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HEALTH AND SAFETY GUIDE FOR THE PRINTING INDUSTRY

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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 under the Department of Health, Education, and Welfare (DHEW) and the Occupational Safety and Health Administration (OSHA) under the Department of Labor. 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.

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This booklet was prepared by a NIOSH Task Force in the Division of Technical Services, and personnel in the Regional Offices, who gathered information from state and federal agencies, trade associations, insurance companies, etc., and through in-plant visits. Those contributing to the development of the "Health and Safety Guide for the Printing Industry" were: Gerald J. Karches, Director of the Task Force; David Sundin, Melvin Okawa, and Harry Markel.

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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.

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HEALTH AND SAFETY GUIDELINES

GENERAL PHILOSOPHY FOR HEALTH AND SAFETY COMPLIANCE

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.

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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.

Identifying hazards by reviewing injury and illness records

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HEALTH AND SAFETY GUIDELINES (cont.)

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.

Management leadership is necessary to ensure success

Management may want to assign safety and health 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 supervisor, 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.

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HEALTH AND SAFETY GUIDELINES (cont.)

REDUCING UNSAFE ACTS AND PRACTICES

EMPLOYEE TRAINING

A safe operation depends largely 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 instruction 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.

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HEALTH AND SAFETY GUIDELINES (cont.)

THE INDUSTRY AND ITS HAZARDS

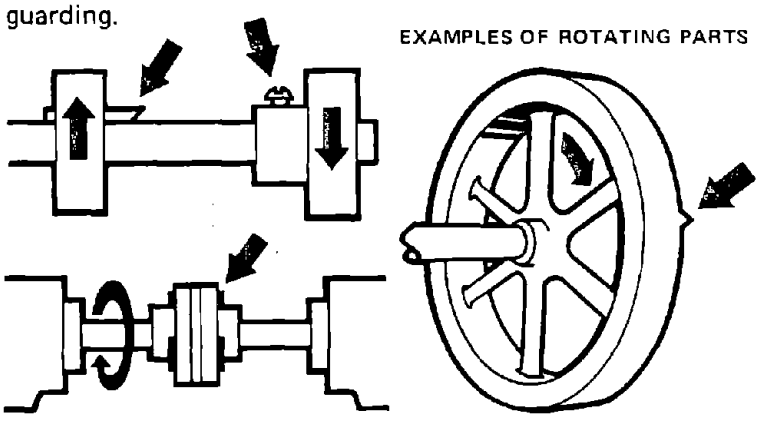
Employees in the printing industry may be confronted with numerous hazards or potential hazards in the course of their duties. These hazards include those of a mechanical, electrical, chemical, or flammable nature. While printing has many safety and health problems common to other industries, recognition and control of those hazards with the greatest potential for injury or illness are emphasized.

MACHINE GUARDING

The variety and uses of machinery in the printing industry poses particular hazards from reciprocating and rotating parts, pinch points, and shear action. Therefore, 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 experienced individuals may at times perform unsafe acts which could lead to injury and death.

The following illustrations depict principals of mechancial action. These actions require consideration for machine guarding.



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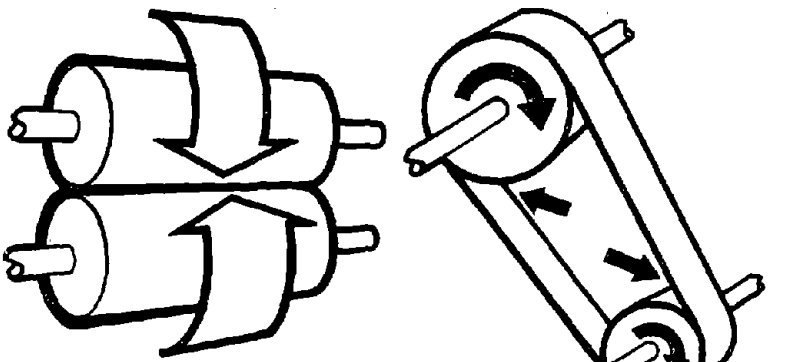
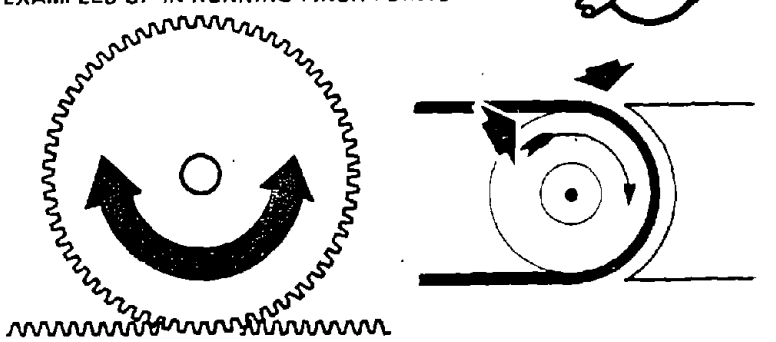
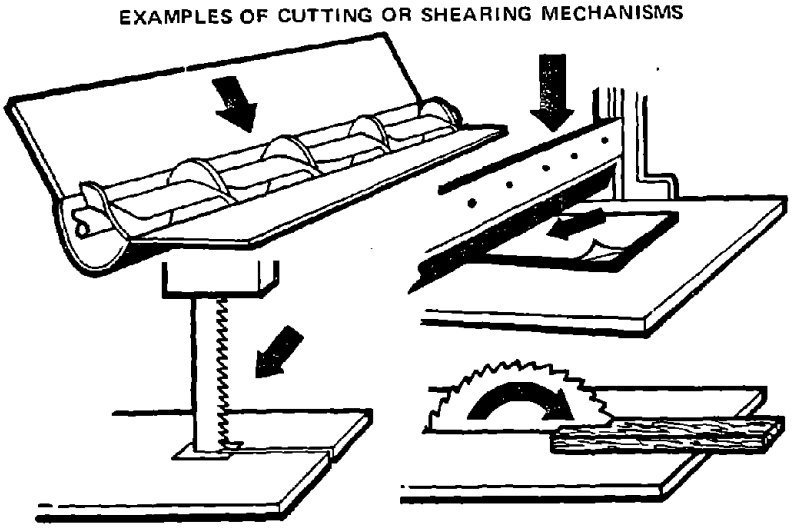


EXAMPLES OF IN-RUNNING PINCH POINTS



EXAMPLES OF CUTTING OR SHEARING MECHANISMS



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HEALTH AND SAFETY GUIDELINES (cont.)

ENVIRONMENTAL CONTROL

The work environment in a printing facility can present particular health hazards to the employees not only in terms of the variety of chemicals, inks, and solvents, but also because of the potential for high noise exposure.

It is important that the employer know what chemicals are in the materials used. Often health hazards are not recognized because the employer is unaware of the contents of trade name products.

Standards are established which limit an employee's exposure to certain chemicals. The employer must insure that these standards are complied with. For the protection of the employee, the employer should identify, either directly or through the manufacturer or supplier, the composition of materials used. Manufacturers and suppliers will usually provide health and safety data sheets defining the hazards (if any) of their products.

The following is a list of typical dangerous materials used in the printing industry. These materials may be toxic, a fire hazard, or both. Less dangerous materials should always be substituted where possible. Suppliers are often able to furnish safety data sheets for all of their products. Safety data sheets will identify the relative hazards associated with a material.

LIST OF TYPICAL DANGEROUS MATERIALS

*Benzene (Benzol)—ink solvent, type wash, roller wash, film cleaner
Carbon Tetrachloride—press wash, type wash, solvent
Carbon Disulfide—blanket wash
Gasoline—type wash, press wash, solvent
Toluene (Toluol)—type wash, press wash, roller wash
Xylene (Xylol)—press wash
Trichlorethylene—type wash, press wash, roller wash
Perchlorethylene—type wash, press wash, roller wash
Lye—glaze breaker (rollers and blankets)
Naphtha—blanket wash
Adhesives (Phenol and Formaldehyde)—bindery
Aniline—ink dyes
Chromic and Bichromic Compounds—plate making
Nitric (and other) Acids—plate making
Concentrated Photographic Chemicals—photo department

*Note: Data suggest that benzene may be linked to a higher incidence of leukemia.

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HEALTH AND SAFETY GUIDELINES (cont.)

In addition to the chemicals used, consideration should be given to by-product hazards formed in certain operations. Specifics to watch for are:

1. Welding performed as a maintenance procedure around chlorinated solvents 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 environmental controls.
3. When certain agents are mixed, sometimes poisonous gases, such as chlorine and cyanide, are formed.
4. 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 protective clothing and other protective equipment, and the practice of good personal hygiene can often prevent these problems.

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

1. Substitution of less toxic materials for more toxic ones—for example, use of methyl chloroform for carbon tetrachloride.
2. Changes of a process—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—employees should be told what hazards they are exposed to and the ways to reduce or limit exposures (see "Employee Training").
6. Personal hygiene—cannot be over-emphasized. Persons should wash their hands before eating. If chemicals or solvents 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.

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HEALTH AND SAFETY GUIDELINES (cont.)

7. Noise exposure is most effectively reduced when engineering and administrative controls can be instituted. Hearing protection devices should only be used as a temporary measure to protect the employee until other controls can be implemented.

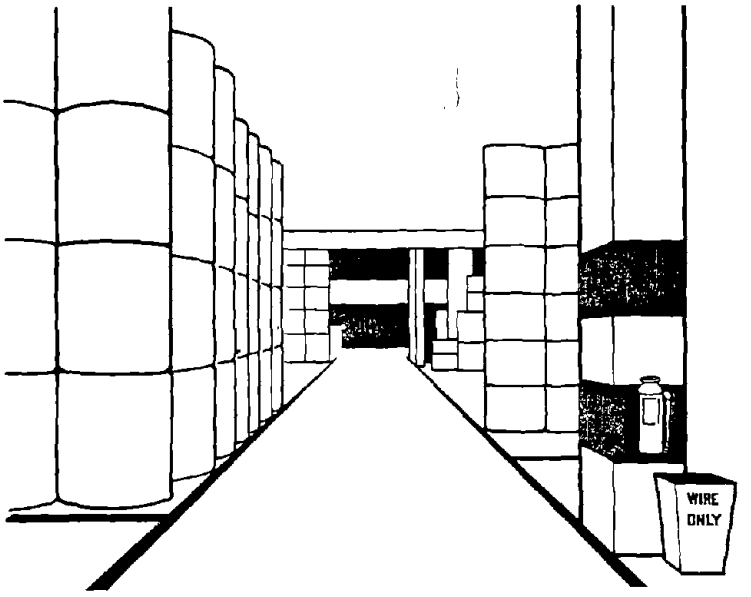
8. Personal protective equipment—such items as respirators, hearing protective devices, protective clothing, and protective equipment (see "Personal Protective Equipment").

