29 CFR 1910.132-138, the "Personal Protection Equipment" standard. & **20 CFR 1910.134 Subpart I** - Personal Protective Equipment

Personal Protective Equipment (PPE)

Preparation

1. Read Applicable Background information and related Company Policy Chapter.
2. Make _____ Copies of this Lesson Plan for Personnel
3. Make Transparency, procure transparency pens, etc.
4. Coffee, tea, snacks

Material

1. Personal Protective Equipment the employee is expected to wear
2.

Objective

By the end of this session, personnel shall be able to discuss:

1. Responsibilities of the Safety and Health Manager, Supervisors, and Employee
2. Training Requirements
3. The Care of PPE
4. The Types of PPE that are to be used at the Company and Methods of Use, including:
   - Eye and Face Protection
   - Hearing Protection
   - Respiratory Protection
   - Head Protection
   - Hand Protection
   - Safety Shoes

Background

The purpose of the Personal Protective Program is to protect our employees by ensuring that Personal Protective Equipment (PPE) is provided, used, and maintained in a sanitary and reliable condition whenever it is necessary due to hazards from processes or in the work environment..

This lesson covers the responsibilities of managers, supervisors and workers, assessment of hazards, selection and use of personal protective equipment (PPE), and training.

Notes

Lesson

Responsibilities of the Safety and Health Manager, Supervisors, and Employee

The Safety and Health Manager will be responsible for assessing the hazards and exposures that may require the use of PPE, determining the type of equipment to be provided, and purchasing the equipment. Input from managers, supervisors, and employees will be obtained and considered in selecting appropriate equipment.

Managers/supervisors will be responsible for training employees in the use and proper care of PPE, ensuring that all employees are assigned appropriate PPE, and ensuring that PPE is worn by employees when and where it is required.

Employees are responsible for following all provisions of this program and related procedures. They are expected to wear PPE when and where it is required.

Training Requirements

Each employee who is required to use PPE will be trained in the following:

- Why PPE is necessary
- When PPE is necessary
- What PPE is necessary and any alternative choices of equipment
- How to properly don, doff, adjust, and wear PPE
- The proper care, maintenance, storage, useful life, and disposal of PPE

The training will include an opportunity for employees to handle the PPE and demonstrate that they understand the training and have the ability to use the PPE properly. Training will be provided by the manager or supervisor of the affected employees. Training will be documented in writing with the documentation including the names of each employee trained, the date(s) of the training, and the subject matter covered.

If an employee, who has been trained, demonstrates a lack of knowledge or behavior which leads the supervisor to believe the employee does not have a proper understanding of the PPE involved, that employee will be retrained. If there are changes in the workplace or processes that change the exposures or type of PPE to be used, all affected employees will be retrained.

Notes

The Care of Personal Protective Equipment

Whenever practical, PPE will be assigned to individual workers for their exclusive use. Employees will be responsible for the PPE equipment assigned to them or used by them.

PPE will be regularly cleaned, inspected and stored according to instructions given during the training sessions or as directed by supervisors or managers. Defective or damaged PPE shall not be used. Employees are to report any defective or damaged equipment to their supervisor for repair or replacement.

The Types of PPE that are to be used at the Company and Methods of Use

Eye and Face Protection-

Thousands of people are blinded each year from work related eye injuries. Injuries that could have been prevented, if only people would have used eye or face protection. The majority of eye injuries can be prevented by the use of suitable/approved safety spectacles, goggles, or shields. Approved eye and face protection shall be worn when there is a reasonable possibility of personal injury. Supervisors, with assistance from the Safety and Health Manager, determine jobs and work areas that require eye protection and the type of eye and face protection that will be used.

Typical hazards that can cause eye and face injury are:

- Splashes of toxic or corrosive chemicals, hot liquids, and molten metals;
- Flying objects, such as chips of wood, metal, and stone dust;
- Fumes, gases, and mists of toxic or corrosive chemicals; and
- Aerosols of biological substances.

Prevention of eye accidents requires that all persons who may be in eye hazard areas wear protective eyewear. This includes employees, visitors, contractors, or others passing through an identified eye hazardous area. To provide protection for these personnel, The Company will procure a sufficient quantity of heavy duty goggles and/or plastic eye protectors which afford the maximum amount of protection possible.

If these personnel wear personal glasses, they shall be provided with a suitable eye protector to wear over them.

