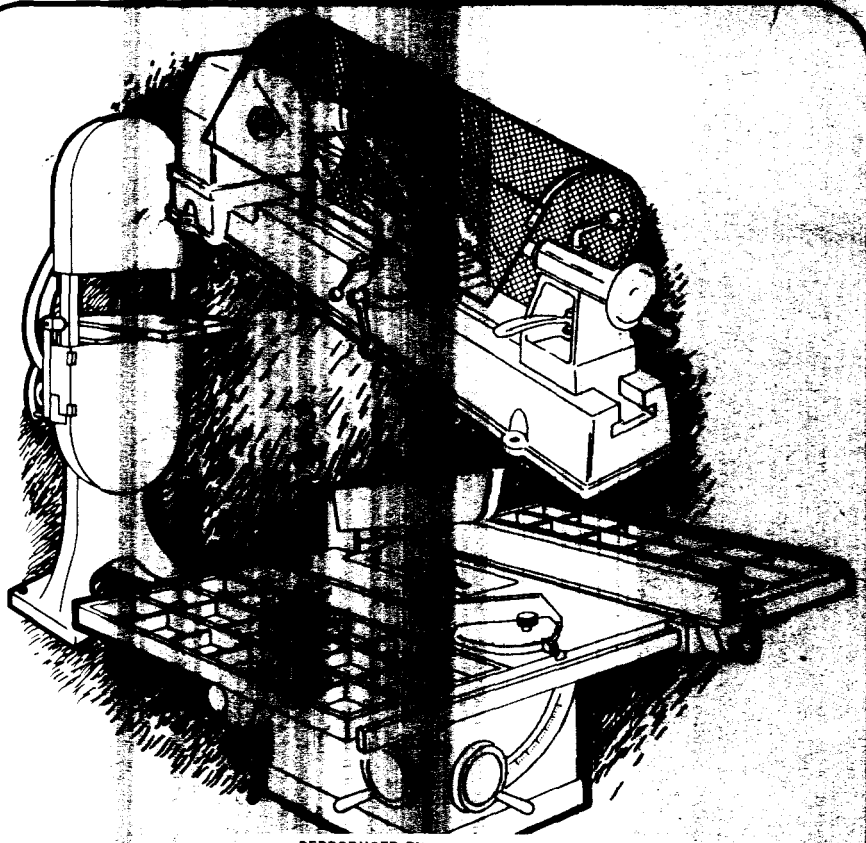
NIOSH

HEALTH AND SAFETY GUIDE FOR MILLWORK SHOPS



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

NIOSH

HEALTH AND SAFETY GUIDES

- ☐ Bulk Petroleum Plants, Pub. No. 76-118
- ☐ Grocery Stores, Pub. No. 75-134
- ☐ Retail Bakeries, Pub. No. 75-135
- ☐ Auto Repair and Body Shops, Pub. No. 75-136
- ☐ Service Stations, Pub. No. 75-139
- ☐ Sporting Goods Stores, Pub. No. 75-141
- ☐ Grain Mills, Pub. No. 75-144
- ☐ Electroplating Shops, Pub. No. 75-145
- ☐ Retail Lumber and Building Materials, Pub. No. 75-146
- ☐ Plastic Fabricators, Pub. No. 75-150
- ☐ Laundries and Dry Cleaners, Pub. No. 75-151
- ☐ Fluid Milk Processors, Pub. No. 75-152
- ☐ The Printing Industry, Pub. No. 75-155
- ☐ Bottled and Canned Soft Drink Facilities, Pub. No. 75-156
- ☐ Food Processors, Pub. No. 75-166
- ☐ Wooden Furniture Manufacturers, Pub. No. 75-167
- ☐ Metal Stamping Operations, Pub. No. 75-174
- ☐ Paint and Allied Products, Pub. No. 75-179
- ☐ Concrete Products Industry, Pub. No. 75-163
- ☐ Paperboard Container Industry, Pub. No. 76-102
- ☐ Hotels and Motels, Pub. No. 76-112
- ☐ Millwork Shops, Pub. No. 76-111
- ☐ Auto and Home Supply Stores, Pub. No. 76-113
- ☐ Farm and Garden Machinery and Equipment Manufacturers, Pub. No. 76-119

Single copies are available from:

Office of Technical Publications
National Institute for
Occupational Safety and Health
Post Office Building
Cincinnati, Ohio 45202

Please include a self-addressed mailing label to assist in answering your request.

NIOSH

HEALTH AND SAFETY GUIDE FOR MILLWORK SHOPS

U.S. DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE
Public Health Service
Center for Disease Control
National Institute for Occupational Safety and Health
Division of Technical Services
Cincinnati, Ohio
December 1975

NIOSH

ACKNOWLEDGMENT

This booklet was prepared by a Task Force in the Division of Technical Services that gathered infromation from state and federal agencies, trade associations, insurance companies, etc., and through in-plant visits by NIOSH personnel. Those contributing to the development of the *"Health and Safety Guide for Millwork Shops"* were: Gerald J. Karches, Director of the Task Force, Arvin G. Apol, and Bobby J. Gunter, Ph.D.

DHEW Publication No. (NIOSH) 76-111

NIOSH

CONTENTS

NIOSH

CONTENTS (cont.)

NIOSH

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", "SHALL", "REQUIRED", and "NECESSARY" 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.

NIOSH

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 when a citation is issued, it is desirable that the employer have demonstrated his willingness to comply with the intent of the law by operating an effective, on-going safety and health program, correcting existing hazards in the workplace, and maintaining records of purchases, installations, and other compliance-promoting activities.

NIOSH

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 in providing 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.

An employee safety committee can provide direct employee involvement in company safety programs.

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

Situations which occur more frequently or 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 hazards.

NIOSH

HEALTH AND SAFETY GUIDELINES (cont.)

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

Safety teams can provide leadership in an emergency.

Management may want to assign responsibilities in the areas of both program development and implementation. Regular meetings or informal discussions can be held to discuss safety promotions, hazards, and injury and illness records. To ensure program success, management leadership is necessary. The person assigned responsibility, for instance the foreman, must be delegated the authority and have management support to carry out the part of the program assigned. Likewise, everyone in the establishment should be aware of the program activities 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.

NIOSH

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 employees authorized to use motorized equipment are thoroughly instructed in its operation and potential hazards.
8. Develop a "good housekeeping" awareness to reduce accidents and to develop the employees' sense of pride in their surroundings. An individual should be assigned responsibility for clean-up.
9. Instruct employees in safe-lifting practices. Such instructions may prevent many injuries. An easily understood chart, HOW TO LIFT SAFELY, is included in the back of this book for posting where it may be seen by employees.

NIOSH

HEALTH AND SAFETY GUIDELINES (cont.)

MACHINE GUARDING

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

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

Machine guarding is extremely important in millwork shops to prevent workers from becoming injured. (See **MACHINE GUARDING.**)

OCCUPATIONAL HEALTH AND ENVIRONMENTAL CONTROL

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

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

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

HEALTH AND SAFETY GUIDELINES (cont.)

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

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

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

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

1. Substitution of less toxic materials.
2. Process change—for example, a change from gas-operated fork lift trucks to electric lift trucks.
3. Isolation—placing the hazardous process in a separate room or in a corner of the building to reduce the number of persons exposed.
4. Administrative controls—limiting the total amount of time an individual is exposed to a health hazard and rotating two or more workers each day.
5. Training and education of employees—employees should be told what hazards they are exposed to and the ways to reduce or limit exposure (see **"Employee Training"**).
6. Personal hygiene—personal hygiene cannot be overemphasized. Persons should wash their hands before eating.

HEALTH AND SAFETY GUIDELINES (cont.)

If chemicals such as caustics, epoxies, and resins, 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, or liquids.

7. Personal protective equipment—such items as respirators, hearing protection devices, protective clothing, and protective equipment (see **"Personal Protective Equipment"**).
8. Ventilation—includes either local exhaust ventilation, where contamination is removed at the point of generation, or general mechanical ventilation (see **"Occupational Health and Environmental Control"**).

GOOD HOUSEKEEPING HELPS PREVENT FIRES

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

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

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

Some common causes of fires in all businesses are:

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

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

NIOSH

HEALTH AND SAFETY GUIDELINES (cont.)

DUST CONTROL

Most dust in a millwork shop is removed by local exhaust systems. However, often there is a considerable accumulation of very fine dust that has settled on rafters and other structural members—especially in areas where sanding is done. Such a situation is potentially hazardous because of the danger of fire and explosion. A flash fire over dust-covered surfaces may be followed by explosions of ever increasing force.

PREVENTING DUST EXPLOSIONS

Employers MUST:

1. Not allow dust to accumulate on equipment.
2. Control ignition sources.
3. Install explosion vents on equipment and buildings.
4. Provide ample fire protection.
5. Instruct employees on the hazards of combustible dust.
6. Provide frequent vacuum cleaning, or the use of soft push brooms.
7. Provide continuous suction to remove fine dust in areas where sanding is performed.
8. Have a proper exhaust system piped to a suitable collector.
9. Never permit compressed air to be used to blow potentially explosive dust.

SAFE SAWING PRACTICES

1. When feeding a table saw, hands MUST be kept out of the line of the cut. Since no guard is entirely foolproof, it could allow a person's hands to follow the stock into the saw. When ripping with the fence gauge near the saw, a push stick MUST always be used to complete the cut.
2. The saw MUST be adjusted to expose the least saw blade area above the table; the lower the blade, the less chance for kickbacks. Hence, it is also good practice to stand out of the line of the stock being ripped. A heavy leather apron or other guard for the abdomen is recommended.
3. **Never saw freehand with a circular table saw.** Such freehand sawing is always dangerous. The stock MUST always

HEALTH AND SAFETY GUIDELINES (cont.)

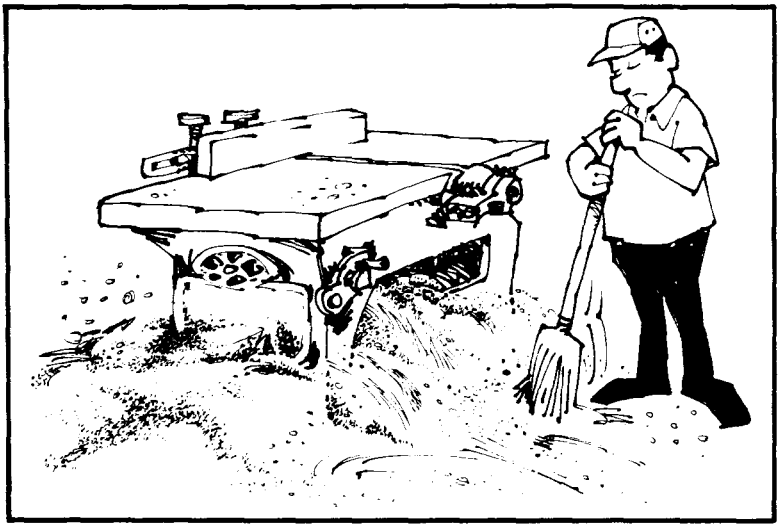
be held against a gauge.

4. The saw MUST be appropriate for the job. For instance, it is an unsafe practice to rip with a crosscut saw or to crosscut with a rip saw.
5. The dangerous practice of removing a hood guard because of narrow clearance on the gauge-side can be avoided by clamping a filler board to the table between the gauge and the saw and using it to guide the stock.
6. Crosscutting long boards on a table saw should be avoided because the operator is required to use considerable hand pressure near the saw blade. Also, boards extending beyond the table may be struck by people or trucks. Long stock should be crosscut on a swing pull saw.
7. Work that should be done on special power-fed machines should not be done on general purpose hand-fed machines.
8. To set the table saw gauge without taking off the guards, a permanent mark should designate the line of cut on the table top.
9. The saw or fence gauge should never be adjusted while the saw is running.
10. A brush or stick should be used to clean sawdust and scrap from a saw.

NIOSH

FREQUENTLY VIOLATED REGULATIONS

WALKING AND WORKING SURFACES



GENERAL REQUIREMENTS

1. The workplace MUST be maintained clean, orderly, sanitary, and, as far as possible, in a dry condition. Spills should be cleaned up promptly.
2. Areas which are constantly wet should have nonslip surfaces where personnel normally walk or work.
3. Every floor, working place, and passageway MUST be maintained free from protruding nails, splinters, holes, and loose boards.
4. Where mechanical handling equipment such as lift trucks is used, sufficient safe clearances MUST be provided for aisles at loading docks, through doorways, and wherever turns or passage must be made. Aisles MUST NOT be obstructed.
5. All permanent aisles MUST be easily recognizable. Usually aisles are identified by painting or taping lines on the floor.
6. The floor load capacity is the maximum weight which can be safely supported by the floor, expressed in pounds per square foot. When this information is not available, and when floor load capacity is in doubt, it is suggested that a competent engineer be consulted. These floor load capacities MUST be posted in a readily visible location (except for slab floors with no basements).

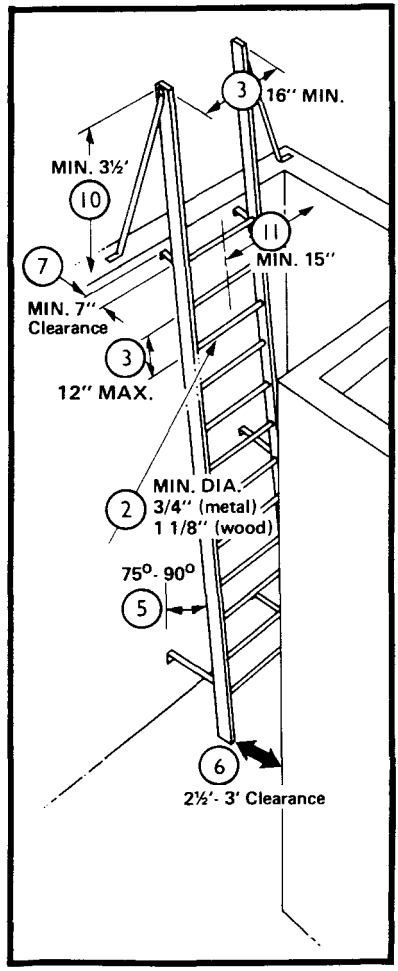
NIOSH

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 inches 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 three 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 longer than 30 feet. 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).



