease) by a minimum distance of 20 feet or by a noncombustible barrier at least 5 feet high and having a one-half hour fire resistance rating.

## FREQUENTLY VIOLATED REGULATIONS WELDING, CUTTING, AND BRAZING (cont.)



5. All cylinder valves are closed when work is finished. Where a special wrench is required it must be left in position on the stem of the valve while the cylinder is in use so that the fuel-gas flow can be quickly turned off in case of emergency. In the case of manifolded or coupled cylinders at least one such wrench must always be available for immediate use.

6. All cylinders are legibly marked to identify contents.

7. Cylinders should be stored in assigned locations where they will not be knocked over or damaged. It is good practice to secure them with lashing or chains.

8. Acetylene must not be utilized at a pressure in excess of 15 psi gauge (or 30 psi absolute).

9. Indoor storage of compressed gas is limited to a total capacity of 2,000 cubic feet or 300 pounds of liquefied petroleum gas.

## FREQUENTLY VIOLATED REGULATIONS WELDING, CUTTING, AND BRAZING (cont.)



10. Hoses showing leaks, burns or worn places which render them unfit for service be replaced or repaired.

11. Management must establish areas for cutting and welding based on the fire potentials of the plant, and establish procedures for welding and cutting in other areas.



12. All welders are trained in the safe operation and use of this equipment.

13. Cutting or welding is not permitted in the presence of explosive atmospheres which may develop inside uncleaned or improperly prepared tanks or equipment, or where combustible dusts are present.

14. Periodic inspection of all resistance welding equipment must be made by qualified maintenance personnel, and records maintained.

15. The work area is made safe by removing combustibles or by protecting them from possible ignition.

16. Fire extinguishing equipment is readily available.

17. Hazardous fumes may be produced during these operations; adequate ventilation must always be provided.

18. Personal protective equipment must be worn when the employees are performing these tasks.

## FREQUENTLY VIOLATED REGULATIONS THE NATIONAL ELECTRICAL CODE (NEC)

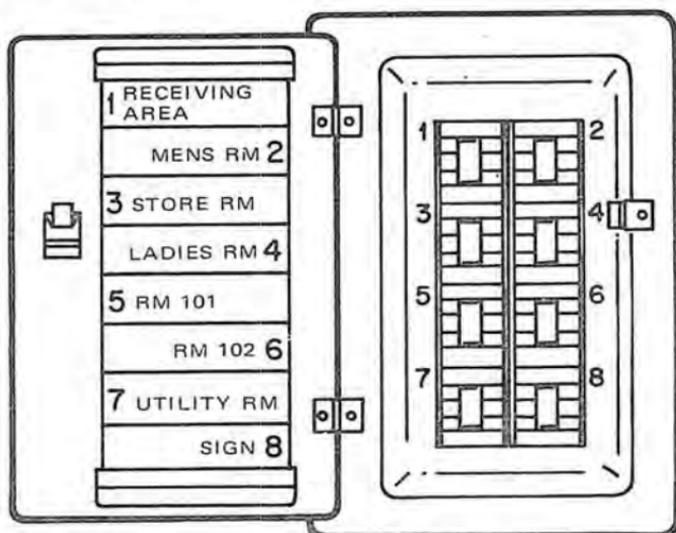
### ELECTRICAL REQUIREMENTS

The National Electrical Code, NFPA 70-1971; ANSI C1-1971 has been adopted as a national consensus standard by OSHA (See "Information Sources"). The purpose of the NEC is the practical safeguarding of any persons and of buildings and their contents from hazards arising from the use of electricity. The code contains basic minimum provisions considered necessary for safety. The electrician should be familiar with these requirements. MORE FIRES ARE CAUSED BY ELECTRICAL MALFUNCTION THAN ANY OTHER CAUSE.

Standards pertaining to electrical equipment and use have been cited as violations more frequently than any others.

It is required that:

1. Each disconnecting means (e.g., circuit breaker or fuse boxes) must be legibly marked to indicate its purpose unless its purpose is evident.



Proper labeling of circuit breakers.

## FREQUENTLY VIOLATED REGULATIONS

### THE NATIONAL ELECTRICAL CODE (NEC) (cont.)

2. Frames of electrical motors, regardless of voltage, must be grounded.

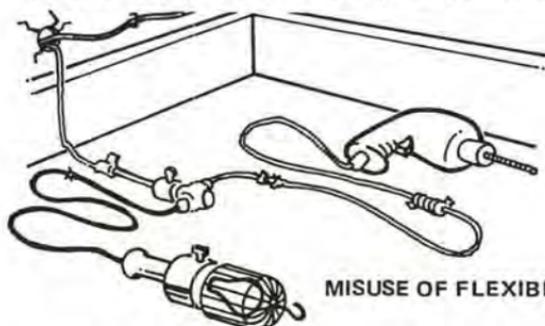
3. Exposed noncurrent-carrying metal parts of fixed equipment that may become energized under abnormal conditions must be grounded under any of the following circumstances:

- In wet or damp locations.
- If in electrical contact with metal.
- If operated in excess of 150 volts to ground.
- When in a hazardous location (See "Hazardous Locations").

4. Exposed noncurrent-carrying metal parts of the following plug-connected equipment which are liable to become energized, must be grounded or double insulated and distinctly marked:

- Portable hand-held motor-operated tools, or
- Appliances, or
- Any equipment operated in excess of 150 volts to ground.

5. Outlets, switches, junction boxes, etc., must be covered.



MISUSE OF FLEXIBLE CORDS

6. Flexible cords may not be:

- Used as a substitute for fixed wiring.
- Run through holes in walls, ceilings, or floors.
- Run through doors, windows, etc.
- Attached to building surfaces.

7. Flexible cords must be:

- Continuous lengths without splices or taps.
- Fastened so that there is no pull on joints or terminal screws.
- Replaced when frayed or insulation has deteriorated.