9. 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").

FIRE HAZARDS

The presence of both flammable and combustible materials in most printing shops makes fire prevention an important part of the overall safety program.

Maintaining a clean and orderly workplace reduces the danger of fires. Flammable materials **must** be and combustible materials **should** be kept only in places which are isolated by fire-resistive construction.



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HEALTH AND SAFETY GUIDELINES (cont.)

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. Even 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 rags with oil or cleaning solvents 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.

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 this connection.

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

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HEALTH AND SAFETY GUIDELINES (cont.)

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.

MATERIAL HANDLING

Materials handling causes or contributes to the majority of injury producing accidents in the industry. This can be reduced through the ready availability of adequate, properly maintained manual and mechanical handling equipment and an effective employee education program in proper lifting procedures (see "How to Lift Safely" chart at back of book and post in a conspicuous place).

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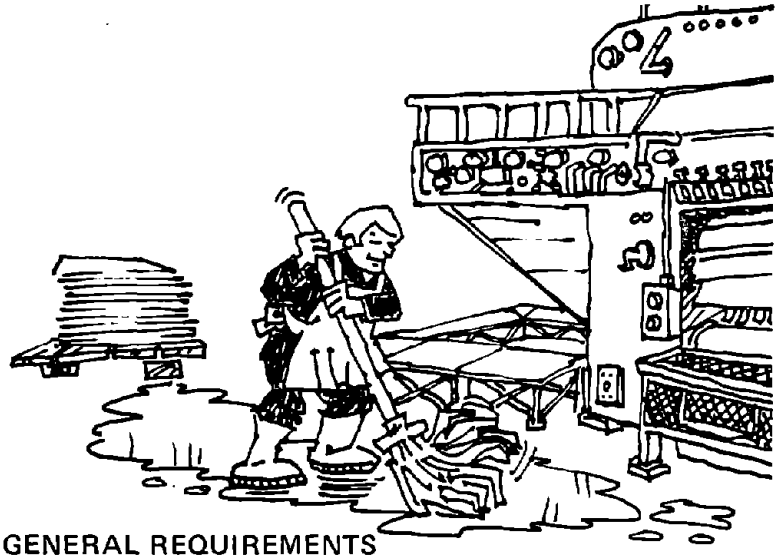
FREQUENTLY VIOLATED REGULATIONS

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. Wet process areas should have non-slip 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).

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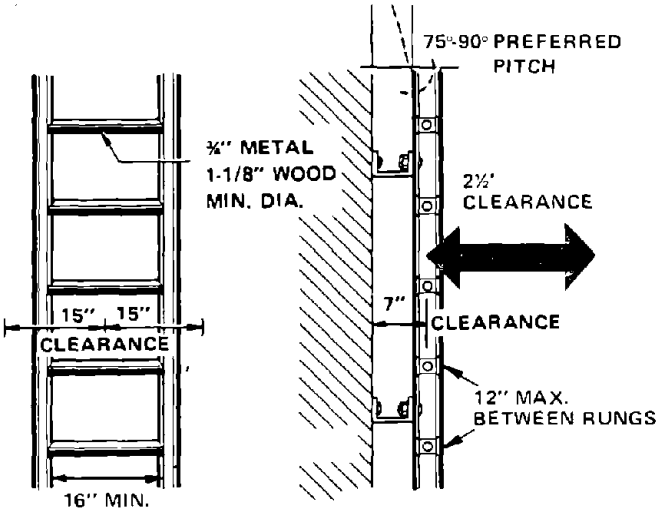
FREQUENTLY VIOLATED REGULATIONS

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 ¾ inch for metal ladders, or 1⅛ 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

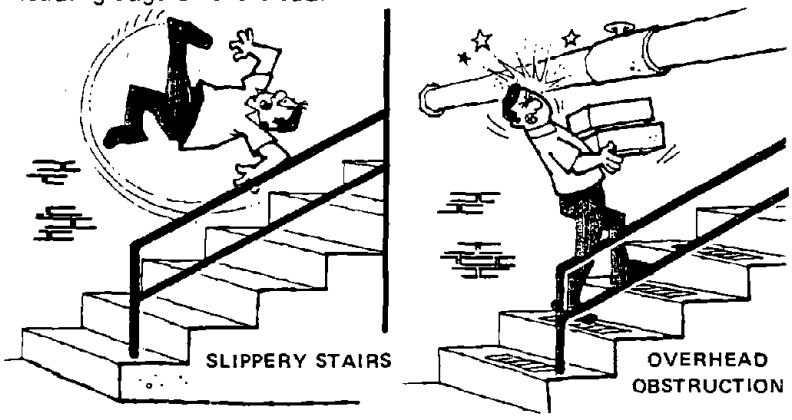
WALKING AND WORKING SURFACES (cont.)

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. Wood ladders 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. Non-slip bases should be used.

FIXED INDUSTRIAL STAIRS

1. Riser 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).

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FREQUENTLY VIOLATED REGULATIONS

WALKING AND WORKING SURFACES (cont.)

5. The angle to the horizontal made by the stairs must be between 30° and 50°.

6. All stairs should be adequately lighted.

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

8. Certain conditions applied to flights of stairs having four or more risers:

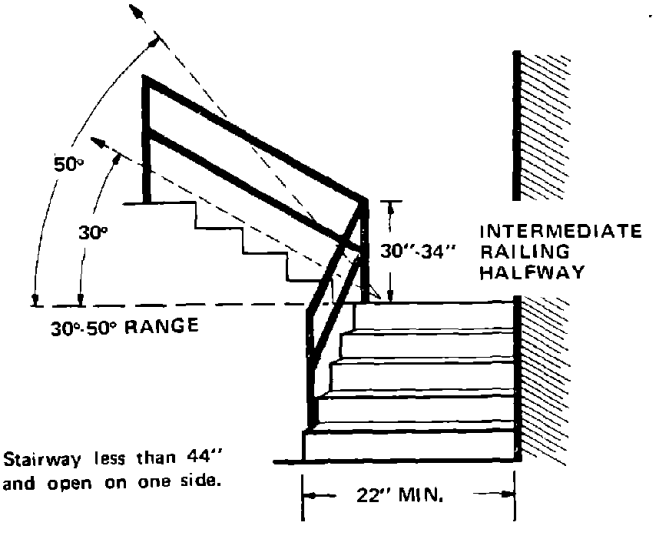
a. A stair railing is required on each open side.

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

c. If the stairway is more than 44 inches wide, a handrail is required on each enclosed side.

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



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FREQUENTLY VIOLATED REGULATIONS

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-inch 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 eight feet.

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.

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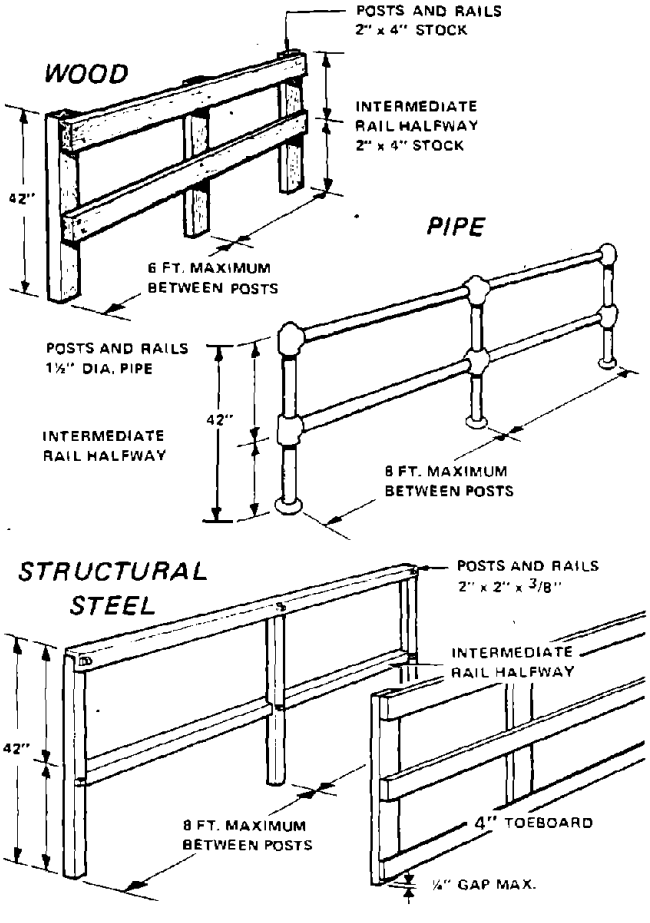
FREQUENTLY VIOLATED REGULATIONS

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



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FREQUENTLY VIOLATED REGULATIONS

EXITS AND EXIT MARKINGS

1. Every exit must have the word "EXIT" in plain legible letters not less than six inches high with the strokes of the letters not less than ¾ inch 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.

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.

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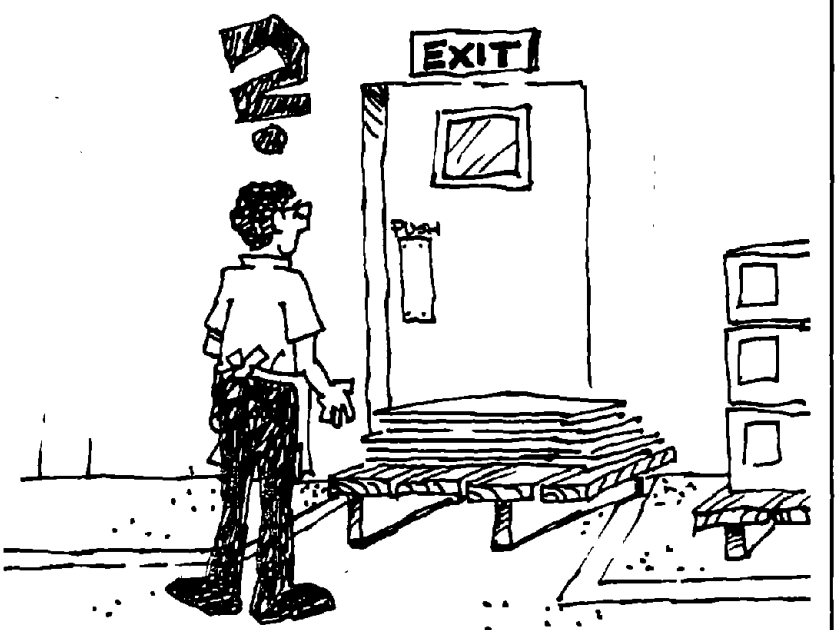
FREQUENTLY VIOLATED REGULATIONS

EXITS AND EXIT MARKINGS (cont)



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.

