

EHS Rules and Regulations for Shipyard and Associated Industries

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**PORTS & MARITIME DEPARTMENT
ENVIRONMENT, HEALTH & SAFETY DIVISION**

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Forward

The EHS Rules and Regulations for Shipyard and Associated Industries ensure a high level of safety of people, property, equipment and environment against hazards associated with Shipyard & Associated Industrial and commercial operations areas under Dubai World jurisdiction. This document should be read in conjunction with EHS – PCFC Health, Safety & Fire Regulations and standards, EHS Health & Safety Guidelines, Environmental Guidelines, Environmental Control Rules & Requirements (all separately published) and applicable local / federal HSE requirements.

The Dubai World operates under a system of prior and continuous approval, and no operation may commence until the facility/operations have been inspected and the Authority is satisfied that it meets its requirements and is fit to operate. When the Authority is satisfied with the facility and operational /HSE controls, then an Operation Fitness Certificate will be issued, to be signed by officials of Environment, Health & Safety (EHS), the Competent Department of Dubai World.

EHS is authorized to make visits to all facilities/operations to ensure that the standards and requirements are being met. During these visits, unsatisfactory circumstances may be found, which need correction and these are drawn to the attention of the Company's senior management. Should any company / lessee not respond positively to notifications from EHS, then EHS will be constrained to take necessary actions /apply appropriate sanctions to ensure a safe and clean environment. We look forward to your cooperation to enhance Environment, Health & Safety Standards.

This first edition will not only contribute to the improvement of the shipyard industry's safety record but will also bring us closer to the goal of zero accident and clean environment to which we all aspire.

SULTAN AHMED BIN SULAYEM
Chairman
Dubai World

Preamble

The nature of works of shipyard and associated industries are traditionally hazardous, with an injury-accident rate more than that of general industry. EHS has targeted the same in its Strategic Plan to reduce injuries, illnesses, prevent fatalities and create clean environment by enforcing the rules, regulations and standards stipulated in this first edition. Safe and healthy working practices benefit everyone from individual employees to the industries they work for and the customers who rely on the services those industries provide.

This Regulation booklet is developed as an integral part of Health, Safety and Fire Regulations and Standards of EHS for Shipyard and associated industrial operations. It is intended to provide the user with detailed regulations and guidance on safe and efficient operations within the Dubai World premises.

The corner stone of good safety management is commitment from the top. In matters of safety, health and pollution prevention, it is the commitment, competence, attitudes and motivation of individuals at all levels that determines the end results.

Section 1

General Information

1.1 Scope

1. These regulations are applicable to all ship repairing, shipbuilding, and other associated activities, all vessels, industries, companies and organizations entering, using or making use of facilities belonging to Dubai World. Neither non-possession nor ignorance of these regulations will be considered a reason of non-imposition of a penalty for violation of these regulations.
2. The Competent Department (EHS) is empowered to enforce these regulations to ensure safe and efficient operation within Dubai world premises.
3. Nothing in these Regulations shall be construed as over-riding or contradicting to:
 4. The Laws of the UAE
 5. The provisions of international, national or regional regulations as applicable.
 6. The Dubai World reserves the right at any time, to alter, change or amend any or all of the provisions contained in these regulations with or without prior notice. The revised EHS regulations supersede earlier issued EHS Regulations. The responsibility for compliance is placed upon “employers” and “employees” as defined in these regulations.
7. Relevant international Regulations & Guidelines such as Health & Safety Executive (HSE), OSHA, NFPA, IMO, IAEA, API, ASME, ASHRAE and BS standards will be the baseline/ reference line for any requirements that have not been referred in this booklet.
8. Without limiting the actions of the competent department in the protection of Health, Safety & Environment, the competent department is empowered to
 - a. Issue appropriate enabling regulations, guidelines and codes of practice for the safe conduct of work and also to amend them where situation & context warrant to induce compliance.
 - b. Inspect all work places, take samples or photographs and issue directions/instructions to ensure compliance with Health, Safety and Environmental requirements
 - c. Issue Correction notices/Warning letters and/or Penalties where deemed required.
 - d. Prepare and execute education/training/awareness programs and / or recommend programs in Health & Safety
 - e. Advise Local/Federal Government Departments (where applicable) on status of non-compliant companies/licensees to enable necessary actions

1.2 Employer Obligation

Each employer shall provide appropriate safety measures to protect workers against the hazards of occupational injuries and diseases that may occur during the work and also against fire and other hazards that may result from the use of machines and other work tools. He shall also adopt all other safety measures prescribed by the Ministry of Labour and Social Affairs.

1.3 Employee Obligation

Every worker shall use the protective gear and the clothing supplied to him for this purpose, shall comply with all instructions given by the employer to protect him against hazards, and shall refrain from taking any action that might obstruct the enforcement of such instructions.

1.4 Drug and Alcohol Policy

It is the policy of Dubai World that the distribution, dispensation, possession or use of drugs, alcohol and the abuse of substances is strictly prohibited without approval from concerned authorities. It shall be unlawful for an employer, his representative or any person having authority over workers to bring or allow any one else to bring any kind of alcoholic beverages into a workplace for consumption therein or to allow any person in a state of drunkenness to enter or remain on the premises. Any person suspected or found to be under the influence of alcohol, non-prescription drugs or substance abuse must not be allowed to enter work sites and he/she may be referred for criminal prosecution.

1.5 No Smoking Policy

Smoking is not allowed within the confines of any buildings and operational areas owned or managed by Dubai World except in designated smoking area. Appropriate warning notices shall be displayed in all those places and on board where smoking is prohibited. This warning shall be written in both English and Arabic, and accompanied by the international prohibition picture sign.

1.6 Definitions

Alarm: A signal or message from a person or device that indicates that there is a fire, medical emergency or other situation that requires emergency response or evacuation.

Alarm system: A system that warns employees at the worksite of danger.

Anchorage: A secure point to attach lifelines, lanyards, or deceleration devices.

Safety(Body) belt: A strap with means to both secure it around the waist and to attach it to a lanyard, lifeline, or deceleration device. Body belts may be used only in fall restraint or positioning device systems and may not be used for fall arrest. Body belts shall be at least one and five-eighths inches (4.13 cm) wide.

Safety (Body) harness: Straps to secure around an employee so that fall arrest forces are distributed over at least the thighs, shoulders, chest and pelvis with means to attach it to other components of a personal fall arrest system.

Cold work: Work that does not involve riveting, welding, burning, or other fire-producing or spark-producing operations.

Contract employer: An employer, (such as a painter, fabricator, carpenter, or scaffolding subcontractor, etc.), who performs work under contract to the host employer or to another employer under contract to the host employer at the host employer's worksite.

Competent Person: A person who can recognize and evaluate employee exposure to hazardous substances or to other unsafe conditions and can specify the necessary protection and precautions necessary to ensure the safety of employees as required by applicable rules, regulations and standards.

Confined Space: An enclosed or partially enclosed workspace, Limited means of entry and exit, Subject to accumulation of toxic or flammable contaminants, May develop an oxygen deficiency, Not intended for continuous employee occupancy

Dangerous atmosphere: An atmosphere that may expose employees to the risk of death, incapacitation, injury acute illness, or impairment of ability to self-rescue (i.e., escape unaided from a confined or enclosed space).

Deceleration device: A mechanism, such as a rope grab, rip stitch lanyard, specially woven lanyard, tearing or deforming lanyard, or automatic self-retracting lifeline/lanyard, that serves to dissipate a substantial amount of energy during a fall arrest, or to limit the energy imposed on an employee during fall arrest.

Designated area: An area established for hot work after an inspection that is free of fire hazards.

EHS approved competent person is a person approved for performing specific task to ensure "safe to work", such as Hot Work & Gas free surveyor etc.,

Emergency operations: Activities performed by fire response organizations that are related to: Rescue, fire suppression, emergency medical care, and special

operations or activities that include responding to the scene of an incident and all activities performed at that scene.

Employee: Any person engaged in ship repairing, ship building, or ship breaking or related employment as defined in these regulations.

Employer: An employer with employees who are employed, in whole or in part, in ship repair, ship building, and ship breaking, or related employment as defined in these regulations.

Equivalent: Alternative designs, materials, or methods to protect against a hazard which the employer can demonstrate will provide an equal or greater degree of safety for employees than the method or item specified in the standard.

Fire hazard: A condition or material that may start or contribute to the spread of fire.

Fire protection: Methods of providing fire prevention, response, detection, control, extinguishment, and engineering.

Fire response: The activity taken by the employer at the time of an emergency incident involving a fire at the worksite, including fire suppression activities carried out by internal or external resources or a combination of both, or total or partial employee evacuation of the area exposed to the fire.

Fire response organization: An organized group knowledgeable, trained, and skilled in shipyard fire fighting operations that responds to shipyard fire emergencies, including: Fire brigades, shipyard fire departments, private or contractual fire departments, and municipal fire departments.

Fire suppression: The activities involved in controlling and extinguishing fires.

Fire watch: The activity of observing and responding to the fire hazards associated with hot work in shipyard employment and the employees designated to do so.

Fixed extinguishing system: A permanently installed fire protection system that either extinguishes or controls fire occurring in the space it protects.

Flammable liquid: Any liquid having a flashpoint below 100°F (37.8°C), except any mixture having components with flashpoints of 100°F (37.8°C) or higher, the total of which make up ninety-nine percent or more of the total volume of the mixture.

Free fall: To fall before a personal fall arrest system begins to apply force to arrest the fall.

Gangway: A ramp-like or stair-like means to board or leave a vessel including accommodation ladders, gangplanks and brows.

Hazardous substance: A substance likely to cause injury because it is explosive, flammable, poisonous, corrosive, oxidizing, irritant, or otherwise harmful.

Hose systems: Fire protection systems consisting of a water supply, approved fire hose, and a means to control the flow of water at the output end of the hose.

Host employer: An employer who is in charge of coordinating work or who hires other employers to perform work at a multiemployer workplace.

Hot work: Riveting, welding, burning or other fire or spark producing operations.

Incipient stage fire: A fire, in the initial or beginning stage, which can be controlled or extinguished by portable fire extinguishers, Class II standpipe or small hose systems without the need for protective clothing or breathing apparatus.

Inerting: The displacement of the atmosphere in a permit space by noncombustible gas (such as nitrogen) to such an extent that the resulting atmosphere is noncombustible. This procedure produces an IDLH oxygen-deficient atmosphere.

Lanyard: A flexible line of rope, wire rope, or strap which generally has a connector at each end for connecting the body belt or body harness to a deceleration device, lifeline, or anchorage.

Lifeline: A component consisting of a flexible line to connect to an anchorage at one end to hang vertically (vertical lifeline), or to connect to anchorages at both ends to stretch horizontally (horizontal lifeline), and which serves as a means for connecting other components of a personal fall arrest system to the anchorage.

Multiemployer workplace: A workplace where there is a host employer and at least one contract employer.

Personal alert safety system (PASS): A device that sounds a loud signal if the wearer becomes immobilized or is motionless for thirty seconds or more.

Personal fall arrest system: A system used to arrest an employee in a fall from a working level. It consists of an anchorage, connectors, body harness and may include a lanyard, a deceleration device, a lifeline, or a suitable combination.

Portable unfired pressure vessel: A pressure container or vessel used aboard ship, other than the ship's equipment, containing liquids or gases under pressure.

Positioning device system: A body belt or body harness system rigged to allow an employee to be supported at an elevated vertical surface, such as a wall or window, and to be able to work with both hands free while leaning.

Powder actuated fastening tool: A tool or machine that drives a stud, pin, or fastener by means of an explosive charge.

Protected space: Any space into which a fixed extinguishing system can discharge.

Qualified person: A person who has successfully demonstrated the ability to solve or resolve problems related to the subject matter and work by possessing a recognized degree or certificate of professional standing or by extensive knowledge, training, and experience.

Related employment: Any employment related to or performed in conjunction with ship repairing, ship building, or ship breaking work, including, but not limited to, inspecting, testing, and serving as a watchman.

Rescue: Locating endangered persons at an emergency incident, removing those persons from danger, treating the injured, and transporting the injured to an appropriate health care facility.

“Shall”: Mandatory.

Ship breaking: Breaking down a vessel’s structure to scrap the vessel, including the removal of gear, equipment or any component part of a vessel.

Ship building: Construction of a vessel, including the installation of machinery and equipment.

Ship repairing: Repair of a vessel including, but not limited to, alterations, conversions, installations, cleaning, painting, and maintenance.

Shipyard fire fighting: The activity of rescue, fire suppression, and property conservation involving buildings, enclosed structures, vehicles, vessels, or similar properties involved in a fire or emergency situation.

Vessel: Every watercraft for use as a means of transportation on water, including special purpose floating structures not primarily designed for or used as a means of transportation on water.

Section 2.0

Fire Protection in Shipyards

2.1 Scope

This section covers employers with employees engaged in shipyard employment aboard vessels and vessel sections and on land-side operations regardless of geographic location. This requires employers to protect all employees from fire hazards in shipyard employment, including employees engaged in fire response activities.

2.2 Employee participation.

The employer shall provide ways for employees or employee representatives, or both to participate in developing and periodically reviewing programs and policies adopted to comply with requirements of fire protection.

2.3 Multiemployer Worksites.

1) **Host employer responsibilities** are to:

- a) Inform all employers at the worksite about the content of the fire safety plan including hazards, controls, fire safety and health rules, and emergency procedures.
- b) Make sure the safety and health responsibilities for fire protection are assigned as appropriate to other employers at the worksite.
- c) If there is more than one host employer, each host employer shall communicate relevant information about fire-related hazards to other host employers. When a vessel owner or operator (temporarily) becomes a host shipyard employer by directing the work of ships' crews on repair modification of the vessel or by hiring other contractors directly, the vessel owner or operator shall also comply with these provisions for host employers.

2) **Contract employer responsibilities** are to:

- a) Make sure that the host employer knows about the fire-related hazards associated with the contract employer's work and what the contract employer is doing to address them.
- b) Advise the host employer of any previously unidentified fire-related hazards that the contract employer identifies at the worksite.