NIOSH

FREQUENTLY VIOLATED REGULATIONS

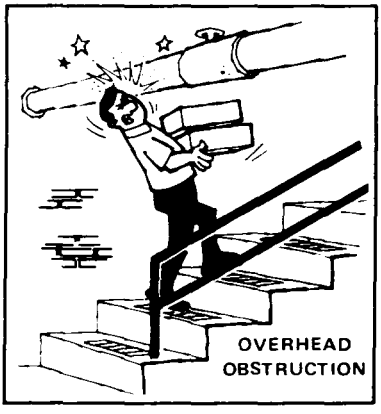
WALKING AND WORKING SURFACES (cont.)

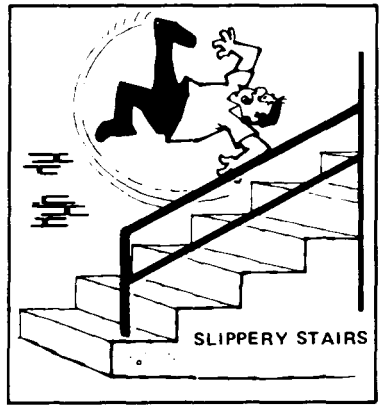
PORTABLE LADDERS:

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

FIXED INDUSTRIAL STAIRS:

1. 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.





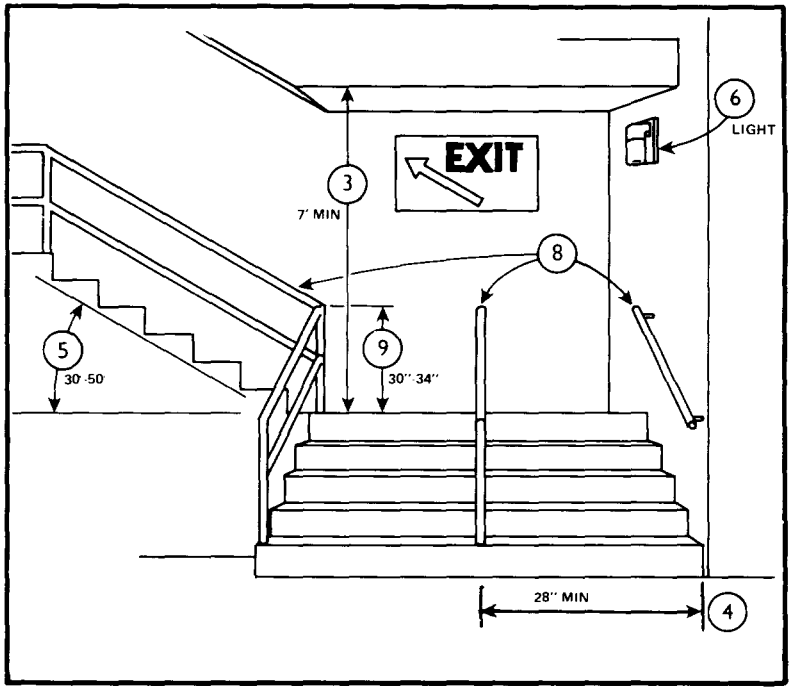
4. The MINIMUM PERMISSIBLE width is 22 inches (if a means of exit access, at least 28 inches).

NIOSH

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. If the flight of stairs has four or more risers:
   a. a stair railing on each open side is REQUIRED.
   b. a hand rail on each enclosed side is REQUIRED if greater than 44 inches wide.
   c. and both sides are enclosed on a stairway less than 44 inches wide, at least one handrail is REQUIRED, preferably on the right side descending.
   d. and if the stairway is 88 or more inches wide, an intermediate stair railing located midway is REQUIRED.
9. The vertical height of the railing MUST be 30 to 34 inches and of construction similar to the standard railing described later in this section.



NIOSH

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" 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:**

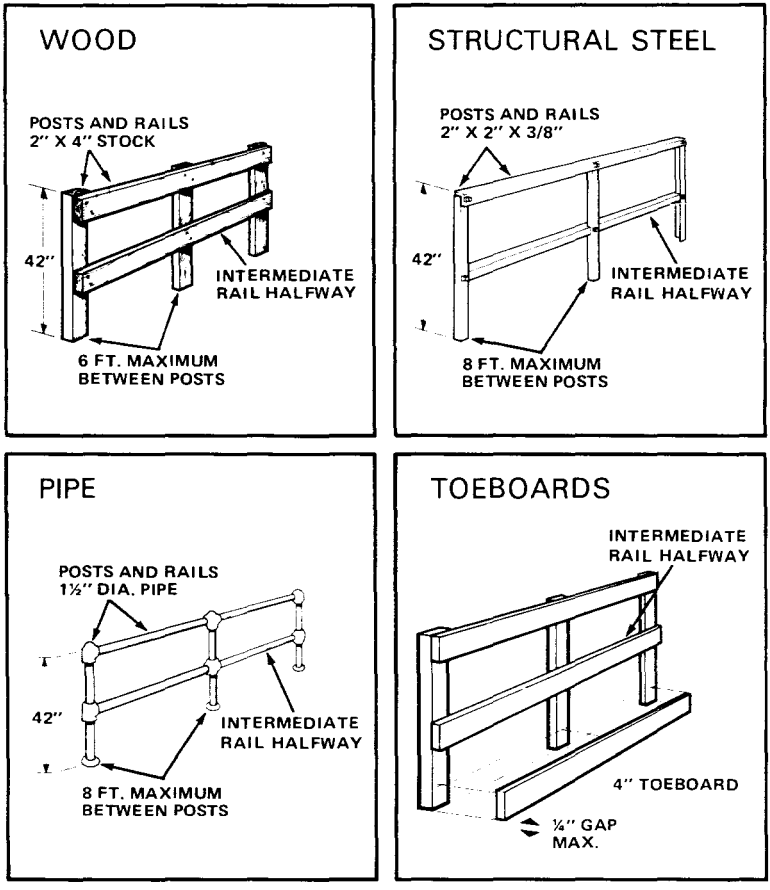
1. Every open-sided floor or platform four feet or more above the adjacent floor or ground level MUST be railed on all open sides except where there is entrance to a ramp, stairway, or fixed ladder.
2. Every stairway floor opening MUST be guarded on all exposed sides except the entrance to the stairway.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

NIOSH

FREQUENTLY VIOLATED REGULATIONS

WALKING AND WORKING SURFACES (cont.)

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



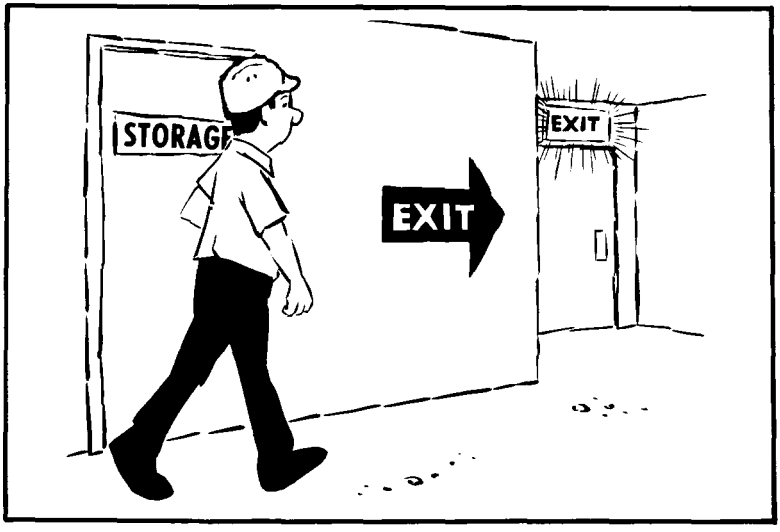
NIOSH

FREQUENTLY VIOLATED REGULATIONS

EXITS AND EXIT MARKING

EXITS AND EXIT MARKINGS

1. Every exit MUST have the word "EXIT" in plain legible letters not less than six inches high with the strokes of the letters not less than ¾ inches wide.
2. Doors, passageways, or stairways which are neither exits nor ways to an exit, but may be mistaken for an exit, MUST be clearly marked "NOT AN EXIT" or MUST be marked by a sign indicating their actual use e.g., "STORAGE ROOM" or "TO BASEMENT".



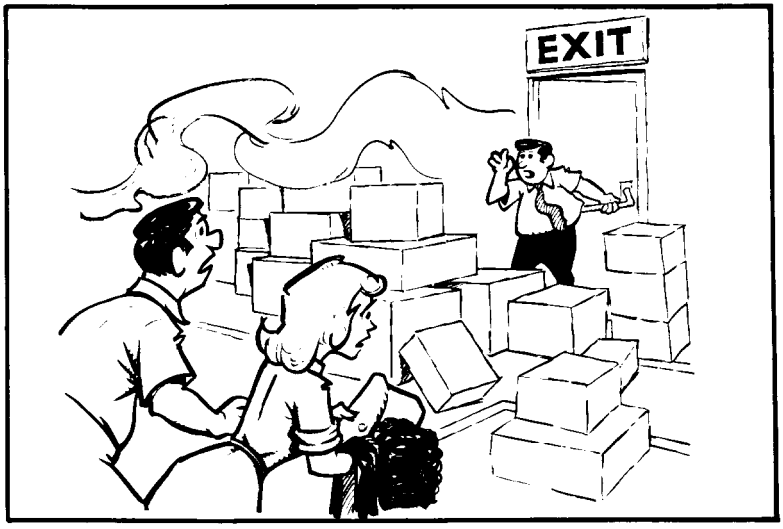
3. When the direction to the nearest exit may not be apparent to an occupant, an exit sign with an arrow indicating direction MUST be used.
4. Exit access MUST be arranged so that it is unnecessary to travel toward any area of high hazard potential in order to reach the nearest exit (unless the path 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.

NIOSH

FREQUENTLY VIOLATED REGULATIONS

EXITS AND EXIT MARKING (cont.)

6. A door from a room to an exit or to a way of exit access MUST be of the side-hinged swinging type. It MUST swing out in the direction of travel if:
   a. 50 or more persons occupy the room or
   b. the exit is for an area of high hazard potential.



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

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

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

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

NIOSH

FREQUENTLY VIOLATED REGULATIONS

OCCUPATIONAL HEALTH AND ENVIRONMENTAL CONTROL

Persons involved in millwork are subject to exposures to numerous gases, dust, and noise that may produce occupational illness or injury.

Millwork shops vary greatly. However, the following potential hazards may be found in most millwork shops:

DUST

Wood dust, if not removed at the source of generation, can present a health hazard. Some dusts are toxic or cause allergic responses in workers. Excessive dust makes good housekeeping difficult and also increases the fire potential.

The best control for wood dust is local exhaust ventilation with subsequent collection by cyclones or bag houses.

If local exhaust ventilation is installed, the following items should be accomplished:

1. The duct velocity should be maintained at a minimum of 3500 feet per minute to prevent dust from accumulating and plugging the system.
2. The ducts should be checked and cleaned at regular intervals.
3. If a bag house is used, it should be shaken regularly.
4. Check V-belts on the drive units of the exhaust fan for slippage or breakage.
5. Check for loose, damaged, or broken ducts.

Respirators may be worn by individuals to prevent inhalation of the wood dust. For more information regarding respirators (see **"Personal Protective Equipment"**).

CARBON MONOXIDE

Gasoline or propane-powered fork lifts emit carbon monoxide. Adequate ventilation MUST be provided to ensure that hazardous levels are not present.

Space heaters should be inspected to make sure the vent is not blocked.

NIOSH

FREQUENTLY VIOLATED REGULATIONS

OCCUPATIONAL HEALTH AND ENVIRONMENTAL CONTROL (cont.)

GLUES AND EPOXIES

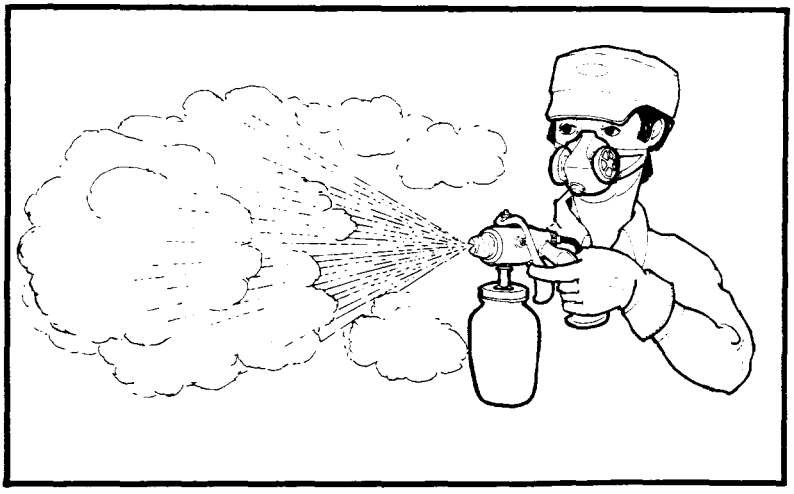
Millwork shops using glues and epoxies should be aware that these compounds cause skin irritation. Good personal hygiene will prevent most skin irritations.

PAINTS, LACQUERS, STAINS, AND SOLVENTS

Thinners used in most paints will have a narcotic effect on workers and on a long-term basis may cause irreparable liver and lung damage. In addition to ventilation in the spray area or paint booth, respirators should be worn (see respirators under "PERSONAL PROTECTIVE EQUIPMENT").

Some of the newer paints contain hardeners and other additives that can cause skin rashes and dermatitis.

Do not permit the painters to wash their hands in the thinners because they take the fats out of the skin and increase the chance for skin rashes and can, in some cases, be absorbed through the skin. Solvent resistant gloves and long sleeved shirts worn while painting will prevent the paints or stains from contacting the skin in those areas. If paints or stains do get on the skin they should be removed by using waterless hand cleaners.



NIOSH

FREQUENTLY VIOLATED REGULATIONS

OCCUPATIONAL HEALTH AND ENVIROMENTAL CONTROL (cont.)

OCCUPATIONAL NOISE EXPOSURE

Excessive noise is one of the most commonly violated standards and can cause permanent hearing damage. To protect employees it is management's responsibility to make sure they are not exposed to noise levels in excess of the standards. The current standard is 90 decibels A-weighted (dBA) for an 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 exposures (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.