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FREQUENTLY VIOLATED REGULATIONS

OCCUPATIONAL HEALTH AND ENVIRONMENTAL CONTROL

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 eight-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 eight hours daily. If no hearing loss is observed, ear protection is not required.

At greater than 90 dBA exposure (eight hours per day) or for higher noise levels in excess of the allowable time (e.g., 100 dBA for more than two 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.

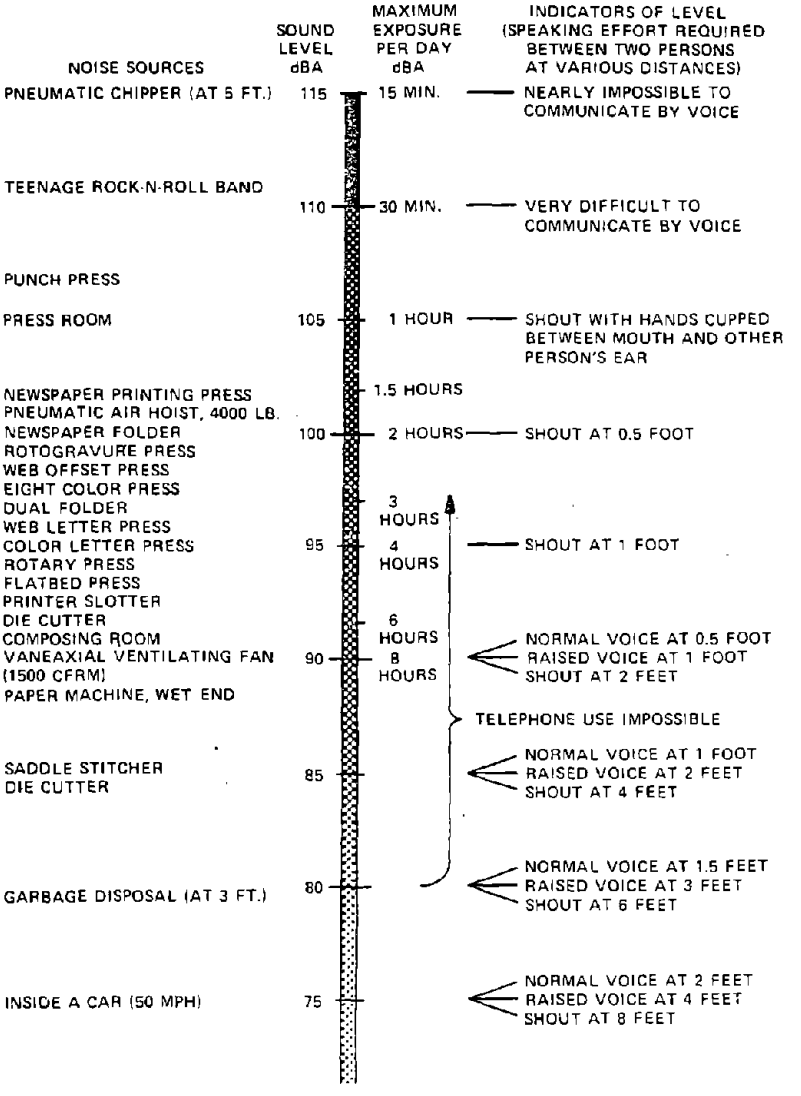
The following table is provided to assist in the evaluation of the noise levels in the workplace. If referral to the table indicates that levels and time of exposure are such that corrective action is needed, it is recommended that professional help be sought to correct the problem. A noise survey by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

NIOSH

FREQUENTLY VIOLATED REGULATIONS

OCCUPATIONAL HEALTH AND ENVIRONMENTAL CONTROL (cont.)

PERMISSIBLE NOISE EXPOSURES



NIOSH

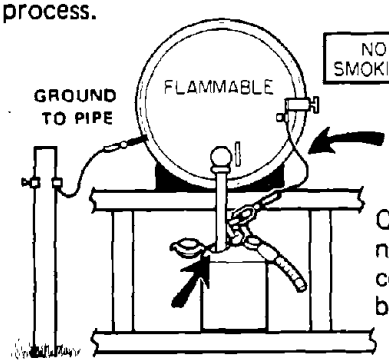
FREQUENTLY VIOLATED REGULATIONS

HAZARDOUS MATERIALS

Flammable and combustible liquids are categorized by their ease of ignition. Flammable liquids are more easily ignited than combustible ones. Some examples of flammables are gasoline, acetone, lacquer thinner; and examples of combustibles are kerosene, fuel oil, Stoddard solvent, etc.

1. The connections on all drums and piped systems of flammable and combustible liquids must be vapor-and-liquid tight.

2. When flammable liquids are transferred from one container to another, for example, from a bulk container to a portable container, they must be effectively bonded and grounded. This practice prevents electrical discharge (e.g., sparks) from the accumulation of static charge because of the transfer process.



3. All spills of flammable or combustible liquids must be cleaned up promptly. With major spills remove ignition sources, ventilate the area, and provide respirators if needed. These liquids must not be allowed to enter a confined space, such as a sewer, because of the possibility of an explosion.

4. Supplies of flammable and combustible liquids must be stored in approved fire-resistant safety containers equipped with flash screens and self-closing lids. These containers can be purchased in an industrial supply house.

5. All flammable liquids must be kept in closed containers when not in use.

6. Combustible waste materials, such as oily shop rags, paint rags, etc., must be stored in covered metal containers and be disposed of daily.

NIOSH

FREQUENTLY VIOLATED REGULATIONS

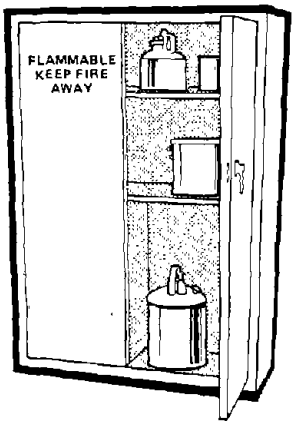
HAZARDOUS MATERIALS (cont.)

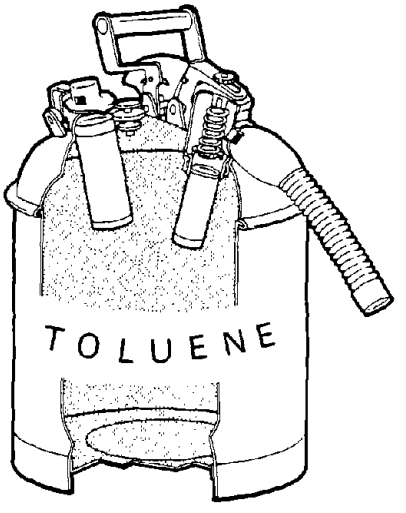
STORAGE

As stated in the "Guidelines" portion of this guide, flammable and combustible liquids must be stored according to appropriate OSHA Regulations.

There should never be over one day's supply of flammable liquids outside of an approved storage area. Storage rooms for flammables are required to have:

1. Explosion proof lights
2. Ventilation with at least six air changes per hour.





STORAGE CABINETS

Cabinets must be distinctly designated "FLAMMABLE—KEEP FIRE AWAY", and be able to withstand a 10-minute fire test, the internal temperature remaining at 325°F or less.

Metal cabinets must be constructed of at least No. 18 gauge sheet iron, double-walled with a 1½-inch air space between. Doors must have three-point locks with the sill raised at least two inches above the cabinet floor.

Wooden cabinets must be constructed of one-inch plywood with rabbetted joints fastened two-directionally with flathead screws.

NIOSH

FREQUENTLY VIOLATED REGULATIONS

HAZARDOUS MATERIALS (cont.)

INSIDE STORAGE

Adequate venting should be provided in all areas where flammable liquids are stored. Roof venting is very important in the event of a fire. The use of roof vents allows smoke and heat to escape, thus, in the event of a fire, fire fighters can get nearer to the fire.

Inside storage rooms for flammables must be prominently posted as a "NO SMOKING" area and openings to other rooms or buildings must be proivded with noncombustible, liquid-tight, raised sills or ramps at least four inches in height. A permissible alternative to a sill or ramp is an open-grated trench which drains to a safe location.

General exhaust ventilation (either gravity or mechanical) which provides for a complete change of air within a room at least six times each hour is required for inside-storage rooms.

OUTSIDE STORAGE

If flammable and combustible liquids are stored outside, the area should be graded so that spills are diverted away from the building. The storage area should be kept free of combustible material not necessary for storage, such as weeds and other debris. Smoking must be prohibited.

LP STORAGE AREA

1. "NO SMOKING" signs must be present on the storage tank.
2. Units to be fueled must be turned off while filling.
3. The LP Tank must be guarded to protect it from vehicular damage.
4. Electrical connections, pumps, switches, etc. must be vapor and explosion proof.

NIOSH

FREQUENTLY VIOLATED REGULATIONS

PERSONAL PROTECTIVE EQUIPMENT

Personal protective equipment is required whenever toxic 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. Furthermore, it must be safely designed and sufficiently well-constructed to provide the protection for which it is intended.

It is required that all personal protective equipment be maintained in a sanitary and reliable condition. Employers should keep in mind that personal protective equipment is not the final solution to hazard elimination. Personal protective equipment is to be used only until engineering or administrative controls can be instituted.

EYE PROTECTION

Eye protection is required where there is a possibility of an eye injury from flying particles, chips, acids, bases, or ultra violet light (from arc lamps).

HEARING PROTECTION

Appropriate hearing protection must be available to personnel, and used, where noise levels are in excess of 90 dBA. Such sound intensity is likely to occur around powerful motor, high speed tools, and operating machinery.

PERSONAL PROTECTIVE CLOTHING

GLOVES

When handling hazardous liquids, employees must wear gloves which are impervious to such liquids. The gloves must be long enough to protect the forearms.