2.4 Fire Safety Plan

2.4.1 General requirements:

The Fire safety Plan shall establish the location, type, and capacity of firefighting equipment such as extinguishers, fire hose and stand pipes, smoke detectors, automatic sprinklers, and other fixed firefighting systems in accordance with applicable fire codes. The plan shall provide for the routine inspection, maintenance, and replacement of this equipment and mandate training for new workers and refresher training for all shipyard employment workers. The plan shall include procedures for the control of fire hazards, such as flammable and non-flammable compressed gases, ignition sources, combustible materials, and welding and hot work operations, and shall include procedures for evacuation.

2.4.2 Employer Responsibilities

The employer shall develop and implement a written fire safety plan that covers all the actions that employers and employees shall take to ensure employee safety in the event of a fire.

Article 92 of Federal Law No 8: Each employer shall display in a conspicuous position at the workplace detailed instructions indicating the measures to be taken to prevent fire and protect the workers against hazards to which they may be exposed while performing their work. Such instructions shall be in Arabic and in another language understood by the worker.

2.4.3 Contract Employers Responsibilities.

Contract employers in shipyard employment shall have a fire safety plan for their employees, and this plan shall comply with the host employer's fire safety plan.

2.4.4 Fire Safety Plan Elements.

The employer shall include the following information in the fire safety plan:

- (a) Identification of the significant fire hazards
- (b) Procedures for recognizing and reporting unsafe conditions
- (c) Alarm procedures
- (d) Procedures for notifying employees of a fire emergency
- (e) Procedures for notifying fire response organizations of a fire emergency
- (f) Procedures for evacuation
- (g) Procedures to account for all employees after an evacuation.
- (h) Names, job titles, or departments for individuals who can be contacted for further information about the plan.

2.4.5 Fire Plan Awareness to Employees.

The employer shall explain the plan to each employee at the following times:

- (a) for employees who are currently working;
- (b) Upon initial assignment for new employees; and
- (c) When the actions the employee shall take under the plan change because of a change in duties or a change in the plan.

2.4.6 Additional Employer Requirements. The employer shall:

- a) Keep the plan accessible to employees and Authorities. Employees shall be able to access the fire safety plan at any time during the work shift. The plan may be in a notebook, on a computer, or in any other appropriate format. The employer may have one or more locations for all safety plans and related information. Employees shall know where to go to access this information and shall be able to obtain the information in a timely manner.
- b) Review and update the plan whenever necessary, but at least annually. Updating the plan when necessary would include when there is a change in the system, the process, or in technology. This ensures that the fire safety plan will be effective for the work that is being performed at any given facility at any given time. DMC/Jadaf Dubai shipyard may be working on several types of vessels during a year, and that each vessel may involve different hazards. The plan may need to be updated to cover those changes as well. For instance, if a shipyard only repairs barges, employees should be aware of the hazards associated with that particular vessel. However, if a tanker vessel is in the shipyard for modifications or repair, the elements of the fire safety plan may need revision to address the different fire hazards associated with such a vessel.
- c) Ensure any outside fire response organization that the employer expects to respond to fires at the employer's worksite has been given a copy of the current plan.

2.5 Fire Precautions for Hot Work.

2.5.1 General requirements

The EHS's requirement is to make sure that the employer identifies all fire hazards in a hot work area, to reduce the potential of fire hazards and to reduce the frequency and severity of any fires resulting from hot work.

Designated areas: The employer may designate areas for hot work in sites such as vessels, vessel sections, fabricating shops, and subassembly areas that are free of fire hazards.

Non-designated areas.

(i) Hot work certificate shall be issued by EHS authorized person before starting hot work in a non-designated area. The employer shall visually inspect the area where hot work is to be performed, including adjacent spaces, to ensure the area is free of fire hazards.

(ii) The employer shall authorize employees to perform hot work only in areas that are free of fire hazards, or that have been controlled by physical isolation, fire watches, or other positive equivalent means.

2.5.2 Specific Hot Work Safety Requirements

Maintaining fire hazard-free conditions. The employer shall keep all hot work areas free of new hazards that may cause or contribute to the spread of fire.

Fuel gas and oxygen supply lines and torches. The employer shall make sure that:

- a) No unattended fuel gas and oxygen hose lines or torches are in confined spaces.
- b) No unattended charged fuel gas and oxygen hose lines or torches are in enclosed spaces for more than fifteen minutes.
- c) All fuel gas and oxygen hose lines are disconnected at the supply manifold at the end of each shift.
- d) All disconnected fuel gas and oxygen hose lines are rolled back to the supply manifold or to open air to disconnect the torch; or extended fuel gas and oxygen hose lines are not reconnected at the supply manifold unless the lines are given a positive means of identification when they were first connected and the lines are tested using a drop test or other positive means to ensure the integrity of fuel gas and oxygen burning system.

2.5.3 Safe Work Permits

All Hot work requires Safe Work permits (authorization certificate) from EHS authorized competent person.

The certificate issued by the EHS authorized competent person shall be posted in the immediate vicinity of the affected operations while they are in progress.

2.5.4 Hot work requiring Gas free Certificate issued by an EHS authorized competent person.

The employer shall ensure that hot work is not performed in or on any of the following confined and enclosed spaces and other dangerous atmospheres, boundaries of spaces or pipelines until the work area has been tested and certified by an EHS authorized competent person as “safe for hot work”.

1. Within, on, or immediately adjacent to spaces that contain or have contained combustible or flammable liquids or gases.
2. Within, on, or immediately adjacent to fuel tanks that contain or have last contained fuel
3. On pipelines, heating coils, pump fittings or other accessories connected to spaces that contain or have last contained fuel.
4. The certificate issued by the EHS authorized competent person shall be posted in the immediate vicinity of the affected operations while they are in progress.
5. Hot work is not permitted in or on the following spaces or adjacent spaces or other dangerous atmospheres until they have been tested by an EHS authorized competent person and determined to contain no concentrations of flammable vapors equal to or greater than 10 percent of the lower explosive limit.

2.6 Fire Watches.

The employer shall create and keep the following requirements for employees performing fire watch in the workplace:

- a) The employees shall be given detailed fire watch training
- b) The duties employees are to perform.
- c) The equipment employees shall be given.
- d) The personal protective equipment (PPE) that shall be made available and worn as required.

2.6.1 Posting fire watches.

The employer shall post a fire watch during hot work but not limited to the following conditions

1. Slag, weld splatter, or sparks might pass through an opening and cause a fire
2. Fire-resistant guards or curtains are not used to prevent ignition of combustible materials on or near decks, bulkheads, partitions, or overheads
3. The hot work is carried out on or near insulation, combustible coatings, or sandwich-type construction that cannot be shielded, cut back, or removed, or in a space within a sandwich-type construction that cannot be inerted
4. Combustible materials adjacent to the opposite sides of bulkheads, decks, overheads, metal partitions, or sandwich-type construction may be ignited by conduction or radiation
5. The hot work is close enough to cause ignition through heat radiation or conduction on the following:
 - a. Insulated pipes, bulkheads, decks, partitions, or overheads; or
 - b. Combustible materials and/or coatings.
6. The work is close enough to unprotected combustible pipe or cable runs to cause ignition.
7. Authority or PCFC -authorized person requires that a fire watch be posted.

2.6.2 Role of Fire Watch Duty

1. The employer shall not assign other duties to a fire watch while the hot work is in progress.
2. Employers shall ensure that employees assigned to fire watch duty:
 - a. Have a clear view of and immediate access to all areas included in the fire watch.
 - b. Are able to communicate with workers exposed to hot work.
 - c. Are authorized to stop work if necessary and restore safe conditions within the hot work area.
 - d. Remain in the hot work area for at least thirty minutes after completion of the hot work, unless the employer or its representative surveys the exposed area and makes a determination that there is no further fire hazard
 - e. Are trained to detect fires that occur in areas exposed to the hot work
 - f. Attempt to extinguish any incipient stage fires in the hot work area that are within the capability of available equipment and within the fire watch's training qualifications.
 - g. Alert employees of any fire beyond the incipient stage
 - h. If unable to extinguish fire in the areas exposed to the hot work, activate the alarm.
3. The employer shall ensure that employees assigned to fire watch are physically capable of performing these duties.

2.7 Fire Response

A plan for fire response functions that:

- a) Addresses procedures for obtaining assistance from the outside fire response organization.
- b) Familiarizes the outside fire response organization with the layout of the employer's facility or worksite, including access routes to controlled areas, and site-specific operations, occupancies, vessels or vessel sections, and hazards
- c) Sets forth how hose and coupling connection threads are to be made compatible and includes where the adapter couplings are kept or
- d) States that the employer will not allow the use of incompatible hose connections.

2.8 Hazards of Fixed Extinguishing Systems on board Vessels and Vessel Sections

Requirements for Automatic and Manual Systems: Before any work is done in a space equipped with fixed extinguishing systems, the employer shall either:

- 1) Physically isolate the systems or use other positive means to prevent the systems' discharge; or
- 2) Ensure employees are trained to recognize:
 - a) Systems' discharge and evacuation alarms and the appropriate escape routes
 - b) Hazards associated with the extinguishing systems and agents including the dangers of disturbing system components and equipment such as piping, cables, linkages, detection devices, activation devices, and alarm devices.
- 3) **Sea and Dock Trials:** During trials, the employer shall ensure that all systems shall remain operational.
- 4) **Doors and Hatches.** The employer shall:
 - (a) Take protective measures to ensure that all doors, hatches, scuttles, and other exit openings remain working and accessible for escape in the event the systems are activated.
 - (b) Ensure that all inward opening doors, hatches, scuttles, and other potential barriers to safe exit are removed, locked open, braced, or otherwise secured so that they remain open and accessible for escape if the systems' activation could result in a positive pressure in the protected spaces sufficient to impede escape.
- 5) **Testing the system.**
 - (a) When testing a fixed extinguishing system involves a total discharge of extinguishing medium into a space, the employer shall evacuate all employees from the space and assure that no employees remain in the space during the discharge. The employer shall retest the atmosphere to ensure that the oxygen levels are safe for employees to enter.
 - (b) When testing a fixed extinguishing system does not involve a total discharge of the system's extinguishing medium, the employer shall make sure that the system's extinguishing medium is physically isolated and that all employees not directly involved in the testing are evacuated from the protected space.
- 6) **Conducting system maintenance.** Before conducting maintenance on a fixed extinguishing system, the employer shall ensure that the system is physically isolated.

- 7) **Using fixed manual extinguishing systems for fire protection.** If fixed manual extinguishing systems are used to provide fire protection for spaces in which the employees are working, the employer shall ensure that:
- (a) Only authorized employees are allowed to activate the system;
 - (b) Authorized employees are trained to operate and activate the systems; and
 - (c) All employees are evacuated from the protected spaces, and accounted for, before the fixed manual extinguishing system is activated.

2.9 Land-Side Fire Protection Systems.

2.9.1 Employer Responsibilities:

The employer shall ensure that all fixed and portable fire protection systems for employee safety or employee protection from fire hazards are provided in land-side facilities, including, but not limited to, buildings, structures, and equipment.

2.9.2 Portable Fire Extinguishers and Hose Systems.

1. The employer shall select, install, inspect, maintain, and test all portable fire extinguishers according to NFPA 10-1998 Standard for Portable Fire Extinguishers
2. The employer is permitted to use Class II or Class III hose systems, in accordance with NFPA 10-1998, as portable fire extinguishers if the employer selects, installs, inspects, maintains, and tests those systems according to the specific recommendations in NFPA 14-2000 Standard for the Installation of Standpipe, Private Hydrant, and Hose Systems.

2.9.3 General Requirements for Fixed Extinguishing Systems. The employer shall:

1. Ensure that any fixed extinguishing system component or extinguishing agent is approved for use on the specific hazards the employer expects it to control or extinguish.
2. Notify employees and take the necessary precautions to ensure employees are safe from fire if for any reason a fire extinguishing system stops working, until the system is working again.
3. Ensure all repairs to fire extinguishing systems and equipment are done by a qualified technician or mechanic.
4. Provide and ensure employees use proper personal protective equipment when entering discharge areas in which the atmosphere remains hazardous to employee safety or health, or provide safeguards to prevent employees from entering those areas.

5. **Post hazard warning or caution signs** at both the entrance to and inside of areas protected by fixed extinguishing systems that use extinguishing agents in concentrations known to be hazardous to employee safety or health.
6. Select, install, inspect, maintain, and test all automatic fire detection systems and emergency alarms according to NFPA 72-1999 National Fire Alarm Code.

2.9.4 Fixed Extinguishing Systems.

The employer shall select, install, maintain, inspect, and test all fixed systems as follows:

1. Standpipe and hose systems according to NFPA 14-2000 Standard for the Installation of Standpipe, Private Hydrant, and Hose Systems
2. Automatic sprinkler systems according to NFPA 25-2002 Standard for the Inspection, Testing, and Maintenance of Water-based Fire Protection Systems, and either NFPA 13-1999 Standard for the Installation of Sprinkler Systems or NFPA 750-2000 Standard on Water Mist Fire Protection Systems.
3. Fixed extinguishing systems that use water or foam as the extinguishing agent according to NFPA 15-2001 Standard for Water Spray Fixed Systems for Fire Protection; NFPA 11-1998 Standard for Low-Expansion Foam; and NFPA 11A-1999 Standard for Medium- and High-Expansion Foam Systems
4. Fixed extinguishing systems using dry chemical as the extinguishing agent according to NFPA 17-2002 Standard for Dry Chemical Extinguishing Systems
5. Fixed extinguishing systems using gas as the extinguishing agent according to NFPA 12-2000 Standard on Carbon Dioxide Extinguishing Systems and NFPA 2001-2000 Standard on Clean Agent Fire Extinguishing Systems

2.10 Fire Fighting Training

2.10.1 Employer Responsibilities:

The employer shall train employees for employees currently working, upon initial assignment for new employees and when necessary to maintain proficiency for employees previously trained. The employer shall use EHS approved institution to conduct the training and conduct regular drills for employees that cover site-specific operations, occupancies, buildings, vessels and vessel sections, and fire-related hazards.