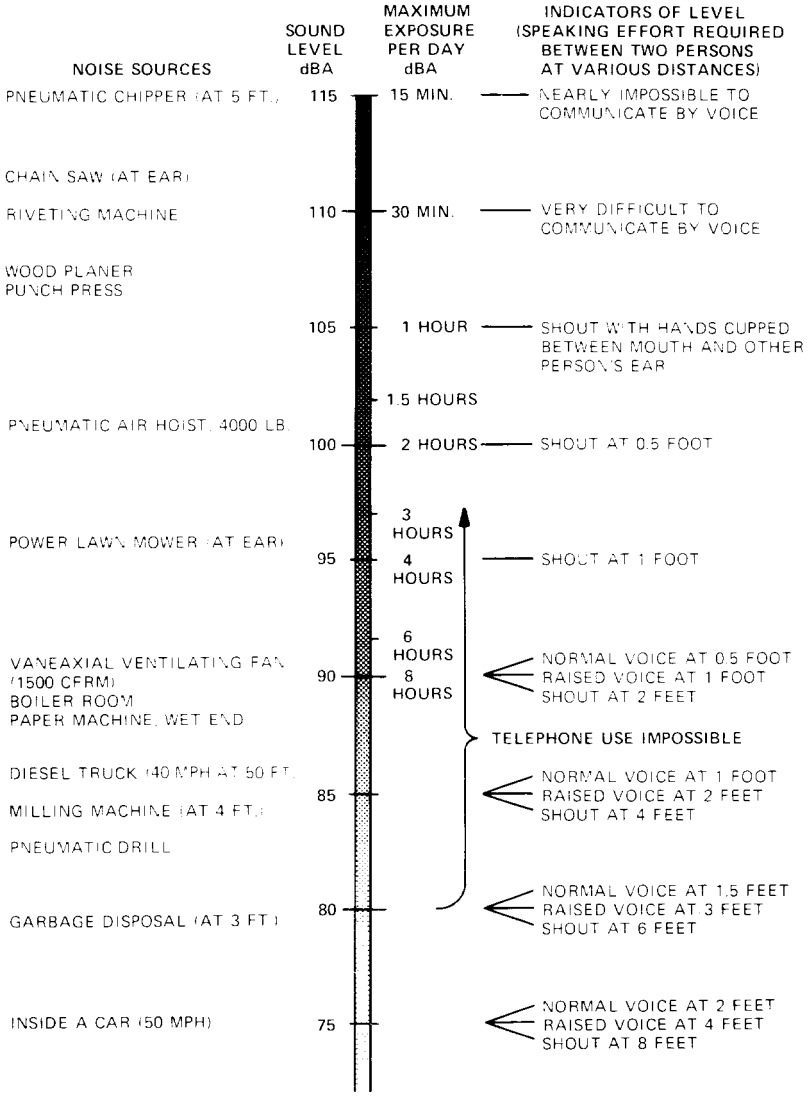
The following table is provided to assist in the evaluation of the noise levels in the workplace. If referral to the table indicates that levels and time of exposure are such that corrective action is needed, it is recommended that professional help be sought to correct the problem. A noise survey by 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

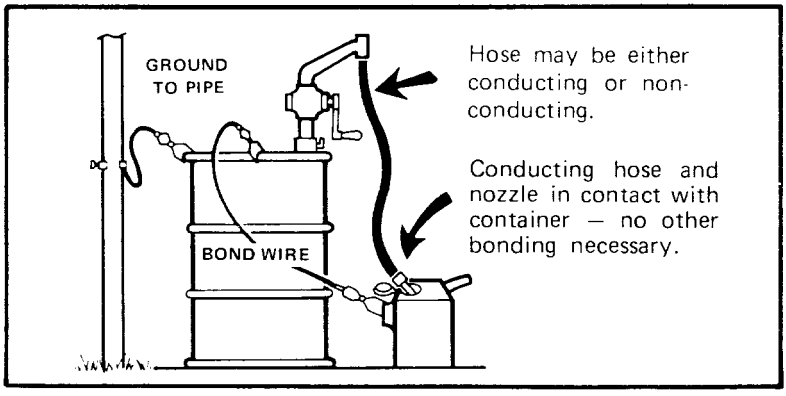
FREQUENTLY VIOLATED REGULATIONS

HAZARDOUS MATERIALS

FLAMMABLE AND COMBUSTIBLE LIQUIDS

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

1. Connections on all drums and piped flammable and combustible liquids MUST be vapor-and-liquid tight.
2. When flammable liquids are transferred from one container to another, for example, from one bulk container to another, 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.
4. Supplies of flammable and combustible liquids MUST be stored in approved fire-resistant safety containers. These containers can be purchased from 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 or paint rags, MUST be stored in covered metal containers and be disposed of daily.

NIOSH

FREQUENTLY VIOLATED REGULATIONS

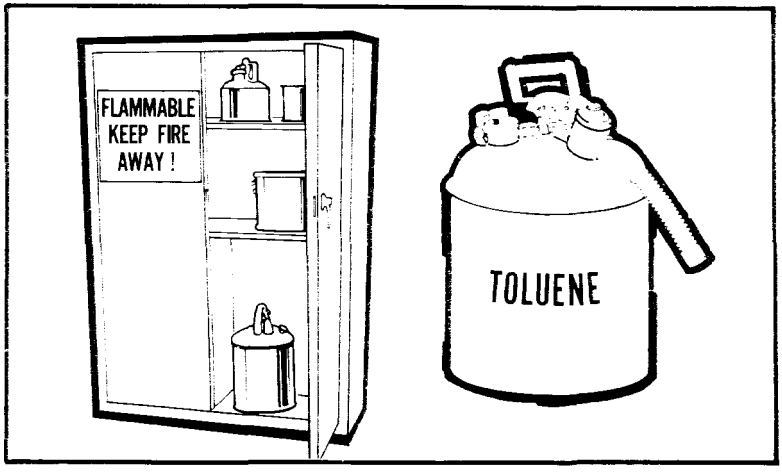
HAZARDOUS MATERIALS (cont.)

Some millwork shops perform their own finishing operations. The finishes include paints, lacquers, thinners, solvents, and other flammable materials.

STORAGE CABINETS

Storage cabinets MUST be distinctly designated "FLAMMABLE—KEEP FIRE AWAY". Storage cabinets MUST meet National Fire Protection Association test requirements. Cabinets constructed in the following manner will meet these requirements:

Metal cabinets—MUST be constructed of at least No. 18 gauge sheet iron, double-walled with tight joints and 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 at least one-inch plywood with rabbetted joints fastened two-directionally with flathead screws.

INSIDE STORAGE

Open flames and smoking MUST NOT be permitted in flammable or combustible liquid storage areas. Openings to other rooms or buildings MUST be provided with noncombustible, liquid-tight, raised sills or ramps at least four inches

HAZARDOUS MATERIALS (cont.)

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 being fueled MUST be turned off while filling.
3. The LP Tank MUST be guarded to protect it from vehicular damage.
4. Electrical connections, pumps, and switches, MUST be vapor-and-explosion proof.

NIOSH

FREQUENTLY VIOLATED REGULATIONS

HAZARDOUS MATERIALS (cont.)

GENERAL SPRAY PAINT OPERATIONS

1. Portable lamps MUST be removed during spraying.
2. Low flash-point thinners (less than 100°F) MAY ONLY BE USED for cleaning purposes if used in a well-ventilated area such as a spray booth.
3. The fire control sprinkler heads MUST be kept clean and free of paint build-up.
4. "NO SMOKING" signs MUST be posted wherever flammable liquids are sprayed or stored.
5. Parts to be painted should be arranged so that overspray and fumes are not drawn through the breathing zone.
6. Protective clothing, such as gloves, apron, and a cloth cap, should be worn.
7. Respirators MUST be cleaned and maintained regularly.
8. There should NEVER be over one day's supply of paint outside of storage rooms or cabinets.

SPRAY AREAS

1. The spray area MUST be at least 20 feet from flames, sparks, non-explosion-proof electric motors, or other ignition sources.
2. The spray area MUST be free from hot surfaces such as heat lamps.
3. Electric lights in the spray area MUST be covered and guarded from accidental breakage.
4. The spray area MUST be kept clean of combustible residue.
5. Mechanical ventilation MUST be provided and operating to remove vapors during the painting.

SPRAY BOOTHS

1. Spray booths MUST be made of metal, masonry, or other suitable noncombustible material and be smooth on the inside to aid in cleaning.

NIOSH

FREQUENTLY VIOLATED REGULATIONS

HAZARDOUS MATERIALS (cont.)

2. Floors and baffles MUST be noncombustible and easily cleaned.
3. Spray-booth lights MUST be explosion proof or enclosed in sealed panels.
4. Ventilation:
   a. Mechanical ventilation MUST be installed and operating during spraying.
   b. The ventilation rate MUST be at least 100 linear feet per minute.
   c. Electric motors for the exhaust fans MUST be outside the booth or ducts and the belts and pulleys fully enclosed.
   d. Air exhausted from the paint booth MUST be discharged outside where it cannot reenter the building.
   e. Ducts connected to the booth MUST have access doors to allow for cleaning.
5. Air supply for paint booths—
   a. Plugged overspray filters MUST be replaced.
   b. When temperatures are below 55°, the make-up air MUST be heated to at least 65°.
   c. The heater for the make-up air MUST be located outside the spray booth.

PAINT DRYING APPARATUS

1. Mechanical ventilation MUST be left on while the paint is drying. A warning sign to this effect MUST be attached to the drying apparatus.
2. The area used for drying with portable heaters or lights MUST be kept clean of overspray products.
3. Heat sources MUST be kept out of the spray area during spray operations.
4. All electrical drying apparatus MUST be properly grounded.

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 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.

EYE PROTECTION

Eye protection is REQUIRED where there is a possibility of an eye injury from flying particles, chips, and corrosive materials. Employees MUST wear eye protection when using grinders, power drills, and other similar equipment.

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.

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.

HEAD PROTECTION

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

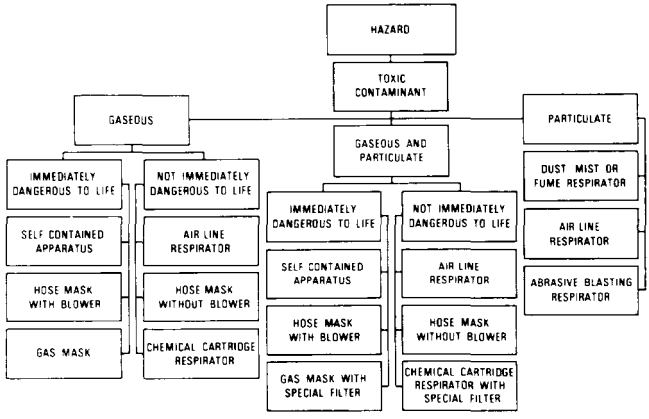
RESPIRATORY PROTECTION

NIOSH-approved respirators MUST be provided by the employer when air is contaminated with harmful dusts,

PERSONAL PROTECTIVE EQUIPMENT (cont.)

fumes, mists, gases, or vapors. When respirators are used a respirator program MUST be established and include the following requirements:

1. Respirators designed to protect against the specific hazards to which the worker is exposed MUST be selected.
2. Written instructions covering selection, cleaning, and use of respirators MUST be available.
3. Employees MUST be trained in the use of respirators, their limitation, proper fitting, and maintenance.
4. Respirators should be cleaned at the end of each day's use. They are taken apart, washed, dried, and defective parts replaced.
5. Two people never wear the same respirator unless it has been cleaned and disinfected between uses.
6. All straps are tied and adjusted.
7. A good face seal—beards, sideburns, glasses may interfere.
8. Filters are replaced when the respirator has been used for the specified lifetime of the cartridge, when an employee can smell vapors in the mask, or when breathing becomes difficult.



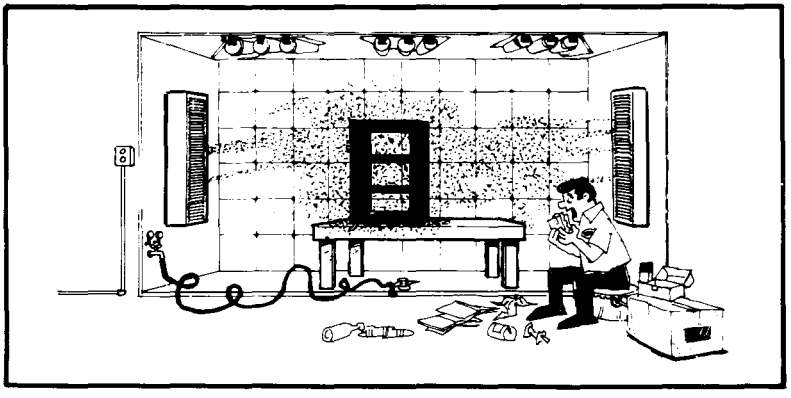
NIOSH

FREQUENTLY VIOLATED REGULATIONS

GENERAL ENVIRONMENTAL CONTROLS

Federal Standards for Occupational Safety and Health which apply to your place of business REQUIRE that:

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.

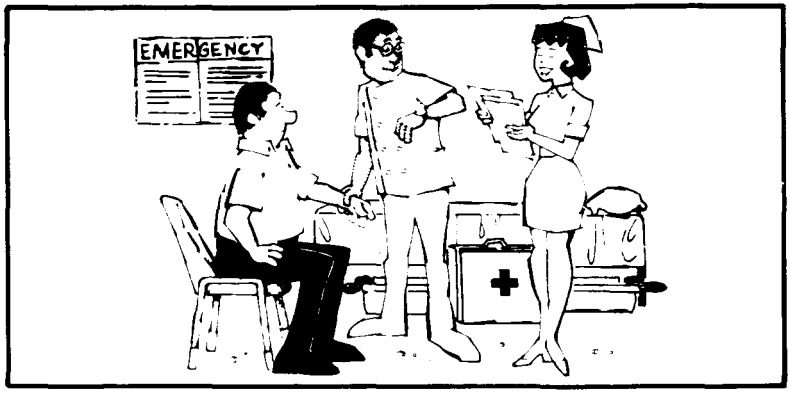
NIOSH

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 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 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 with OSHA approved programs 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.
3. **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.**

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.