APRONS

When aprons are used as protection from caustics, the material must also be impervious.

FOOT PROTECTION

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

NIOSH

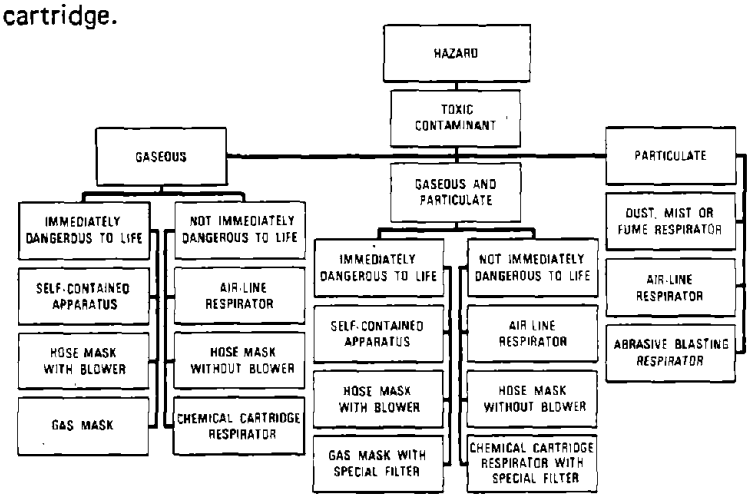
FREQUENTLY VIOLATED REGULATIONS

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 must be selected which are designed to protect against the specific hazards to which the worker is exposed.
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 use.
6. All straps are tied and adjusted.
7. A good face seal is necessary—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.



NIOSH

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.

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. Beverages or food must not be stored or consumed in a toilet room or in an area exposed to materials which could be hazardous if ingested.

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

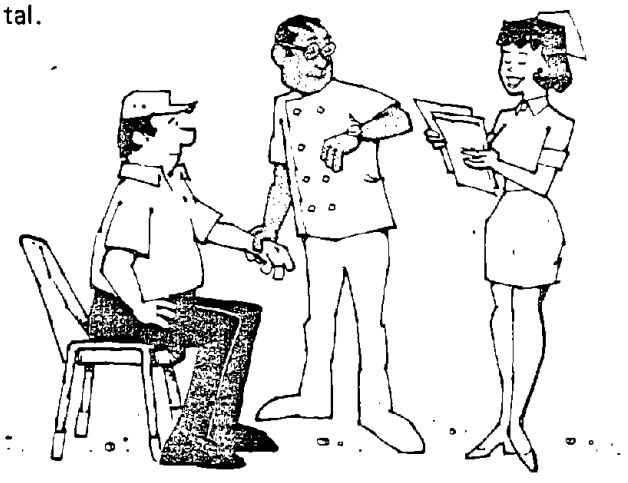
NIOSH

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 preplacement 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 the worst conditions) which is used for treatment of injured or ill employees the following are required:

1. At least one and preferably more 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.

NIOSH

FREQUENTLY VIOLATED REGULATIONS

MEDICAL AND FIRST AID (cont.)

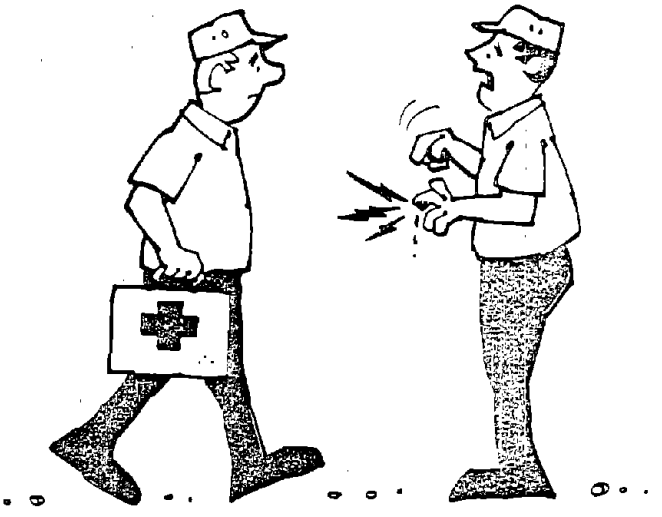
2. First aid supplies must be readily available and approved by a consulting physician. These supplies should be in sanitary containers with individually sealed packages for material such as gauze, bandages, and dressings that must be sterile. Other items often needed are adhesive tape, triangular bandages (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.

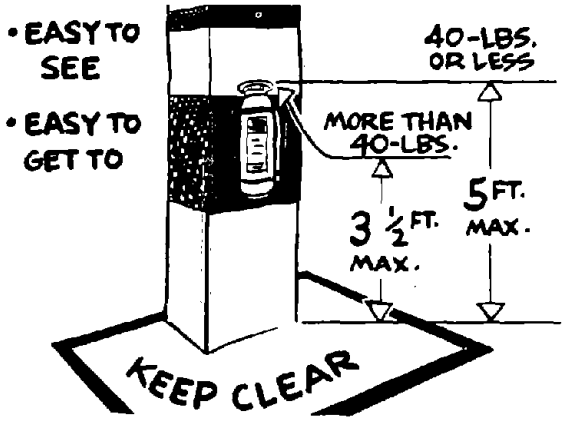
Reference to "Recordkeeping Requirements" toward the back of this Guide gives a discussion of records which must be maintained for occupational injuries and illnesses.



NIOSH

FREQUENTLY VIOLATED REGULATIONS

FIRE PROTECTION



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 five 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.

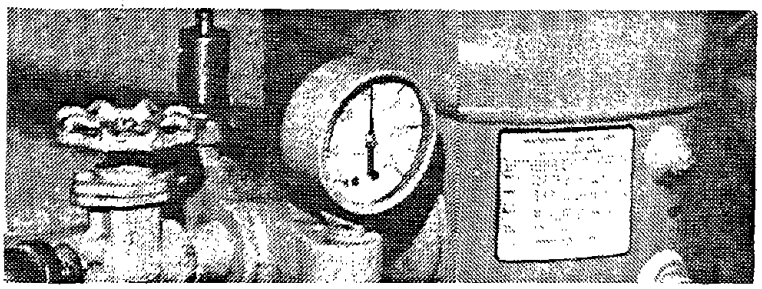
NIOSH

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.

NIOSH

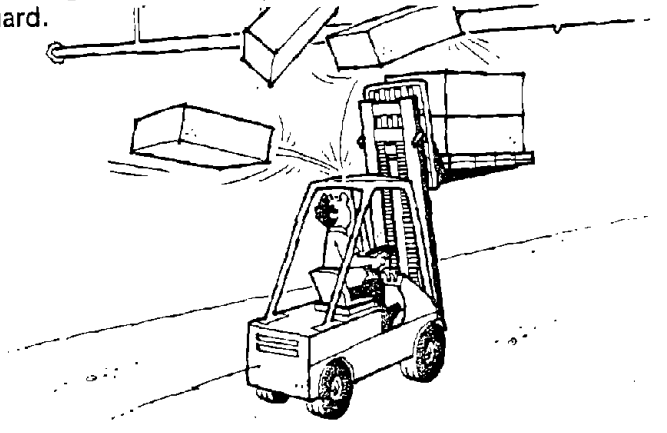
FREQUENTLY VIOLATED REGULATIONS

MATERIALS HANDLING AND STORAGE

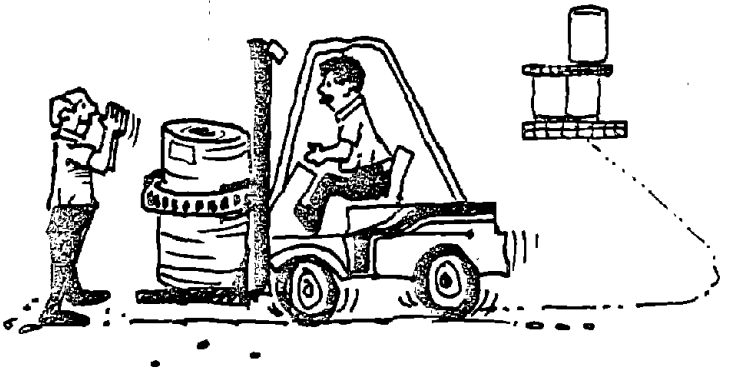
POWERED INDUSTRIAL TRUCKS

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.

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



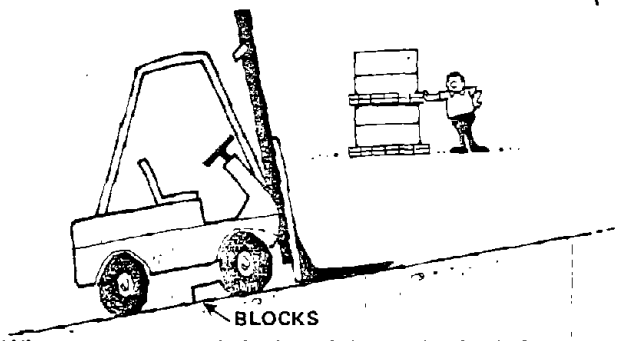
2. Methods must be developed and used to effectively train operators in the safe operation of powered industrial trucks, and only trained and authorized operators may operate the truck.



NIOSH

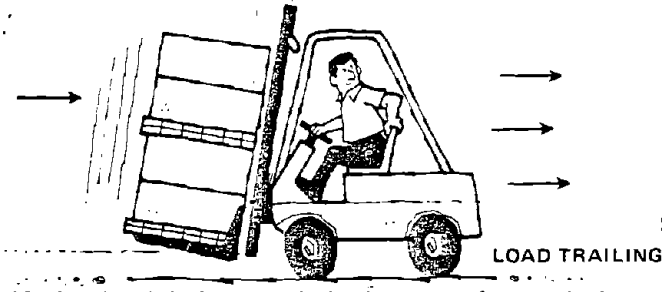
FREQUENTLY VIOLATED REGULATIONS

MATERIALS HANDLING AND STORAGE (cont.)



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.



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.

NIOSH

FREQUENTLY VIOLATED REGULATIONS

MATERIALS HANDLING AND STORAGE (cont.)

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 any 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.

NIOSH

FREQUENTLY VIOLATED REGULATIONS

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, 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 OSHA Regional Offices 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. Enclose the operation
2. Interlocking devices
3. Moving barriers
4. Removal devices
5. Remote control
6. Two-hand tripping devices
7. Electronic safety devices

The following page contains examples of specific equipment that must be guarded. Generally all powered equipment must be safeguarded to prevent employees from the various dangers caused by moving parts.

