

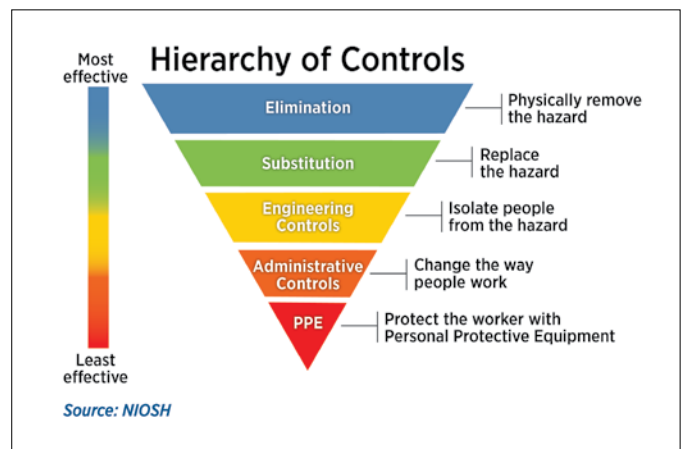
# Personal Protective Equipment Guidelines for Assessment, Selection, and Training

Shipyard employment is dangerous work. As a result, the use of personal protective equipment (PPE) in conjunction with engineering controls, work practices, and administrative controls is necessary for most operations. Typical PPE for shipyard work may include protection for the eyes, face, feet and head, knees and elbows, protective clothing and gloves, respiratory and hearing protection, and fall protection. Employers must assess work activities to determine hazards and identify the appropriate controls.

## Conducting a Hazard Assessment

A hazard assessment identifies hazards that require the use of PPE. To adequately protect workers, OSHA recommends that employers:

1. **Collect, organize, and analyze information** on workplace hazards that may already be available through operating manuals, safety data sheets (SDS), previous injury and illness records, safety committee findings, and workers' compensation reports.
2. **Inspect the workplace and observe workplace operations** to identify hazards such as falling objects, harmful chemicals, dust accumulation, radiation exposures (ionizing and non-ionizing), noise, drowning, and [hazardous energy](#). Inspections should be conducted regularly and include all operations, equipment, work areas, and facilities during each shift.
3. **Identify control options** for identified hazards. Each hazard should be classified by type, level of risk, and the seriousness of any potential injury. Use input from workers, OSHA standards and guidance, industry consensus standards, National Institute for Occupational Safety and Health (NIOSH) publications, and manufacturers' literature to determine potential control measures.
4. **Select and implement** the control measures determined to be the most effective and feasible, making sure not to introduce new hazards (e.g., exhaust of contaminated air into occupied work spaces). The use of engineering controls, safe work practices, and administrative controls should be explored first, followed by PPE.
5. **Follow up** to confirm that the control measures implemented are effective. All PPE must be kept clean and in good working order. Any defective or damaged protective equipment must be replaced and reissued PPE must be cleaned and sanitized before reuse.



## Selection of Personal Protective Equipment

When the use of PPE is necessary, employers should select PPE that provides protection greater than the minimum required. Where an assessment identifies exposures to multiple hazards, PPE that protects workers from those hazards, with emphasis on the most severe hazard, should be provided (such as when selecting welding gloves).

PPE must fit properly and should be sufficiently comfortable to encourage use. During selection, employers need to:

- Be familiar with all potential hazards and the types of PPE available;
- Evaluate the hazards associated with the work environment and the capabilities of the available PPE;
- Choose the PPE that ensures an adequate level of protection without presenting other risks for workers; and

- Fit workers with the appropriate protective device(s) and provide training for its use and care. Workers should be made aware of all warning labels and limitations of their PPE.

Appendix A of 29 CFR part 1915, subpart I provides recommended PPE for common work activities conducted in shipyard employment. Supplemental protective equipment may be required, such as using chemical-resistant boots during work in tanks or voids.

## Payment for Personal Protective Equipment

Employers must provide workers with appropriate PPE required by OSHA standards at no cost to the workers (29 CFR 1915.152) — **except:**

- Shoes or boots with built-in metatarsal protection that employees ask to use instead of metatarsal guards that are provided by the employer at no cost to employees;
- Everyday clothing, such as long-sleeve shirts, long pants, street shoes, and normal work boots; or ordinary clothing, skin creams, or other items used solely for protection from weather — such as winter coats, jackets, gloves, parkas, rubber boots, hats, raincoats, ordinary sunglasses, and sunscreen;
- Non-specialty safety-toe protective footwear (including steel-toe shoes or steel-toe boots) and non-specialty prescription safety eyewear, provided that the employer permits these items to be worn off the jobsite;
- Replacement PPE when the employee has lost or intentionally damaged the PPE; and
- Employee-owned PPE where the worker volunteers to use the PPE they already own. Employers must ensure that the worker-owned PPE fits properly and provides adequate protection.