# **NIOSH**

## **FREQUENTLY VIOLATED REGULATIONS**

### **THE NATIONAL ELECTRICAL CODE (NEC) (cont.)**

#### **ARCING PARTS**

Parts of electrical equipment which in ordinary operation produce arcs, sparks, etc. must be enclosed unless they are separated and isolated from all combustible materials.

#### **HAZARDOUS LOCATIONS**

Combustible dust around grain machinery is Hazardous Classification II. Therefore, it is necessary to enclose electrical apparatus in such a manner to keep grain dust out. Dust inside the apparatus could ignite due to arcs, sparks or heat. Grain dust accumulated outside the enclosure or in mid-air must also be kept from igniting.

**RECORDKEEPING REQUIREMENTS**

Recordkeeping requirements under OSHA compile factual information about accidents that have happened. These records provide employers with a measure for evaluating the success of their health and safety activities and of identifying high risk areas of the business to which attention should be directed. Federal regulations require that employers with 11 or more employees at any time during the calendar year are required to complete OSHA Forms 100, 101 (or their equivalent), and 102. These records must be maintained for five years, excluding the current year. Forms 100 and 101 must be kept current to within 6 days.

The types of work-related injuries and illnesses which must be recorded are those involving fatalities, lost workdays, or those which are nonfatal and do not cause lost workdays for the employee, but do require medical treatment, job transfer or termination, or resulted in loss of consciousness. Employers are also required to report within 48 hours to OSHA any occurrence of a work-related fatal accident, or an accident requiring the hospitalization of five or more employees. An annual summary, Form 102, must be posted for the entire month of February.

Employers are required to maintain accurate records of certain potentially toxic or harmful physical agents which must be monitored or measured, and to promptly advise any employee of any excessive exposure and the corrective action undertaken. Examples are asbestos, ionizing radiation, etc.

For more detailed information, the booklet "Recordkeeping Requirements Under the Williams-Steiger Occupational Safety and Health Act of 1970" is available from OSHA.

# NIOSH

## RECORDKEEPING REQUIREMENTS (Cont.)

# job safety and health protection

The Occupational Safety and Health Act of 1970 provides job safety and health protection for workers through the promotion of safe and healthful working conditions throughout the Nation. Requirements of the Act include the following:

**Employers:** Each employer shall furnish to each of his employees employment and a place of employment free from recognized hazards that are causing or are likely to cause death or serious harm to his employees; and shall comply with occupational safety and health standards issued under the Act.

**Employees:** Each employee shall comply with all occupational safety and health standards, rules, regulations and orders issued under the Act that apply to his own actions and conduct on the job.

The Occupational Safety and Health Administration (OSHA) of the Department of Labor has the primary responsibility for administering the Act. OSHA issues occupational safety and health standards, and its Compliance Safety and Health Officers conduct jobsite inspections to ensure compliance with the Act.

**Inspection:** The Act requires that a representative of the employer and a representative authorized by the employees be given an opportunity to accompany the OSHA inspector for the purpose of aiding the inspection.

Where there is no authorized employee representative, the OSHA Compliance Officer must consult with a reasonable number of employees concerning safety and health conditions in the workplace.

**Complaint:** Employees or their representatives have the right to file a complaint with the nearest OSHA office requesting an inspection if they believe unsafe or unhealthy conditions exist in their workplace. OSHA will respond, on request, names of employees complaining.

The Act provides that employees may not be discharged or discriminated against in any way for filing safety and health complaints or otherwise exercising their rights under the Act.

An employee who believes he has been discriminated against may file a complaint with the nearest OSHA office within 30 days of the alleged discrimination.

**Citation:** If upon inspection OSHA believes an employer has violated the Act, a citation alleging such violations will be issued to the employer. Each citation will specify a time period within which the alleged violation must be corrected.

The OSHA citation must be prominently displayed at or near the place of alleged violation for three days, or until it is corrected, whichever is later, to warn employees of dangers that may exist there.

**Proposed Penalty:** The Act provides for mandatory penalties against employers of up to \$1,000 for each serious violation and for optional penalties of up to \$1,000 for each nonserious violation. Penalties of up to \$1,000 per day may be proposed for failure to correct violations within the proposed time period. Also, any employer who willfully or repeatedly violates the Act may be assessed penalties of up to \$10,000 for each such violation.

Criminal penalties are also provided for in the Act. Any willful violation resulting in death of an employee, upon conviction, is punishable by a fine of not more than \$10,000 or by imprisonment for not more than six months, or by both. Conviction of an employer after a first conviction doubles these maximum penalties.

While providing penalties for violations, the Act also encourages actions by labor and management before an OSHA inspection, to reduce injuries and illnesses arising out of employment.

**More Information:** Additional information and copies of the Act, specific OSHA safety and health standards, and other applicable regulations may be obtained from the nearest OSHA Regional Office in the following locations:

Atlanta, Georgia  
Boston, Massachusetts  
Chicago, Illinois  
Dallas, Texas  
Denver, Colorado  
Kansas City, Missouri  
New York, New York  
Philadelphia, Pennsylvania  
San Francisco, California  
Seattle, Washington

Telephone numbers for these offices, and additional Area Office locations, are listed in the telephone directory under the United States Department of Labor in the United States Government Listing.



Washington, D. C.  
1974  
OSHA 2283

Peter J. Brennan  
Secretary of Labor

**U. S. Department of Labor**  
Occupational Safety and Health Administration

OSHA 2283-107-84

Employers must post one of the full size versions (10x16) of this type of OSHA poster or a state-approved poster where required.

## CHECKLISTS

Since safe conditions depend on vigilance for possible hazards and immediate remedial action, periodic inspections are one of the most important aspects of a successful safety and health program.

Management will find a checklist, such as the one presented on the following pages, helpful in performing a self-inspection of its facility. Because businesses vary, it is best that each business develop a customized list from the information in this booklet and a walk-through inspection.

Using this checklist, the manager, supervisor, or employee representative makes periodic inspections (preferably at least once each month) to identify problem areas so that corrective action may be taken.

Reference made in the "Checklist" subtitles refers to appropriate sections of "general industry standards, Title 29 Code of Federal Regulations Part 1910."