Notes

Specifications of Eye/Face Protectors -

Eye and face protectors procured, issued to, and used by Company personnel must conform to the following design and standards:

a) Provide adequate protection against the particular hazards for which they are designed

b) Fit properly and offer the least possible resistance to movement and cause minimal discomfort while in use.

c) Be durable.

d) Be easily cleaned or disinfected for or by the wearer.

e) Be clearly marked to identify the manufacturer.

f) Persons who require corrective lenses for normal vision, and who are required to wear eye protection, must wear goggles or spectacles of one of the following types:

1) Spectacles with protective lenses which provide optical correction.

2) Goggles that can be worn over spectacles without disturbing the adjustment of the spectacles.

3) Goggles that incorporate corrective lenses mounted behind the protective lenses.

Description and Use of Eye/Face Protectors

a) Safety Spectacles. Protective eye glasses are made with safety frames, tempered glass or plastic lenses, temples and side shields which provide eye protection from moderate impact and particles encountered in job tasks such as carpentry, woodworking, grinding, scaling, etc.

b) Single Lens Goggles. Vinyl framed goggles of soft pliable body design provide adequate eye protection from many hazards. These goggles are available with clear or tinted lenses, perforated, port vented, or non-vented frames.

Single lens goggles provide similar protection to spectacles and may be worn in combination with spectacles or corrective lenses to insure protection along with proper vision.

Notes

Description and Use of Eye/Face Protectors- (continued)

c) Welders/Chippers Goggles. These goggles are available in rigid and soft frames to accommodate single or two eye piece lenses.

Welders goggles provide protection from sparking, scaling or splashing metals and harmful light rays. Lenses are impact resistant and are available in graduated shades of filtration.

Chippers/grinders goggles provide eye protection from flying particles. The dual protective eye cups house impact resistant clear lenses with individual cover plates.

d) Face Shields. These normally consist of an adjustable headgear and face shield of tinted/transparent acetate or polycarbonate materials, or wire screen. Face shields are available in various sizes, tensile strength, impact/heat resistance and light ray filtering capacity. Face shields will be used in operations when the entire face needs protection and should be worn to protect eyes and face against flying particles, metal sparks, and chemical/ biological splash.

e) Welding Shields. These shield assemblies consist of vulcanized fiber or glass fiber body, a ratchet/button type adjustable headgear or cap attachment and a filter and cover plate holder. These shields will be provided to protect workers' eyes and face from infrared or radiant light burns, flying sparks, metal spatter and slag chips encountered during welding, brazing, soldering, resistance welding, bare or shielded electric arc welding and oxyacetylene welding and cutting operations.

The Safety and Health Manager maintains a supply of various eye and face protective devices. Personnel requiring prescription safety glasses must contact the Safety and Health Manager.

Emergency Eyewash Facilities-

Emergency eyewash facilities meeting the requirements of ANSI Z358.1-1981 shall be provided in all areas where the eyes of any employee may be exposed to corrosive materials. All such emergency facilities shall be located where they are easily accessible to those in need.

Notes

Hearing Protection-

When should you wear a hearing protection device? You should wear a hearing protection device whenever you are exposed to noise that is:

- Greater than 80 dB sound levels for an 8-hour period, or
- 120 dB peak sound pressure level or greater, or
- when directed by your supervisor

Hearing protection devices are the first line of defense against noise in environments where engineering controls have not reduced employee exposure to safe levels. Hearing protective devices can prevent significant hearing loss, but only if they are used properly.

The most popular hearing protection devices are earplugs which are inserted into the ear canal to provide a seal against the canal walls. Earmuffs enclose the entire external ears inside rigid cups. The inside of the muff cup is lined with acoustic foam and the perimeter of the cup is fitted with a cushion that seals against the head around the ear by the force of the headband.

Preformed earplugs and earmuffs should be washed periodically and stored in a clean area, and foam inserts should be discarded after each use. It is important for you to wash hands before handling pre-formed earplugs and foam inserts to prevent contaminants from being placed in the ear which may increase your risk of developing infections.

Also, check hearing protective devices for signs of wear or deterioration and replace devices periodically.

The Safety and Health Manager maintains a supply of a variety of disposable foam ear inserts and earmuffs.

Many types of hearing protection devices are available. Popular types of hearing protection devices are:

1. Foam Earplugs
2. PVC Earplugs
3. Earmuffs

Each of the types of hearing protection devices has its advantages and disadvantages.
The advantages of Foam and PVC earplugs are:

1. Small & lightweight;
2. Comfortable in hot environments; and
3. Easily used with other safety equipment.

Notes

The disadvantages of earplugs are:

1. May work loose and require occasional refitting;
2. Require specific fitting instructions; and
3. Are frequently soiled.