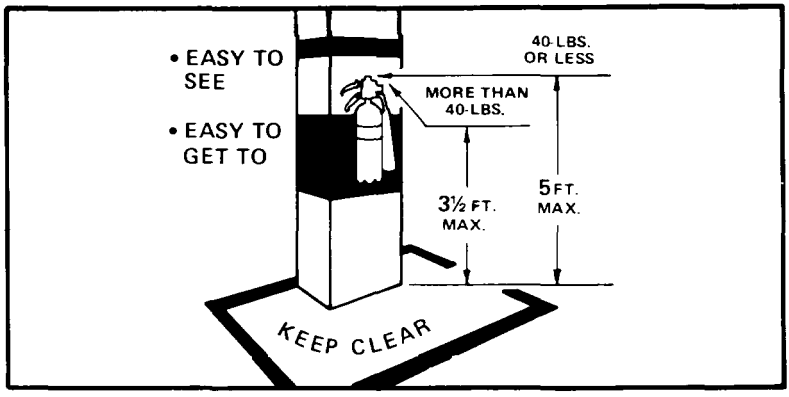
NOTE: *First aid is immediate, temporary treatment given in the event of accident or illness—before the doctor arrives. Immediate first aid (within four minutes) may be the difference between complete recovery, permanent impairment, or DEATH.*

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 5 feet (to the top of the extinguisher) if 40 pounds or less, or 3½ feet if heavier.
5. Be inspected by management or a designated employee at least monthly to insure that they:
   a. Are in their designated places.
   b. Have not been tampered with or actuated.
   c. Do not have corrosion or other impairment.
6. Be inspected at least yearly and 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

FIRE PROTECTION (cont.)

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 are 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 containing only small amounts of combustible material may be stored up to 18 inches from the sprinkler deflector.
5. Alarm systems, audible to all employees, MUST be provided on all automatic sprinkler installations.

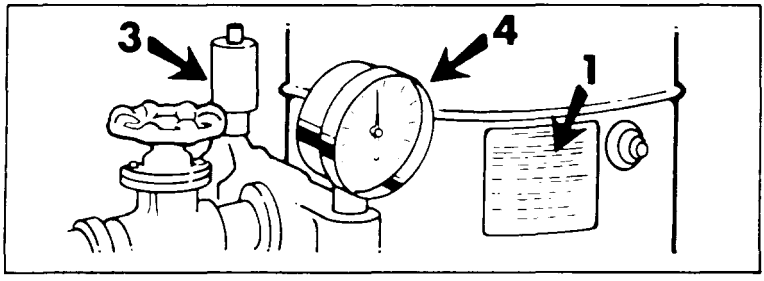
NIOSH

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

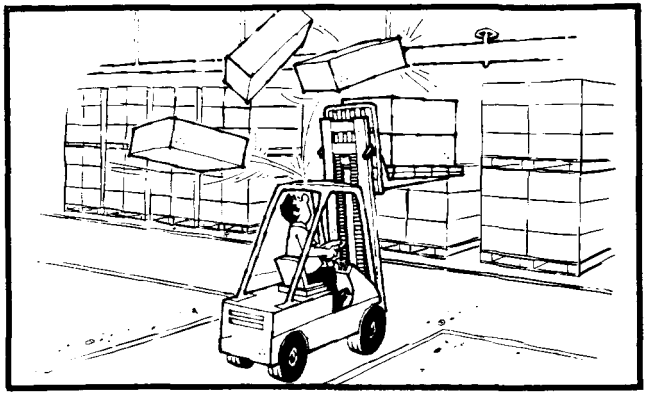
FREQUENTLY VIOLATED REGULATIONS

MATERIALS HANDLING AND STORAGE

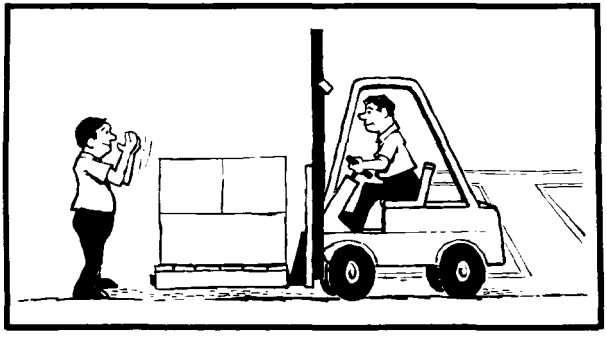
POWERED INDUSTRIAL TRUCKS

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.

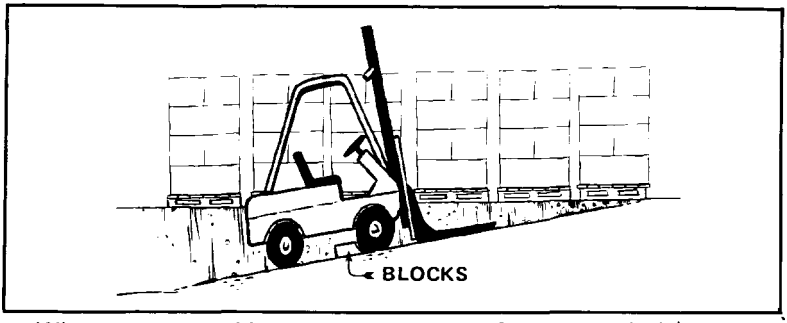
High-lift-rider trucks MUST be fitted with an overhead guard.



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.*

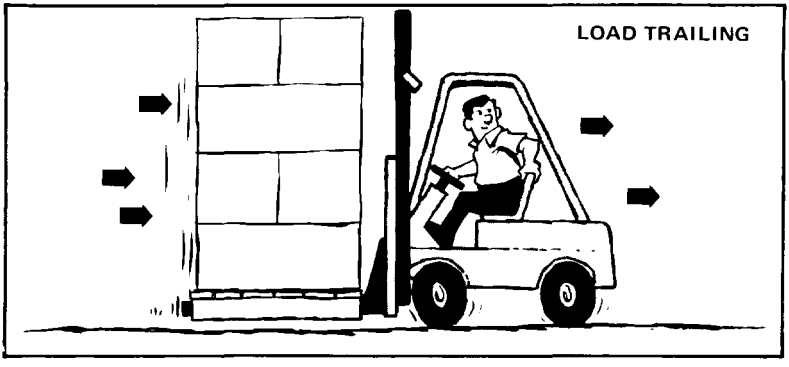


MATERIALS HANDLING AND STORAGE (cont.)



When a powered industrial truck is left unattended (operator 25 feet or more away or truck not in view), the forks MUST be lowered, the control lever positioned in neutral, the power shut off, and the brakes set. The wheels MUST be blocked if parked on an incline.

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.



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

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.

NIOSH

FREQUENTLY VIOLATED REGULATIONS

MATERIALS HANDLING AND STORAGE (cont.)

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

HOISTS

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

1. The rated load MUST be legibly marked on each side of the hoist. Employees should be made aware of the weight of the load.
2. The hoist MUST be equipped with a self-setting brake, applied to the motor shaft or some part of the gear train.
3. For powered hoists, holding brakes MUST be applied automatically when the power is off.
4. Hooks, chains, and all functional operating mechanisms MUST be visually inspected daily for indications 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.

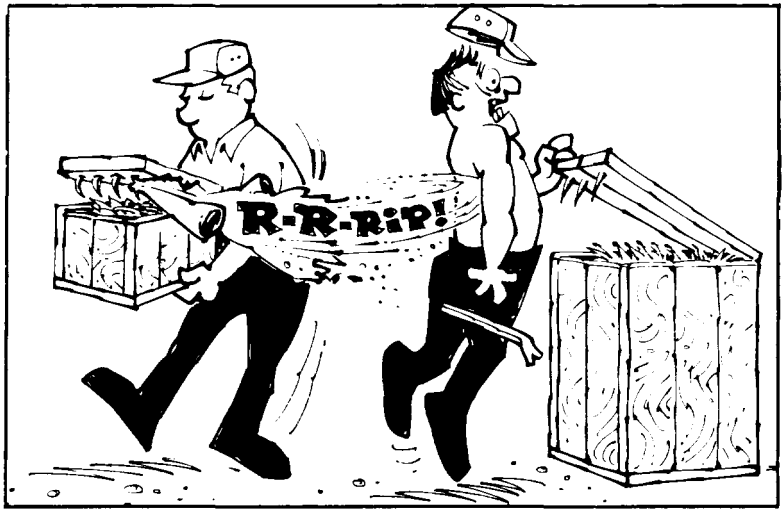
NIOSH

FREQUENTLY VIOLATED REGULATIONS

MATERIALS HANDLING AND STORAGE (cont.)

MATERIALS HANDLING HAZARDS

1. Remove all protruding nails from boxes before unpacking or carrying.



2. Keep scrap lumber clear of operating area.
3. Cylindrical objects that are stored in a horizontal position should be nested and blocked to prevent rolling.
4. Flammable packing materials should be placed in closed metal containers to prevent fire hazards.
5. Enforce "NO SMOKING" regulations in hazardous areas.

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 an OSHA Regional Office listed in the back of this book. Many equipment representatives can assist in obtaining the necessary protective devices.

SPECIALTY EQUIPMENT

Many millwork shops build equipment that is suited to their particular needs. Two important things to remember are adequate guarding of moving parts and complete enclosure if possible.

GENERAL REQUIREMENTS FOR SAFE OPERATION OF WOODWORKING EQUIPMENT

1. **"STOP" SWITCH.** Every machine MUST have a "stop" switch within easy reach of the operator. Machines requiring more than one operator MUST have "stop" switches handy to each operator.
2. **MASTER SWITCH.** Every machine MUST be provided with a means of keeping the machine inoperative while repairs or adjustments are being made. A disconnect switch that can be locked in the "off" position is recommended.
3. **CUTTING TOOLS.** Sharp cutting tools are safer and more efficient. Dull tools tend to "grab" and create a hazardous condition.
4. **GUARDS AND OTHER SAFETY DEVICES.** Safe operation REQUIRES proper guarding of point of operation,

MACHINERY AND MACHINE GUARDING (cont.)

drive train, V-belts, etc., and the proper utilization of all devices and methods promoting safety.

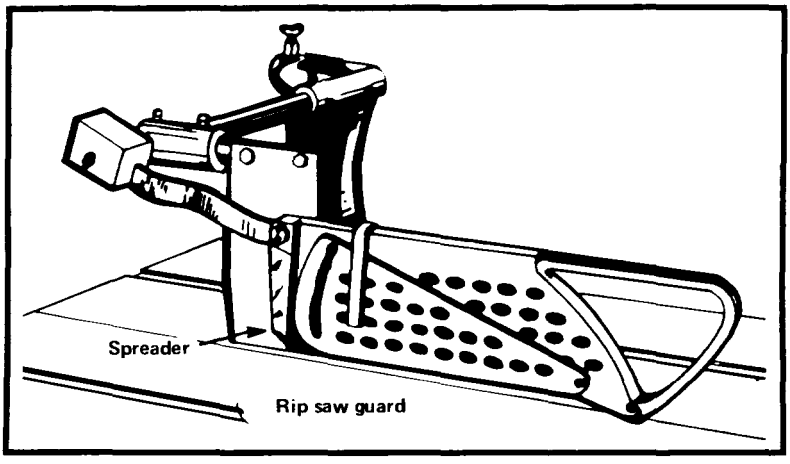
5. **SCRAP AND WASTE.** The working surface of machinery MUST be kept clear of scrap material to prevent possible serious injuries should scrap come in contact with saw or cutter blades.

The following pages contain 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.

SPECIFIC REQUIREMENTS FOR WOODWORKING EQUIPMENT

RIP SAWS

1. Rip saws MUST have a hood that covers the saw at all times, to the depth of the teeth.
2. The hood MUST adjust itself automatically to the thickness of and remain in contact with the material being cut.
3. A spreader and non-kickback device MUST be provided.
4. The exposed part of the saw underneath the table MUST be guarded.



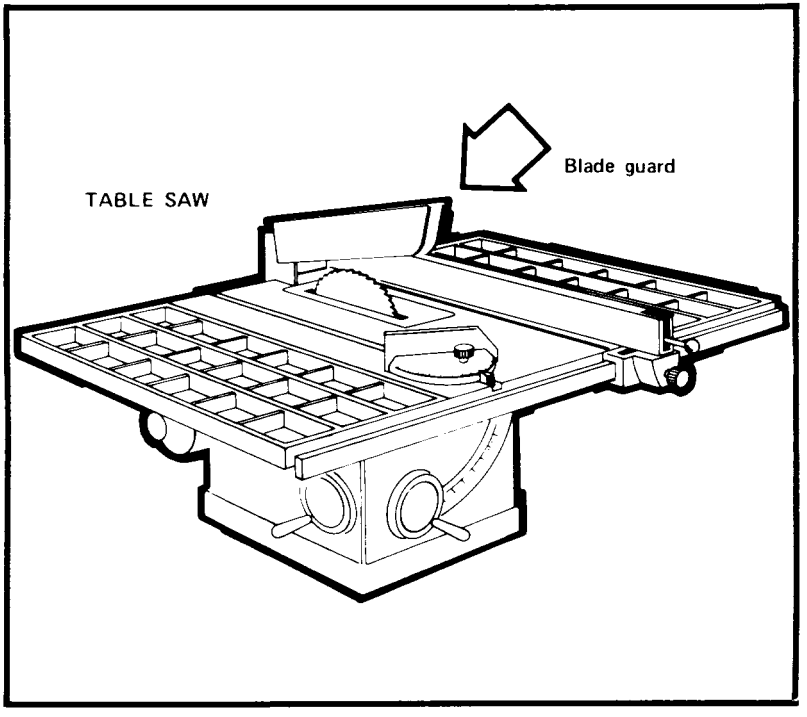
NIOSH

FREQUENTLY VIOLATED REGULATIONS

MACHINERY AND MACHINE GUARDING (cont.)

TABLE SAWS

1. Table saws MUST be provided with a hood that covers the saw at all times.
2. The standard hood guard may be impractical when rabbeting and dadoing. In this case, an effective guarding procedure can be utilized by the use of a jig to hold the work, thereby keeping the hands away from the blade.
3. Table saws do not have to be equipped with a spreader or non-kickback device, unless used as a rip saw.
4. The exposed part of the saw underneath the table MUST be guarded.