NIOSH

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.

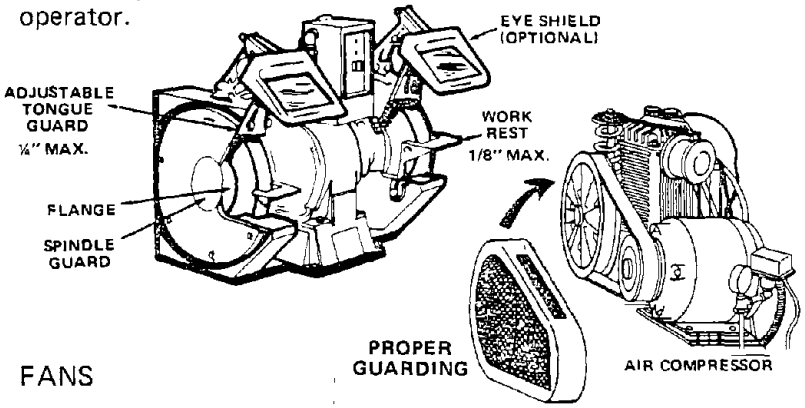
The exposed area of the grinding wheel and sides for the safety guards should not exceed more than one-fourth of the entire wheel.

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 ¼ 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 ½ inch.

AIR COMPRESSORS

Must have their flywheel and drive pulley fully enclosed.

NIOSH

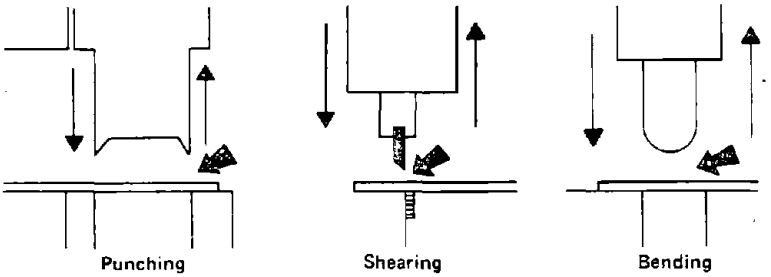
FREQUENTLY VIOLATED REGULATIONS

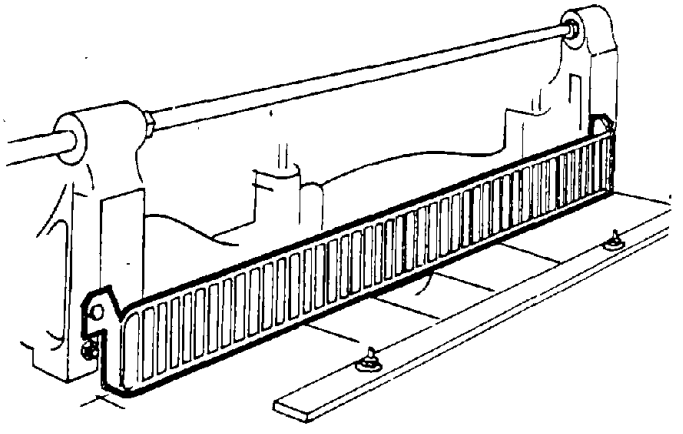
MACHINERY AND MACHINE GUARDING (cont.)

PUNCHING, SHEARING, AND BENDING ACTIONS

Punching, shearing, or bending action results when power is applied to a ram (plunger) or knife for the purpose of blanking, trimming, drawing, punching, shearing, or stamping metal or other materials as differentiated from removing the material in the form of chips. The danger of this type of action lies at the point-of-operation where stock is actually inserted, maintained, and withdrawn.

Typical examples of equipment involving punching, shearing, or bending action include power presses, foot and hand presses, bending presses or brakes, as well as squaring, guillotine, and alligator shears.





Adjustable barrier guard for feed side of squaring shear

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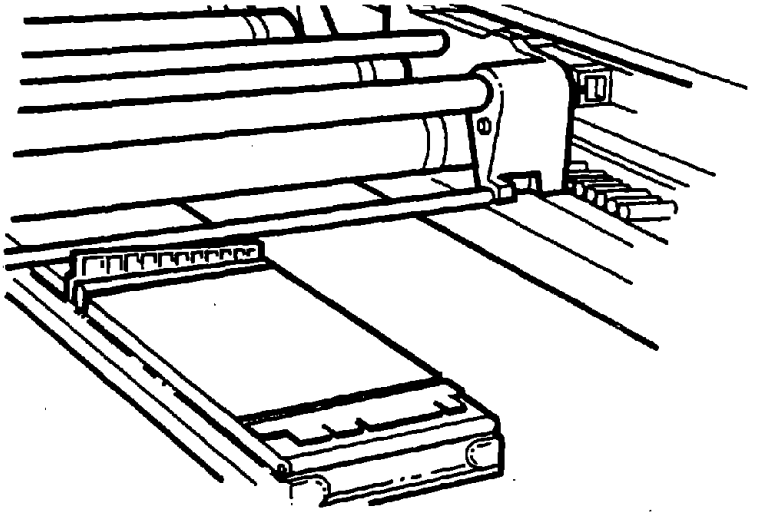
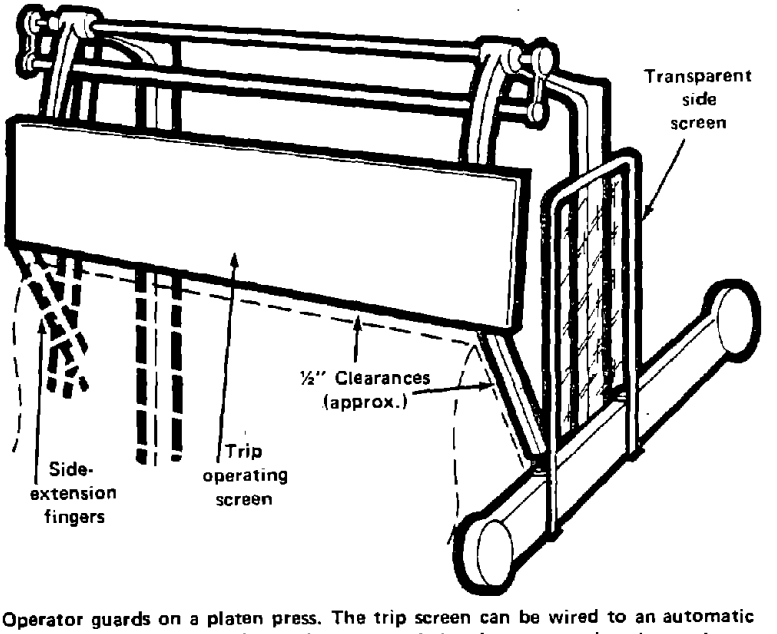
FREQUENTLY VIOLATED REGULATIONS

MACHINERY AND MACHINE GUARDING (cont.)



Sensitive safety guard on a proof press prevents damage to the press from work ups.

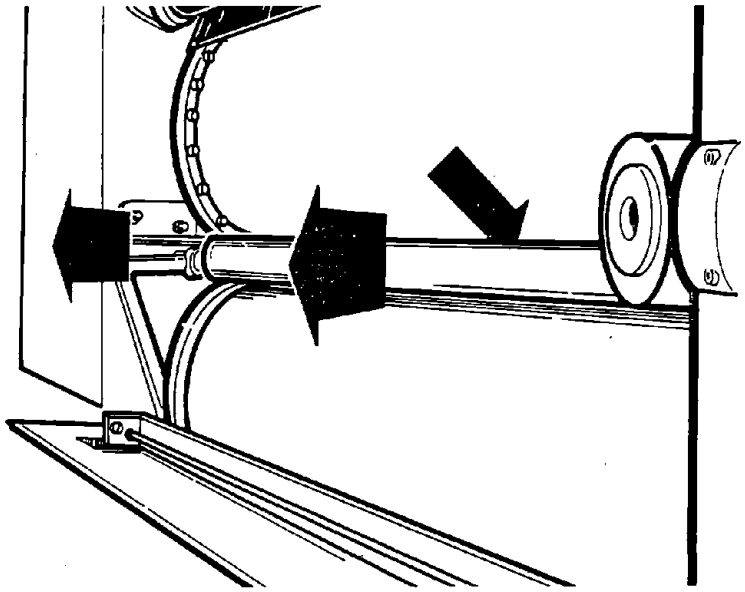


Operator guards on a platen press. The trip screen can be wired to an automatic stop, or be designed to throw the operator's hands away as the platen closes.

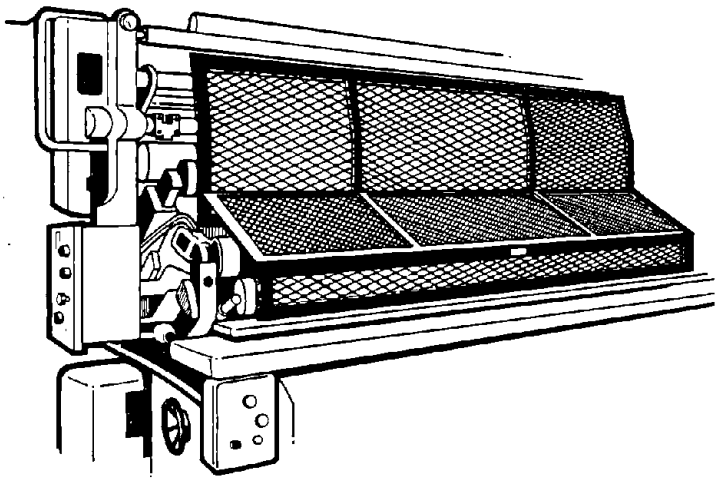
NIOSH

FREQUENTLY VIOLATED REGULATIONS

MACHINERY AND MACHINE GUARDING (cont.)



This pressure-sensitive guard at the plate-to-blanket nip automatically stops the press when an object wedges between it and the cylinder.



Guarding of the inking and dampening rollers at the press infeed. The guard is hung on a metal bar which also serves as a handrail for crewmen using the feed table walkway.