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Earmuffs are another type of hearing protection device.
The advantages of earmuffs are:

1. Easy for your employer to supervise the wearing of this device;
2. One size fits all; and
3. Fits better for longer periods of time.

The disadvantages of earmuffs are:

1. May fit tight on your head;
2. Uncomfortable in a warm environment; and
3. Problems occur when used with other equipment.

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Respiratory Protection-

Inhaling hazardous materials damages the delicate structure of your lungs. Lungs that have been damaged are more susceptible to respiratory diseases. These diseases often cannot be cured, and eventually lead to death. In short, respiratory protection is serious business. Respiratory hazards may occur through exposure to harmful dusts, fogs, fumes, mists, gases, smoke, sprays, and vapors.

Notes

Dusts are formed whenever solid material is broken down into tiny particles. Dusts are often produced during sanding and grinding operations.

Vapors are substances that are created when a solid or liquid material evaporates. Materials that evaporate easily at room temperature include paint thinner, solvents, and gasoline.

Fogs are vapors which have condensed into tiny airborne particles or droplets. An example of a hazardous fog would be an insect fogger used to rid industrial and residential areas of ticks and fleas.

Mists & Sprays are very small droplets of liquid material suspended in the air. They are often produced by spray and coating operations.

Gases are materials that become airborne at room temperature. Gases may have an odor, but many do not. Some gases can be seen, but again, others cannot. Gases may be heavier than air, or lighter than air, but in either case, can travel for great distances undetected.

Fumes can occur whenever a metal, plastic, or polymer is subjected to a high heat during such processes as welding and soldering operations.

Smoke is made up of small particles produced by the incomplete combustion of any material that has carbon in it. Smoke is often produced during processes that require high heat or burning as part of the manufacturing process.

The Safety and Health Manager is responsible for the Respiratory Protection Program at the Company and conducts respirator training and fit tests and is responsible for determining the proper type of respiratory protection required for the particular hazard.

Notes

Types of Respirators

There are two major categories of respirators:

1. Air Purifying Respirators-These types of respirators include:
    - Air Purifying Disposable Particulate Masks;
    - Air Purifying Half Mask Respirators;
    - Air Purifying Full Face Mask Respirators;
    - Gas Masks; and
    - Powered Air Purifying Respirators.
2. Supplied Air Respirators-These types of respirators include:
    - Airline Respirators;
    - Emergency Escape Breathing Apparatus; and
    - Self-Contained Breathing Apparatus (SCBA).

Selecting the Correct Respirator

The first step in selecting the correct respirator is to determine the level of hazard that is posed by the environment in which you will be working. To do this, you must be able to answer four basic questions:

1. What type of contaminant is present?
2. What is the form of the contaminant?
3. How toxic is the contaminant?
4. What is the concentration of the contaminant?

Because you may not be able to answer these questions on your own, always work with your supervisor or Safety and Health Manager to determine the correct answers to these questions.

In addition to determining the level of hazard that is posed by the environment, you must also consider:

1. How long will you be exposed to the contaminant?
2. What is your individual sensitivity to the contaminant?
3. What are your individual requirements?
    - Do you wear glasses?
    - Do you have a beard or other facial hair?
    - Do you wear dentures?
    - Will you have to wear other protective equipment?

Talk with your supervisor or safety professional to determine the correct respirator you will need to work safely.

Notes

Every time you use your respirator, you must first inspect it. To properly inspect a respirator before using it, you should look for:

- Cracks or chips in the faceplate;
- Cracks or holes in the breathing tube or airlines;
- Worn or frayed straps;
- Worn or damaged fittings;
- Bent or corroded buckles; and
- Dirty or improperly seated valves.

If you find anything wrong with your respirator, do not use it. Have it repaired or replaced immediately.

Adherence to the following guidelines will help ensure the proper and safe use of respiratory equipment:

- Wear only the respirator you have been instructed to use. For example, do not wear a self-containing breathing apparatus if you have been assigned and fitted for a half-mask respirator.
- Wear the correct respirator for the particular hazard. For example, some situations, such as chemical spills or other emergencies, may require a higher level of protection than your respirator can handle. Also, the proper cartridge must be matched to the hazard (a cartridge designed for dusts and mists will not provide protection from vapors)
- Check the respirator for a good fit before each use. Positive and negative fit checks should be conducted.
- Check the respirator for deterioration before and after use. Do not use a defective respirator.
- Recognize indications that cartridges and canisters are at their end of service. If in doubt, change cartridges/ canisters before using respirator.
- Practice moving and working while wearing the respirator so that you can get used to it.
- Clean the respirator after each use, thoroughly dry it and place the cleaned respirator in a sealable plastic bag.
- Store respirators carefully in a protected location away from excessive heat, light, and chemicals.