NIOSH

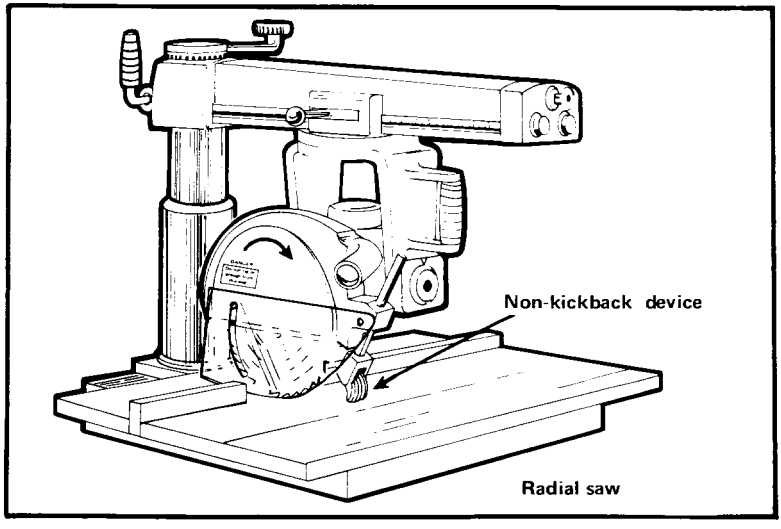
FREQUENTLY VIOLATED REGULATIONS

MACHINERY AND MACHINE GUARDING (cont.)

RADIAL SAWS

MUST be provided with:

1. An upper hood to enclose the top portion of the blade down to a point that will include the end of the saw arbor. The sides of the lower exposed portion of the blade MUST be guarded to the full diameter of the blade by a device that automatically adjusts to the thickness of the stock being cut.
2. Non-kickback dogs on both sides of saw, designed to provide adequate holding power for all thicknesses of material being cut, if used for ripping.
3. An adjustable stop, limiting forward travel of the blade beyond distance necessary to complete cut in repetitive operations.
4. A head which automatically returns to starting position.
5. Marking on hood showing the direction of saw rotation. In addition, a permanent label MUST be affixed to the rear of the guard reading: **"DANGER, DO NOT RIP OR PLOUGH FROM THIS END".**



Radial saw

NIOSH

FREQUENTLY VIOLATED REGULATIONS

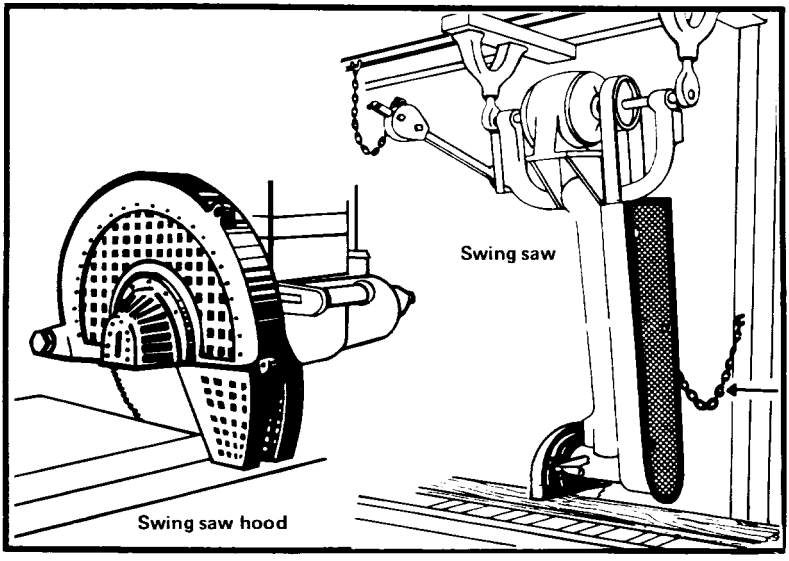
MACHINERY AND MACHINE GUARDING (cont.)

SWING CUTOFF SAWS AND SLIDING CUTOFF SAWS MOUNTED ABOVE THE TABLE

MUST be provided with:

1. A hood completely enclosing the upper half of the saw, the arbor end, and the point of operation at all positions of the saw. The hood MUST be designed to automatically cover the lower part of the blade. When saw is returned to the back of the table, the hood MUST rise on top of the fence. When moved forward, hood MUST drop and remain in contact with top of table or material being cut.
2. An effective device to return the saw automatically to the back of the table when released.
3. Limit chains or other equally effective devices to prevent the saw from swinging beyond the front or back edges of table or beyond a forward position where the gullets of the lowest saw teeth can be above the table top.

(Inverted swing cutoff saws require a hood that covers the portion of the saw protruding above the table or above the material being cut. It MUST automatically adjust to the thickness of, and remain in contact with, the material being cut.)



NIOSH

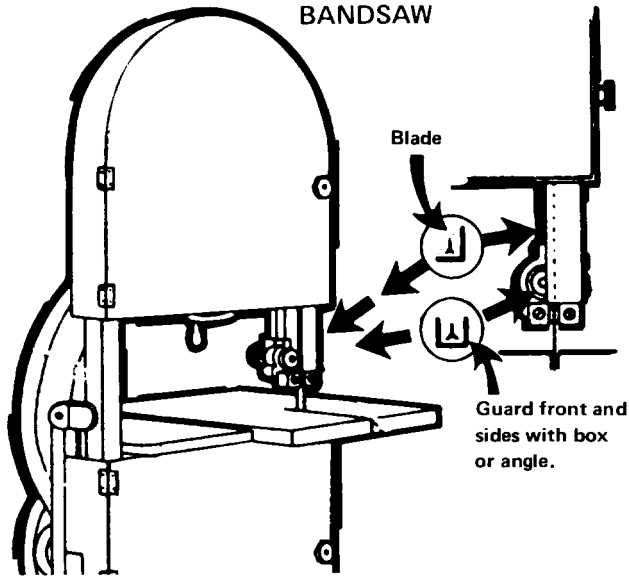
FREQUENTLY VIOLATED REGULATIONS

MACHINERY AND MACHINE GUARDING (cont.)

BANDSAWS AND BAND RESAWS

MUST be provided with:

1. An enclosure for the entire blade except for the working portion of blade.
2. An enclosure for wheels.
3. A tension control device.
4. A suitable guard on in-running feed rolls.



Band or band resaw wheels MUST be completely enclosed and all portions of the blade MUST be guarded, except that portion between the guide rolls and the table.

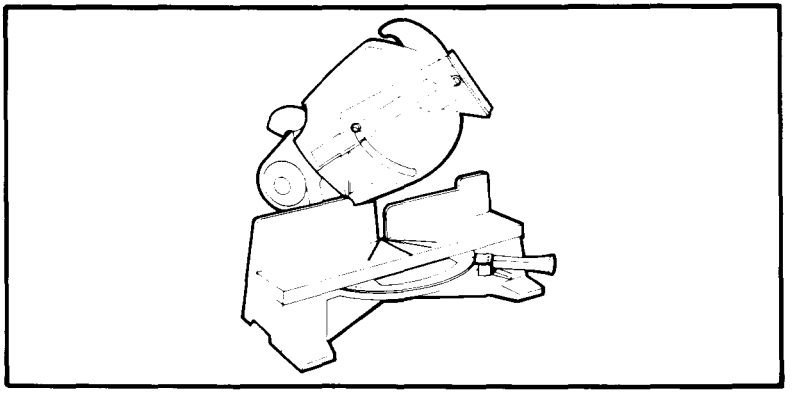
NIOSH

FREQUENTLY VIOLATED REGULATIONS

MACHINERY AND MACHINE GUARDING (cont.)

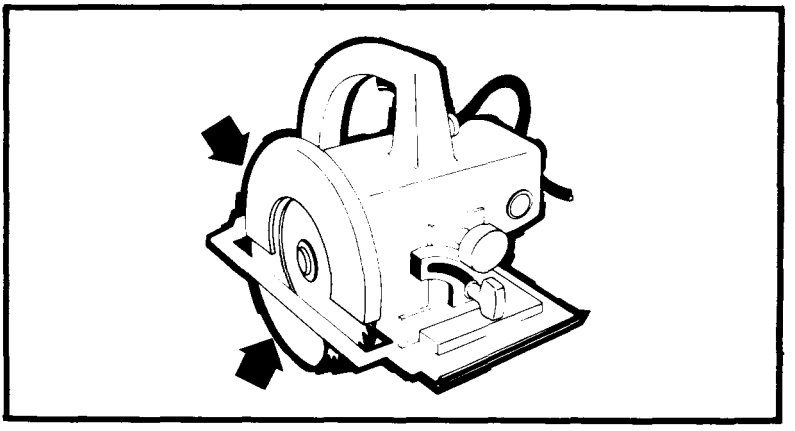
MITER SAWS

1. The hood MUST enclose the upper part of the blade.
2. The lower part of the blade MUST be adequately guarded.



PORTABLE CIRCULAR SAWS

1. The blade MUST be guarded above and below the base plate or shoe.
2. When the saw is withdrawn from the work, the lower guard MUST automatically and instantly return to covered position.
3. The saw MUST be equipped with a dead-man switch.



NIOSH

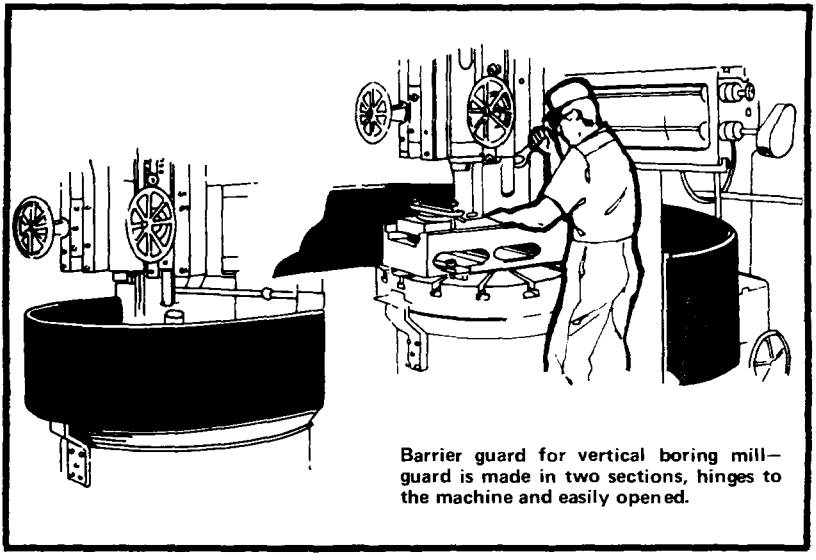
FREQUENTLY VIOLATED REGULATIONS

MACHINERY AND MACHINE GUARDING (cont.)

BORING AND MORTISING MACHINES

Requirements:

1. Safety bit chucks with no projecting setscrews.
2. Boring bits and chuck should be completely enclosed above material being worked.
3. Top of cutting chain and driving mechanism enclosed.
4. Counterweight—acceptable means to prevent its dropping:
   a. Bolt through both bar and counterweight.
   b. Bolt through extreme end of bar.
   c. Safety chain attached if counterweight does not encircle bar.
   d. Counterweight suspended by chain or wire rope, MUST travel in pipe or other enclosure.
5. Universal joints on spindles of boring machines completely enclosed.
6. Foot treadle protected from accidental tripping by inverted U-shaped metal guard.



Barrier guard for vertical boring mill—guard is made in two sections, hinges to the machine and easily opened.

NIOSH

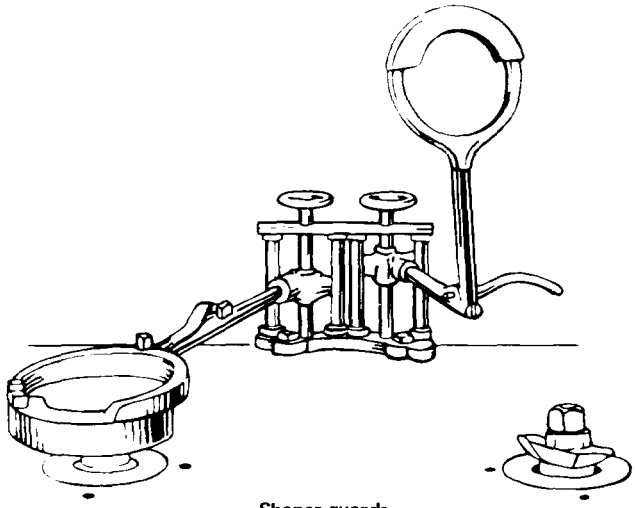
FREQUENTLY VIOLATED REGULATIONS

MACHINERY AND MACHINE GUARDING (cont.)

WOOD SHAPERS AND SIMILAR EQUIPMENT

Requirements:

1. Cutting heads MUST be enclosed with cage or adjustable guard of greater diameter than cutter. Warning devices of leather or other material attached to the spindle are not acceptable.
2. Single cutter knives in shaper heads MUST be properly balanced.
3. Double-spindle shapers REQUIRE a starting and stopping device for each spindle.



Shaper guards

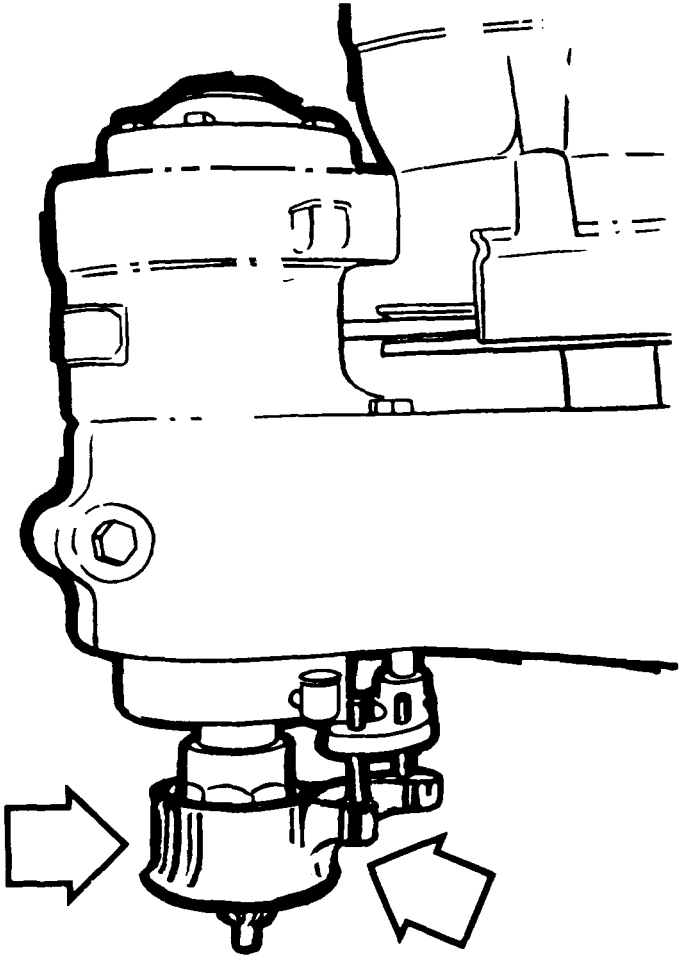
NIOSH

FREQUENTLY VIOLATED REGULATIONS

MACHINERY AND MACHINE GUARDING (cont.)