2.10.2 Training Areas

The employer shall ensure that all employees are trained on:

1. The emergency alarm signals, including system discharge alarms and employee evacuation alarms.

2. The primary and secondary evacuation routes that employees shall use in the event of a fire in the workplace. While all vessels and vessel sections shall have a primary evacuation route, a secondary evacuation route is not required when impracticable.
3. Additional training requirements for employees expected to fight incipient stage fires.

The employer shall ensure that employees expected to fight incipient stage fires are trained on the following:

- a. The general principles of using fire extinguishers or hose lines, the hazards involved with incipient fire fighting, and the procedures used to reduce these hazards.
 - b. The hazards associated with fixed and portable fire protection systems that employees may use or to which they may be exposed during discharge of those systems; and
 - c. The activation and operation of fixed and portable fire protection systems that the employer expects employees to use in the workplace
4. Additional training requirements for Fire Watch Duty: The employer shall ensure that each fire watch is trained by EHS approved institution to conduct the training to cover the items as follows:
 - a) Before being assigned to fire watch duty
 - b) Whenever there is a change in operations that presents a new or different hazard
 - c) Whenever the employer has reason to believe that the fire watch's knowledge, skills, or understanding of the training previously provided is inadequate.
 - d) Annually.
 6. The employer shall ensure that each employee who stands fire watch duty is trained in:
 - a) The basics of fire behavior, the different classes of fire and of extinguishing agents, the stages of fire, and methods for extinguishing fires
 - b) Extinguishing live fire scenarios whenever allowed by local and federal law
 - c) The recognition of the adverse health effects that may be caused by exposure to fire

- d) The physical characteristics of the hot work area
 - e) The hazards associated with fire watch duties
 - f) The personal protective equipment (PPE) needed to perform fire watch duties safely
 - g) The use of PPE
 - h) The selection and use of any fire extinguishers and fire hoses likely to be used by a fire watch in the work area
 - i) The location and use of barriers
 - j) The means of communication designated by the employer for fire watches
 - k) When and how to start fire alarm procedures
 - l) The employer's evacuation plan.
7. The employer shall ensure that each fire watch is trained to alert others to exit the space whenever:
- a) The fire watch perceives an unsafe condition
 - b) The fire watch perceives that a worker performing hot work is in danger
 - c) The employer or a representative of the employer orders an evacuation; or
 - d) An evacuation signal, such as an alarm, is activated.

2.10.3 Training Records.

The employer shall keep records that demonstrate that employees have been trained as required by these regulations.

- a) The employer shall ensure that the records include the employee's name, the trainer's name, the type of training, and the date(s) on which the training took place.
- b) The employer shall keep each training record and make it available for inspection

Section 3

Tank Cleaning Work

3.1 Scope

The employer shall ensure that manual cleaning and other cold work are not performed in the following spaces unless the conditions for performing cleaning or cold work have been met:

- a) Spaces containing or having last contained bulk quantities of combustible or flammable liquids or gases; and
- b) Spaces containing or having last contained bulk quantities of liquids, gases or solids that are toxic, corrosive or irritating.

3.2 Requirements for performing cleaning or cold work in Confined/Enclosed (Tank) Space

1. Liquid residues of hazardous materials shall be removed from work spaces as thoroughly as practicable before employees start cleaning operations or cold work in a space. Special care shall be taken to prevent the spilling or for shore-side operations, onto the surrounding work area.
2. Testing shall be conducted by EHS approved competent person to determine the concentration of flammable, combustible, toxic, corrosive, or irritant vapors within the space prior to the beginning of cleaning or cold work.
3. Continuous ventilation shall be provided at volumes and flow rates sufficient to ensure that the concentration(s) of:
 - a. Flammable vapor is maintained below 10 percent of the lower explosive limit; and Spaces containing highly volatile residues may require additional ventilation to keep the concentration of flammable vapors below 10 percent of the lower explosive limit and within the permissible exposure limit.
 - b. Toxic, corrosive, or irritant vapors are maintained within the permissible exposure limits and below IDLH levels.
4. Testing shall be conducted by the EHS approved competent person as often as necessary during cleaning or cold work to assure that air concentrations are below 10 percent of the lower explosive limit and within the PELs and below IDLH levels. Factors such as, but not limited to, temperature, volatility of the residues and other existing conditions in

and about the spaces are to be considered in determining the frequency of testing necessary to assure a safe atmosphere.

5. Spills or other releases of flammable, combustible, toxic, corrosive, and irritant materials shall be cleaned up as work progresses.
6. An employee may not enter a confined or enclosed space or other dangerous atmosphere if the concentration of flammable or combustible vapors in work spaces exceeds 10 percent of the lower explosive limit. A person (other than a responsible person entering with a view to issuing a certificate of entry) shall not, unless he is wearing a breathing apparatus of a type suitable for the purpose of this regulation, enter or remain in an oil-tank on board or in a vessel unless, since the oil-tank last contained oil, a certificate of entry has been obtained and is in force in respect of the tank.

Exception: An employee may enter for emergency rescue or for a short duration for installation of ventilation equipment provided:

- (i) No ignition sources are present
 - (ii) The atmosphere in the space is monitored continuously
 - (iii) The atmosphere in the space is maintained above the upper explosive limit
 - (iv) Respiratory protection, personal protective equipment, and clothing are provided in accordance with applicable rules and regulations.
7. A competent person shall test ventilation discharge areas and other areas where discharged vapors may collect to determine if vapors discharged from the spaces being ventilated are accumulating in concentrations hazardous to employees.
 8. If the concentrations of exhaust vapors that are hazardous to employees are accumulating, all work in the contaminated area shall be stopped until the vapors have dissipated or been removed.
 9. Only explosion-proof, self-contained portable lamps, or other electric equipment approved for the hazardous location shall be used until such spaces have been certified as "safe for workers."
 10. The employer shall prominently post signs that prohibit sources of ignition within or near a space that has contained flammable or combustible liquids or gases in bulk quantities:
 - a. At the entrance to those spaces;
 - b. In adjacent spaces; and
 - c. In the open area adjacent to those spaces.
 11. All air moving equipment and its component parts, including duct work, capable of generating a static electric discharge of sufficient energy to create a source of ignition, shall be bonded electrically to the structure of a vessel or

vessel section or, in the case of land-side spaces, grounded to prevent an electric discharge in the space.

12. Fans shall have non-sparking blades, and portable air ducts shall be of non-sparking materials.

3.3 Maintenance of Safe Conditions in Tanks

1. **Preventing hazardous materials from entering:** Pipelines that could carry hazardous materials into spaces that have been certified “safe for workers” or “safe for hot work” shall be disconnected, blanked off, or otherwise blocked by a positive method to prevent hazardous materials from being discharged into the space.
2. **Alteration of existing conditions:** When a change that could alter conditions within a tested confined or enclosed space or other dangerous atmosphere occurs, work in the affected space or area shall be stopped. Work may not be resumed until the affected space or area is visually inspected and retested and found to be “safe for workers” or “safe for hot work”
3. **Tests to maintain the conditions of an EHS authorized person 's certificates:** A competent person shall visually inspect and test each space certified as “safe for workers” or “safe for hot work,” as often as necessary to ensure that atmospheric conditions within that space are maintained within the conditions established by the certificate after the certificate has been issued.
4. Every employer or ship owner for whom a certificate of entry is obtained shall ensure that the certificate or a duplicate thereof is posted as soon as may be and remains posted in a position where it may be conveniently read by all persons concerned.
5. **Change in the conditions of a EHS authorized person 's certificate:** If a competent person finds that the atmospheric conditions within a certified space fail to meet the applicable requirements, work in the certified space shall be stopped and may not be resumed until the space has been retested by EHS authorized person and a new certificate issued
6. **Tests to maintain EHS authorized person’s findings.** Competent person from employer side continue to test and visually inspect spaces as often as necessary to ensure that the required atmospheric conditions within the tested space are maintained.

3.4 Warning Signs

The employer shall ensure that each sign or label posted can be perceived and understood by all employees.

3.5 Pressure Testing of Tanks

Where, in connection with the operations, any tank requires to be leak tested by air pressure the following provisions shall be observed:

1. The air pressure shall be kept to a minimum value and in any case shall not exceed 5 pounds per square inch gauge (0.24 Bar).
2. Where for special reasons it may be necessary to use air at a pressure exceeding 3 pounds per square inch gauge (.20 Bar) all persons shall be evacuated from the test area except the persons directly involved in the test operation
3. Each tank shall be provided with a suitable appliance to prevent the test pressure being exceeded
4. Where a relief valve is to be used, the following provisions shall be observed
5. two relief valves shall be fitted to each tank
6. two correct pressure gauges shall be placed close together to facilitate comparison of readings
7. Each test shall be supervised by a competent person who shall also ensure that the relief appliance and pressure gauges are serviceable and suitable for each test.

Section 4

Surface Preparation and Preservation

4.1 Scope

This section applies to surface preparation and preservation during ship yard & industrial activities.

4.2 Precautions for Water Cleaning

- 1) Wash water runoff shall be channeled through filter fences before discharging to holding tank/recycling plant.
- 2) The runoff shall be filtered through suitable filter to reduce the discharge particulates. The filter material shall be periodically removed and replaced to maintain effectiveness.
- 3) Runoff Water may periodically pool in the area of the filter fence due to sediment, grit, or other particulates becoming trapped. When this occurs, the obstructing material shall be cleaned up immediately and disposed of in a designated waste bin.
- 4) Any activity which has potential of electric shock shall be not be carried out at close proximity to water cleaning operations and all electric equipments shall be adequately protected against ingress water spray/moisture.

4.3 Water Blasting / Hydro blasting

Water blasting/hydro blasting is performed either to clean sediment or marine growth from the vessel hull or to remove the top layers of hull paint. These techniques shall generate large volumes of water with the potential of transporting existing pollutants to surface waters.

- 1) Water blasting/hydro blasting shall not be conducted unless prior cleanup of the dry dock or marine railway floor lids is completed.
- 2) Runoff generated from water blasting, hydro blasting shall not be allowed to discharge directly into surface waters. All discharges shall flow into an approved treatment unit or into holding tank. The design flow of the collection and treatment system shall be adequate to receive the water blasting runoff flow rates.
- 3) Prior to entering floor drains and sumps, water blasting runoff may also channeled through filtering units which will catch most of the particles of paint and marine growth.
- 4) The effluent discharge from the runoff water treatment shall meet the EHS harbour discharge standards.
- 5) All pump connections, valves, meters and couplings shall be watertight. Leaks shall be immediately repaired when discovered.

4.4 Toxic Cleaning Solvents

When toxic solvents are used, the employer shall employ one or more of the following measures to safeguard the health of employees exposed to these solvents.

- 1) The cleaning operation shall be isolated and adequately enclosed to prevent the escape of vapor into the working space.
- 2) Either natural ventilation or mechanical exhaust ventilation shall be used to remove the vapor at the source and to dilute the concentration of vapors in the working space to a concentration which is safe for the entire work period.
- 3) The employer shall ensure that employees are protected against:
 - a. Toxic vapors by suitable respiratory protective equipment that meets the applicable regulatory requirements
 - b. Exposure of skin and eyes to contact with toxic solvents and their vapors by suitable clothing and equipment.

4.5 Chemical Paint and Preservative Removers.

- 1) The employer shall ensure that employees are protected against:
 - a. Skin contact during the handling and application of chemical paint and preservative removers.
 - b. Eye injury by goggles or face shields that meet the regulatory requirements
- 2) The employer shall ensure that employees using paint and rust removers containing strong acids or alkalis are protected by suitable face shields to prevent chemical burns on the face and neck in addition to the other applicable regulatory requirements.
- 3) The employer shall ensure that all employees working within range of a steam gun blast are protected by suitable face shields. Metal parts of the steam gun itself shall be insulated to protect the operator against heat burns.

4.6 Mechanical Paint Removers.

4.6.1 Power & Hand Tools.

- 1) The employer shall ensure that employees engaged in the removal of paints, preservatives, rusts or other coatings by means of power tools and hand tools are protected against eye injury by goggles or face shields.
- 2) All portable rotating tools used for the removal of paints, preservatives, rusts or other coatings shall be adequately guarded to protect both the operator and nearby workers from flying missiles.

- 3) Portable electric tools shall be grounded.
- 4) In a confined space, the employer shall provide mechanical exhaust ventilation sufficient to keep the dust concentration to a minimum, or shall protect employees by respiratory protective equipment.

4.6.2 Flame Removal.

- 1) The employer shall ensure that when hardened preservative coatings are removed by flame in enclosed spaces, the employees exposed to fumes are protected by air line respirators. Employees performing this operation in the open air, and those exposed to the resulting fumes, shall be protected by a fume filter respirator.
- 2) Flame or heat shall not be used to remove soft and greasy preservative coatings.

4.6.3 Abrasive Blasting.

1.General Requirements:

Abrasive blasting operations shall be carried out in an isolated manner to minimize exposure to employees and prevent exposure to others in the work area and the environment. This operation shall not be carried out in a wet berth ,but only in a dedicated dry berth. Open air blasting and sand blasting shall not be permitted. Employer shall use permanent or portable shelters for blasting structures, components and parts. The blasting operation shall not be carried out unless the drain gratings/sills/strainers/filters are sealed such that all of the spent grit can be recovered.

2.Blasting Cabinets

For small objects, a properly designed, sealed, and ventilated blasting cabinet shall be used to eliminate operator and bystander exposure to hazardous air contaminants.

3.Blasting Rooms

For transportable objects too large for blasting cabinets, a blasting room where blasting is done manually by one or more operators working inside the room shall be used. Blasting rooms should have sufficient ventilation to:

- 1) Provide good operator visibility
- 2) Prevent dust from settling and accumulating in the room
- 3) Reduce dust concentrations so that PPE provides adequate protection, and
- 4) Prevent the escape of contaminants into adjacent work areas or the environment.