Notes

Head Protection-

Hats and caps have been designed and manufactured to provide workers protection from impact, heat, electrical and fire hazards. These protectors consist of the shell and the suspension combined as a protective system. Safety hats and caps will be of nonconductive, fire and water resistant materials. Bump caps or skull guards are constructed of lightweight materials and are designed to provide minimal protection against hazards when working in congested areas.

Head protection will be furnished to, and used by, all employees and contractors engaged in construction and other miscellaneous work in head-hazard areas. Head protection will also be required to be worn by engineers, inspectors, and visitors at construction sites. Bump caps/skull guards will be issued to and worn for protection against scalp lacerations from contact with sharp objects. They will not be worn as substitutes for safety caps/hats because they do not afford protection from high impact forces or penetration by falling objects.

Hard Hats- There are three classes of hard hats:

Class A Hard Hats are designed to:
- Protect you from falling objects; and
- Protect you from electrical shocks up to 2,200 volts.

Class B Hard Hats are designed to:
- Protect you from falling objects; and
- Protect you from electrical shocks up to 20,000 volts.

Class C Hard Hats Protect you from falling objects but
- DO NOT protect you from electrical shocks

Bump Caps are made from lightweight plastic and are designed to protect you from bumping your head on protruding objects. Bump caps DO NOT:
- Protect you from falling objects; or
- Protect you from electrical shocks.

WARNING: You should never substitute a bump cap for a hard hat.

Notes

Wearing the Hard Hat-

-Always wear your hard hat while you are working in areas where there are potential head hazards.

- Adjust the suspension inside your hard hat so that the hat sits comfortably, but securely on your head.

- Inspect the shell of your hard hat for cracks, gouges, and dents. Inspect the suspension system for frayed or broken straps. If your hard hat needs to be repaired, have it repaired immediately or ask your employer for a new one.

- Never paint, scratch or drill "air holes" in your hard hat. You may apply reflective plastic tape if you must work at night.

- Never use metal tape on your helmet because it can conduct electricity.

- Never carry personal belongings such as cigarettes, lighters, or pens in your hard hat.

Caring for the Hard Hat

Because your hard hat is an important piece of personal protective equipment, you should:

- Clean your hard hat at least once a month (or as needed) to remove oil, grease, chemicals, and sweat that can collect in and around your hat.

- You can clean your hat by soaking it in a solution of mild soap and hot water for 5-10 minutes. Rinse with clear water, wipe, and let air dry. Or, follow the manufacturer's recommendations for cleaning your hat.

- Because sunlight and heat can damage the suspension of your hat, always store your hat in a clean, dry, and cool location.

There are NO excuses for not wearing your hard hat!

Hand Protection-

Skin contact is a potential source of exposure to toxic materials; it is important that the proper steps be taken to prevent such contact. Gloves should be selected on the basis of the material being handled, the particular hazard involved, and their suitability for the operation being conducted. One type of glove will not work in all situations.

Most accidents involving hands and arms can be classified under four main hazard categories: chemicals, abrasions, cutting, and heat. There are gloves available that can protect workers from any of these individual hazards or any combination thereof.

Notes

The first consideration in the selection of gloves for use against chemicals is to determine, if possible, the exact nature of the substances to be encountered. Read instructions and warnings on chemical container labels and MSDS's before working with any chemical. Recommended glove types are often listed in the section for personal protective equipment.

All glove materials are eventually permeated by chemicals. However, they can be used safely for limited time periods if specific use and glove characteristics (i.e., thickness and permeation rate and time) are known. The Safety and Health Manager can assist is determining the specific type of glove material that should be worn for a particular chemical.

Gloves should be replaced periodically, depending on frequency of use and permeability to the substance(s) handled. Gloves overtly contaminated should be rinsed and then carefully removed after use.

Gloves should also be worn whenever it is necessary to handle rough or sharp-edged objects, and very hot or very cold materials. The type of glove materials to be used (in these situations) include leather, welder’s gloves, aluminum-backed gloves, and other types of insulated glove materials.

Careful attention must be given to protecting your hands when working with tools and machinery. Power tools and machinery must have guards installed or incorporated into their design that prevent the hands from contacting the point of operation, power train, or other moving parts. To protect the hands from injury due to contact with moving parts, it is important to:

- Ensure that guards are always in place and used.
- Always lock out machines or tools and disconnect the power before making repairs.
- Treat a machine without a guard as inoperative; and
- Do not wear gloves around moving machinery, such as drill presses, mills, lathes, and grinders.