## Eye and Face Protection

Shipyard workers can have their eyes and faces exposed to numerous hazards, including flying particles, light radiation, and acids or caustic liquids. The necessary eye and face protection will vary depending on the work activity. Employers must supply appropriate PPE for the work being done, and make sure it is worn. Where workers require corrective lenses, the prescription lenses should be incorporated into the design of the eye protection when possible. While it is acceptable to wear additional eye protection over their prescription lenses, it is important that the protective eye wear does not inhibit or limit the worker's vision, nor interfere with the protective eyewear fitting properly.

## Foot Protection

Many occupations in shipyard employment require the use of safety shoes. Safety shoes, including boots, must meet the specifications contained in any of the following consensus standards — ASTM F-2412-2005 and ASTM F-2413-2005, ANSI Z41-1999, or ANSI Z41-1991 — and provide impact and compression protection for the foot.

Metatarsal guards, made of aluminum, steel, fiber, or plastic, are effective in limiting injury caused by the impact of heavy objects on the instep (or top portion) of the foot. Electrical workers must wear safety shoes that are non-conductive. Safety shoes or boots with rubber or synthetic material are used for protection against acids, caustics, and other solvents. When necessary, safety shoes or boots can be obtained that provide puncture protection. As with all protective equipment, safety footwear should be inspected before each use for cracks, holes, separation of materials, and broken buckles or laces. It is important to follow the manufacturer's cleaning and maintenance recommendations, as well as to check soles for embedded items (e.g., metal fragments).

## Head Protection

Head protection is required if there is the potential for objects to strike and penetrate workers on their heads, or workers' heads to come into contact with electrical hazards. Hard hats must meet the American National Standards Institute (ANSI) Z89.1 standard, which defines the types and classes of hard hats for specific hazards; design and performance requirements for impact, penetration, and electrical shock; and testing requirements. Although manufacturers typically test and certify their products, employers must verify that their hard hats meet OSHA standards.

Hard hats must be replaced if they show signs of damage (dents, cracks, penetration, or fatigue due to rough treatment). Hard hats should be inspected for damage and signs of fatigue each time they are used. Labels or paints should not be applied to hard hats. These materials have the potential to conceal defects or damage that would compromise its effectiveness, and may also eliminate electrical resistance. The life span of hard hats will vary depending on the work environments. Many hard hat manufacturers recommend that they be replaced every five years, as well as support straps annually, regardless of their appearance. Exposure to high temperatures, chemicals, or sunlight may accelerate deterioration; in such situations, hard hats should be replaced more frequently.

## Protective Clothing and Gloves

Employers are responsible for supplying and ensuring that workers use the appropriate protective clothing, including flame-resistant, high-voltage, and utility coveralls; and gloves or other hand protection to prevent skin absorption of harmful substances, thermal burns, and cuts or scrapes from sharp objects. When selecting the appropriate protective clothing, employers should take into account the reason for use, the duration and frequency it will be worn, the degree of dexterity needed, and whether disposable or reusable clothing is appropriate. PPE intended to protect workers from exposure to toxic substances or harmful physical agents should be inspected before each use for damage that could compromise safety.

## Knee and Elbow Protection

Shipyard work activities, such as welding or grinding, often put workers in awkward and prolonged static postures, such as kneeling or leaning on their elbows. Whenever possible, changes to equipment, work practices, and procedures should be implemented to minimize these risk factors. For example, long extension handles for hand tools enable operators to work from a standing position, instead of kneeling or crouching for extended periods. Knee and elbow pads (or similar supports) help distribute weight evenly and reduce contact stress.

## Respiratory Protection

Respirators effectively protect workers from occupational diseases caused by contaminated breathing air; their use is encouraged even when exposures are below the exposure limit. However, the control of contaminants, such as from harmful dusts, fogs, fumes, etc., should first be attempted through the use of engineering control measures (for example, enclosure or confinement of the operation, general and local ventilation, and substitution of less toxic materials). When such controls are determined infeasible, or while they are being installed, employers must provide workers with adequate respiratory protection equipment, training, and medical evaluations as outlined in [29 CFR 1910.134](#). Before initial use of respirators, and at least annually, workers must be trained on:

- Why the respirator is necessary and how proper fit, usage, or maintenance can increase its effectiveness;
- The limitations and capabilities of the respirator;
- How to use the respirator in emergency situations, including situations in which the respirator malfunctions;
- How to inspect, put on and remove, use, and check the seals of the respirator;
- Procedures for maintenance and storage; and
- How to recognize medical signs and symptoms that may limit or prevent the effective use of respirators.

The voluntary use of respirators is permitted to offer an added level of comfort and protection for workers, but should be monitored closely. Paragraph (c) of [29 CFR 1910.134](#) provides requirements where respirator use is not required, but worn voluntarily. If a respirator is used improperly or not kept clean, the respirator can become a hazard to the worker. Whether employers provide workers with respirators, or workers use their own respirators voluntarily, the employer must ensure that the equipment fits properly, is certified to protect workers from the contaminant of concern, and manufacturer's instructions are followed.