**CHECKLISTS (Cont.)****WALKING AND WORKING SURFACES****AISLES AND FLOOR (29 CFR 1910.22)**

Yes No

Are all places of employment kept clean and orderly? \_\_\_\_\_  Are floors, aisles and passageways kept clean and dry and all spills cleaned up immediately? \_\_\_\_\_  Are floor holes, such as drains, covered? \_\_\_\_\_  Are permanent aisles appropriately marked? \_\_\_\_\_  Are wet surface areas covered with non-slip materials? \_\_\_\_\_  **STORAGE LOFTS, SECOND FLOORS, ETC.  
(29 CFR 1910.22, .23)**Are signs showing floor-load capacity present? \_\_\_\_\_  Are platforms, storage lofts, balconies, etc. that are more than 4 feet above the floor protected with standard guardrails? \_\_\_\_\_  Are all platforms, lofts, and balconies (where people or machinery could be exposed to falling objects) guarded with standard 4-inch toeboards? \_\_\_\_\_  **STAIRS (29 CFR 1910.24)**Are there standard stair rails or handrails on all stairways having 4 or more risers? \_\_\_\_\_

**CHECKLISTS (cont.)**

	Yes	No
Are all stairways at least 22 inches wide? _____	<input type="checkbox"/>	<input type="checkbox"/>
Do stairs have at least a 7-foot overhead clearance? _____	<input type="checkbox"/>	<input type="checkbox"/>
Do stairs angle no more than 50° and no less than 30°? _____	<input type="checkbox"/>	<input type="checkbox"/>
<b>LADDERS (29 CFR 1910.25., .26, .27)</b>		
Have defective ladders (e.g. broken rungs, side rails, etc.) been tagged as "DANGEROUS, DO NOT USE" and removed from service for repair or destruction? _____	<input type="checkbox"/>	<input type="checkbox"/>
Is it prohibited to use the top of an ordinary step ladder as a step? _____	<input type="checkbox"/>	<input type="checkbox"/>
Do fixed ladders have at least 3½ feet of extension at the top of the landing? _____	<input type="checkbox"/>	<input type="checkbox"/>
Is the distance between the centerline of rungs on a fixed ladder and the nearest permanent object in back of the ladder at least 7 inches or more? _____	<input type="checkbox"/>	<input type="checkbox"/>
Do fixed ladders longer than 20 feet have cages? _____	<input type="checkbox"/>	<input type="checkbox"/>
Do fixed ladders longer than 30 feet have landing platforms? _____	<input type="checkbox"/>	<input type="checkbox"/>
Do all fixed ladders have a preferred pitch of 75°-90°? _____	<input type="checkbox"/>	<input type="checkbox"/>

**CHECKLISTS (cont.)**

Yes    No

EGRESS (29 CFR 1910.36-.38)

Are all exits marked with an exit sign and illuminated by a reliable light source?  
\_\_\_\_\_

Is the lettering at least 6 inches high with the principle letter strokes at least  $\frac{3}{4}$  of an inch wide? \_\_\_\_\_

Is the direction to exits, when not immediately apparent, marked with visible signs?  
\_\_\_\_\_

Are doors or other passageways, that are neither exits nor access to an exit, and located where they may be mistaken for exits, appropriately marked "NOT AN EXIT", "TO BASEMENT", "STOREROOM", etc.?  
\_\_\_\_\_

Are exit doors side-hinged?  
\_\_\_\_\_

Are all doors that must be passed through to reach an exit or way to an exit, always free to access with no possibility of a person being locked inside?  
\_\_\_\_\_

Are all exit routes always kept free of obstructions? \_\_\_\_\_

**CHECKLISTS (cont.)****MANLIFTS (29 CFR 1910.68)**

	Yes	No
Are all floor openings guarded? _____	<input type="checkbox"/>	<input type="checkbox"/>
Is the area at the bottom landing kept clear of stairs, ladders, and debris? _____	<input type="checkbox"/>	<input type="checkbox"/>
Is a fixed metal ladder provided for the entire travel of the manlift? _____	<input type="checkbox"/>	<input type="checkbox"/>
Are both runs of the manlift adequately illuminated? _____	<input type="checkbox"/>	<input type="checkbox"/>
Are brakes provided which are capable of stopping and holding 250 pounds on each step? _____	<input type="checkbox"/>	<input type="checkbox"/>
Are signs posted giving instructions for the use of the manlift? _____	<input type="checkbox"/>	<input type="checkbox"/>
Are the manlifts inspected at least every 30 days with a record made of the findings? _____	<input type="checkbox"/>	<input type="checkbox"/>

**CHECKLISTS (Cont.)****OCCUPATIONAL HEALTH AND ENVIRONMENTAL CONTROL (29 CFR 1910.93,.94,.95)**

Yes      No

Is management aware of the hazards caused by various chemicals used in the plant?  
\_\_\_\_\_

Is employee exposure to these chemicals kept within the acceptable levels?  
\_\_\_\_\_

Are eye wash fountains and safety showers provided in areas where chemicals, such as caustics, are used?  
\_\_\_\_\_

Are all containers, such as vats, storage tanks, etc. labeled as to their contents?  
\_\_\_\_\_

Are employees required to wear personal protective equipment (gloves, eye protection, respirators, etc.) when handling hazardous materials? \_\_\_\_\_

If internal combustion engines are used, is carbon monoxide kept within acceptable levels? \_\_\_\_\_

Is employee exposure to welding fumes controlled by ventilation, use of respirators, exposure time or other means?  
\_\_\_\_\_

Is vacuuming used wherever possible rather than blowing or sweeping dust?  
\_\_\_\_\_

Is adequate ventilation provided to minimize exposure to grain dust and fumigants?  
\_\_\_\_\_

Have administrative or engineering controls been established to prevent over-exposure to grain dust and fumigants?  
\_\_\_\_\_