ROUTER (OTHER THAN HAND HELD)

The tops and sides of the router MUST be covered.



Router. Enclosure covers top and sides of router.

NIOSH

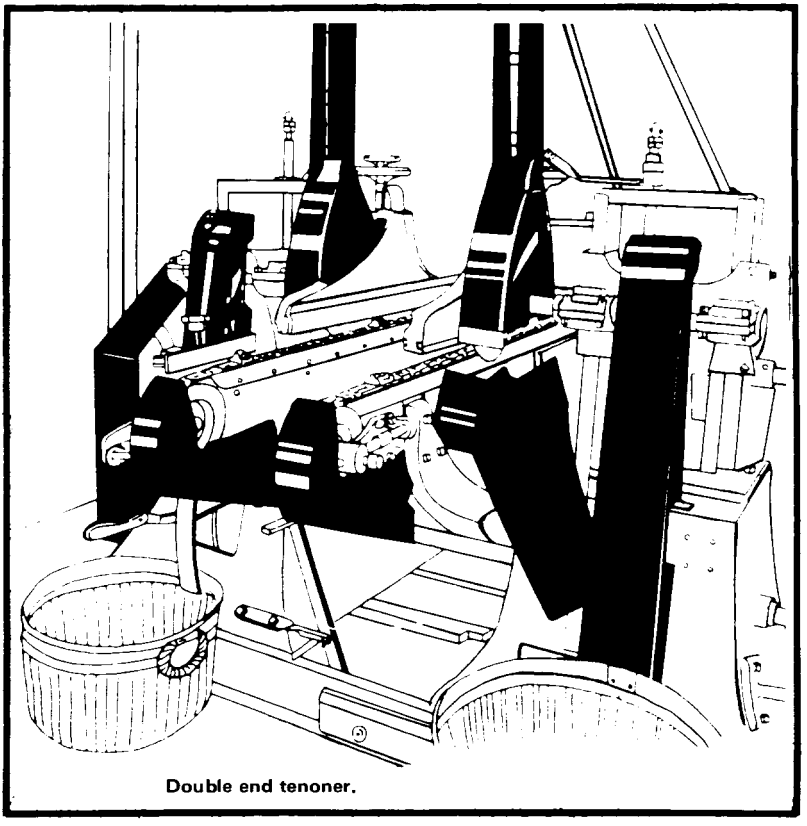
FREQUENTLY VIOLATED REGULATIONS

MACHINERY AND MACHINE GUARDING (cont.)

TENONING MACHINES

Requirements:

1. Feed chains and sprockets of all double end tenoning machines MUST be enclosed except for the portion necessary to convey stock.
2. Unused part of all cutting heads and saws MUST be covered by metal guards (one-sixteenth inch minimum sheet metal or three-sixteenth inch minimum cast iron). If exhaust system is used, the guard MUST form all or part of the hood and it MUST be constructed with metal as thick as specified above.



Double end tenoner.

NIOSH

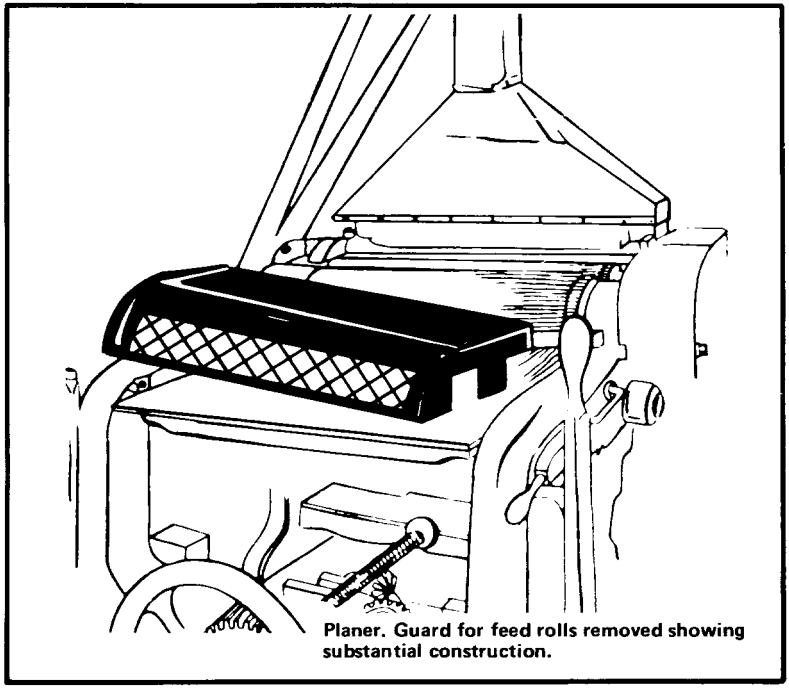
FREQUENTLY VIOLATED REGULATIONS

MACHINERY AND MACHINE GUARDING (cont.)

PLANING, MOLDING, STICKING, AND MATCHING MACHINES

Requirements:

1. Cutting heads and saws MUST be guarded with metal. Minimum one-sixteenth inch thick if sheet metal or minimum three-sixteenth inch thick if cast iron.
2. Feed rolls MUST be guarded by a hood or suitable guard to prevent the operator's hands from coming in contact with the in-running rolls.
3. Surfacers or planers which can accept multiple pieces of wood simultaneously MUST be provided with either sectional infeed rolls that provide contact pressure on feed stock or suitable section kickback finger devices at the infeed end.



Planer. Guard for feed rolls removed showing substantial construction.

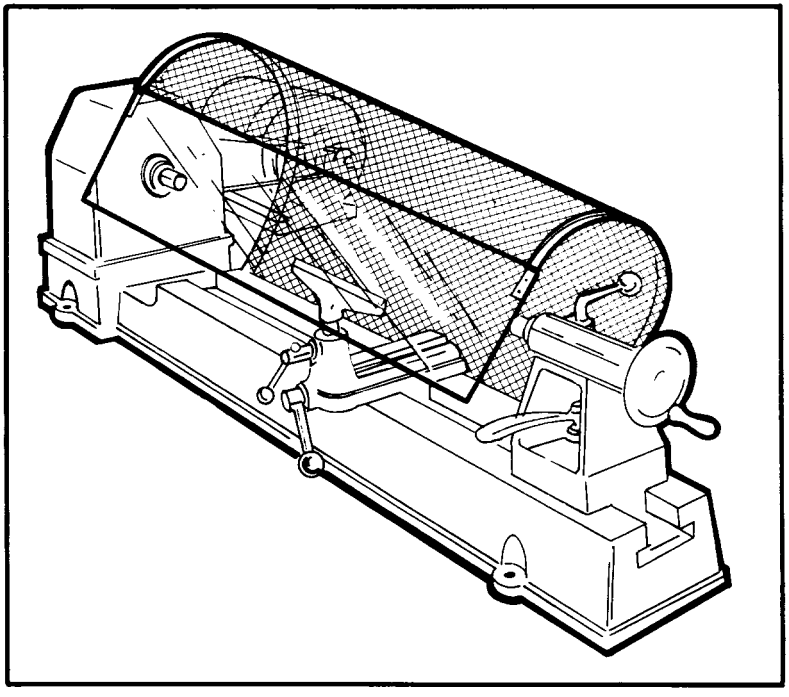
NIOSH

FREQUENTLY VIOLATED REGULATIONS

MACHINERY AND MACHINE GUARDING (cont.)

LATHES

1. Wood-turning lathes: cutting heads covered as completely as possible by hoods or shields hinged to the machines so they can be thrown back for adjusting.
2. Shoe last and spoke lathes, doweling machines, wood heel turning machines, and other automatic wood turning lathes of the rotating knife type, REQUIRE hoods covering cutter blades excepting contact points.
3. Lathes used for turning long pieces of stock held only between the two centers MUST have long curved guards extending over the top of the lathe to prevent work pieces from being thrown out of the lathe if they become loose.



NIOSH

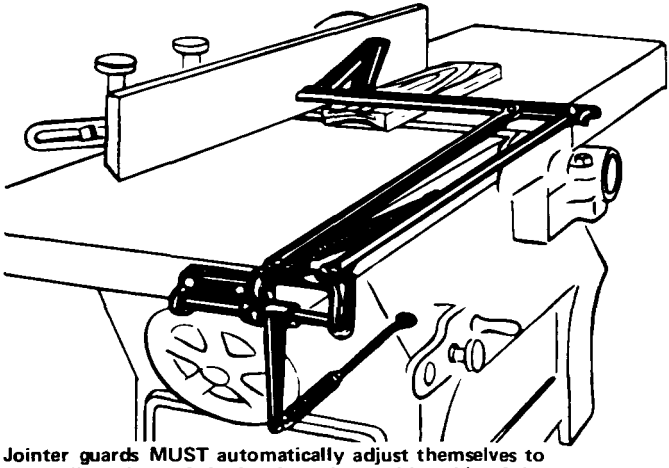
FREQUENTLY VIOLATED REGULATIONS

MACHINERY AND MACHINE GUARDING (cont.)

JOINTERS

Requirements:

1. Hand-fed with horizontal head: a cylindrical cutting head with knife projecting no more than one-eighth inch beyond cylinder.
2. Table openings: clearance between rear table and cutter head—one-eighth inch maximum. Table throat opening (when tables are set with each other for zero cut) two and one-half inches maximum.
3. Horizontal head: an automatic guard covering the head on the working side of the fence or gauge, and a guard covering the head back of the fence or gauge.
4. Vertical head: an exhaust hood or other guard completely enclosing the revolving head except for a slot wide enough to perform the work.



Jointer guards MUST automatically adjust themselves to cover all sections of the head on the working side of the fence or gauge and should remain in contact with the material at all times. The section of the cutting head back of the fence or gauge MUST also be guarded.

NIOSH

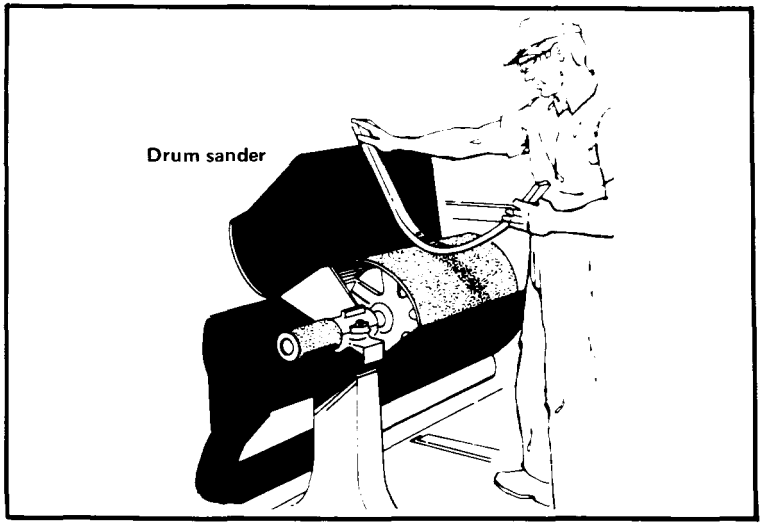
FREQUENTLY VIOLATED REGULATIONS

MACHINERY AND MACHINE GUARDING (cont.)

SANDING MACHINES

Requirements:

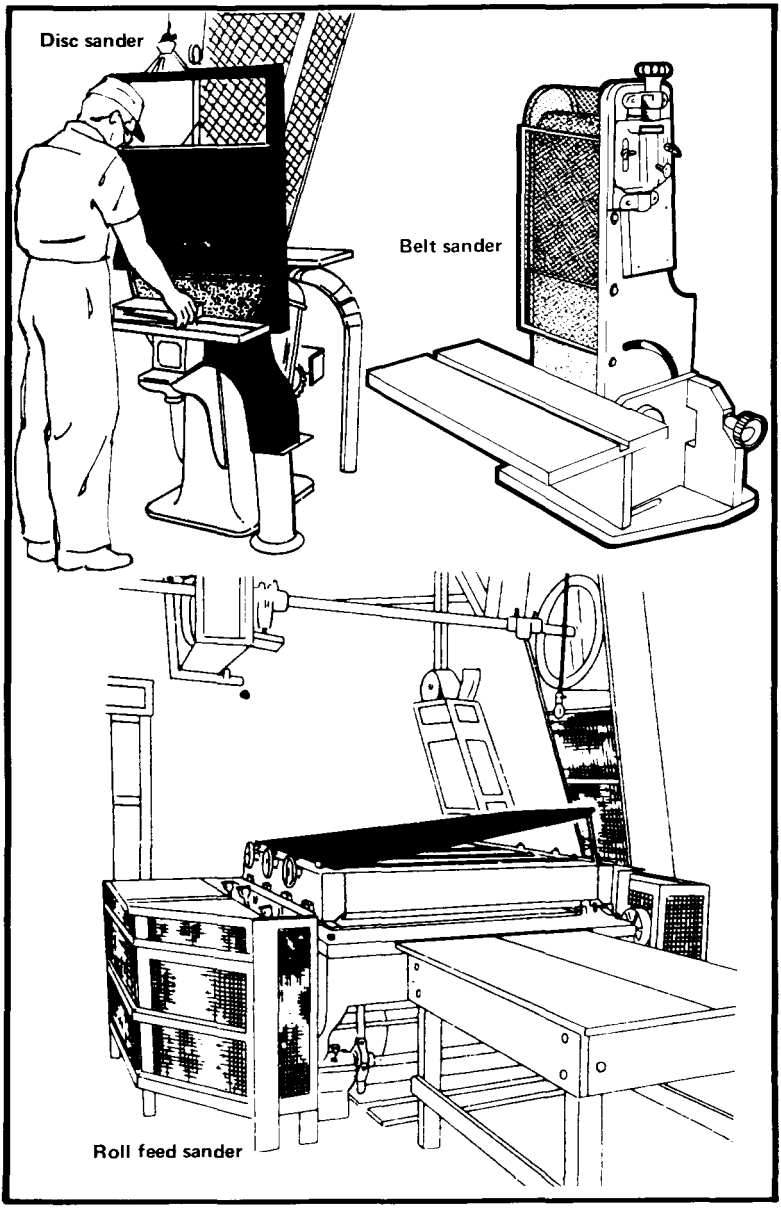
1. Self-feed sanding machines REQUIRE a semi-cylindrical guard to protect operator's hands from the in-running rolls. The guard MUST be of heavy material well secured to the frame carrying the rolls so as to stay in adjustment for any thickness of stock. The bottom of the guard should come down to within three-eighths inch of the contact face of the feed roll where it touches the stock.
2. Drum sanders REQUIRE an exhaust hood (or other guard if no exhaust system is necessary). A guard is needed to enclose the revolving drum, except portion of drum above the table.
3. Disc sanders REQUIRE enclosed disc, except for the portion of the disc above the table.
4. Belt sanders REQUIRE guards at each nip point where the sanding belt runs on to a pulley. The unused part of the sanding belt MUST be guarded against accidental contact.