## Fall Protection

In shipyards, workers have the potential to fall from overhead platforms or other elevated locations. Employers must identify and provide fall protection devices as outlined in [29 CFR 1915.159](#) and [1915.160](#) to protect workers from such fall hazards. Workers must

be trained to understand the application limits of the equipment and proper hook-up, anchoring, and tie-off techniques. Training must also ensure that workers can demonstrate the proper use, inspection, and storage of their equipment.

## Hearing Protection

Noise at excessive levels in the workplace can lead to hearing loss, tinnitus (ringing in the ear), stress, anxiety, high blood pressure, gastrointestinal problems, and chronic fatigue. OSHA's permissible exposure limit (PEL) for noise, as outlined in [29 CFR 1910.95](#), is 90 decibel (dB) for an 8-hour time-weighted average (TWA), using an exchange rate 5 dB. This means that when the noise level is increased by 5 dB, the amount of time a person can be exposed to that noise level without hearing protection is cut in half (e.g., 95 dB = 4 hours of maximum exposure). In cases where workplace sound levels exceed the PEL, employers must implement administrative and/or engineering controls to protect workers. When engineering or administrative controls fail to reduce the noise level to within the permissible levels, hearing protection (ear plugs or earmuffs) must be provided and used to reduce the noise to an acceptable level.

Implementation of a hearing conservation program is required when workers are exposed to a TWA noise level of 85 dB or higher over an 8-hour work shift. This means employers must measure noise levels and supply workers with the appropriate level of hearing protection. Workers must be trained in the use and care of the hearing protection.

Repeat sampling of noise levels must be conducted whenever a change in production, process, equipment, or controls has the potential for an increase in noise exposures. This will help to evaluate the adequacy of the hearing protection in use, as well as identify other workers that may be exposed at or above the action level. Performance of a 6-month baseline and annual hearing exams, which must be provided to workers at no cost, is required.

## Training

Training workers about hazards and controls is an important part of workplace safety. Where hazards or the potential for hazards are identified that require the use of PPE, employers must provide and ensure that each affected worker is trained in and uses the appropriate PPE ([29 CFR 1915.152](#)). This includes protective clothing, protective shields, protective barriers, personal fall protection equipment, and lifesaving equipment. Workers required to use PPE must be trained to know:

- When PPE is necessary;
- What kind of PPE is necessary;
- How to properly put it on, adjust, wear, and take off PPE;
- The limitations of the equipment; and
- Proper care, maintenance, useful life, and disposal of the equipment.



## On-Site Consultation

OSHA's On-Site Consultation Program offers free and confidential occupational safety and health services to small and medium-sized businesses in all states and several territories, with priority given to high-hazard worksites. On-Site Consultation services are separate from enforcement and do not result in penalties or citations. Consultants from state agencies or universities work with employers to identify workplace hazards, provide advice on compliance with OSHA standards, and assist in establishing and improving safety and health programs. To locate the OSHA On-Site Consultation Program nearest you, call 1-800-321-6742 (OSHA) or visit [www.osha.gov/consultation](http://www.osha.gov/consultation).

## More Information

For additional information, see OSHA's shipbuilding and repair webpage at [www.osha.gov/SLTC/shipbuildingrepair](http://www.osha.gov/SLTC/shipbuildingrepair), [Enforcement Guidelines for Personal Protective Equipment \(PPE\) in Shipyard Employment \(CPL 02-01-049\)](#), and implementing a safety and health program at [www.osha.gov/shpguidelines](http://www.osha.gov/shpguidelines).

## Workers' Rights

Workers have the right to:

- Working conditions that do not pose a risk of serious harm.
- Receive information and training (in a language and vocabulary the worker understands) about workplace hazards, methods to prevent them, and the OSHA standards that apply to their workplace.
- Review records of work-related injuries and illnesses.
- File a complaint asking OSHA to inspect their workplace if they believe there is a serious hazard or that their employer is not following OSHA's rules. OSHA will keep all identities confidential.
- Exercise their rights under the law without retaliation, including reporting an injury or raising health and safety concerns with their employer or OSHA. If a worker has been retaliated against for using their rights, they must file a complaint with OSHA as soon as possible, but no later than 30 days.

For additional information, see OSHA's Workers page ([www.osha.gov/workers](http://www.osha.gov/workers)).

## How to Contact OSHA

Under the Occupational Safety and Health Act of 1970, employers are responsible for providing safe and healthful workplaces for their employees. OSHA's role is to ensure these conditions for America's working men and women by setting and enforcing standards, and providing training, education and assistance. For more information, visit [www.osha.gov](http://www.osha.gov) or call OSHA at 1-800-321-OSHA (6742), TTY 1-877-889-5627.



U.S. Department of Labor



**Occupational  
Safety and Health  
Administration**

This is one in a series of informational fact sheets highlighting OSHA programs, policies or standards. It does not impose any new compliance requirements. For a comprehensive list of compliance requirements of OSHA standards or regulations, refer to Title 29 of the Code of Federal Regulations. This information will be made available to sensory-impaired individuals upon request. The voice phone is (202) 693-1999; teletypewriter (TTY) number: 1-877-889-5627.