**CHECKLISTS (cont.)****OCCUPATIONAL NOISE EXPOSURE  
(29 CFR 1910.95)**

Yes    No

If a noise problem is suspected, have noise levels been accurately measured?  
\_\_\_\_\_

If a noise problem exists, have plans to reduce noise levels by engineering methods been formulated (e.g. enclosure, maintenance, different methods of processing)?  
\_\_\_\_\_

If engineering controls cannot reduce the noise to safe levels: have administrative controls, such as limiting worker-exposure in a given area, been started?  
\_\_\_\_\_

Are affected employees given annual audiometric tests if necessary?  
\_\_\_\_\_

Do all employees in high-noise areas wear hearing protection?  
\_\_\_\_\_

Are annual noise surveys made to re-evaluate problem areas?  
\_\_\_\_\_

**CHECKLISTS (Cont.)****PERSONAL PROTECTIVE EQUIPMENT  
(29 CFR 1910.132-137)**

Yes      No

Is personal protective equipment provided, used, and maintained wherever it is necessary?  
\_\_\_\_\_

Is employee-owned personal protective equipment, such as gloves, protective shoes, etc., adequate, and properly maintained?  
\_\_\_\_\_

Is eye protection available where debris or flying objects could be a hazard?  
\_\_\_\_\_

Are respirators provided and worn during dusty operations, paint spraying, etc.?  
\_\_\_\_\_

Is the proper respirator in use for the hazards present? (For example, dust masks do not protect against solvent vapors.)  
\_\_\_\_\_

Is hearing protection used when noise exceeds 90 dBA (e.g. when using hammer mills)?  
\_\_\_\_\_

      **RESPIRATORY PROTECTION DEVICES  
(29 CFR 1910.134)**

Are respirators provided when necessary?  
\_\_\_\_\_

Are there written standard operating procedures for the selection and use of respirators?  
\_\_\_\_\_

**CHECKLISTS (Cont.)**

	Yes	No
Is the user instructed and trained in the proper use of respirators? _____	<input type="checkbox"/>	<input type="checkbox"/>
Where practicable, are respirators assigned for use by employees individually? _____	<input type="checkbox"/>	<input type="checkbox"/>
Are respirators cleaned and disinfected after use? _____	<input type="checkbox"/>	<input type="checkbox"/>
Are respirators stored in a convenient, clean, and sanitary location? _____	<input type="checkbox"/>	<input type="checkbox"/>
Are routinely-used respirators inspected during cleaning? _____	<input type="checkbox"/>	<input type="checkbox"/>

**CHECKLISTS (cont.)****GENERAL ENVIRONMENTAL CONTROLS****SANITATION (29 CFR 1910.141-149)**

	Yes	No
Are restrooms and washrooms kept in clean and sanitary condition? _____	<input type="checkbox"/>	<input type="checkbox"/>
Are covered receptacles for sanitary napkins provided in the women's restroom? _____	<input type="checkbox"/>	<input type="checkbox"/>
Are covered receptacles for waste food kept in clean and sanitary condition? _____	<input type="checkbox"/>	<input type="checkbox"/>
Is all water that is provided for drinking, washing and cooking, suitable for drinking? _____	<input type="checkbox"/>	<input type="checkbox"/>
Are all outlets for water that is not suitable for drinking, clearly posted as "UNSAFE FOR DRINKING, WASHING OR COOKING"? _____	<input type="checkbox"/>	<input type="checkbox"/>
Are employees prohibited from eating in areas where toxic materials are present? _____	<input type="checkbox"/>	<input type="checkbox"/>

**CHECKLISTS (cont.)****MEDICAL AND FIRST AID (29 CFR 1910-151)**

Yes      No

Is at least one employee on each shift currently qualified to render first aid in the absence of a nearby clinic or hospital? (Some states require first-aid trained persons regardless of nearby clinics or hospitals.)

---

Are first-aid supplies readily available, inspected and replenished?

---

Are first-aid supplies approved by a consulting physician, indicating that they are adequate?

---

Are medical personnel readily available for advice and consultation on matters of employee health?

---

Is there a first-aid kit easily accessible to the work area?

---

Are emergency phone numbers posted?

---

Where employees may be exposed to injurious corrosive materials, are they provided with quick-drenching and flushing facilities for immediate emergency use?

---

## CHECKLISTS (cont.)

### FIRE PROTECTION

(29 CFR 1910.157, .159, .160)

Are extinguishers selected for the types of combustibles and flammables in the areas where they are to be used?

- Class A. Ordinary combustible material fires
- Class B. Flammable-liquid, or grease fires
- Class C. Energized-electrical-equipment fires

Yes No

Are extinguishers fully charged and in designated places?

Are extinguishers located along normal paths of travel?

Are extinguisher locations free from obstruction or blockage?

Are extinguishers not mounted too high? If not exceeding 40 pounds, the top must not be higher than 5 feet above floor-greater than 40 pounds, the top must not be higher than 3½ feet above floor.

Have all extinguishers been serviced, maintained and tagged at intervals not to exceed 1 year?

Are all extinguishers checked (by management or designated employee) monthly to see if they are in place or if they have been discharged, etc.?

Have all extinguishers been hydrostatically tested according to schedules set for the type of extinguisher?