NIOSH

FREQUENTLY VIOLATED REGULATIONS

MACHINERY AND MACHINE GUARDING (cont.)



NIOSH

FREQUENTLY VIOLATED REGULATIONS

MACHINERY AND MACHINE GUARDING (cont.)

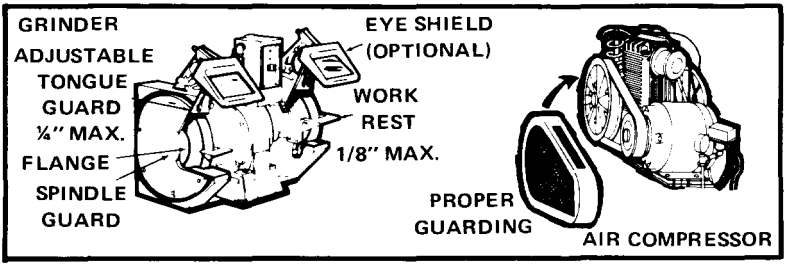
GRINDERS

Requirements:

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 are 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 one-eighth 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 one-fourth 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 one-half inch.

AIR COMPRESSORS

MUST have their flywheel and drive pulley **fully enclosed.**

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 and portable grinders MUST be equipped with guards above and below the base

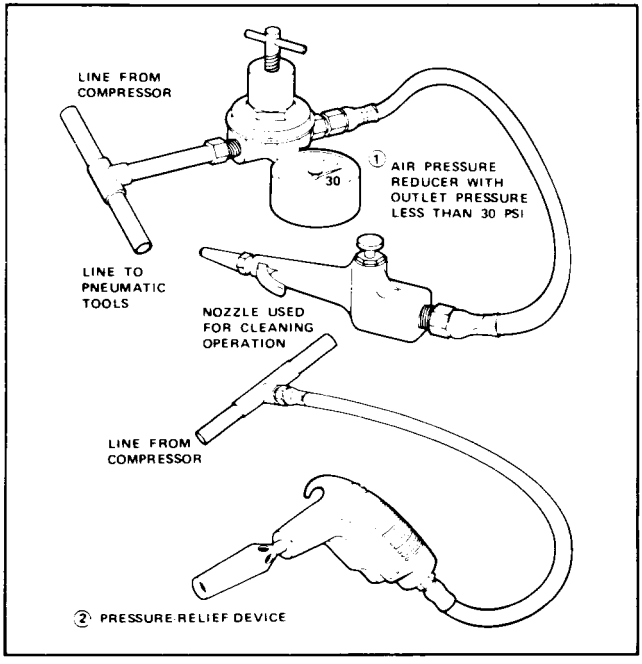
HAND AND PORTABLE POWERED TOOLS (cont.)

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 or be doubly insulated and identified as such.

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 "below 30 psi" requirement are illustrated below.



NIOSH

FREQUENTLY VIOLATED REGULATIONS

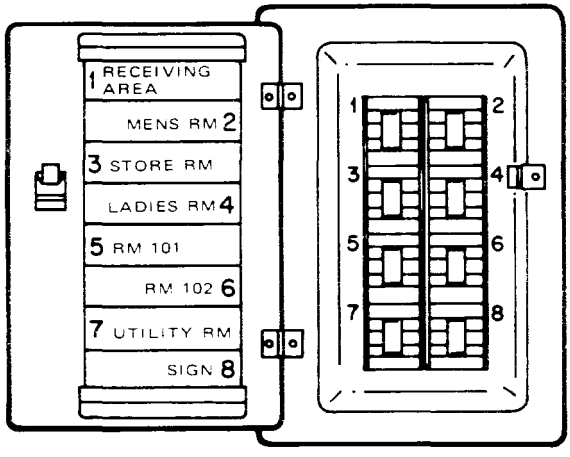
THE NATIONAL ELECTRICAL CODE (NEC)

ELECTRICAL REQUIREMENTS

The National Electrical Code, NFPA 70-1971; ANSI C1-1971 has been adopted as a national consensus standard by OSHA. (Refer to **INFORMATION SOURCES.**) The purpose of the NEC is the practical safeguarding of any persons and of buildings and their contents from hazards arising from the use of electricity. The code contains basic minimum provisions considered necessary for safety. The electrician should be familiar with these requirements.

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.

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

NIOSH

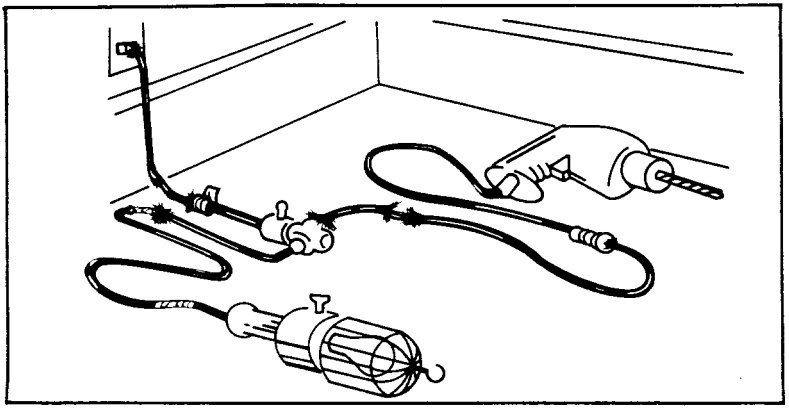
FREQUENTLY VIOLATED REGULATIONS

THE NATIONAL ELECTRICAL CODE (NEC) (cont.)

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 doubly insulated and distinctly marked:
   a. Portable hand-held motor-operated tools.
   b. Appliances.
   c. Any equipment operated in excess of 150 volts to ground.
5. Outlets, switches, junction boxes, etc., MUST be covered.



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.

NIOSH

FREQUENTLY VIOLATED REGULATIONS

THE NATIONAL ELECTRICAL CODE (NEC) (cont.)

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 previous calendar year 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.

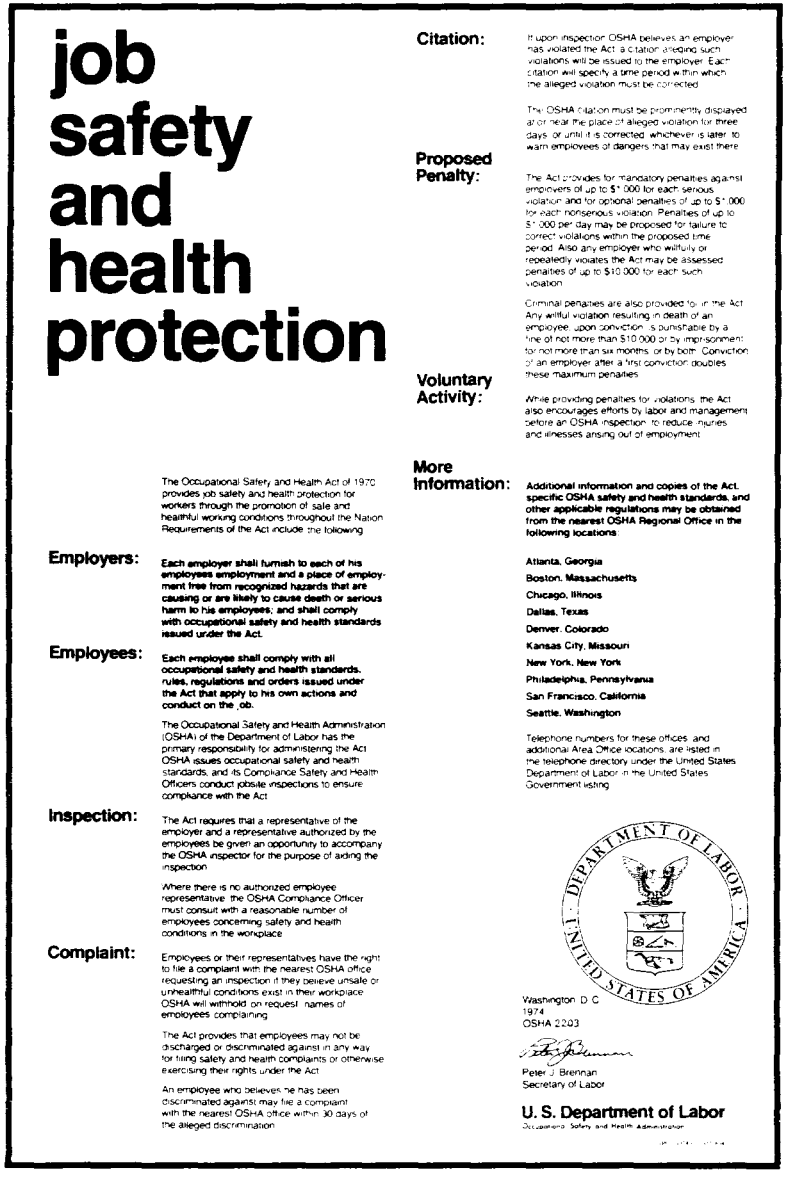
The types of work-related injuries and illnesses which MUST be recorded are those involving fatalities, lost workdays, or those which are nonfatal and do not cause lost workdays for the employee, but do require medical treatment, job transfer or termination, or resulted in loss of consciousness. Employers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

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

NIOSH

RECORDKEEPING REQUIREMENTS (cont.)



job safety and health protection

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

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

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

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

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

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

Complaint: Employees or their representatives have the right to file a complaint with the nearest OSHA office requesting an inspection if they believe unsafe or 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 $7,000 for each serious violation, and for optional penalties of up to $7,000 for each nonserious violation. Penalties of up to $7,000 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 $70,000 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

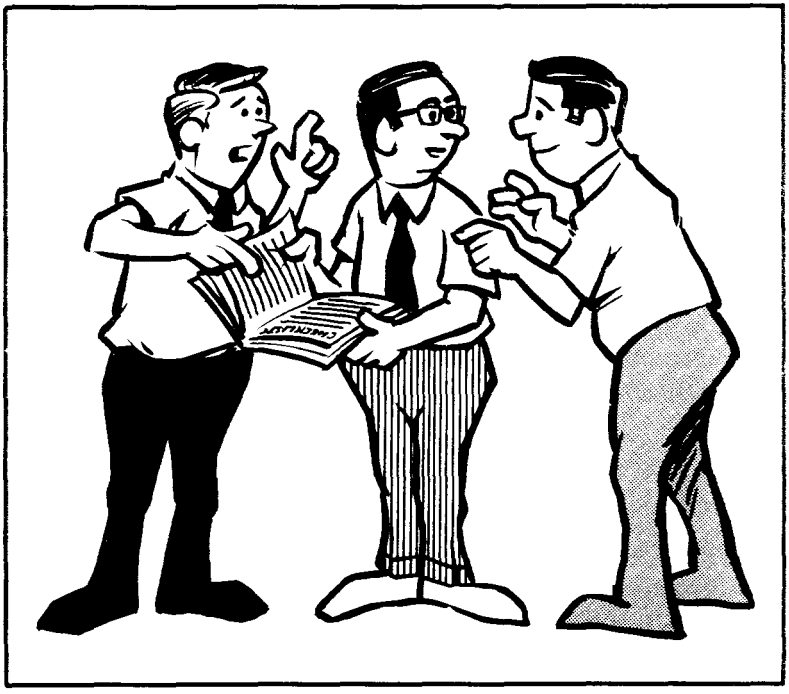
CHECKLISTS

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 should make periodic inspections (preferably at least once each month) to identify problem areas so that corrective action may be taken.

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



CHECKLISTS (cont.)

	Yes	No
WALKING AND WORKING SURFACES		
AISLES AND FLOOR (29 CFR 1910.22)		
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, and balconies that are more than four feet above the floor protected with standard guardrails?	☐	☐
Are all platforms, lofts, and balconies (above 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?	☐	☐
Are all stairways at least 22 inches wide?	☐	☐

NIOSH

CHECKLISTS (cont.)

	Yes	No
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 or 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, .37)		
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?	☐	☐

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 1910.94, .95, .1000)

Is management aware of the hazards caused by various materials used in the plant (e.g., dusts, glues, paints, or solvents)?	☐	☐
Is employee exposure to these chemicals kept within the acceptable levels?	☐	☐
Are all containers, such as vats and storage tanks, labeled as to their contents?	☐	☐
If internal combustion engines are used, is carbon monoxide kept within acceptable levels?	☐	☐

CHECKLISTS (cont.)

	Yes	No
If epoxy glues are used, do employees wash thoroughly after skin contact?	☐	☐
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)?	☐	☐
If engineering controls cannot reduce the noise to safe levels: have administrative controls, such as limiting worker-exposure in a given area, been started?	☐	☐
Are affected employees given annual audiometric tests if necessary?	☐	☐
Do all employees in high-noise areas wear hearing protection?	☐	☐
Are annual noise surveys made to re-evaluate problem areas?	☐	☐

CHECKLISTS (cont.)

HAZARDOUS MATERIALS	Yes	No
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 or pans)?	☐	☐
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?	☐	☐
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 LP-gas storage tanks guarded to prevent damage from vehicles?	☐	☐
Are "NO SMOKING" signs posted on LP-gas tanks?	☐	☐

CHECKLISTS (cont.)