Operators working inside abrasive blasting rooms shall be protected by appropriate PPE such as hoods and Type CE NIOSH certified abrasive blasting airline respirators, or by positive-pressure blasting helmets.

4. Temporary Enclosures

For large objects or structures that cannot be transported, or for fixed structures, temporary enclosures shall be used. Where possible, objects or structures shall be fully enclosed. When full enclosure is not possible, extend screening above the object or structure, and blast downwards. Air monitoring shall be used to ensure that employees outside the enclosure are not exposed to elevated levels of air contaminants. If high levels of air contaminants are detected outside the enclosure, then the employer shall ensure the following:

- a. Employees shall be excluded from these areas through the use of warnings signs and barricades or provided with appropriate PPE and
- b. Better control measures should be investigated and implemented.

5. Equipment.

Hoses and fittings used for abrasive blasting shall meet the following requirements:

Hoses: Hose of a type to prevent shocks from static electricity shall be used.

Hose couplings: Hose lengths shall be joined by metal couplings secured to the outside of the hose to avoid erosion and weakening of the couplings.

Nozzles: Nozzles shall be attached to the hose by fittings that will prevent the nozzle from unintentionally becoming disengaged. Nozzle attachments shall be of metal and shall fit onto the hose externally.

Dead man control: A dead man control device shall be provided at the nozzle end of the blasting hose either to provide direct cutoff or to signal the pot tender by means of a visual and audible signal to cut off the flow, in the event the blaster loses control of the hose. The pot tender shall be available at all times to respond immediately to the signal.

Inspection and Replacement: Hoses and all fittings used for abrasive blasting shall be inspected frequently to insure timely replacement before an unsafe amount of wear has occurred.

6. Personal Protective Equipment

- a. The employer shall ensure that abrasive blasters working in enclosed spaces are protected by abrasive blasting respirators.
- b. The employer shall ensure that abrasive blasters working in the open are protected against eye injury by goggles or face shields and adequately guarded to protect both the operator and nearby workers from flying missiles.

- c. The employer shall ensure that employees, including machine tenders and abrasive recovery workers, working in areas where unsafe concentrations of abrasive materials and dusts are present are protected by eye and respiratory protective equipment.
- d. The employer shall ensure that a blaster is protected against injury from exposure to the blast by appropriate protective clothing, including gloves that meet the regulatory requirements.
- e. A surge from a drop in pressure in the hose line can throw a blaster off the staging. To protect against this hazard, the employer shall ensure that a blaster is protected by a personal fall arrest system. The personal fall arrest system shall be tied off to the ship or other structure during blasting from elevations where adequate fall protection cannot be provided by railings.

4.7 Waste Management and Prevention

- 1) Employer shall ensure that Pollutants and wastes typically generated by dry abrasive blasting and hull cleaning shall not enter waterways through shipyards' storm water drain, or when a dry berth is flooded or by any other means. These waste streams can be hazardous to people and the environment because they might contain toxic metals.
- 2) Spent grit shall be stored in a dedicated area having impervious floor, away from surface waters and storm water drains.
- 3) Generated waste shall be removed at regular intervals but at least once in a day from the working area without causing any accumulation.
- 4) Wastes shall be segregated, stored and disposed or recycled as per the applicable requirements.

4.8 Painting.

4.8.1 General Requirements

Employer shall make arrangement for paint products entering into marine environment. Store unopened paints, primers, epoxies etc., in a fire-resistant enclosure or fenced secure area with impervious floor and bermed area to contain at least 110% of the largest container or 25% of the total volume of the drums to be stored up to 10KL plus 10% of any volume in excess thereof, which ever is greater (given the small size of most paint containers, the later criterion is most relevant). Employees shall use mixing shelters with containment pans to reduce general spillages. Employer shall use permanent or portable shelters for spray painting structures, components and parts. The painting operation shall not be carried out unless the floor is covered appropriately that the paint particles can not enter the drains. Empty paint cans shall be allowed to air dry before disposal.

4.8.2 Paints mixed with toxic solvents.

When employees spray paints mixed with toxic solvents, the employer shall ensure that the following conditions are met:

- 1) In confined spaces, employees continuously exposed to spraying are protected by air line respirators.
 - a. In tanks or compartments, employees continuously exposed to spraying are protected by air line respirators. Where mechanical ventilation is provided, employees are protected by respirators.
 - b. In large and well ventilated areas, employees exposed to spraying are protected by respirators.
- 2) The employer shall ensure that where employees apply by brush paints with toxic solvents in confined spaces or other areas where lack of ventilation creates a hazard, the employees are protected by filter respirators.
- 3) The metallic parts of air moving devices, including fans, blowers, and jet-type air movers, and all duct work shall be electrically bonded to the vessel's structure.

4.8.3 Paints and tank coatings dissolved in highly volatile, toxic and flammable solvents.

Several organic coatings, adhesives and resins are dissolved in highly toxic, flammable and explosive solvents with flash points below 80°F. Work involving such materials shall be done only when all of the following special precautions have been taken:

- 1) Sufficient exhaust ventilation shall be provided to keep the concentration of solvent vapors below ten percent of the lower explosive limit. Frequent tests shall be made by a competent person to ascertain the concentration.
- 2) If the ventilation fails or if the concentration of solvent vapors reaches or exceeds ten percent of the lower explosive limit, painting shall be stopped and the compartment shall be evacuated until the concentration again falls below ten percent of the lower explosive limit. If the concentration does not fall when painting is stopped, additional ventilation to bring the concentration down to ten percent of the lower explosive limit shall be provided.
- 3) Ventilation shall be continued after the completion of painting until the space or compartment is gas free. The final determination as to whether the space or compartment is gas free shall be made after the ventilating equipment has been shut off for at least twenty minutes.

- 4) Exhaust ducts shall discharge clear of working areas and away from sources of possible ignition. Periodic tests shall be made to ensure that the exhausted vapors are not accumulating in other areas within or around the vessel or ship yard area.
- 5) All motors and control equipment shall be of the explosion-proof type. Fans shall have nonferrous blades. Portable air ducts shall also be of nonferrous materials. All motors and associated control equipment shall be properly maintained and grounded.
- 6) Only non-sparking paint buckets, spray guns and tools shall be used. Metal parts of paint brushes and rollers shall be insulated. Staging shall be erected in a manner which ensures that it is non-sparking.
- 7) Only explosion proof lights, approved by the recognized bodies, shall be used.
- 8) A competent person shall inspect all power and lighting cables to ensure that the insulation is in excellent condition, free of all cracks and worn spots, that lines are not overloaded, and that they are suspended with sufficient slack to prevent undue stress or chafing.
- 9) The face, eyes, head, hands and all other exposed parts of the bodies of employees handling highly volatile paints shall be protected. All footwear shall be non-sparking, such as rubbers, rubber boots or rubber soled shoes without nails. Coveralls or other outer clothing shall be made of cotton. Rubber gloves, instead of plastic gloves, shall be used to protect against the danger of static sparks.
- 10) No matches, lighted cigarettes, cigars, or pipes, and no cigarette lighters or ferrous articles shall be taken into the area where work is being done.
- 11) All solvent drums taken into the compartment shall be placed on nonferrous surfaces and shall be grounded to the vessel. Metallic contact shall be maintained between containers and drums when materials are being transferred from one to another.
- 12) Spray guns, paint pots, and metallic parts of connecting tubing shall be electrically bonded, and the bonded assembly shall be grounded to the vessel.
- 13) The employer shall ensure that all employees continuously in a compartment in which such painting is performed, are protected by air line respirators and by suitable protective clothing. Employees entering such compartments for a limited time shall be protected by filter cartridge type respirators.
- 14) The employer shall ensure that all employees doing exterior paint spraying with such paints are protected by suitable filter cartridge type respirators and by suitable protective clothing.

4.9 Safety Precautions for Flammable liquid

In all cases when liquid solvents, paint and preservative removers, paints are capable of producing a flammable atmosphere under the conditions of use the following precautions shall be taken:

- 1) Smoking, open flames, arcs and spark-producing equipment shall be prohibited in the area.
- 2) Ventilation shall be provided in sufficient quantities to keep the concentration of vapors below ten percent of their lower explosive limit. Frequent tests shall be made by a competent person to ascertain the concentration.
- 3) Scrapings and rags soaked with these materials shall be kept in a covered metal container.
- 4) Only explosion proof lights shall be used.
- 5) A competent person shall inspect all power and lighting cables to ensure that the insulation is in excellent condition, free of all cracks and worn spots, that lines are not overloaded, and that they are suspended with sufficient slack to prevent undue stress or chafing.
- 6) Suitable fire extinguishing equipment shall be immediately available in the work area and shall be maintained in a state of readiness for instant use.

Section 5

Hot Work

5.1 Scope

This section applies to welding, cutting and heating operation. Employer is required to protect employees from exposure to all harmful radiation arising from welding, cutting and heating process. Applicable work permit procedure (hot work, cold work permit) shall be followed prior to commencement of any hot and cold works. Fire extinguishing equipment shall always be available during welding/cutting work

5.2 Mechanical ventilation requirements for Welding, Cutting and Heating

1. Mechanical ventilation shall consist of either general mechanical ventilation systems or local exhaust systems.
2. General mechanical ventilation shall be of sufficient capacity and so arranged as to produce the number of air changes necessary to maintain welding fumes and smoke within safe limits.
3. Local exhaust ventilation shall consist of freely movable hoods intended to be placed by the welder or burner as close as practicable to the work. This system shall be of sufficient capacity and so arranged as to remove fumes and smoke at the source and keep the concentration of them in the breathing zone within safe limits.
4. Contaminated air exhausted from a working space shall be discharged into the open air or otherwise clear of the source of intake air.
5. All air replacing that withdrawn shall be clean and respirable.
6. Oxygen shall not be used for ventilation purposes, comfort cooling, blowing dust or dirt from clothing, or for cleaning the work area.

5.2.1 Welding, Cutting and Heating in Confined spaces.

In addition to the above mentioned ventilation requirements, the following requirements also shall be complied with whenever welding, cutting or heating is performed in a confined space.

1. More than one means of access shall be provided to a confined space in which employees are working and in which the work may generate a hazardous atmosphere in the space except where the structure or arrangement of the vessel makes this provision impractical.

2. When the ventilation ducts required by these regulations shall pass through these means of access, the ducts shall be of such a type and so arranged as to permit free passage of an employee through at least two of these means of access.
3. When sufficient ventilation cannot be obtained without blocking the means of access, employees in the confined space shall be protected by air line respirators and an employee on the outside of such a confined space shall be assigned to maintain communication with those working within it and to aid them in an emergency.

5.2.2 Welding, Cutting or Heating of Metals of Toxic Significance

1. This operation in any enclosed spaces aboard the vessel involving the metals shall be performed with either general mechanical or local exhaust ventilation or employees shall be protected by air line respirators
2. Employees performing such operations in the open air shall be protected by filter type respirators.
3. Other employees exposed to the same atmosphere as the welders or burners shall be protected in the same manner as the welder or burner.

5.3 Safety Requirements for General Welding, Cutting and Heating

1. Welding, cutting and heating not involving conditions or materials described in above section may normally be done without mechanical ventilation or respiratory protective equipment, but where, because of unusual physical or atmospheric conditions, an unsafe accumulation of contaminants exists, suitable mechanical ventilation or respiratory protective equipment shall be provided.
2. Employees performing any type of welding, cutting or heating shall be protected by suitable eye protective equipment.
3. Welders and other employees who are exposed to radiation shall be suitably protected so that the skin is covered completely to prevent burns and other damage by ultraviolet rays. Welding helmets and hand shields shall be free of leaks and openings, and free of highly reflective surfaces.
4. Residues and cargos of metallic ores of toxic significance shall be removed from the area or protected from the heat before welding, cutting or heating is begun.
5. Drums, containers, or hollow structures which have contained toxic or flammable substances shall, before welding, cutting, or heating is undertaken on them, either be filled with water or thoroughly cleaned of such substances and ventilated and tested.

6. Before heat is applied to a drum, container, or hollow structure, a vent or opening shall be provided for the release of any built-up pressure during the application of heat.

5.3.1 Welding, Cutting and Heating In Way of Preservative Coatings

1. Before welding, cutting or heating is commenced on any surface covered by a preservative coating whose flammability is not known, a test shall be made by a competent person to determine its flammability. Preservative coatings shall be considered to be highly flammable when scrapings burn with extreme rapidity.
2. Precautions shall be taken to prevent ignition of highly flammable hardened preservative coatings. When coatings are determined to be highly flammable they shall be stripped from the area to be heated to prevent ignition. A fire hose with fog nozzle, which has been uncoiled and placed under pressure, shall be immediately available for instant use in the immediate vicinity, consistent with avoiding freezing of the hose.
3. In enclosed spaces all surfaces covered with toxic preservatives shall be stripped of all toxic coatings for a distance of at least 4 inches from the area of heat application or the employees shall be protected by air line respirators.
4. In the open air employees shall be protected by a filter type respirator.
5. Before welding, cutting or heating is commenced in enclosed spaces on metals covered by soft and greasy preservatives, the following precautions shall be taken: EHS approved competent person shall test the atmosphere in the space to ensure that no hot work shall be commenced until all necessary precautions have been taken as will ensure that the welding, cutting or heating can be performed in safety.
6. The preservative coatings shall be removed for a sufficient distance from the area to be heated to ensure that the temperature of the un-stripped metal will not be appreciably raised. Artificial cooling of the metal surrounding the heated area may be used to limit the size of the area required to be cleaned.
7. Immediately after welding, cutting or heating is commenced in enclosed spaces on metal covered by soft and greasy preservatives, and at frequent intervals thereafter, a competent person shall make tests to ensure that no flammable vapors are being produced by the coatings. If such vapors are determined to be present, the operation shall be stopped immediately and shall not be resumed until such additional precautions have been taken as are necessary to ensure that the operation can be resumed safely.