**CHECKLISTS (cont.)****AUTOMATIC SPRINKLER (if applicable)**

	Yes	No
Is there at least one automatic water supply of adequate pressure, capacity and reliability? _____	<input type="checkbox"/>	<input type="checkbox"/>
Are water-flow alarms provided on all sprinklers? _____	<input type="checkbox"/>	<input type="checkbox"/>
Are the sprinkler systems periodically inspected and continuously maintained? _____	<input type="checkbox"/>	<input type="checkbox"/>
Is the clearance between sprinkler deflectors and the top of storage at least 18''? _____	<input type="checkbox"/>	<input type="checkbox"/>

**DRY CHEMICAL SYSTEMS (if applicable)**

Does a competent inspector make annual inspections and perform tests on all dry chemical systems? _____	<input type="checkbox"/>	<input type="checkbox"/>
Are the inspector's reports kept on file? _____	<input type="checkbox"/>	<input type="checkbox"/>
Are visual inspections regularly made? _____	<input type="checkbox"/>	<input type="checkbox"/>
Are all dry chemical systems continuously maintained? _____	<input type="checkbox"/>	<input type="checkbox"/>
Is combustible material never piled within 36 inches of the sprinkler system for Class I storage? _____	<input type="checkbox"/>	<input type="checkbox"/>
Is combustible material never piled next to lights or within 18 inches of the sprinkler system for Class II and III storage? _____	<input type="checkbox"/>	<input type="checkbox"/>

**CHECKLISTS (cont.)****COMPRESSED AIR (29 CFR 1910.169)**

Yes      No

Are pulleys and belts on compressors and motors completely guarded?  
\_\_\_\_\_

Are flexible cords or plugs on electric motors periodically checked and replaced if in a deteriorated condition?  
\_\_\_\_\_

Do the relief valves operate properly?  
\_\_\_\_\_

Are air tanks drained regularly?  
\_\_\_\_\_

Is the pressure-relief device and gauge in good operating condition?  
\_\_\_\_\_

Is air pressure reduced to less than 30 psi when the nozzle, used for cleaning, is dead ended? \_\_\_\_\_

Have employees been instructed that the use of compressed air to blow debris from clothing or body is prohibited because it can enter the body and cause serious harm?  
\_\_\_\_\_

**CHECKLISTS (Cont.)****MATERIALS HANDLING AND STORAGE  
(29 CFR 1910.176-181)**

	Yes	No
Is there safe clearance for equipment through aisles and doors? _____	<input type="checkbox"/>	<input type="checkbox"/>
Is stored material stable and secure? _____	<input type="checkbox"/>	<input type="checkbox"/>
Are storage areas free from tripping hazards? _____	<input type="checkbox"/>	<input type="checkbox"/>
Are only trained operators allowed to operate powered lift trucks? _____	<input type="checkbox"/>	<input type="checkbox"/>
Are appropriate overhead guards installed on powered lift trucks? _____	<input type="checkbox"/>	<input type="checkbox"/>
Is battery charging on electric units performed only in designated areas? _____	<input type="checkbox"/>	<input type="checkbox"/>
Are "NO SMOKING" signs posted near electric battery charging units? _____	<input type="checkbox"/>	<input type="checkbox"/>
On units using internal combustion engines, do the exhaust gases in the room not exceed allowable limits for carbon monoxide? _____	<input type="checkbox"/>	<input type="checkbox"/>
Are dock boards (bridge plates) used when loading or unloading from dock to truck or dock to rail car? _____	<input type="checkbox"/>	<input type="checkbox"/>

## CHECKLISTS (cont.)

	Yes	No
Are containers of combustibles or flammables, when stacked one upon the other, always separated by dunnage sufficient to provide stability? _____	<input type="checkbox"/>	<input type="checkbox"/>
Are racks and platforms loaded within the limits of their capacity? _____	<input type="checkbox"/>	<input type="checkbox"/>
Is all storage secured against sliding or collapsing? _____	<input type="checkbox"/>	<input type="checkbox"/>
Are all vehicles shut off prior to loading? _____	<input type="checkbox"/>	<input type="checkbox"/>
Have aisles been designated and kept clear to allow unhindered passage? _____	<input type="checkbox"/>	<input type="checkbox"/>
If motorized equipment, such as lift trucks, is used, are aisles permanently marked, providing sufficient clearance for passage of the equipment? _____	<input type="checkbox"/>	<input type="checkbox"/>
Are specifications posted for maximum loads which are approved for floors (except slabs with no basements), roof of a building, or some other structure? _____	<input type="checkbox"/>	<input type="checkbox"/>
Are lift trucks selected and approved for the atmosphere (e.g. grain dust) in which they operate? _____	<input type="checkbox"/>	<input type="checkbox"/>

## CHECKLISTS (cont.)

### MACHINE AND MACHINE GUARDING (29CFR 1910.212)

	Yes	No
Are belts, pulleys, and rotating shafts (air compressor, drill presses, etc.) properly guarded? _____	<input type="checkbox"/>	<input type="checkbox"/>
Are chains, sprockets and gears properly guarded? _____	<input type="checkbox"/>	<input type="checkbox"/>
Are all in-going nip points properly guarded? _____	<input type="checkbox"/>	<input type="checkbox"/>
Are rotating shafts that are not smooth properly guarded? _____	<input type="checkbox"/>	<input type="checkbox"/>
Are all rotating parts (lubrication, fittings, etc.) recessed or covered with collars? _____	<input type="checkbox"/>	<input type="checkbox"/>
Are all pieces of equipment with an electric motor or any electrical connection effectively grounded? _____	<input type="checkbox"/>	<input type="checkbox"/>
Are sprockets and V-belt drives within reach of platforms and passageways or less than 7 feet from the floor completely enclosed? _____	<input type="checkbox"/>	<input type="checkbox"/>
Are fans less than 7 feet above floor guarded, having openings 1/2 inch or less? _____	<input type="checkbox"/>	<input type="checkbox"/>

### ABRASIVE WHEEL MACHINERY (Grinders) (29CFR 1910.215)

Is the work rest used and kept adjusted to within 1/8 inch of wheel? _____	<input type="checkbox"/>	<input type="checkbox"/>
Is the adjustable tongue on top side of grinder used and kept adjusted to within 1/4 inch of wheel? _____	<input type="checkbox"/>	<input type="checkbox"/>

**CHECKLISTS (cont.)**

Yes      No

Do side guards cover the spindle, nut and flange and 75% of the wheel diameter?  
\_\_\_\_\_