NIOSH

FREQUENTLY VIOLATED REGULATIONS

HAND AND PORTABLE POWERED TOOLS

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

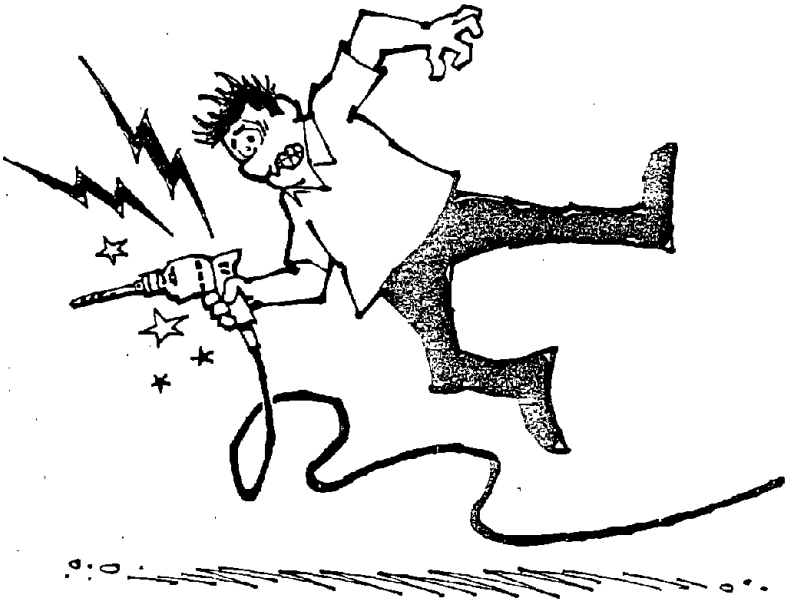
1. Each employer is responsible for the safe condition of tools and equipment used by employees, including tools and equipment which may be furnished by employees.

2. Hammers with broken or cracked handles, chisels and punches with mushroomed heads, or bent or broken wrenches should not be used.

3. 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.

4. 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.

5. 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.

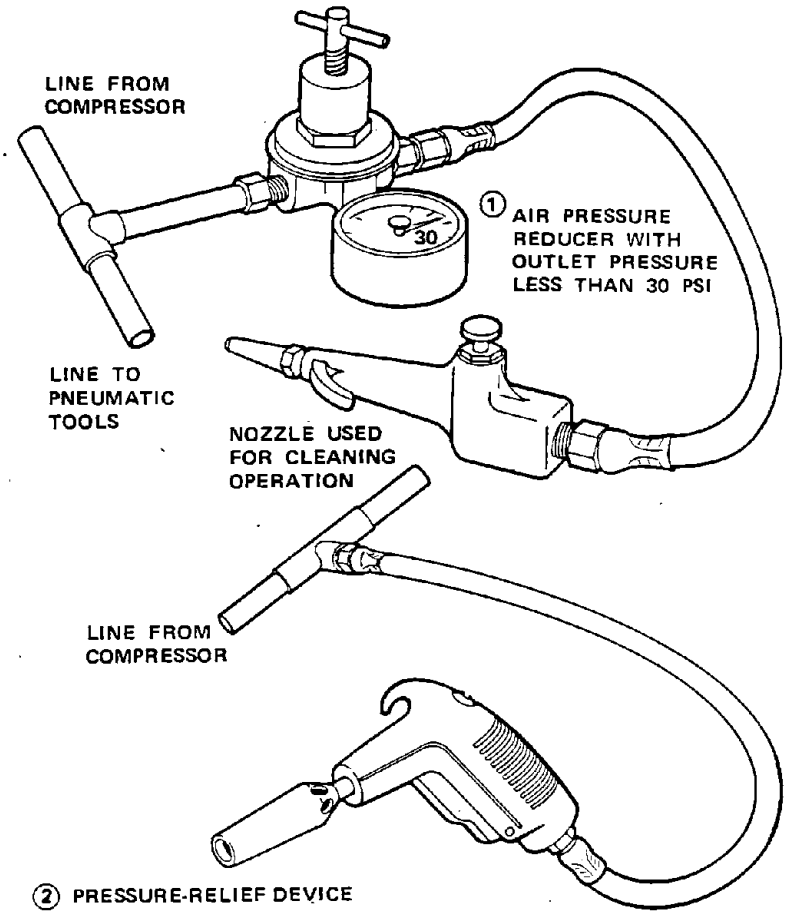


NIOSH

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.

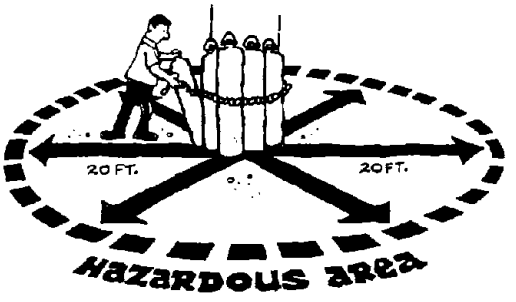


NIOSH

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.

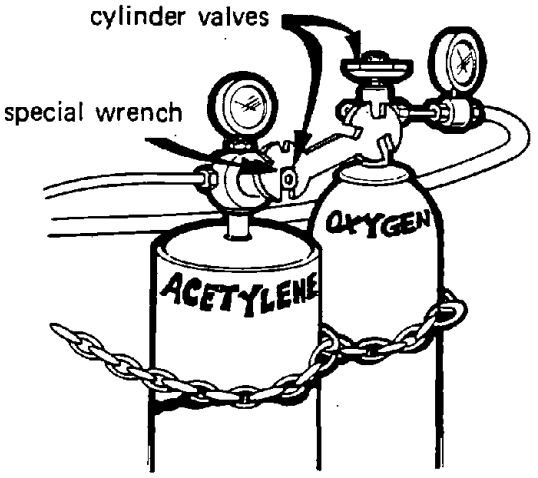
3. Valve protection caps are utilized where the cylinder is designed to accept a cap except when cylinders are in use or connected for use.

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 five feet high and having a one-half hour fire resistance rating.

NIOSH

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 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.

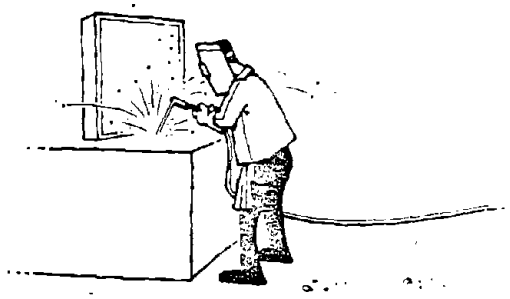
NIOSH

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.

NIOSH

FREQUENTLY VIOLATED REGULATIONS

THE NATIONAL ELECTRICAL CODE (NEC)

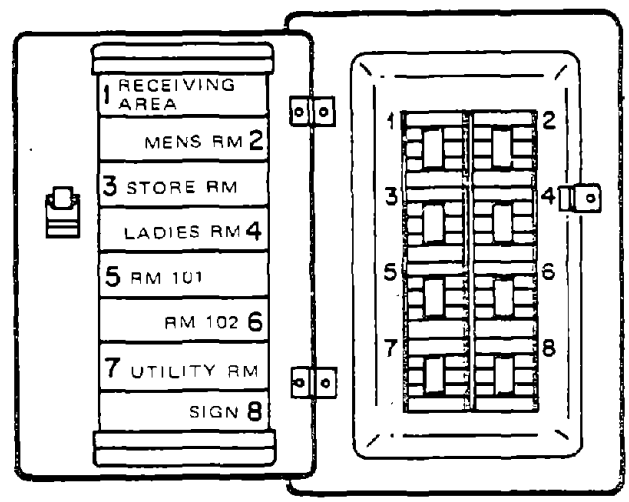
ELECTRICAL REQUIREMENTS

MORE FIRES ARE CAUSED BY ELECTRICAL MALFUNCTION THAN ANY OTHER CAUSE, and standards pertaining to electrical equipment and use in all industries have been cited as violations more frequently than any others.

The National Electrical Code, NFPA 70-1971; ANSI C1-1971 has been adopted as a national consensus standard by OSHA (refer to "Information Sources"). The purpose of the NEC is the practical safeguarding of persons and 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.

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.

NIOSH

FREQUENTLY VIOLATED REGULATIONS

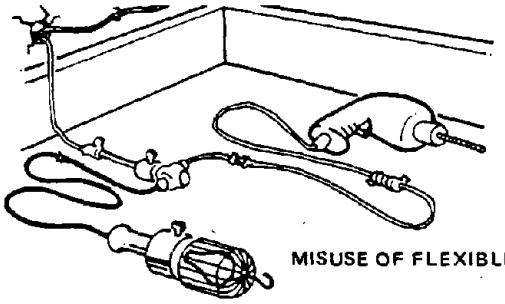
THE NATIONAL ELECTRICAL CODE (NEC) (cont.)

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:
   a. In wet or damp locations.
   b. If in electrical contact with metal.
   c. If operated in excess of 150 volts to ground.
   d. When in a hazardous location

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:
   a. Portable hand-held motor-operated tools, or
   b. Appliances, or
   c. 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:
   a. Used as a substitute for fixed wiring.
   b. Run through holes in walls, ceilings, or floors.
   c. Run through doors, windows, etc.
   d. Attached to building surfaces.

7. Flexible cords must be:
   a. Continuous lengths without splices or taps.
   b. Fastened so that there is no pull on joints or terminal screws.
   c. Replaced when frayed or insulation has deteriorated.

NIOSH

RECORDKEEPING REQUIREMENTS

Recordkeeping requirements under OSHA are intended to 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 six days.