5.4 Handling of Gas Cylinders

1. Every person engaged in conveyance shall take all precautions to prevent explosion.
2. Valve protection caps shall be in place and secure. Oil shall not be used to lubricate protection caps.
3. When cylinders are hoisted, they shall be secured on a cradle. They shall not be hoisted by means of magnets or choker slings.
4. Cylinders shall be moved by tilting and rolling them on their bottom edges. They shall not be intentionally dropped, struck, or permitted to strike each other violently
5. Approval from EHS is required for transporting vehicle of gas cylinder/bulk gas.
6. The design, construction and installation of bulk gas storage tanks should meet relevant international standards such as NFPA, API, ASME or any other relevant current standards
7. Valve protection caps shall not be used for lifting cylinders from one vertical position to another. Bars shall not be used under valves or valve protection caps to pry cylinders loose when frozen. Warm, not boiling, water shall be used to thaw cylinders loose.
8. Unless cylinders are firmly secured on a special carrier intended for this purpose, regulators shall be removed and valve protection caps put in place before cylinders are moved.
9. Drivers of every vehicle or trailer carrying any cylinder must be aware of the contents of cylinders and emergency procedures in case gas leakage/accident.
10. The supplier or owner of a transport vehicle should train the drivers in safe handling and emergency procedures.
11. A suitable cylinder truck, chain, or other steadying device shall be used to keep cylinders from being knocked over while in use.
12. When work is finished, when cylinders are empty or when cylinders are moved at any time, the cylinder valves shall be closed.
13. Acetylene cylinders shall be secured in an upright position at all times except, if necessary, for short periods of time while cylinders are actually being hoisted or carried. Under no circumstances shall an acetylene cylinder be transported, stored or used in the horizontal position.

14. Extreme caution shall be taken to avoid knocking or jarring acetylene cylinders which can lead to internal self heating and risk of explosion.
15. Gas cylinders are to be fitted with Flame Arresters & Flash Back fire valves.

5.5 Storage of Cylinders

1. Cylinders shall be kept far enough away from the actual welding or cutting operation so that sparks, hot slag or flame will not reach them. When this is impractical, fire resistant shields shall be provided.
2. Cylinders shall be placed where they cannot become part of an electrical circuit. Electrodes shall not be struck against a cylinder to strike an arc.
3. Battery of Oxygen and Acetylene gas cylinders shall not be stored together and adequate distance of about 6 meter shall be maintained if possible at the worksite
4. The store shall be located as far as possible but not less than 20 metres from flammable substances such as oil, gasoline or waste. Inside buildings, there should be a separation of at least 6 metres (20 feet) between oxygen and fuel-gas (combustible gas) cylinders unless there is a fire-resistive partition between them.
5. Acetylene cylinders shall be placed with valve end up whenever they are in use. They shall not be placed in a location where they would be subject to open flame, hot metal, or other sources of artificial heat.
6. Cylinders containing oxygen or acetylene or other fuel gas shall not be taken into confined spaces.
7. Gas cylinders shall not be subjected to impact and shall not be placed in intense sunshine or close to any object radiating heat or fire
8. Charged and empty cylinders shall be stored separately.

5.6 Management of Cylinders.

1. Cylinders, whether full or empty, shall not be used as rollers or supports.
2. All cylinders shall conform to International standards of construction and be maintained in good condition.
3. The date of manufacture and hydrostatic test date shall be clearly and legibly marked upon the cylinders.
4. All cylinders shall be tested, inspected and filled in accordance with International standards.
5. Cylinders or containers shall be legibly and durably marked at the valve end preferably not on the cylinder part of the body with the following:

- a. The chemical formula or symbol and the name of the gas it contains.
 - b. In the case of mixtures, the chemical formula or symbols and the names and proportions of the constituent gases.
 - c. In the case of common organic refrigerants, the chemical formula or symbol.
6. All cylinders shall be colour coded according to the contents of the cylinder and the hazards involved. All colour coding shall be maintained in a clear and legible condition.
 7. Refilling of cylinders shall not be permitted at worksite .No person other than the gas supplier shall attempt to mix gases in a cylinder. No one shall use a cylinder's contents for purposes other than those intended by the supplier. Only cylinders bearing identification and inspection markings shall be used.
 8. No damaged or defective cylinder shall be used.
 9. Gas cylinders are to be fitted with Flame Arresters & Flash Back fire valves.

10. Acetylene and Oxygen Manifolds.

- a. Acetylene and oxygen manifolds shall bear the name of the substance they contain in letters at least one (1) inch high which shall be either painted on the manifold or on a sign permanently attached to it.
 - b. Acetylene and oxygen manifolds shall be placed in safe and accessible locations in the open air. They shall not be located within enclosed spaces.
 - c. Manifold hose connections, including both ends of the supply hose that lead to the manifold, shall be such that the hose cannot be interchanged between Acetylene and oxygen manifolds and supply header connections. Adapters shall not be used to permit the interchange of hose. Hose connections shall be kept free of grease and oil.
 - d. When not in use, manifold and header hose connections shall be capped.
 - e. Nothing shall be placed on top of a manifold, when in use, which will damage the manifold or interfere with the quick closing of the valves.
11. Defective gas cylinders are to be marked “DEFECTIVE” and shall be returned to the supplier as soon as possible.
 12. Oxygen cylinders and oxygen equipment shall not be placed in oily locations and handled with oily hands or gloves.
 13. Valves on all gas cylinders shall always be closed during pause in work, or on work completion. Valve covers are to be fitted when cylinders are not in use.
 14. It is not permissible to use defective or damaged gauges on gas cylinders.

5.7 Gas Cylinder Accessories

5.7.1 Hose.

- 1) Acetylene gas hose and oxygen hose shall be easily distinguishable from each other. Acetylene gas hoses are to be red, oxygen hoses are to be blue. Oxygen and Acetylene hoses shall not be interchangeable.
- 2) Hoses and other equipment shall not be hung on gas cylinders, valves or other fixtures.
- 3) Gas hoses shall not be laid over hot steam boilers or steam pipes etc.
- 4) All hose carrying acetylene, oxygen, natural or manufactured fuel gas, or any gas or substance which may ignite or enter into combustion or be in any way harmful to employees, shall be inspected at the beginning of each shift. Defective hose shall be removed from service.
- 5) Hose which has been subjected to flashback or which shows evidence of severe wear or damage shall be tested to twice the normal pressure to which it is subject, but in no case less than two hundred(200) psi. Defective hose or hose in doubtful condition shall not be used.
- 6) Hose couplings shall be of the type that cannot be unlocked or disconnected by means of a straight pull without rotary motion. The only permissible way join hoses are to use junction nipples.
- 7) Boxes used for the stowage of gas hose shall be ventilated.

5.7.2 Torches.

- 1) Clogged torch tip openings shall be cleaned with suitable cleaning wires or other devices designed for such purpose.
- 2) Torches shall be inspected at the beginning of each shift for leaking shutoff valves, hose couplings, and tip connections. Defective torches shall not be used.
- 3) Torches shall be lighted by friction lighters or other approved devices, and not by matches or from hot work.

5.7.3 Pressure Regulators.

Oxygen and fuel gas pressure regulators including their related gauges shall be in proper working order while in use.

5.8 Radioactive Works

- 1) Radioactive work permit (on S3 Form) from EHS is required before carrying out radiography work involving radioactive material.
- 2) Any activity which involves the use of radioactive material, shall be performed by competent persons specially trained in the proper and safe operation of such equipment.

Section 6

Scaffolds, Ladders and Other Working Surfaces

6.1 Scope

This section applies to scaffolds, ladders and other working surfaces of shipyard activities.

6.2 Scaffolds

1. All scaffolds shall be inspected and authorized for “safe to work” by competent person prior to put into use.
2. All scaffolds and their supports whether of steel or other material, shall be capable of supporting the load they are designed to carry with a safety factor of not less than four.
3. Scaffolds shall be maintained in a safe and secure condition. Any component of the scaffold which is broken, burned or otherwise defective shall be replaced.
4. Metal scaffold members shall be maintained in good repair and free of corrosion.
5. Barrels, boxes, cans, loose bricks, or other unstable objects shall not be used as working platforms or for the support of planking intended as scaffolds or working platforms.
6. No scaffold shall be erected, moved, dismantled or altered except under the supervision of competent persons.
7. No welding, burning, riveting or open flame work shall be performed on any staging suspended by means of fiber rope.
8. Employer shall ensure that they have arrangements in place to ensure safety, and that these arrangements are reviewed regularly and take into account the following factors, and any others deem appropriate: Scaffold design
 - Duty rating and actual imposed loadings on scaffolds, particularly wind loading when scaffolds are clad with debris netting or sheeting
 - Arrangements for stabilizing scaffolds, e.g. ties, buttresses, etc.
 - Risk of impact by vehicles
 - Frequency and thoroughness of scaffold inspection arrangements
 - Selection and testing of scaffold ties
 - Permit application procedures, where appropriate
 - Public protection
 - Systems in place for the handover of new or adapted scaffolds
 - Training and competence of scaffold erectors
 - Adequacy of scaffold foundations
 - Prevention of un-authorized modifications.

6.3 Staging

1. All staging and every part thereof shall be of good construction, of suitable and sound material and of adequate strength for the purpose for which it is used and shall be properly maintained, and every upright and thwart shall be kept so fixed, secured or placed in position as to prevent, so far as is reasonably practicable, accidental displacement.
2. All stages used in connection with the operations shall be of sufficient width to secure the safety of the persons working thereon.
3. All planks forming stages shall be securely fastened to prevent them from slipping unless they extend 460 millimetres (18 inches) or more beyond the inside edge of the thwart or support on which they rest.
4. All staging used in connection with the operations shall be inspected before use, and thereafter at regular and frequent intervals, by a competent person.
5. All dry dock altars and shoring sills on or from which persons perform work in connection with the operations shall be of sound construction and properly maintained.
6. Lifting bridles on working platforms suspended from cranes shall consist of four legs so attached that the stability of the platform is assured.
7. Unless the crane hook has a safety latch or is moused, the lifting bridles on working platforms suspended from cranes shall be attached by shackles to the lower lifting block or other positive means shall be taken to prevent them from becoming accidentally disengaged from the crane hook.

6.3.1 Boatswain's chair

A boatswain's chair, cage or similar plant or equipment shall not be used unless:

- 1) It is of good construction, suitable and sound material, adequate strength, free from patent defect, and properly maintained
- 2) The outriggers or other supports are of adequate strength and properly installed and supported
- 3) The chains, ropes, lifting gear or other means of suspension used therewith are securely attached to the outriggers or other supports and to the chair, cage or similar plant or equipment, or to any lifting appliance or other device attached thereto, as the case may be
- 4) Suitable means are provided to prevent any occupant falling out,
- 5) It is free of materials or articles liable to interfere with the occupant's handhold or foothold or otherwise endanger him.
- 6) Suitable measures are taken to prevent spinning or tipping in a manner dangerous to any occupant
- 7) Its installation has been, and its use is, supervised by a competent person.
- 8) A boatswain's chair, cage, skip or similar plant or equipment shall not be used as a working place in circumstances in which a suspended stage could be

used, unless the work is of such short duration as to make the use of a suspended stage unreasonable, or the use of a suspended stage is not reasonably practicable.

- 9) A boatswain's chair, cage, or similar plant or equipment shall not be used in connection with the operations unless it has been inspected by a competent person before use.

6.3.2 Stages from which a person is liable to fall a distance of more than 2 metres

- 1) This regulation applies to stages from which a person is liable to fall a distance of more than 2 meters (6 feet 6 inches) or into water in which there is a risk of drowning.
 - a. so far as is reasonably practicable, be closely boarded, planked or plated and provided with suitable toe boards
 - b. be so constructed or placed that a person is not liable to trip or to fall through a gap in the staging not being a necessary and no larger than necessary gap having regard to the nature of the work being carried on
 - c. be at least 430 millimeters (17 inches) wide.
- 2) Every side of a stage to which this regulation applies shall—
 - a. if it is not a side immediately adjacent to any part of a vessel, be fenced with a guard rail or guard rails which shall be so placed as to prevent so far as practicable the fall of persons from the stage, or from any raised standing place on the stage to a height of at least one meter (39 inches) above the stage or
 - b. if it is a side immediately adjacent to any part of a vessel, be placed as near as practicable to that part, having regard to the nature of the work being carried on and to the nature of the structure of the vessel.
- 3) In the case of stages which are suspended by ropes or chains, and which are used solely for painting, the fencing may be provided by means of a taut guard rope or ropes.
- 4) The side of a stage or, as the case may be, any part of the side of a stage need not be fenced so long as, the nature of the work being carried on makes the fencing of that side or, as the case may be, that part impracticable.
- 5) Guard rails provided may be removed for the time and to the extent necessary for the access of persons or for the movement of materials; but guard rails removed for either of these purposes shall be replaced as soon as practicable.

6.4 Ladders

This regulation applies to every ladder which

- 1) Affords persons employed with a means of access to or egress from or communication with their place of employment in any shipyard, harbour or wet-dock or any vessel therein.
- 2) Every ladder shall be of good construction, of suitable and sound material and of adequate strength for the purpose for which it is used and shall be properly maintained.
- 3) A ladder shall not be used which has
 - a. a defective stile or side or a missing or a defective rung, or
 - b. any rung which depends for its support solely on nails, spikes or other similar fixing.
 - c. Every rung of a ladder shall be properly fixed to the stiles or sides.
- 4) a ladder standing on a base shall not be used unless
 - a. it is securely fixed near to its upper resting place, or in the case of a vertical ladder near to its upper end provided that where such fixing is impracticable the ladder shall be securely fixed at or near to its lower end,
 - b. it has a level and firm footing and is not standing on loose material or other loose packing,
 - c. it is secured where necessary to prevent undue swaying or sagging
 - d. it is equally and properly supported on each stile or side.
- 5) In the case of a ladder standing on a base, if possible, a person shall be stationed at the foot of the ladder when in use to prevent it slipping.