Are bench and pedestal grinders permanently mounted? \_\_\_\_\_

Are goggles or face shields always worn when grinding? \_\_\_\_\_

## CHECKLISTS (Cont.)

### HAND AND PORTABLE POWER TOOLS (29CFR 1910.242-244)

	Yes	No
Are tools and equipment (both company and employee-owned) in good condition? _____	<input type="checkbox"/>	<input type="checkbox"/>
Have mushroomed heads on chisels, punches, etc. been reconditioned or replaced if necessary? _____	<input type="checkbox"/>	<input type="checkbox"/>
Have broken hammer handles been replaced? _____	<input type="checkbox"/>	<input type="checkbox"/>
Have worn or bent wrenches been replaced? _____	<input type="checkbox"/>	<input type="checkbox"/>
Has compressed air used for cleaning been reduced to 30 psi when dead ended? _____	<input type="checkbox"/>	<input type="checkbox"/>
Have employees been instructed that the use of compressed air to blow debris from clothing or body is prohibited because it can enter the body and cause serious harm? _____	<input type="checkbox"/>	<input type="checkbox"/>
Have deteriorated air hoses been replaced? _____	<input type="checkbox"/>	<input type="checkbox"/>
Are portable abrasive wheels appropriately guarded? _____	<input type="checkbox"/>	<input type="checkbox"/>
Have employees been made aware of the hazards caused by faulty or improperly used hand tools? _____	<input type="checkbox"/>	<input type="checkbox"/>
Are only non-sparking tools used in areas contaminated by excessive grain dust? _____	<input type="checkbox"/>	<input type="checkbox"/>

## CHECKLISTS (cont.)

### WELDING, CUTTING AND BRAZING (29 CFR 1910.252)

Yes No

Are fuel gas cylinders and oxygen cylinders separated by 20 feet or a barrier 5 feet high having a ½-hour fire resistance rating?  
\_\_\_\_\_

Are cylinders secured and stored where they cannot be knocked over?  
\_\_\_\_\_

Are cylinder protective caps in place except when the cylinder is in use?  
\_\_\_\_\_

Are compressed gas cylinders kept away from sources of heat, elevators, stairs, or gangways?  
\_\_\_\_\_

Are only instructed employees, who are judged competent by the employer, allowed to use oxygen or fuel gas equipment?  
\_\_\_\_\_

Do all cylinders (except those with fixed hand wheels) have non-adjustable wrenches, keys, or handles in place on valve stems while cylinders are in use?  
\_\_\_\_\_

Is welding always conducted at a safe distance from flammable liquids or dusty areas?  
\_\_\_\_\_

Are all compressed gas cylinders legibly marked for identifying the content?  
\_\_\_\_\_

Are the valves shut off when the cylinder is not in use?  
\_\_\_\_\_

Are flash shields provided to protect nearby workers from the welding flash?  
\_\_\_\_\_

**CHECKLISTS (cont.)****NATIONAL ELECTRICAL CODE****ELECTRICAL WIRING**

	Yes	No
Have exposed wires, frayed cords and deteriorated insulation been repaired or replaced? _____	<input type="checkbox"/>	<input type="checkbox"/>
Are junction boxes, outlets, switches and fittings covered? _____	<input type="checkbox"/>	<input type="checkbox"/>
Is all metal fixed electrical equipment grounded? _____	<input type="checkbox"/>	<input type="checkbox"/>
Does all equipment connected by cord and plug have grounded connections? _____	<input type="checkbox"/>	<input type="checkbox"/>
Are electrical appliances such as vacuums, blowers, vending machines, etc. grounded? _____	<input type="checkbox"/>	<input type="checkbox"/>
Are all portable electrical hand tools grounded? (Double insulated tools are acceptable without grounding.) _____	<input type="checkbox"/>	<input type="checkbox"/>
Are breaker switches identified as to their use? _____	<input type="checkbox"/>	<input type="checkbox"/>
Do flexible cords and cables not run through holes in wall or ceiling or through doorways or windows? _____	<input type="checkbox"/>	<input type="checkbox"/>
Are flexible cords and cables free from splices or taps? _____	<input type="checkbox"/>	<input type="checkbox"/>

**CHECKLISTS (cont.)**

	Yes	No
Are flexible cords and cables fastened so that there is no direct pull on joints or terminal screws? _____	<input type="checkbox"/>	<input type="checkbox"/>
Are flexible cords and cables never substituted for fixed wiring? _____	<input type="checkbox"/>	<input type="checkbox"/>
Are flexible cords and cables not attached to building surfaces? _____	<input type="checkbox"/>	<input type="checkbox"/>
Is electrical equipment accessible, in good repair and approved for the location? _____	<input type="checkbox"/>	<input type="checkbox"/>

**CHECKLISTS (cont.)****RECORDKEEPING (29 CFR 1904.2-.8)**

	Yes	No
Is employee poster (OSHA or equivalent state poster) prominently displayed? _____	<input type="checkbox"/>	<input type="checkbox"/>
Have occupational injuries or illnesses, except minor injuries requiring only first aid, been recorded on OSHA Form Nos. 100 and 101, or equivalent? _____	<input type="checkbox"/>	<input type="checkbox"/>
Has a summary of all occupational injuries and illnesses been compiled at the conclusion of each calendar year and been recorded on OSHA Form No. 102? Was it posted during the month of February? _____	<input type="checkbox"/>	<input type="checkbox"/>
Have all OSHA records been retained for a period of five years, excluding the current year? _____	<input type="checkbox"/>	<input type="checkbox"/>

## **INFORMATION SOURCES**

**AMERICAN NATIONAL STANDARDS INSTITUTE (ANSI)**  
1430 Broadway, New York, N.Y. 10018

- A12.1 Floor and Wall Openings
- A14.1 Portable Wood Ladders
- A58.1 Minimum Design Load
- A64.1 Fixed Stairs
- B15.1 Mechanical Power Transmission
- C1 National Electric Code
- Z4.1 Sanitation in Places of Employment

**NATIONAL FIRE PROTECTION ASSOCIATION (NFPA)**  
470 Atlantic Ave.  
Boston, Mass. 02210

- NFPA-10-1970 Installation of Portable Fire Extinguishers
- NFPA-101-1970 Life Safety Code
- NFPA-13A-1971 Sprinkler Systems, Maintenance
- NFPA-17-1969 Dry Chemical Extinguishing Systems
- NFPA-70-1971 National Electric Code

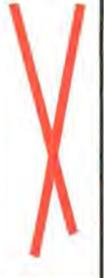
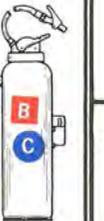
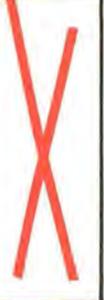
**NATIONAL SAFETY COUNCIL**  
425 North Michigan Avenue  
Chicago, Illinois 60611

### **NIOSH AND OSHA REGIONAL DIRECTORS**

Trade associations and insurance companies can also provide useful information. The Small Business Administration will provide information concerning procedures for securing economic assistance on compliance with the OSHA Standards (if needed).