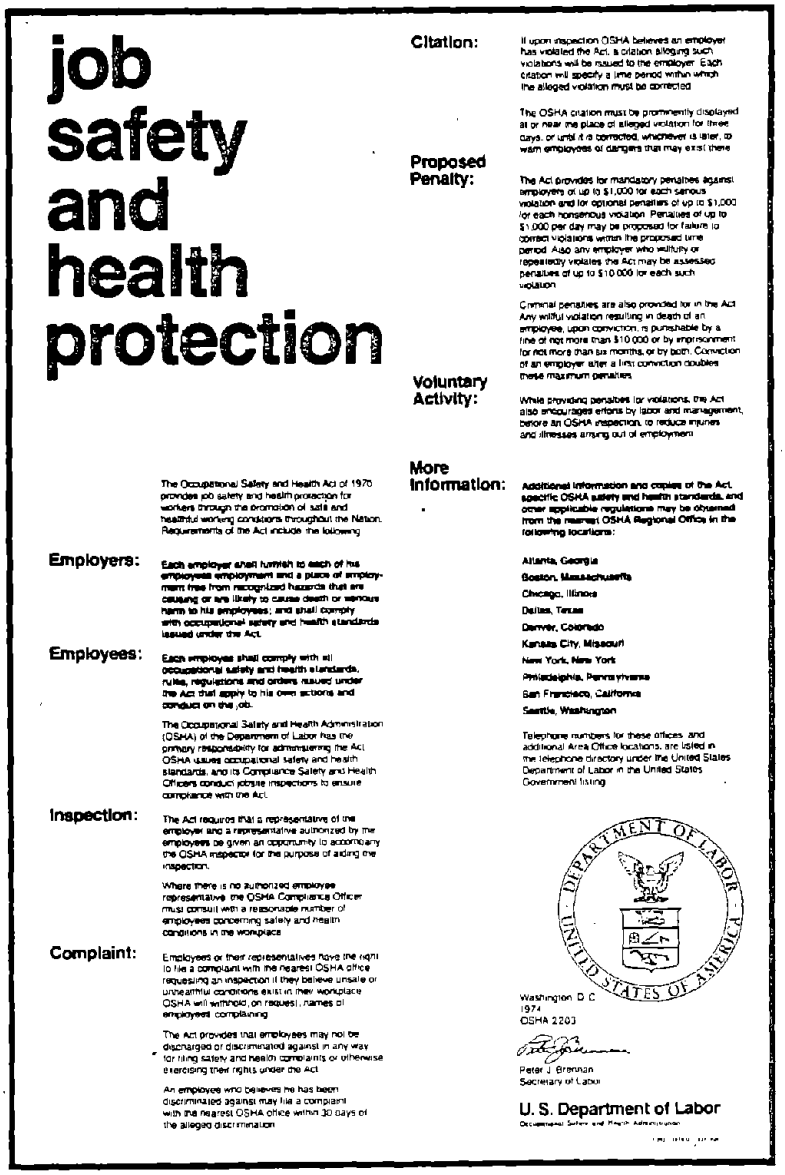
The types of work-related injuries and illnesses which must be recorded are those involving fatalities, lost workdays, or those which are nonfatal and do not cause lost workdays for the employee, but do require medical treatment, job transfer or termination, or resulted in loss of consciousness. Employers 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.

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 unhealthful conditions exist in their workplace. OSHA will withhold, 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.

Voluntary Activity: While providing penalties for violations, the Act also encourages efforts 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.

DEPARTMENT OF LABOR · UNITED STATES OF AMERICA

Washington, D.C.
1974
OSHA 2203

Peter J. Brennan
Secretary of Labor

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

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

NIOSH

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."

NIOSH

CHECKLISTS (Cont.)

WALKING AND WORKING SURFACES
AISLES AND FLOORS (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 four 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 four-inch toeboards?	☐	☐

STAIRS (29 CFR 1910.24)

Are there standard stair rails or handrails on all stairways having four or more risers?	☐	☐

NIOSH

CHECKLISTS (cont.)

	Yes	No
Are all stairways at least 22 inches wide?	☐	☐
Do stairs have at least a seven-foot overhead clearance?	☐	☐
Do stairs angle no more than 50° and no less than 30°?	☐	☐
LADDERS (29 CFR 1910.25., .26, .27)		
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?	☐	☐
Is it prohibited to use the top of an ordinary step ladder as a step?	☐	☐
Do fixed ladders have at least 3½ feet of extension at the top of the landing?	☐	☐
Is the distance between the centerline of rungs on a fixed ladder and the nearest permanent object in back of the ladder at least seven inches or more?	☐	☐
Do all fixed ladders have a preferred pitch of 75°-90°?	☐	☐
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 six inches high with the principle letter strokes at least ¾ of an inch wide?	☐	☐

NIOSH

CHECKLISTS (cont.)

	Yes	No
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?	☐	☐

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

Is management aware of the hazards caused by various chemicals used in the plant (solvents, epoxy resins, isocyanates, styrene, etc.)?	☐	☐
Is employee exposure to these chemicals kept within acceptable levels?	☐	☐
Are eye wash fountains and safety showers provided in areas where chemicals, such as caustics, are used?	☐	☐

NIOSH

CHECKLISTS (cont.)

	Yes	No
Are all containers, such as vats, storage tanks, etc. labeled as to their contents?	☐	☐
Are employees required to wear personal protective equipment when handling hazardous materials (gloves, eye protection, respirators, etc.)?	☐	☐
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?	☐	☐
OCCUPATIONAL NOISE EXPOSURE (29 CFR 1910.95)		
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)?	☐	☐

NIOSH

CHECKLISTS (cont.)

	Yes	No
If engineering controls cannot reduce the noise to safe levels:		
1. Have administrative controls, such as limiting worker-exposure in a given area, been started?	☐	☐
2. Are affected employees given annual audiometric tests, if necessary?	☐	☐
3. Do all employees in high-noise areas wear hearing protection?	☐	☐
4. Are annual noise surveys made to re-evaluate the problem?	☐	☐

HAZARDOUS MATERIALS

FLAMMABLE AND COMBUSTIBLE LIQUIDS (29 CFR 1910.106)

Are all connections on drums and combustible liquid piping vapor and liquid tight?	☐	☐
Are flammable liquids kept in closed containers when not in use (e.g., parts cleaning tanks, pans, etc.)?	☐	☐
Are all spills of flammable or combustible liquids cleaned up promptly?	☐	☐
Is combustible waste material (oily rags, etc.) stored in covered metal receptacles and disposed of daily?	☐	☐
Are bulk drums of flammable liquids grounded and bonded to containers during dispensing?	☐	☐

NIOSH

CHECKLISTS (cont.)

	Yes	No
Are gasoline and other flammable liquids stored in approved containers?	☐	☐
Do storage rooms for flammable and combustible liquids have explosion-proof lights?	☐	☐
Do storage rooms for flammable and combustible liquids have mechanical or gravity ventilation (at least six air changes per hour)?	☐	☐
Are storage cabinets for flammable liquids labeled "FLAMMABLE–KEEP FIRE AWAY"?	☐	☐
Is there never more than one day's supply of flammable liquids outside of approved storage cabinets or rooms?	☐	☐
PERSONAL PROTECTIVE EQUIPMENT (29 CFR 1910.132-137)		
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 and used where debris or flying objects could be a hazard?	☐	☐
Are ear plugs or muffs available and worn during noisy conditions?	☐	☐
Is slip-resistant footwear worn?	☐	☐

NIOSH

CHECKLISTS (Cont.)

	Yes	No
Are hard hats or safety shoes available where falling objects could be a hazard?	☐	☐
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?	☐	☐
Is the user instructed and trained in the proper use of respirators?	☐	☐
Where practicable, are respirators assigned for use by employees individually?	☐	☐
Are respirators cleaned and disinfected after use?	☐	☐
Are respirators stored in a convenient, clean, and sanitary location?	☐	☐
Are routinely-used respirators inspected during cleaning?	☐	☐
GENERAL ENVIRONMENTAL CONTROLS		
SANITATION (29 CFR 1910.141-149)		
Are restrooms and washrooms kept in clean and sanitary condition?	☐	☐
Are covered receptacles for sanitary napkins provided in the women's restroom?	☐	☐

NIOSH

CHECKLISTS (cont.)

	Yes	No
Are covered receptacles for waste food kept in clean and sanitary condition?	☐	☐
Is all water that is provided for drinking, washing, and cooking, suitable for drinking?	☐	☐
Are all outlets for water that is not suitable for drinking, clearly posted as "UNSAFE FOR DRINKING, WASHING, OR COOKING"?	☐	☐
Are employees prohibited from eating in areas where toxic materials are present?	☐	☐
Has pest control been exercised?	☐	☐
If employees are permitted to eat on the premises, are they provided with a suitable space for that purpose?	☐	☐

MEDICAL AND FIRST AID (29 CFR 1910-151)

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?	☐	☐

NIOSH

CHECKLISTS (cont.)

	Yes	No
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?	☐	☐

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	☐	☐
Are extinguishers fully charged and in their 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 five feet above floor-greater than 40 pounds, the top must not be higher than 3½ feet above floor.	☐	☐

NIOSH

CHECKLISTS (cont.)

	Yes	No
Have all extinguishers been serviced, maintained, and tagged at intervals not to exceed one 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?	☐	☐
AUTOMATIC SPRINKLER (if applicable)		
Is there at least one automatic water supply of adequate pressure, capacity, and reliability?	☐	☐
Are water-flow alarms provided on all sprinklers?	☐	☐
Are the sprinkler systems periodically inspected and continuously maintained?	☐	☐
Is combustible material never piled within 36 inches of the sprinkler system except as mentioned below? 1. Solid piles 15 feet high or in piles 12 feet high with horizontal channels. 2. Commodities containing only small amounts of combustible material.	☐	☐
Is the storage of material, mentioned in No's. 1 and 2 above, never piled next to lights or within 18 inches of the sprinkler system?	☐	☐

NIOSH

CHECKLISTS (cont.)

	Yes	No
DRY CHEMICAL SYSTEMS (if applicable)		
Does a competent inspector make annual inspections and perform tests on all dry chemical systems?	☐	☐
Are the inspector's reports kept on file?	☐	☐
Are visual inspections regularly made?	☐	☐
Are all dry chemical systems maintained in full operating condition at all times?	☐	☐
COMPRESSED AIR (29 CFR 1910.169)		
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?	☐	☐

NIOSH

CHECKLISTS (cont.)

MATERIALS HANDLING AND STORAGE (29 CFR 1910.176-181)

	Yes	No
Is there safe clearance for equipment through aisles and doors?	☐	☐
Is stored material stable and secure?	☐	☐
Are storage areas free from tripping hazards?	☐	☐
Are only trained operators allowed to operate powered lift trucks?	☐	☐
Are appropriate overhead guards installed on powered lift trucks?	☐	☐
Is battery charging on electric units performed only in designated areas?	☐	☐
Are "NO SMOKING" signs posted near electric battery charging units?	☐	☐
Are dock boards (bridge plates) used when loading or unloading from dock to truck or dock to rail car?	☐	☐
Are containers of combustibles or flammables, when stacked one upon the other, always separated by dunnage sufficient to provide stability?	☐	☐

NIOSH

CHECKLISTS (cont.)