The Safety and Health Manager can help the supervisor identify appropriate glove selections for their operations. The Safety and Health Manager also maintains a selection of gloves for various tasks.

Notes

Wearing and Using Gloves-

- Select and use the right kind of glove for the job you are going to be performing.
- Select gloves that fit.
- Some gloves may be chemical specified and have a life expectancy. Discard them after the recommended time has expired.
- Remove any rings, watches, or bracelets that might cut or tear your gloves.
- Wash your hands before and after wearing your gloves.
- Inspect your gloves before you use them. Look for holes and cracks that might leak.
- Replace gloves that are worn or torn.
- After working with chemicals, hold your gloved hands under running water to rinse away any chemicals or dirt before removing the gloves.
- Wash cotton gloves as needed.
- Avoid borrowing gloves. Gloves are personal protective equipment.
- Store gloves right side out in a clean, cool, dry, ventilated area.
- Never wear gloves around powered rotating equipment - drills, lathes, etc.

Other Protective Measures

Barrier Creams

- Water Repellent Creams are used to protect your hands from caustic chemicals.
- Solvent-Repellent Creams are used to protect your hands from solvents, oils, and other organic chemicals.
- Sunscreens protect your skin from the damaging effects of the sun.
- Vanishing Creams protect your skin against mild acids, and make cleaning up easier.

WARNING: Never substitute a barrier cream when you should use gloves.

- Forearm Cuffs are used to protect your forearm.
- Thumb Guards and Finger Cots protect only your thumb or fingers.
- Mittens protect your hands while working around very cold or hot materials.
- Hand Pads are often found in kitchens and laboratories. Hand pads protect your hands while working around very hot materials.

Notes

Safety Shoes and Foot Protection-

Safety shoes shall be worn in the shops, warehouses, maintenance, cagewash, glassware, and other areas as determined by the Safety and Health Manager. All safety footwear shall comply with American National Standards Institute (ANSI) Standard ANSI Z41-1991, "American National Standard for Personal Protection - Protective Footwear. Protective footwear purchased before July 5, 1994, shall comply with ANSI Standard Z41.1-1967.

Permanent full time employees will be initially issued two pairs of safety shoes of approved type. Shoes will be replaced or repaired as necessary based on supervisory approval. Other than permanent employees will be issued one pair of safety shoes with replacement as necessary based on supervisory approval.

Potential Hazards-

Impact Injuries- If you have ever stubbed your toe, you know that impact injuries can hurt. At work, heavy objects can fall on your feet. If you work around sharp objects, you can step on something sharp and puncture your foot.

Injuries from Spills and Splashes- Liquids such as acids, caustics, and molten metals can spill into your shoes and boots. These hazardous materials can cause chemical and heat burns.

Compression Injuries- Heavy machinery, equipment, and other objects can roll over your feet. The result of these types of accidents is often broken or crushed bones.

Electrical Shocks- Accidents involving electricity can cause severe shocks and burns.

Extremes in Cold, Heat, and Moisture- If not protected, your feet can suffer from frostbite if you must work in an extremely cold environment. Extreme heat, on the other hand, can blister and burn your feet. Finally, extreme moisture in your shoes or boots can lead to fungal infections.

Slipping- Oil, water, soaps, wax, and other chemicals can cause you to slip and fall.

Notes

Wearing and Using Safety Footwear

- Select and use the right kind of footwear for the job you are going to be performing. Footwear should meet or exceed the standards set by ANSI (ANSI Z41-1991).
- Avoid footwear made of leather or cloth if you work around acids or caustics. These chemicals quickly eat through the leather or cloth, and can injure your feet.
- Select footwear that fit.
- Inspect your footwear before you use them. Look for holes and cracks that might leak.
- Replace footwear that are worn or torn.
- After working with chemicals, hose your footwear with water to rinse away any chemicals or dirt before removing your footwear.
- Avoid borrowing footwear. Footwear is *Personal* Protective Equipment
- Store footwear in a clean, cool, dry, ventilated area.

Safety Shoes and Boots

There are many types of footwear that are designed to protect your feet

Steel toe footwear protects your toes from falling objects and from being crushed. Metatarsal footwear have special guards that run from your ankle to your toes and protect your entire foot. Reinforced sole footwear have metal reinforcement that protects your foot from punctures. Latex/Rubber footwear resists chemicals and provides extra traction on slippery surfaces.

Closure

Personal protective equipment can only be effective if the equipment is selected based on its intended use, employees are trained in its use, and the equipment is properly tested and maintained, and worn. The best protection comes from an interested management and work force committed to sound work practices.

What questions do you have?

Notes