Section 7

Safe Access and Other Working Surfaces

7.1 General Requirements

1. A safe means of access to and egress from every place at which any person has at any time to work in connection with the operations shall, in so far as is reasonably practicable, be provided and maintained.
2. The means of access and egress provided shall be suitable and sufficient having regard to the number of persons employed and shall, so far as is reasonably practicable, be kept clear of any obstruction and of any substances likely to make footholds or handholds insecure and a source of danger to persons employed.
3. Where outside staging is erected in a shipyard, there shall, having regard to the extent of the staging and to the nature of work to be done, be provided sufficient ladders giving direct access to the stages.
4. Where a vessel is under construction or reconstruction and persons employed are liable to go forward, aft or athwart ship across or along uncovered deck-beams, or across or along floors, sufficient planks shall be provided on those deck-beams or on those floors for the purpose of access to or from places of work, and sufficient and suitable portable ladders shall be provided so as to give access either from the ground or outer bottom plating to the top of the floor. A footway or passageway constructed of planks shall not be less than 430 millimeters (17 inches) wide.

7.2 Access to Vessel

Whenever a ship is lying at a wharf or quay, or is in a dry dock a safe means of access to the ship from the wharf, quay or dock side shall be provided in the following manner

- 1) whenever practicable, one or more ship's accommodation ladders, or one or more soundly constructed gangways or similar constructions or any combination of any such ladders, gangways or constructions which shall be
 - a. not less than 600 millimetres (24 inches) wide
 - b. properly secured
 - c. not inclined at too steep an angle, and
 - d. fenced throughout on each side to a clear height of 1 metre (39 inches) by means of upper and lower rails, taut ropes or chains, or by any other equally safe means, provided that, in the case of a ship's accommodation ladder, such fencing may be on one side only if the other side is protected by the side of the ship
 - e. in any other case, there shall be provided one or more ladders of sound material and adequate length which shall be properly secured to prevent them from slipping.

- 2) Where, at any dry dock, there is a gangway giving access from an altar of the dock to a vessel which is in the dock for the purpose of undergoing any of the operations, and the edge of the altar is unfenced, adequate hand-holds shall be available for any length of the altar which persons employed commonly use when passing between the gangway and the nearest flight of steps which gives access to ground level
- 3) Whenever a ship is alongside any vessel and persons employed have to pass from the one to the other, safe means of access shall be provided for their use, unless the conditions are such that it is possible, without undue risk, to pass from the one to the other without the aid of any special appliance

7.3 Vessels Used for Access /Working place

1. Where any person employed has to proceed to or from a ship by water, proper measures shall be taken to provide for his safe transport
2. Scows and floating platforms used for the purpose of the operations shall be of sound construction and properly maintained and shall not be overcrowded

7.4 Access to and from Bulwark

Where there is a gangway leading on to a bulwark of a vessel, there shall be provided

1. wherever practicable, a platform at the inboard end of the gangway with safe means of access therefrom to the deck, or
2. where such a platform is not practicable, a second gangway or stairway leading from the bulwark on to the deck which shall either be attached to the end of the first-mentioned gangway or be placed contiguous to it, and a suitable means of access, securely protected by fencing, shall be provided from the one gangway or stairway to the other.

7.5 Access to Cargo Spaces and Confined Spaces

7.5.1 Cargo Spaces

1. There shall be at least one safe and accessible ladder in any cargo space which employees shall enter.
2. When any fixed ladder is visibly unsafe, the employer shall prohibit its use by employees.
3. Straight ladders of adequate strength and suitably secured against shifting or slipping shall be provided as necessary when fixed ladders in cargo spaces do not meet the safety requirements.

7.5.2 Confined Spaces.

1. More than one means of access shall be provided to a confined space in which employees are working and in which the work may generate a hazardous atmosphere in the space except where the structure or arrangement of the vessel makes this provision impractical.
2. When the ventilation ducts required by these regulations shall pass through these means of access, the ducts shall be of such a type and so arranged as to permit free passage of an employee through at least two of these means of access.

7.6 Safety Precautions for Working Surfaces.

1. The employer shall provide and ensure the use of fall protection when employees work aloft or elsewhere at elevations more than 5 feet above a solid surface.
2. Employees shall be protected by the use of scaffolds, ladders, or personal protection equipment.
3. Employees shall work from scaffolds when visually restricted by Blasting hoods, Welding helmets and Burning goggles except for the initial and final welding or burning operation to start or complete a job such as the erection and dismantling of hung scaffolding; or Other similar, non-repetitive jobs of brief duration.
4. For work performed in restricted quarters, such as behind boilers and in between congested machinery units and piping, work platforms at least 20 inches wide shall be used. Backrails may be omitted if bulkheads, boilers, machinery units, or piping afford proper protection against falling.
5. When employees are boarding, leaving, or working from small boats or floats, they shall be protected by personal flotation devices

7.7 Guarding of Deck Openings and Edges.

1. When employees are working in the vicinity of flush manholes and other small openings of comparable size in the deck and other working surfaces, such openings shall be suitably covered or guarded to a height of not less than 30 inches, except where the use of such guards is made impracticable by the work actually in progress.
2. When employees are working around open hatches not protected by coamings to a height of 24 inches or around other large openings, the edge of the opening shall be guarded in the working area to a height of 36 to 42 inches,

except where the use of such guards is made impracticable by the work actually in progress.

3. When employees are exposed to unguarded edges of decks, platforms, flats, and similar flat surfaces, more than 5 feet above a solid surface, the edges shall be guarded by adequate guardrails, unless the nature of the work in progress or the physical conditions prohibit the use or installation of such guardrails.
4. When employees are working near the unguarded edges of decks of vessels afloat, they shall be protected by buoyant personal flotation devices.
5. Sections of bilges from which floor plates or gratings have been removed shall be guarded by guardrails except where they would interfere with work in progress. If these open sections are in a walkway at least two 10-inch planks placed side by side, or equivalent, shall be laid across the opening to provide a safe walking surface.
6. Gratings, walkways, and catwalks, from which sections or ladders have been removed, shall be barricaded with adequate guardrails.

Section 8

Lifting Appliances

8.1 General Inspection Requirements

1. Before a lifting appliance is taken into use for the first time in the operations, or after it has undergone any substantial alteration or repair, it shall be tested and thoroughly examined by a competent person in the approved manner. A certificate of such test and examination in the approved form and signed by the competent person making or responsible for the carrying out of the test and examination and specifying the safe working load or loads of the appliance, shall have been obtained and shall be kept available for inspection.
2. Every lifting appliance shall be thoroughly examined by a competent person at least once in every period of twelve months and a report in the approved form of the results of every such examination, and signed by the person making or responsible for the carrying out of the examination, shall be kept available for inspection.
3. Every lifting appliance shall have plainly marked upon it the safe working load.
4. Every crane of variable operating radius (including a crane with a derricking jib) shall
 - a. have plainly marked upon it the safe working load at various radii of the jib or crab, in the case of a crane with a derricking jib, the maximum radius at which the jib may be worked, and
 - b. be fitted with an accurate indicator, clearly visible to the driver, showing the radius of the jib or crab at any time and the safe working load corresponding to that radius.
5. Chains and lifting gear other than rope slings shall be thoroughly examined by a competent person at least once in every period of six months and reports of the results of such examinations in the approved form and signed by the person making or responsible for the carrying out of the examination, shall be kept available for inspection. Each chain shall bear an indication of the month in which it was thoroughly inspected. The thorough inspection shall include inspection for wear, defective welds, deformation and increase in length or stretch.
6. Ropes and rope slings shall have been thoroughly examined by a competent person within the period of three months before they are used.
7. Tested & Examined Lifting Equipments & Lifting Appliances which are safe to use shall be provided with easily identifiable marks such as acceptable color coding system.
8. A load shall not be left suspended from a lifting appliance other than a self-sustaining, manually operated lifting appliance unless there is a competent person in charge of the appliance while the load is so suspended.

9. All gear and equipment provided by the employer for rigging and materials handling shall be inspected before each shift and, when necessary, at intervals during its use to ensure that is safe. Defective gear shall be removed and replaced before further use.
10. All lifting equipment including mobile cranes, Gantry Cranes, Crawler Cranes, Tower Cranes, EOT Cranes, Forklifts etc. shall be tested/certified with a Load Certificate at suitable intervals in accordance with PCFC Health, Safety & Fire Regulations & Standards.
11. Approval from EHS is required for entry of Lifting Equipment into PCFC/DMC areas. All drivers /operators of such lifting equipment should have obtained the necessary licenses from the respective Police Department(s).

8.2 Safety factors

8.2.1 Ropes, chains and slings.

- a. Safety factor of Manila rope and manila rope slings not less than five is maintained.
- b. Safety factor of Wire rope and wire rope slings not less than five is maintained.
- c. Protruding ends of strands in splices on wire slings and bridles shall be covered or blunted. Wire rope shall not be secured by knots.
- d. Where U-bolt wire rope clips are used to form eyes, relevant standards shall be used to determine the number and spacing of clips. The U-bolt shall be applied so that the “U” section is in contact with the dead end of the rope.

8.2.2 Chains and Chain Slings.

- a. Relevant standards shall be used to determine the working load limit of various sizes of wrought iron and alloy steel chains and chain slings.
- b. Chain slings shall be removed from service when, due to stretch, the increase in length of a measured section exceeds five percent; when a link is bent, twisted or otherwise damaged or defective welds appear.
- c. A load shall not be lifted with a chain having a kink or knot in it. A chain shall not be shortened by bolting, wiring or knotting.

8.2.3 Shackles

Safety factor of Shackles not less than five is maintained.

8.3 Chain Blocks and Pull-lifts.

1. Chain Blocks and pull-lifts shall be clearly marked to show the capacity and the capacity shall not be exceeded.
2. Chain Blocks shall be regularly inspected to ensure that they are safe, particular attention being given to the lift chain, pinion, sheaves and hooks for distortion and wear. Pull-lifts shall be regularly inspected to ensure that they are safe, particular attention being given to the ratchet, pawl, chain and hooks for distortion and wear.
3. Straps, shackles, and the beam or overhead structure to which a Chain Blocks or pull-lift is secured shall be of adequate strength to support the weight of load plus gear. The upper hook shall be moused or otherwise secured against coming free of its support.
4. Scaffolding shall not be used as a point of attachment for lifting devices, such as tackles, chain falls, and pull-lifts unless the scaffolding is specifically designed for that purpose.

8.4 Hoisting and Hauling Equipment.

1. Only those employees who understand the signs, notices, and operating instructions, and are familiar with the signal code in use, shall be permitted to operate a crane, winch, or other power operated hoisting apparatus.
2. No employee known to have defective uncorrected eyesight or hearing, or to be suffering from heart disease, epilepsy, or similar ailments which may suddenly incapacitate him, shall be permitted to operate a crane, winch or other power operated hoisting apparatus.
3. The moving parts of hoisting and hauling equipment shall be guarded
4. Derrick and Crane Certification: Derricks and cranes which are part of, or regularly placed aboard barges, other vessels and are used to transfer materials or equipment from or to a vessel or drydock, shall be tested and certificated by persons accredited for that purpose.

8.5 Mobile Crawler or Truck Cranes used on a Vessel:

1. The maximum manufacturer's rated safe working loads for the various working radii of the boom and the maximum and minimum radii at which the boom may be safely used with and without outriggers shall be conspicuously posted near the controls and shall be visible to the operator. A radius indicator shall be provided.

2. The posted safe working loads of mobile crawler or truck cranes under the conditions of use shall not be exceeded.
3. Accessible areas within the swing radius of the outermost part of the body of a revolving derrick or crane whether permanently or temporarily mounted, shall be guarded in such a manner as to prevent an employee from being in such a position as to be struck by the crane or caught between the crane and fixed parts of the vessel or of the crane itself.

Section 9

Tools

9.1 Scope

This section applies to tools and related equipment.

9.2 General Precautions.

1. Hand lines, slings, tackles of adequate strength, or carriers such as tool bags with shoulder straps shall be provided and used to handle tools, materials, and equipment so that employees will have their hands free when using ship's ladders and access ladders. The use of hose or electric cords for this purpose is prohibited.
2. All portable, power-driven circular saws shall be equipped with guards above and below the base plate or shoe. The upper guard shall cover the saw to the depth of the teeth, except for the minimum arc required to permit the base to be tilted for bevel cuts. The lower guard shall cover the saw to the depth of the teeth, except for the minimum arc required to allow proper retraction and contact with the work. When the tool is withdrawn from the work, the lower guard shall automatically and instantly return to the covering position.
3. The moving parts of machinery shall be guarded. The moving parts of drive mechanisms, such as gearing and belting on large portable tools, shall be adequately guarded.
4. Before use, pneumatic tools shall be secured to the extension hose or whip by some positive means to prevent the tool from becoming accidentally disconnected from the whip.
5. Headers, manifolds and widely spaced hose connections on compressed air lines shall bear the word "air" in letters at least 1 inch high, which shall be painted either on the manifolds or separate hose connections, or on signs permanently attached to the manifolds or connections. Grouped air connections may be marked in one location.
6. Before use, compressed air hose shall be examined. Visibly damaged and unsafe hose shall not be used.

9.3 Portable Electric Tools

1. The frames of portable electric tools and appliances, except double insulated tools, shall be grounded either through a third wire in the cable containing the circuit conductors or through a separate wire which is grounded at the source of the current.

2. Grounding circuits, other than by means of the structure of the vessel on which the tool is being used, shall be checked to ensure that the circuit between the ground and the grounded power conductor has resistance which is low enough to permit sufficient current to flow to cause the fuse or circuit breaker to interrupt the current.
3. Portable electric tools which are held in the hand shall be equipped with switches of a type which shall be manually held in the closed position.
4. Worn or frayed electric cables shall not be used.
5. The employer shall notify the officer in charge of the vessel before using electric power tools operated with the vessel's current.