	Yes	No
Are storage cabinets for flammable and combustible liquids labeled "FLAMMABLE—KEEP FIRE AWAY"?	☐	☐
Is there never more than one day's paint supply outside of approved storage cabinets or rooms?	☐	☐
Do metal or wood storage cabinets meet the minimum construction requirements (see **HAZARDOUS MATERIALS**)?	☐	☐
PAINT SPRAY OPERATIONS (29 CFR 1910.107)		
GENERAL		
Are portable lamps removed during spray operations?	☐	☐
Do cleaning solvents have high flash points (not less than 100°F)?	☐	☐
Are fire control sprinkler heads kept clean?	☐	☐
Are "NO SMOKING" signs posted in the spray area, paint room, paint booth, and paint storage area?	☐	☐
Are the electric motors for exhaust fans placed outside booths or ducts?	☐	☐
Are belts and pulleys inside the booth fully enclosed?	☐	☐
Do ducts have access doors to permit cleaning?	☐	☐

NIOSH

CHECKLISTS (cont.)

	Yes	No
At low temperatures (below 55°) is make-up air heated to at least 65°?	☐	☐
Is the make-up air heater located outside the spray booth?	☐	☐
Do all drying spaces have adequate ventilation?	☐	☐
Is the spray area at least 20 feet from flame, sparks, electric motors, or other ignition sources?	☐	☐
Is the spray area free of hot surfaces?	☐	☐
Is the spray area kept clean of combustible residue?	☐	☐
Are spray booths constructed of metal, masonry or other substantial noncombustible material?	☐	☐
Are spray booth floors and baffles noncombustible and easily cleaned?	☐	☐
Do spray booths have explosion-proof lights or are they lighted through sealed clear panels?	☐	☐
Is mechanical ventilation on during spray operations?	☐	☐
Is infra-red drying apparatus kept out of the spray area during spraying operations?	☐	☐
Is the spray area completely ventilated before using the drying apparatus?	☐	☐
Is the electric drying apparatus properly grounded?	☐	☐

NIOSH

CHECKLISTS (cont.)

	Yes	No
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 where debris or flying 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?	☐	☐
Are respirators provided and worn during dusty operations, paint spraying, etc.?	☐	☐
Is the proper respirator in use for the hazards present? (For example, dust masks do not protect against solvent vapors.)	☐	☐
Is 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?	☐	☐

NIOSH

CHECKLISTS (cont.)

	Yes	No
Are respirators stored in a convenient, clean, and sanitary location?	☐	☐
Are respirators inspected during cleaning?	☐	☐

GENERAL ENVIRONMENTAL CONTROLS

SANITATION (29 CFR 1910.141)

Are restrooms and washrooms kept in clean and sanitary condition?	☐	☐
Are covered receptacles for sanitary napkins provided in the women's restroom?	☐	☐
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 water outlets that are 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?	☐	☐

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.)	☐	☐

NIOSH

CHECKLISTS (cont.)

	Yes	No
Are first aid supplies readily available, inspected, and replenished?	☐	☐
Are first aid supplies approved by a consulting physician, indicating that they are adequate?	☐	☐
Are medical personnel readily available for advice and consultation on employee health matters?	☐	☐
Is 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 designated places?	☐	☐
Are extinguishers located along normal paths of travel?	☐	☐

NIOSH

CHECKLISTS (cont.)

	Yes	No
Are extinguisher locations free from obstruction or blockage?	☐	☐
Are extinguishers not mounted too high? If 40 pounds or less, the top must be below 5 feet above floor; greater than 40 pounds, the top must be below 3½ feet above floor.	☐	☐
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?	☐	☐
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 the clearance between sprinkler deflectors and the top of storage at least 18 inches?	☐	☐

NIOSH

CHECKLISTS (cont.)

	Yes	No
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?	☐	☐
MATERIALS HANDLING AND STORAGE (29 CFR 1910.176-.181)		
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 industrial trucks?	☐	☐
Are appropriate overhead guards installed on powered industrial trucks?	☐	☐
Is battery charging on electric units performed only in designated areas?	☐	☐

CHECKLISTS (cont.)

	Yes	No
Are "NO SMOKING" signs posted near electric battery charging units?	☐	☐
On units using internal combustion engines, do the exhaust gases in the room not exceed allowable limits for carbon monoxide?	☐	☐
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?	☐	☐
Are racks and platforms loaded within capacity limits?	☐	☐
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 equipment passage?	☐	☐

MACHINE AND MACHINE GUARDING (29 CFR 1910.212)

Are belts, pulleys, and rotating shafts (air compressor and drill presses) properly guarded?	☐	☐
Are chains, sprockets, and gears properly guarded?	☐	☐

NIOSH

CHECKLISTS (cont.)

	Yes	No
Are all in-going nip points properly guarded?	☐	☐
Are rotating shafts that are not smooth properly guarded?	☐	☐
Are all rotating parts (such as lubrication and fittings) 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) (29 CFR 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.)

	Yes	No
WOODWORKING EQUIPMENT (29 CFR 1910.213)		
Are there proper guards on all:		
Rip saws?	☐	☐
Table saws?	☐	☐
Radial arm saws?	☐	☐
Swing saws?	☐	☐
Miter saws?	☐	☐
Band saws?	☐	☐
Skill saws?	☐	☐
Jointers?	☐	☐
Planers?	☐	☐
Tenoning machines?	☐	☐
Disc sanders?	☐	☐
Belt sanders?	☐	☐
Drum sanders?	☐	☐
Shapers?	☐	☐
Routers?	☐	☐
Other specialty equipment?	☐	☐
Are there limit chains or stops on:		
Swing saws?	☐	☐
Radial arm saws?	☐	☐
Are there devices used to automatically return the swing saw or radial saw back to its original position?	☐	☐
Are saws used for ripping equipped with anti-kickback dogs?	☐	☐

CHECKLISTS (cont.)

	Yes	No
Are all surfacers or planers that run stock of varying thickness equipped with yielding sectional rolls or antikickback fingers at the infeed end?	☐	☐
Does every machine have a master switch to keep it inoperative during repairs or adjustments?	☐	☐
Are there stop switches handy to each operator on machines requiring more than one operator?	☐	☐

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

Are tools and equipment (both company and employee-owned) in good condition?	☐	☐
Have mushroomed heads on chisels and punches been reconditioned 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?	☐	☐

CHECKLISTS (cont.)

	Yes	No
Are portable abrasive wheels appropriately guarded?	☐	☐
Have employees been made aware of the hazards caused by faulty or improperly used hand tools?	☐	☐

NATIONAL ELECTRICAL CODE

ELECTRICAL WIRING

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, polishers, and vending machines 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 wall or ceiling holes or through doorways or windows?	☐	☐
Are flexible cords and cables free from splices or taps?	☐	☐

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

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 Avenue
Boston, Mass. 02110

- ☐ NFPA-10-1970 Installation of Portable Fire Extinguisher
- ☐ NFPA-101-1970 Life Safety Code

NATIONAL SAFETY COUNCIL
425 North Michigan Avenue
Chicago, Illinois 60611

NIOSH AND OSHA REGIONAL DIRECTORS

Trade associations, state and local governmental agencies, and your insurance company can also provide useful information. The Small Business Administration will provide information concerning procedures for securing economic assistance in compliance with the OSHA Standards (if needed).

NIOSH AND OSHA REGIONAL OFFICES

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

NIOSH REGIONAL OFFICES

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

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.: 312/353-1710

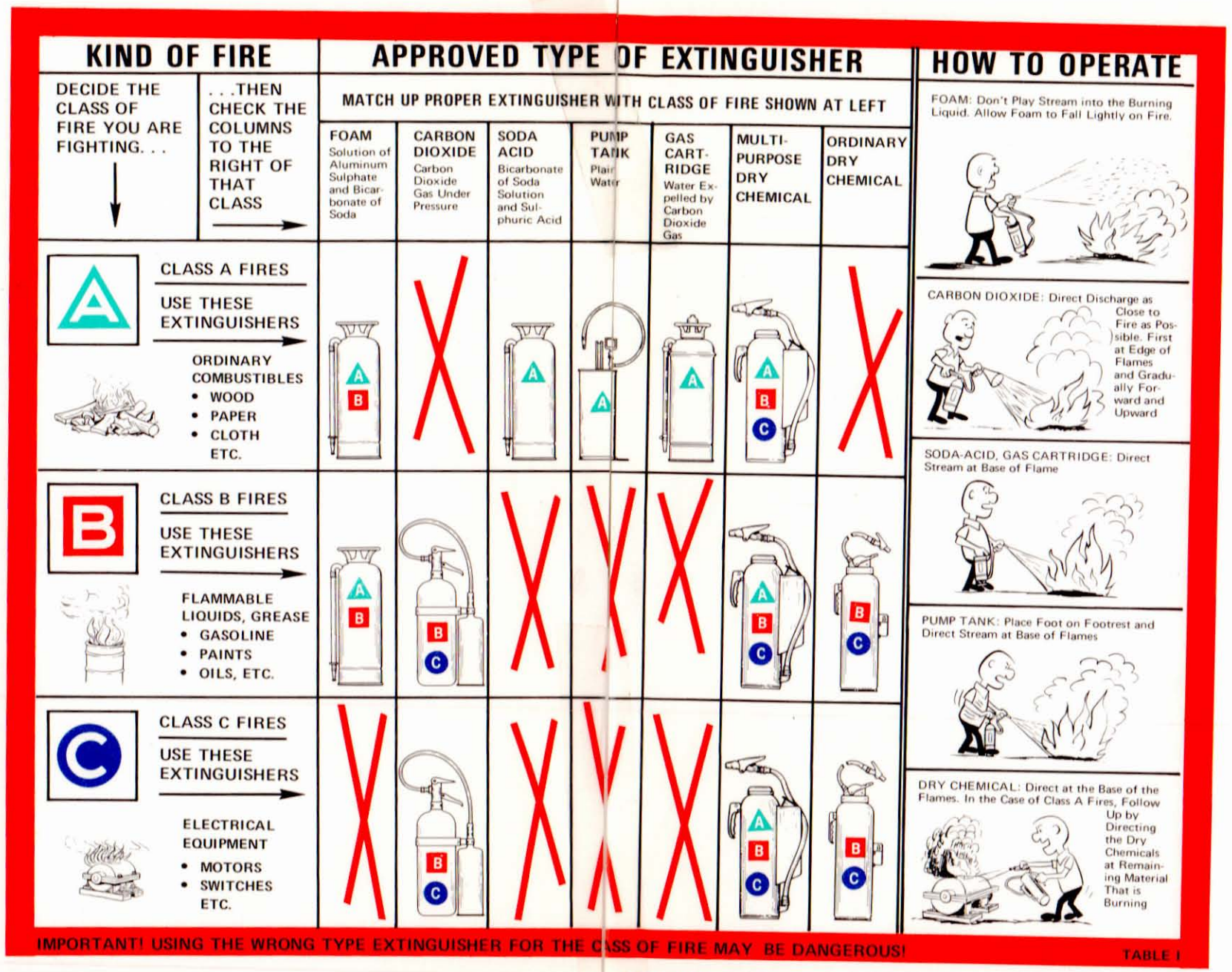
DHEW, Region VI
1200 Main Tower Building
Dallas, Texas 75202
Tel.: 214/655-3081

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



85-a

HOW TO LIFT SAFELY

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

The factors that contribute to safe lifting are...

DETERMINE IF OBJECTS CAN BE LIFTED AND CARRIED, SAFELY.

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

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

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

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

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

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

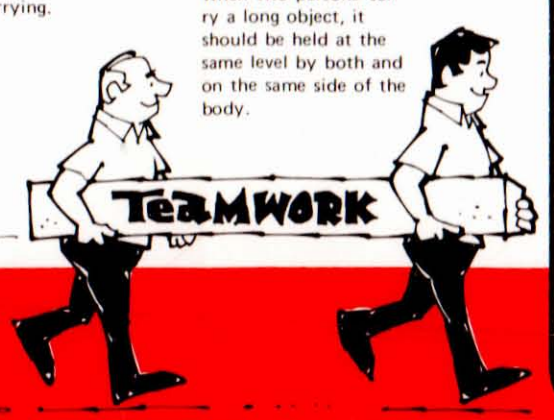
7. Setting the load down, is just as important as picking it up. Using leg and back muscles, comfortably lower load by bending your knees. When load is securely positioned, release your grip.

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

When lifting and carrying with another person—teamwork is important.

The load should be equally distributed. Movements must be coordinated so you both start and finish the lift action at the same time and perform turning movements together.

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

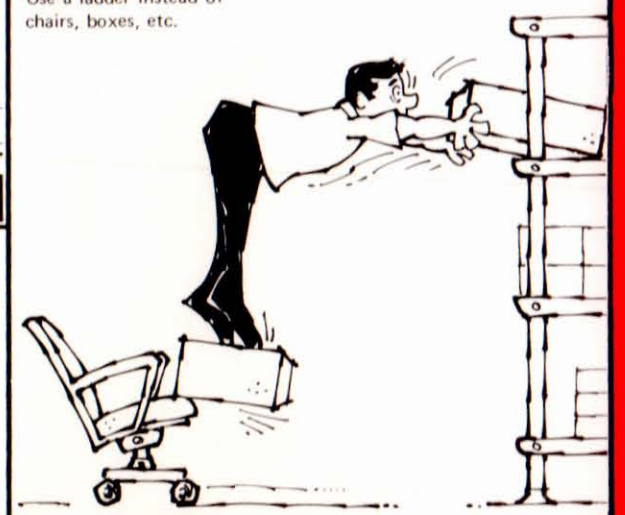


Avoid strain by storing heavy objects at least 12 inches above the floor.

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.



OSHA REGIONAL OFFICES

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

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

Region III
U.S. Department of Labor
Occupational Safety and Health Administration
15220 Gateway Center, 3535 Market Street
Philadelphia, Pennsylvania 19104 . . . . . Telephone: 215/596-1201

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 Street
Chicago, Illinois 60604 . . . . . Telephone: 312/353-4716/7

Region VI
U.S. Department of Labor
Occupational Safety and Health Administration
7th Floor, Texaco Building, 1512 Commerce Street
Dallas, Texas 75210 . . . . . 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
1808 Smith Tower Building, 506 Second Avenue
Seattle, Washington 98104 . . . . . Telephone: 206/442-5930