	Yes	No
Are racks and platforms loaded wtihin the limits of their capacity?	☐	☐
Is all storage secured against sliding or collapsing?	☐	☐
Are all vehicles shut off prior to loading?	☐	☐
Have aisles been designated and kept clear to allow unhindered passage?	☐	☐
If motorized equipment, such as lift trucks, is used, are aisles permanently marked, providing sufficient clearance for passage of the equipment?	☐	☐
Are specifications posted for maximum loads which are approved for floors (except slabs with no basements), roof of a building, or some other structure?	☐	☐

MACHINE AND MACHINE GUARDING (29 CFR 1910.212)

Are belts, pulleys, and rotating shafts of powered machinery properly guarded?	☐	☐
Are chains, sprockets, and gears properly guarded?	☐	☐
Are all in-going nip points (e.g., rollers, cylinders) properly guarded?	☐	☐
Are rotating shafts that are not smooth properly guarded?	☐	☐

NIOSH

CHECKLISTS (cont.)

	Yes	No
Are all rotating parts (lubrication, fittings, etc.) recessed or covered with collars?	☐	☐
Are all pieces of equipment with an electric motor or any electrical connection effectively grounded?	☐	☐
Are sprockets and V-belt drives within reach of platforms and passageways or less than seven feet from the floor completely enclosed?	☐	☐
Are fans less than seven feet above floor guarded, having openings ½ inch or less?	☐	☐
ABRASIVE WHEEL MACHINERY (Grinders) (29CFR 1910.215)		
Is the work rest used and kept adjusted to within 1/8 inch of wheel?	☐	☐
Is the adjustable tongue on top side of grinder used and kept adjusted to within ¼ inch of wheel?	☐	☐
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?	☐	☐

NIOSH

CHECKLISTS (Cont.)

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

	Yes	No
Are tools and equipment (both company and employee-owned) in good condition?	☐	☐
Have mushroomed heads on chisels, punches, etc. been reconditioned or replaced if necessary?	☐	☐
Have broken hammer handles been replaced?	☐	☐
Have worn or bent wrenches been replaced?	☐	☐
Has compressed air used for cleaning been reduced to 30 psi when 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?	☐	☐
Have deteriorated air hoses been replaced?	☐	☐
Are portable abrasive wheels appropriately guarded?	☐	☐
Have employees been made aware of the hazards caused by faulty or improperly used hand tools?	☐	☐

NIOSH

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 five 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?	☐	☐

NIOSH

CHECKLISTS (cont.)

NATIONAL ELECTRICAL CODE
ELECTRICAL WIRING

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

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CHECKLISTS (cont.)

	Yes	No
Are flexible cords and cables fastened so that there is no direct pull on joints or terminal screws?	☐	☐
Are flexible cords and cables never substituted for fixed wiring?	☐	☐
Are flexible cords and cables not attached to building surfaces?	☐	☐

RECORDKEEPING (29 CFR 1904.2-.8)

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

NIOSH

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
- ☐ NFPA-17-1969 Dry Chemical Extinguishing Systems
- ☐ NFPA-70-1971 National Electric Code

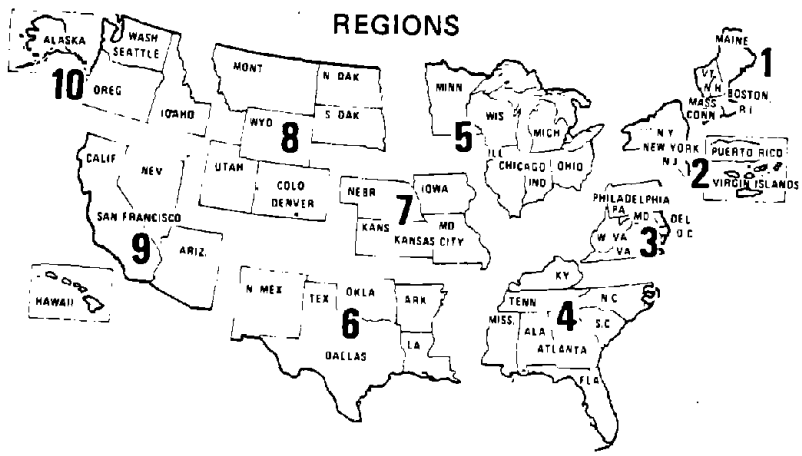
NATIONAL SAFETY COUNCIL
425 North Michigan Avenue
Chicago, Illinois 60611

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 AND OSHA REGIONAL OFFICES

The following pages list NIOSH and OSHA regional offices which 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 publications.



NIOSH REGIONAL OFFICES

DHEW, Region I
Government Center (JFK Fed. Bldg.)
Boston, Massachusetts 02203
Tel.: 617/223-6668/9

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.: 215/596-6716

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.: 312/886-3651

DHEW, Region VI
1200 Main Tower Building, Room 1700-A
Dallas, Texas 75245
Tel.: 214/655-3081

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 (223 FOB)
San Francisco, California 94102
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
JFK Building, Room 1804
Boston, Massachusetts 02203 ..... Telephone: 617/223-6712/3

Region II
U.S. Department of Labor
Occupational Safety and Health Administration
1515 Broadway (1 Astor Plaza), Room 3445
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: 215/596-1201

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
230 S. Dearborn, 32nd Floor
Chicago, Illinois 60604 ..... Telephone: 312/353-4716/7

Region VI
U.S. Department of Labor
Occupational Safety and Health Administration
555 Griffin Square Building, Room 602
Dallas, Texas 75202 ..... Telephone: 214/749-2477/8/9 or 2567

Region VII
U.S. Department of Labor
Occupational Safety and Health Administration
Federal Building, Room 3000, 911 Walnut Street
Kansas City, Missouri 64106 ..... Telephone: 816/374-5861

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
6048 Federal Office Building, 909 First Avenue
Seattle, Washington 98174 ..... Telephone: 206/442-5930

☆ U.S. GOVERNMENT PRINTING OFFICE: 1976—657-692

KIND OF FIRE

DECIDE THE CLASS OF FIRE YOU ARE FIGHTING. . .

. . .THEN CHECK THE COLUMNS TO THE RIGHT OF THAT CLASS

APPROVED TYPE IF EXTINGUISHER

MATCH UP PROPER EXTINGUISHER WITH CLASS OF FIRE SHOWN AT LEFT

FOAM	CARBON DIOXIDE	SODA-ACID	PUMP TANK	GAS CARTRIDGE	MULTI-PURPOSE DRY CHEMICAL	ORDINARY DRY CHEMICAL
Solution of Aluminum Sulphate and Bicarbonate of Soda	Carbon Dioxide Gas Under Pressure	Bicarbonate of Soda Solution and Sulphuric Acid	Plain Water	Water Expelled by Carbon Dioxide Gas		
USE	X	USE	USE	USE	USE	X
X	X	X	X	X	USE	USE
X	USE	X	X	X	USE	USE

CLASS A FIRES — USE THESE EXTINGUISHERS

ORDINARY COMBUSTIBLES
- WOOD
- PAPER
- CLOTH

ETC.

CLASS B FIRES — USE THESE EXTINGUISHERS

FLAMMABLE LIQUIDS, GREASE
- GASOLINE
- PAINTS
- OILS, ETC.

CLASS C FIRES — USE THESE EXTINGUISHERS

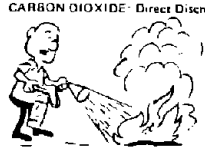
ELECTRICAL EQUIPMENT
- MOTORS
- SWITCHES

ETC.

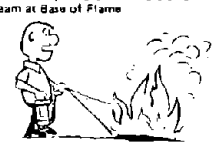
HOW TO OPERATE

FOAM: Don't Play Stream into the Burning Liquid. Allow Foam to Fall Lightly on Fire.

CARBON DIOXIDE: Direct Discharge as Close to Fire as Possible. First at Edge of Flames and Gradually Forward and Upward



SODA-ACID, GAS CARTRIDGE: Direct Stream at Base of Flame



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 MAY BE DANGEROUS

NATIONAL INSTITUTE FOR OCCUPATIONAL SAFETY AND HEALTH

HOW TO LIFT SAFELY

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

The factors that contribute to safe lifting are...

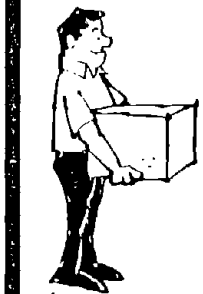
1. Approach the load and size it up (weight, size and shape). Consider your physical ability to handle the load.

2. Place the feet to the object 6 to 12 inches 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*.

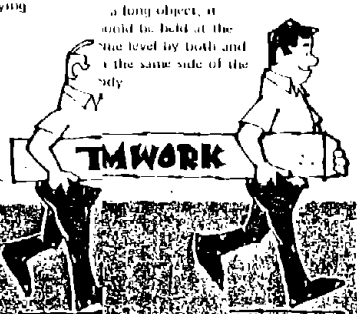
7. Setting the load down, is just as important as picking it up. Using leg and back muscles, comfortably lower load by bending your knees. When load is securely positioned, release your grip.

DETERMINE IF HELP CAN BE HAD EARLIER

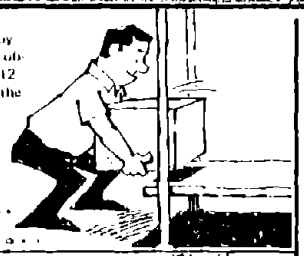
Stack material in such a manner as to permit full view while carrying.

Weight and carrying with another person's work is important. The load be equally distributed. Movements must be coordinated so you can avoid finish the lift action at the same and perform turning movements together.

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



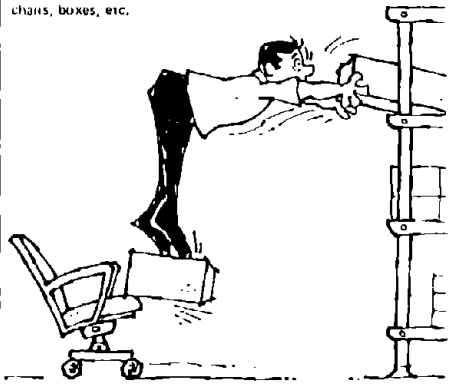
Avoid strain by storing heavy objects at least 12 inches above the floor.



Avoid *awkward positions* or twisting movements while lifting.

Over-reaching and stretching to reach overhead objects *may result in strains or falls*.

Use a ladder instead of chairs, boxes, etc.



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. _____