9.4 Hand Tools

1. Employers shall not issue or permit the use of unsafe hand tools.
2. Wrenches, including crescent, pipe, end and socket wrenches, shall not be used when jaws are sprung to the point that slippage occurs.
3. Impact tools, such as drift pins, wedges, and chisels, shall be kept free of mushroomed heads.
4. The wooden handles of tools shall be kept free of splinters or cracks and shall be kept tight in the tool.

9.5 Abrasive wheels

1. Floor stand and bench mounted abrasive wheels used for external grinding shall be provided with safety guards (protection hoods). Safety guards shall be strong enough to withstand the effect of a bursting wheel.
2. Floor and bench mounted grinders shall be provided with work rests which are rigidly supported and readily adjustable. Such work rests shall be kept a distance not to exceed 1/8 inch from the surface of the wheel.
3. Cup type wheels use for external grinding shall be protected by either a revolving cup guard or a band type guard. All other portable abrasive wheels used for external grinding shall be provided with safety guards, except as follows:
 - a. When the work location makes it impossible.
 - b. When wheels 2 inches or less in diameter which are securely mounted on the end of a steel mandrel are used.
4. Portable abrasive wheels used for internal grinding shall be provided with safety flanges (protection flanges) except as follows:

- a. When wheels 2 inches or less in diameter which are securely mounted on the end of a steel mandrel are used.
 - b. If the wheel is entirely within the work being ground while in use.
5. When safety guards are required, they shall be so mounted as to maintain proper alignment with the wheel, and the guard and its fastenings shall be of sufficient strength to retain fragments of the wheel in case of accidental breakage. The maximum angular exposure of the grinding wheel periphery and sides shall not exceed 180 degrees.
 6. When safety flanges are required, they shall be used only with wheels designed to fit the flanges. Only safety flanges of a type and design and properly assembled so as to insure that the pieces of the wheel will be retained in case of accidental breakage shall be used.
 7. All abrasive wheels shall be closely inspected and ring tested before mounting to ensure that they are free from cracks or defects.
 8. Grinding wheels shall fit freely on the spindle and shall not be forced on. The spindle nut shall be tightened only enough to hold the wheel in place.
 9. The power supply shall be sufficient to maintain the rated spindle speed under all conditions of normal grinding. The rated maximum speed of the wheel shall not be exceeded.
 10. The employer shall ensure that all employees using abrasive wheels are protected by eye protection equipment except when adequate eye protection is provided by eye shields permanently attached to the bench or floor stand.

9.6 Powder-Actuated Fastening Tools

1. The employer shall ensure powder-actuated fastening tools are used, designed, constructed, and maintained in accordance with relevant international standards
2. The employer shall ensure that employees using powder-actuated fastening tools are protected by personal protective equipment .The employer shall also meet the requirements of Hearing loss prevention (noise).

9.7 Internal Combustion Engines, other than Ship's Equipment

1. When internal combustion engines, furnished by the employer are used in a fixed position below decks, for such purposes as driving pumps, generators, and blowers, the exhaust shall be led to the open air, clear of any ventilation intakes and openings through which it might enter the vessel
2. All exhaust line joints and connections shall be checked for tightness immediately upon starting the engine, and any leaks shall be corrected at once.

3. When internal combustion engines on vehicles, such as forklifts and mobile cranes, or on portable equipment such as fans, generators, and pumps exhaust into the atmosphere below decks, the competent person shall make tests of the carbon monoxide content of the atmosphere as frequently as conditions require ensuring that dangerous concentrations do not develop. Employees shall be removed from the compartment involved when the carbon monoxide concentration exceeds 50 parts per million (0.005%). The employer shall use blowers sufficient in size and number and so arranged as to maintain the concentration below this allowable limit before work is resumed.
4. Area shall be maintained tidy without any fuels/ lub oil leak from the engine. Replenishment tanks/ drums of Fuel oil & Lub oil shall not be stored close to the running engine and minimum 6 meter distance shall be maintained.

Section 10

Ship's Machinery and Piping Systems

10.1 Scope

This section applies to ship's machinery and piping systems

10.2 Ship's Boilers and Ship's Piping Systems

Before work is performed in the fire, steam, or water spaces of a boiler or on a valve, fitting, or section of piping in a piping system where employees may be subject to injury from the direct escape of a high temperature medium, such as steam, or water, oil, or other medium at a high temperature entering from an interconnecting system, the employer shall insure that the following steps are taken:

1. The isolation and shutoff valves connecting the dead boiler/ piping system with the live system or systems shall be secured, blanked, and tagged indicating that employees are working in the boiler or on the piping systems. This tag shall not be removed nor the valves unblanked until it is determined that this may be done without creating a hazard to the employees working in the boiler/on the piping system, or until the work in the boiler/on the piping system is completed.
2. Drain connections to atmosphere on all of the dead interconnecting systems shall be opened for visual observation of drainage.
3. A warning sign calling attention to the fact that employees are working in the boilers shall be hung in a conspicuous location in the engine room. This sign shall not be removed until it is determined that the work is completed and all employees are out of the boilers.

10.3 Ship's Propulsion Machinery

1. Before work is performed on the main engine, reduction gear, or connecting accessories, the employer shall ensure that the following steps are taken:
 - a. The Turning (jacking) gear shall be engaged to prevent the main engine from turning over. A sign shall be posted at the throttle indicating that the Turning gear is engaged. This sign shall not be removed until the Turning gear can be safely disengaged.
 - b. If the Turning gear is electrically driven, the circuit controlling the Turning gear shall be deenergized by tripping the circuit breaker, opening the switch or removing the fuse, whichever is appropriate. The breaker, switch, or fuse location shall be tagged indicating that employees are working on the main engine.
2. Before the Turning gear is operated, the following precautions shall be taken:

- a. A check shall be made to ensure that all employees, equipment, and tools are clear of the engine, reduction gear, and its connecting accessories.
 - b. A check shall be made to ensure that all employees, equipment and tools are free of the propeller and continuous monitoring shall be maintained.
3. Before work is started on or in the immediate vicinity of the propeller, a warning sign calling attention to the fact that employees are working in that area shall be hung in a conspicuous location in the engine room. This sign shall not be removed until it is determined that the work is completed and all employees are free of the propeller.
 4. Before the main engine is turned over (e.g., when warming up before departure or testing after an overhaul) a check shall be made to ensure that all employees, equipment, and tools are free of the propeller.

10.4 Ship's Deck Machinery

Before work is performed on the anchor windlass or any of its attached accessories, the employer shall ensure that the following steps are taken:

1. The devil claws (also known as chain stoppers) shall be made fast to the anchor chains.
2. The riding pawls shall be in the engaged position.
3. In the absence of devil claws and riding pawls, the anchor chains shall be secured to a suitable fixed structure of the vessel.

10.5 Portable Air Receivers and other Unfired Pressure Vessels.

1. Portable, unfired pressure vessels shall be marked and reported indicating that they have been designed and constructed to meet the applicable international standards. They shall be subjected to a hydrostatic pressure test of one and one-half times the working pressure of the vessels.
2. The relief valves on the portable, unfired pressure shall be set to the safe working pressure of the vessels, or set to the lowest safe working pressure of the systems, whichever is lower.
3. A record of such examinations and tests shall be maintained.

10.6 Drums and Containers

1. Pressure vessels, drums and containers containing toxic or flammable liquids or gases shall not be stored or used where they are subject to open flame, hot metal, or other sources of artificial heat.

2. Drums and containers containing flammable or toxic liquids or gases are placed in a dedicated storage area with barriers or guards shall be erected to protect them from such physical damage. The storage area with impervious floor and diked area to contain at least 110% of the largest container or 25% of the total volume of the drums to be stored up to 10KL plus 10% of any volume in excess thereof, which ever is greater (given the small size of most paint containers, the later criterion is most relevant).
3. Fire extinguishers adequate in number and suitable for the hazard shall be provided. These extinguishers shall be located in the immediate area where pressure vessels, drums and containers containing flammable liquids or gases are stored or in use. Such extinguishers shall be ready for use at all times.

10.7 Electrical Machinery-Electrical Circuits and Distribution Boards

1. Before an employee is permitted to work on an electrical circuit, except when the circuit shall remain energized for testing and adjusting, the circuit shall be de-energized and checked at the point at which the work is to be done to insure that it is actually de-energized. When testing or adjusting an energized circuit a rubber mat, duck board, or other suitable insulation shall be used underfoot where an insulated deck does not exist.
2. The circuit breaker, switch, or fuse location shall be tagged to indicate that an employee is working on the circuit. Such tags shall not be removed nor the circuit energized until it is definitely determined that the work on the circuit has been completed.
3. When work is performed immediately adjacent to an open-front energized board or in back of an energized board, the board shall be covered or some other equally safe means shall be used to prevent contact with any of the energized parts.

Section 11

General Working Conditions

11.1 Scope

This section applies to general working conditions of all working sites of the shipyard and associated industries. An employer shall ensure that each workplace is perfectly clean, ventilated and provided with adequate lighting, drinking water and toilets.

11.2 Housekeeping.

1. Good housekeeping conditions shall be maintained in all working site at all times. Adequate aisles and passageways shall be maintained in all work areas. All staging platforms, ramps, stairways, walkways, aisles, and passageways on vessels or dry docks shall be kept clear of all tools, materials, and equipment except that which is in use, and all debris such as welding rod tips, bolts, nuts, and similar material. Hose and electric conductors shall be elevated over or placed under the walkway or working surfaces or covered by adequate crossover planks.
2. All working areas on vessels and dry docks shall be kept reasonably free of debris, and construction material shall be so piled as not to present a hazard to employees.
3. Slippery conditions on walkways or working surfaces shall be eliminated as they occur.
4. Free access shall be maintained at all times to all exits and to all fire-alarm boxes or fire-extinguishing equipment.
5. All oils, paints, thinners, solvents waste, rags, or other flammable substances shall be kept in fire resistant covered containers when not in use and during storage .

11.3 Illumination

1. All parts of a vessel and all other places where the operations are being carried on, and all approaches to such parts and to places to which a person employed may be required to proceed, shall be sufficiently and suitably lighted.
2. All means of access and walkways leading to working areas as well as the working areas themselves shall be adequately illuminated.
 - a. Temporary lights shall meet the following requirements: Temporary lights shall be equipped with guards to prevent accidental contact with the bulb, except that guards are not required when the construction of the reflector is such that the bulb is deeply recessed.

- b. Temporary lights shall be equipped with heavy duty electric cords with connections and insulation maintained in safe condition. Temporary lights shall not be suspended by their electric cords unless cords and lights are designed for this means of suspension. Splices which have insulation equal to that of the cable are permitted.
 - c. Cords shall be kept clear of working spaces and walkways or other locations in which they are readily exposed to damage.
- 3. Exposed noncurrent-carrying metal parts of temporary lights furnished by the employer shall be grounded either through a third wire in the cable containing the circuit conductors or through a separate wire which is grounded at the source of the current.
- 4. Where temporary lighting from sources outside the vessel is the only means of illumination, portable emergency lighting equipment shall be available to provide illumination for safe movement of employees.
- 5. Employees shall not be permitted to enter dark spaces without a suitable portable light. The use of matches and open flame lights is prohibited. In non-gas free spaces, portable lights shall be explosion-proof.
- 6. Temporary lighting stringers or streamers shall be so arranged as to avoid overloading of branch circuits. Each branch circuit shall be equipped with overcurrent protection of capacity not exceeding the rated current carrying capacity of the cord used.
- 7. Portable lamps (including hand lamps carried by persons employed) used for the purposes of the operations shall be maintained in an efficient state, in efficient working order
- 8. A person (whether or not a person employed) shall not, unless duly authorized or in case of necessity, interfere with or remove any means of lighting provided in a working area.

11.4 Shore Electric Power

When the vessel is supplied with electric power from a source outside the vessel, the following precautions shall be taken prior to energizing the vessel's circuits:

- 1. If in dry dock, the vessel shall be adequately grounded.
- 2. The employer shall ascertain from responsible vessel's representatives, having knowledge of the condition of the vessel's electrical system, that all circuits to be energized are in a safe condition.
- 3. All circuits to be energized shall be equipped with overcurrent protection of capacity not exceeding the rated current carrying capacity of the cord used.

11.5 Work on or in the vicinity of Radar and Radio.

1. No employees other than radar or radio repairmen shall be permitted to work on masts, king posts or other aloft areas unless the radar and radio are secured or otherwise made incapable of radiation. In either event, the radio and radar shall be appropriately tagged.
2. Testing of radar or radio shall not be done until the employer can schedule such tests at a time when no work is in progress aloft or personnel can be cleared from the danger area according to minimum safe distances established for and based on the type, model, and power of the equipment.

11.6 Work in or on lifeboats.

1. Before employees are permitted to work in or on a lifeboat, either stowed or in a suspended position, the employer shall ensure that the boat is secured independently of the releasing gear to prevent the boat from falling due to accidental tripping of the releasing gear and movement of the davits or capsizing of a boat in chocks.
2. Employees shall not be permitted to remain in boats while the boats are being hoisted into final stowed position.
3. Employees shall not be permitted to work on the outboard side of lifeboats stowed on their chocks unless the boats are secured by gripes or otherwise secured to prevent them from swinging outboard.

11.7 Health and Hygiene.

1. No chemical product, such as a solvent or preservative; no structural material, such as cadmium or zinc coated steel, or plastic material; and no process material, such as welding filler metal; which is a hazardous material may be used until the employer has ascertained the potential fire, toxic, or reactivity hazards which are likely to be encountered in the handling, application, or utilization of such a material. A completed MSDS form shall be preserved and available for inspection for each hazardous chemical on the worksite.
2. The employer shall instruct employees who will be exposed to the hazardous materials as to the nature of the hazards and the means of avoiding them.
3. The employer shall provide all necessary controls, and the employees shall be protected by suitable personal protective equipment against the hazards identified.
4. The employer shall provide adequate washing facilities for employees engaged in the application of paints or coatings or in other operations where contaminants can, by ingestion or absorption, be detrimental to the health of the employees.