### **NIOSH FILMS**

The NIOSH health and safety film "Grain Elevator and Feed Mill Safety" is available for free loan from the NIOSH Regional Offices and the Office of Technical Publications.

KIND OF FIRE		APPROVED TYPE OF EXTINGUISHER						HOW TO OPERATE
DECIDE THE CLASS OF FIRE YOU ARE FIGHTING. . . ↓	. . . THEN CHECK THE COLUMNS TO THE RIGHT OF THAT CLASS →	MATCH UP PROPER EXTINGUISHER WITH CLASS OF FIRE SHOWN AT LEFT						FOAM: Don't Play Stream into the Burning Liquid. Allow Foam to Fall Lightly on Fire. 
		FOAM Solution of Aluminum Sulphate and Bicarbonate of Soda	CARBON DIOXIDE Carbon Dioxide Gas Under Pressure	SODA ACID Bicarbonate of Soda Solution and Sulphuric Acid	PUMP TANK Plain Water	GAS CARTRIDGE Water Expelled by Carbon Dioxide Gas	MULTI-PURPOSE DRY CHEMICAL	
 <b>CLASS A FIRES</b> USE THESE EXTINGUISHERS → ORDINARY COMBUSTIBLES • WOOD • PAPER • CLOTH ETC.								CARBON DIOXIDE: Direct Discharge as Close to Fire as Possible. First at Edge of Flames and Gradually Forward and Upward 
 <b>CLASS B FIRES</b> USE THESE EXTINGUISHERS → FLAMMABLE LIQUIDS, GREASE • GASOLINE • PAINTS • OILS, ETC.								SODA-ACID, GAS CARTRIDGE: Direct Stream at Base of Flame 
 <b>CLASS C FIRES</b> USE THESE EXTINGUISHERS → ELECTRICAL EQUIPMENT • MOTORS • SWITCHES ETC.								PUMP TANK: Place Foot on Footrest and Direct Stream at Base of Flames 
								DRY CHEMICAL: Direct at the Base of the Flames. In the Case of Class A Fires, Follow Up by Directing the Dry Chemicals at Remaining Material That is Burning 

IMPORTANT! USING THE WRONG TYPE EXTINGUISHER FOR THE CLASS OF FIRE MAYBE DANGEROUS!

TABLE I

## NIOSH AND OSHA REGIONAL OFFICES

The following pages list NIOSH and OSHA regional offices. Either of these facilities serving the state can provide information on the Occupational Safety and Health Act including questions on standards interpretations, voluntary compliance information, copies of the OSHA Standards, OSHA Act, Employee Rights Posting Notice, and other OSHA publications.



### NIOSH REGIONAL OFFICES

DHEW, Region I  
Government Center (JFK Fed. Bldg.)  
Boston, Massachusetts 02203  
Tel.: 617/223-5807

DHEW, Region II—Federal Building  
26 Federal Plaza  
New York, New York 10007  
Tel.: 212/264-2485/8

DHEW, Region III  
3525 Market Street P.O. Box 13716  
Philadelphia, Pennsylvania 19101  
Tel.: 215/597-6716

DHEW, Region IV  
50 Seventh Street, N.E.  
Atlanta, Georgia 30323  
Tel.: 404/526-5474

DHEW, Region V  
300 South Wacker Drive  
Chicago, Illinois 60607  
Tel.: 312/353-1710

DHEW, Region VI  
1114 Commerce Street (Rm. 8-C-53)  
Dallas, Texas 75202  
Tel.: 214/749-2261

DHEW, Region VII  
601 East 12th Street  
Kansas City, Missouri 64106  
Tel.: 816/374-5332

DHEW, Region VIII  
19th & Stout Streets  
9017 Federal Building  
Denver, Colorado 80202  
Tel.: 303/837-3979

DHEW, Region IX  
50 Fulton Street (254 FOB)  
San Francisco, California 94012  
Tel.: 415/556-3781

DHEW, Region X  
1321 Second Avenue (Arcade Bldg.)  
Seattle, Washington 98101  
Tel.: 206/442-0530

## OSHA REGIONAL OFFICES

### Region I

U.S. Department of Labor  
Occupational Safety and Health Administration  
18 Oliver Street, Fifth Floor  
Boston, Massachusetts 02110 Telephone: 617/223-6712/3

### Region II

U.S. Department of Labor  
Occupational Safety and Health Administration  
1515 Broadway (1 Astor Plaza)  
New York, New York 10036 Telephone: 212/971-5941/2

### Region III

U.S. Department of Labor  
Occupational Safety and Health Administration  
15220 Gateway Center, 3535 Market Street  
Philadelphia, Pennsylvania 19104 Telephone: 215/597-1201

### Region IV

U.S. Department of Labor  
Occupational Safety and Health Administration  
1375 Peachtree Street, N.E., Suite 587  
Atlanta, Georgia 30309 Telephone: 404/526-3573/4 or 2281/2

### Region V

U.S. Department of Labor  
Occupational Safety and Health Administration  
300 South Wacker Drive, Room 1201  
Chicago, Illinois 60606 Telephone: 312/353-4716/7

### Region VI

U.S. Department of Labor  
Occupational Safety and Health Administration  
7th Floor, Texaco Building, 1512 Commerce Street  
Dallas, Texas 75201 Telephone: 214/749-2477/8/9 or 2567