5. The employer shall encourage good personal hygiene practices by informing the employees of the need for removing surface contaminants by thorough washing of hands and face prior to eating or smoking.
6. The employer shall not permit eating or smoking or resting in areas undergoing surface preparation or preservation or where ship repairing, shipbuilding, or similar operations produce atmospheric contamination.
7. **Canteen Facility:** There shall be provided and maintained for the use of all persons employed who remain in the shipyard or dry dock during meal intervals, suitable and adequate mess-rooms or canteen accommodation .
8. The employer shall not permit employees to work in the immediate vicinity of uncovered garbage and shall ensure that employees working beneath or on the outboard side of a vessel are not subject to contamination by drainage or waste from overboard discharges.

11.8 First aid.

1. Every employer shall provide one or more first-aid boxes containing medicines, the Ministry of Labour and Social Affairs may prescribe bandages, antiseptics and such other first-aid material as. There shall be one first-aid box for every 100 workers; the box shall be located in a conspicuous place, within the easy reach of the workers, and shall be controlled by a person specialized in administering first aid.
2. Unless a first-aid room and a qualified attendant are close at hand and prepared to render first aid to employees on behalf of the employer, the employer shall furnish a first-aid kit for each vessel on which work is being performed, except that when work is being performed on more than one small vessel at one pier, only one kit shall be required. The kit, when required, shall be kept close to the vessel and at least one employee, close, at hand, shall be qualified to administer first aid to the injured.
3. The contents of the first-aid kit shall be checked before being sent out on each job and at least weekly on each job to ensure that the expended items are replaced.
4. There shall be available for each vessel on which ten or more employees are working one Stokes basket stretcher, or equivalent, permanently equipped with bridles for attaching to the hoisting gear, except that no more than two stretchers are required on each job location. A blanket or other liner suitable for transferring the patient to and from the stretcher shall be provided. Stretchers shall be kept close to the vessels.
5. All premises shall be provided with adequate first aid facilities with at least two trained first aiders during working hours.
6. An employee shall provide or ensure that there are an adequate and appropriate number of suitable persons for rendering first aid. A first aider is a person who has received training and who holds a current first aid certificate from an

organization or employer whose training and qualification for first aiders are approved by authority.

7. First aid training should be given by EHS Approved agencies (See H&S Guidelines) such as: A registered medical practitioner or nurses with knowledge and experience of first aid in the workplace, such certificate being renewable every two years.
8. Employer shall ensure that the number of appointed and/or first aiders and other first aid requirements are provided in accordance with PCFC Health , Safety & Fire Regulations & Standards , Third Edition

Section 12

Personal Protective Equipment (PPE)

12.1 General Requirements

The employer shall provide and ensure that each affected employee uses the appropriate personal protective equipment (PPE) for the eyes, face, head, extremities, torso, and respiratory system, including protective clothing, protective shields, hearing protection, protective barriers, personal fall protection equipment, and life saving equipment, wherever the employee is exposed to hazards that require the use of PPE.

12.2 Risk (Hazard) Assessment and Equipment Selection.

1. **Legal Compliance: Article 98 of Federal Law No:8:** The employer or his representative shall inform each worker, upon recruitment, of the occupational hazards involved and the protective measures he must take, and shall post detailed written instructions in this respect at the workplaces.
2. Employer shall conduct a risk assessment for protecting employees, properties & business and effective control measures shall be put in place to ensure the asset and workforce - is protected.
3. The employer shall assess its work activity to determine if hazards that require the use of personal protective equipment (PPE) are present, or are likely to be present. Verify that the risk assessment has been performed through a document that contains the following information
 - a. Identify the Hazards
 - b. Decide who might be harmed & how
 - c. Evaluate the risk and decide on precautions
 - d. Record your findings and implement them
 - e. Review the risk assessment and update if necessary
 - f. Date(s) of the hazard assessment; and
 - g. The name of the competent person performing the hazard assessment.
4. If such hazards are present, or likely to be present, the employer shall:
 - a. Select, and require each affected employee to use, PPE that will protect the employee from the hazards identified in the risk assessment
 - b. Inform the affected employee what types of PPE to use
 - c. Select PPE that properly fits the affected employee
5. The employer shall ensure that employees do not use defective or damaged PPE.
6. The employer shall ensure that all unsanitary PPE, including all previously used PPE, is cleaned and disinfected before it is reissued.

12.3 PPE Training.

The employer shall provide training to each employee for whom PPE is required.

1. **Legal Compliance: Article 100 of Federal Law No:8**Each worker shall comply with the orders and instructions related to industrial security and safety precautions, shall use the appropriate protective devices and treat any such devices in his possession with due care. No worker shall commit any act leading to non-compliance with such instructions, or to the misuse, damage or destruction of the equipment provided for protecting the health and safety of the workers.
2. Each employee whose work activities require the use of PPE shall be trained to know at least the following:
 - a. When PPE is necessary
 - b. What PPE is necessary
 - c. How to properly put on, take off, adjust, and wear PPE
 - d. The limitations of the PPE and
 - e. The proper care, maintenance, useful life and disposal of the PPE.
3. The employer shall ensure that each affected employee demonstrates the ability to use PPE properly before being allowed to perform work where its use is required.
4. The employer shall verify that each affected employee has received the required training through a document that contains the following information:
 - a. Name of each employee trained
 - b. Date(s) of training; and
 - c. Type of training the employee received.

12.4 Eye and Face Protection.

1. The employer shall provide each affected employee with eye and face protection according to the following requirements:
 - a. Each affected employee shall use appropriate eye or face protection when exposed to eye or face hazards caused by flying particles, molten metal, liquid chemicals, acid or caustic liquids, chemical gases or vapors, or potentially injurious light radiation.
 - b. Each affected employee shall use equipment with filter lenses of a shade that provides appropriate protection from injurious light radiation.
2. When electric welding is in progress at any place and persons other than those engaged in that process are employed in a position where the rays are likely to be injurious to their eyes, screens shall, where practicable, be provided at that place for the protection of those persons.
3. Where it is not practicable to provide effective protect of those persons by screening, suitable goggles shall be provided for their use.

12.5 Protection against Dust

Breathing apparatus of a type suitable shall be provided and maintained for the use of every person employed in any of the following kinds of work; the scaling, scurfing or cleaning of boilers, combustion chambers or smoke boxes, where that

work exposes those persons to dust of such a character and to such an extent as to be likely to be injurious or offensive. It shall be the duty of the persons employed to use the breathing apparatus provided for their use.

12.6 Head Protection

1. All persons employed in or frequenting any place in a shipyard and on a ship or vessel where there are risks of falling objects or of injury to the head from other causes shall be provided with suitable safety helmets and every such person shall wear the helmet provided for his use.
2. Each affected employee wears a protective helmet designed to reduce electrical shock hazards where there is potential for electric shock or burns from contact with exposed electrical conductors that could contact the head.

12.7 Foot Protection.

The employer shall ensure that each affected employee wears protective footwear when working in areas where:

- a. There is a danger of foot injuries from falling or rolling objects
- b. There is a danger of foot injuries from objects piercing the sole
- c. Where an employee's feet are exposed to electrical hazards.

12.8 Hand and Protective Clothing

1. The employer shall ensure that each affected employee uses appropriate hand protection and other protective clothing where there is exposure to hazards such as:
Skin absorption of harmful substances
 - a. Severe cuts or lacerations
 - b. Severe abrasions
 - c. Punctures
 - d. Chemical burns
 - e. Thermal burns
 - f. Harmful temperature extremes an
 - g. Sharp objects.
2. **Hot work operations:** The employer shall ensure that an employee's clothing is free from flammable or combustible materials (such as grease or oil) while engaged in hot work operations or working near an ignition or oxygen source.
3. **Electrical protective devices:** The employer shall ensure that each affected employee wears protective electrical insulating gloves and sleeves or other electrical protective equipment, if that employee is exposed to electrical shock hazards while working on electrical equipment.

4. Adequate and suitable protective clothing for:
 - a. any person who by the reason of the nature of his work is required to continue working in the open air during rain, hot weather
 - b. any person who by the reason of the nature of the task is required to work in particularly dirty circumstances shall be provided.

12.9 Noise at Workplace

Suitable precautions shall be taken to protect workers against the harmful effects of excessive noise at the workplace.

1. Control of Noise

- a. For the purpose of this regulation, the employees at work shall be aware of action levels that exist for the control of noise at work. The action levels are as follows:-
- b. First Action Level means a daily personal noise exposure of 85 dB(A) based on an 8 hour time weighted average period per day.
- c. Second Action Level means a daily personal noise exposure of 90 dB(A) based on an 8 hour time weighted average per day.
- d. Peak Action Level means a level of peak sound pressure of 200 pascals.

2. General Requirements

The Employer shall ensure that where their employees are exposed to the first action level or above or the peak action level or above a noise assessment is carried out by a trained and experienced person. The assessment shall identify the workers at risk and the noise levels to which those workers are exposed to. The Employer shall ensure that the risk of damage to the hearing of their employees from exposure to noise is reduced to the lowest level reasonably practicable.

3. Reduction of Noise Exposure

The Employer shall ensure that where his workers are exposed to the second action level or above or the peak action level or above he shall reduce exposure to noise of these workers so far as is reasonably practicable. Reduction of exposure is to be by any means other than the use of personal ear protectors.

4. Use of Personal Ear Protection

The Employer shall rely on the use of personal ear protection only after the measures taken to control noise have failed to reduce the workers exposure to noise to below the first action level or below the peak action level. Where a worker is exposed to noise in excess of the first action level but below the second action level they are to ensure that personal ear protection is provided at the request of the workers. Where a worker is exposed to noise levels in excess of the second action level or in excess of the peak action level then they shall provide personal ear protection to every worker and the wearing of the personal ear protection shall be enforced.

5. Hearing Protection Zones

Any area or areas, where workers may be exposed to noise levels in excess of the second action level or in excess of the peak action level, are clearly identified. The areas are to be marked as personal ear protection zones and the responsible person shall enforce the wearing of personal ear protection in these zones.

12.10 Lifesaving Equipment.

12.10.1 Personal Flotation Devices (PFD).

Employer shall provide employees with PFDs, where risk of falling into water, approved by the United States Coast Guard for use on commercial or merchant vessels / relevant international agencies. The following are appropriate or allowable United States Coast Guard approved PFDs.

Type of PFD	General Description
Type I	Off-shore life jacket – effective for all waters or where rescue may be delayed.
Type II	Near-shore buoyant vest – intended for calm, inland water or where there is a good chance of quick rescue.
Type III	Flotation aid – good for calm, inland water, or where there is a good chance for rescue.
Type V	Flotation aids such as boardsailing vests, deck suits, work vests and inflatable PFDs marked for commercial use.

Note:

- a. Commercially available PFDs are marked or imprinted with the Type of PFD.
- b. Type IV PFDs are throwable devices. They are used to aid persons who have fallen into the water.
- c. The employer shall ensure that each personal flotation device is inspected before use for dry rot, chemical damage, or other defects that may affect its strength and buoyancy. Defective personal flotation devices shall not be used.
- d. When employees are boarding, leaving, or working from small boats or floats, they shall be protected by personal flotation devices.
- e. When employees are working near the unguarded edges of decks of vessels afloat, they shall be protected by buoyant personal flotation devices.

12.10.2 Ring Life Buoys and Ladders.

1. The employer shall ensure that when work is performed on a floating vessel 200 feet (61 m) or more in length, at least three 30-inch (0.76 m) U.S. Coast Guard approved ring life buoys with lines attached are located in readily visible and accessible places. Ring life buoys shall be located one forward, one aft, and one at the access to the gangway.
2. On floating vessels under 200 feet (61 m) in length, at least one 30-inch (0.76 m) U.S. Coast Guard approved ring life buoy with line attached shall be located at the gangway.
3. At least one 30-inch (0.76 m) U.S. Coast Guard approved ring life buoy with a line attached shall be located on each staging alongside of a floating vessel on which work is performed.
4. At least 90 feet (27.43 m) of line shall be attached to each ring life buoy.
5. There shall be at least one portable or permanent ladder near each floating vessel on which work is performed. The ladder shall be long enough to help an employee reach safety in the event of a fall into the water.

12.11 Fall Protection

1. The employer shall provide and ensure the use of fall protection when employees work aloft or elsewhere at elevations more than 5 feet above a solid surface.
2. The employer shall ensure that personal fall arrest systems are rigged so that an employee can neither free fall more than 6 feet (1.83 m) nor contact any lower level.
3. The attachment point of a body harness is in the center of the wearer's back near the shoulder level, or above the wearer's head. If the maximum free fall distance is less than 20 inches, the attachment point may be located in the chest position.
4. Personal fall arrest systems are inspected before each use for wear, damage, and other deterioration. Defective components are removed from service.
5. Personal fall arrest systems and components subjected to impact loading are immediately removed from service and not used again for employee protection until inspected and determined by a qualified persons to be undamaged and suitable for reuse.
6. The employer shall provide for prompt rescue of employees in the event of a fall or shall ensure that employees are able to rescue themselves.

7. Personal fall arrest systems and components are used only for employee fall protection and not to hoist materials.
8. Before using personal fall arrest equipment, the employer shall ensure that each affected employee is trained to understand the application limits of the equipment and proper hook-up, anchoring, and tie-off techniques. Affected employees shall also be trained to demonstrate the proper use, inspection, and storage of their equipment.

12.12 Safety Training

1. Effective measures shall be taken to ensure that every person employed shall receive adequate training and instruction in the precautions to be taken for his protection in relation to his health and safety.
2. The person or persons appointed for Health & Safety responsibilities shall not be required to carry out any other duties, if so doing would not prevent or unnecessarily delay securing the safety or health of persons employed.
3. The person or persons appointed in pursuance of this regulation shall investigate all accidents and shall keep a record of the investigations made and of measures taken to prevent their recurrence.