### Region VII

U.S. Department of Labor  
Occupational Safety and Health Administration  
Walttower Building, Room 300, 823 Walnut Street  
Kansas City, Missouri 64106 Telephone: 816/374-5249 or 5240

### Region VIII

U.S. Department of Labor  
Occupational Safety and Health Administration  
Federal Building, Room 15010, 1961 Stout Street  
Denver, Colorado 80202 Telephone: 303/837-3883

### Region IX

U.S. Department of Labor  
Occupational Safety and Health Administration  
9470 Federal Building, 450 Golden Gate Avenue  
Post Office Box 36017  
San Francisco, California 94102 Telephone: 415/556-0584

### Region X

U.S. Department of Labor  
Occupational Safety and Health Administration  
1808 Smith Tower Building, 506 Second Avenue  
Seattle, Washington 98104 Telephone: 206/442-5930

# HOW TO LIFT SAFELY

The following safe practices should be observed in order to avoid injury.

The factors that contribute to safe lifting are...



1. Approach the load and size it up (weight, size and shape.) Consider your physical ability to handle the load.



2. Place the feet close to the object to be lifted 8 to 12 inches apart for good balance.



3. Bend the knees to the degree that is comfortable and get a good handhold. Then using both leg and back muscles...



4. Lift the load straight up—smoothly and evenly. Pushing with your legs, keep load close to your body.



5. Lift the object into carrying position, making no turning or twisting movements until the lift is completed.



6. Turn your body with changes of foot position after looking over your path of travel making sure it is clear.



7. Setting the load down, is just as important as picking it up. Using leg and back muscles, comfortably lower load by bending your knees. When load is securely positioned, release your grip.



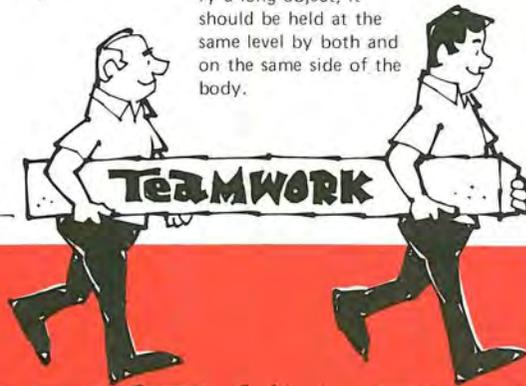
DETERMINE IF OBJECTS CAN BE LIFTED AND CARRIED SAFELY.



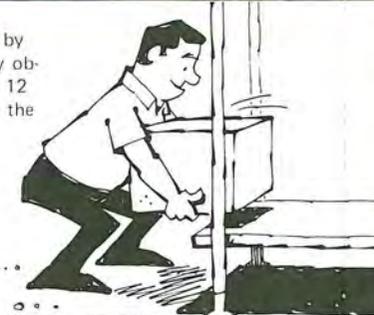
Stack material in such a manner as to permit full view while carrying.

When lifting and carrying with another person—teamwork is important. The load should be equally distributed. Movements must be coordinated so you both start and finish the lift action at the same time and perform turning movements together.

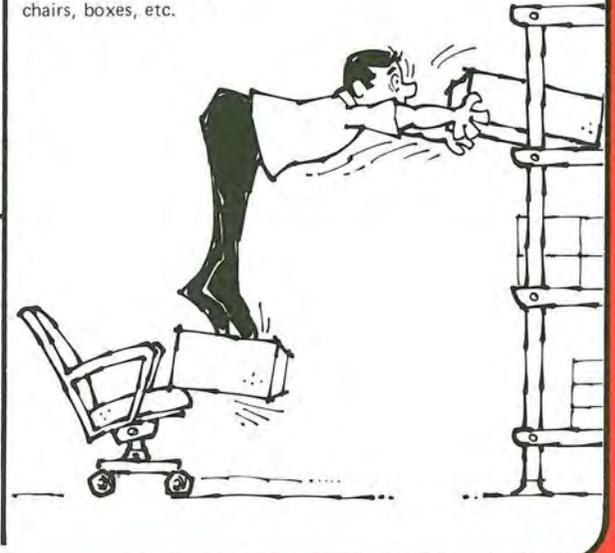
When two persons carry a long object, it should be held at the same level by both and on the same side of the body.



Avoid strain by storing heavy objects at least 12 inches above the floor.



Over-reaching and stretching to reach overhead objects may result in strains or falls. Use a ladder instead of chairs, boxes, etc.



Avoid awkward positions or twisting movements while lifting.





# EMERGENCY INFORMATION

## FIRE

Telephone Fire Department \_\_\_\_\_

Nearest Alarm Box at \_\_\_\_\_

## CRIME

Telephone Police \_\_\_\_\_

## INJURY/ILLNESSES

Avoid infection of minor injuries; always get medical attention or skilled first aid.

Doctor \_\_\_\_\_

Office \_\_\_\_\_ Tel. \_\_\_\_\_

Residence \_\_\_\_\_ Tel. \_\_\_\_\_

Hospital \_\_\_\_\_

Address \_\_\_\_\_ Tel. \_\_\_\_\_

Ambulance \_\_\_\_\_

Address \_\_\_\_\_ Tel. \_\_\_\_\_

(In emergencies, get medical attention and transportation elsewhere if necessary.)

In all cases of Fire, Crime, Accident, or Sickness, promptly notify:

1. Name \_\_\_\_\_ Office Tel. \_\_\_\_\_

Address \_\_\_\_\_ Res. Tel. \_\_\_\_\_

or

2. Name \_\_\_\_\_ Office Tel. \_\_\_\_\_

Address \_\_\_\_\_ Res. Tel. \_\_\_\_\_

DEPARTMENT OF  
HEALTH, EDUCATION, AND WELFARE  
PUBLIC HEALTH SERVICE  
CENTER FOR DISEASE CONTROL  
NATIONAL INSTITUTE FOR OCCUPATIONAL SAFETY AND HEALTH

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Cincinnati, Ohio 45202

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