



CONTROL MEASURES FOR HAZARDS & RISKS IN PORT AREA TO ACHIEVE WORKPLACE SAFETY

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ABSTRACT: Port areas are hazardous place for work activities. It's going to be handling an entire varieties of cargoes and dealing with different types and varieties of entities and personnel. Work on ports takes place throughout the day and night and doesn't stop due to any form of weather. There are usually pressures to load or unload a ship's cargoes quickly to catch a high water for ship to be able to leave the port with a deep draft, or to free a place for other ships waiting to enter. Also truckers and drivers need to finish their job in the port as quickly as possible to go back on the road for a new job.

These factors create different types of hazards and risks associated with different and dynamic operations, dynamic circumstances cause dynamic risks. Port Authorities should apply applicable health and safety measures in different sites to manage these risks properly. The port authority has to highlight the most hazards found in numerous workplaces and descriptions what they have to try to benefit the law.

Port work usually involves variety of various employers, contractors, agencies and will all have an effect on every other's activity. These could embody harbor authorities, port operators, Stevedoring companies, handlers, ships' masters and crew, and temporary staff.

To maintain constant health and safety normal, a risk assessment of all activities should be done. This could determine the measures they have to possess in situ to benefit their duties beneath health and safety law and cut back risks to this point as within reason practicable; conjointly if one thing went wrong what area unit the countermeasures and the way to traumatize matters and complete a report.

Safety in ports is that the responsibility of everybody, government, national and international agencies are directly or indirectly involved to develop safe systems for labor and make sure that they're place into and are followed by all. The introduction of latest concepts and ideas in load handling demands that special attention to be paid to safety necessities.

The Scope of this paper is to identify hazards, risks and control measures to eliminate occupational accidents, ill health and injuries which will lead to safe work environment. The descriptive methodology will identify different activities which take place in ports, the associated risks and the mitigation of these risks to achieve the required safety standard.



INTRODUCTION

Health and safety of dockers and alternative port staff will probably be compromised once employers obtain to scale back prices or privatize their operations, The health and safety of port staff are often vulnerable once casual or untrained labor don't follow health and safety best practice, conjointly once they work for long hours or while not adequate breaks, coping with exaggerated workloads as employers obtain to try and do additional work with fewer personnel. Inadequate or unsuitable safety instrumentation, consumer goods or procedures also are in danger.

So the training for all port staff is crucial and also the ITF is drive to win acceptable coaching standards in ports round the world to make sure the best standards of health and safety attainable are bonded.

Traditionally, management viewed safety programs as non-complementary hindrances poignant desired performance levels and infringements upon expected earnings. Higher insurance premiums, worker's compensation claims, penalties, however, are way pricier than the look, implementation, and management of safety and health plans. (www.itfglobal.org)

Safety and health plans are important in today's international economy. With increasing globalization, levels of mercantilism and commercialism are calculable to achieve a high record. Additional product coming into port facilities necessitates additional handling instrumentation on-terminal and product movements to deliver it to its next stage within the intermodal method therefore increasing the possibilities for employee accidents.

Examples of business responses that have improved operating conditions embrace safety-training programs, environmentally friendly initiatives and also the introduction of machine-controlled machineries like electric-powered handling instrumentation, automatic target-hunting vehicles, and optical character recognition devices. (www.academia.edu)

From the opposite hand in keeping with the International Labor Organization (ILO), the principal hazards which will arise from port operations are, among others, fumes, dust, and exposure to venturesome air chemical substances, Such health hazards ought to be known, the risks proverbial and evaluated, the hazards to health understood and effective preventative measures place in situ to make sure the health of the port staff involved.

Although this acknowledgment, over the last years several accidents keep occurring in port employees ensuing from exposure to air pollutants. Particulate matters, benzoyl, volatile organic compounds, atomic number 7 oxides, sulfur oxides, CO, gas, serious metals, dioxins, pesticides accustomed treat turn out are virtually common air pollutants meet in port facilities.

The found out of an observance system on air waste concentrations and health effects in port areas has been mentioned by International Labor Organization because the crucial step towards the integrated management of those problems.

The main air chemical agents are bestowed in terms of their risk, a short reference on the legislative and restrictive framework on the problem is completed and also the main measures and actions for attempt the matter are made public.

This paper can describe terminal worksite safety hazards and conditions through descriptive methodology. establish the creation of safety programs, and highlight business plans to enhance port employee safety and health and the way management strives to attain operational proficiency and cut back accident rates with restricted resources.



PORT LABOUR

The term “Port labor” are often thought-about because of the loading or unloading of ships, or typically, like all forms of product handling in port zone, together with the stuffing and removal of containers, the Loading and Unloading of upcountry waterway vessels, Lorries and railway wagons, the storage and Semi - an industrial process of products in warehouses and supply areas, etc.

PORT OPERATIONS

Ports are key hubs within the international freight distribution system at the core of the world economy. Port and dock staff offer an important service in supporting the strategic offer chains necessary to transnational firms.

Port areas are hazardous place for work activities. It’s going to be handling an entire varieties of cargoes and dealing with different types and varieties of entities and personnel. Work at ports takes place throughout the day and night and all told sorts of weather. There are usually pressures to load or unload a ship’s product quickly to catch a tide or to liberate a wharf. Visiting drivers need to load up or drop off their product as quickly as attainable and quickly go back on the road.

These factors create different types of hazards and risks associated with different and dynamic operations, dynamic circumstances cause dynamic risks. Port Authorities should apply applicable health and safety measures in different sites to manage these risks properly. The port authority has to highlight the most hazards found in numerous workplaces and describe what they have to try to befit the law in site to manage these risks properly. (HSE)

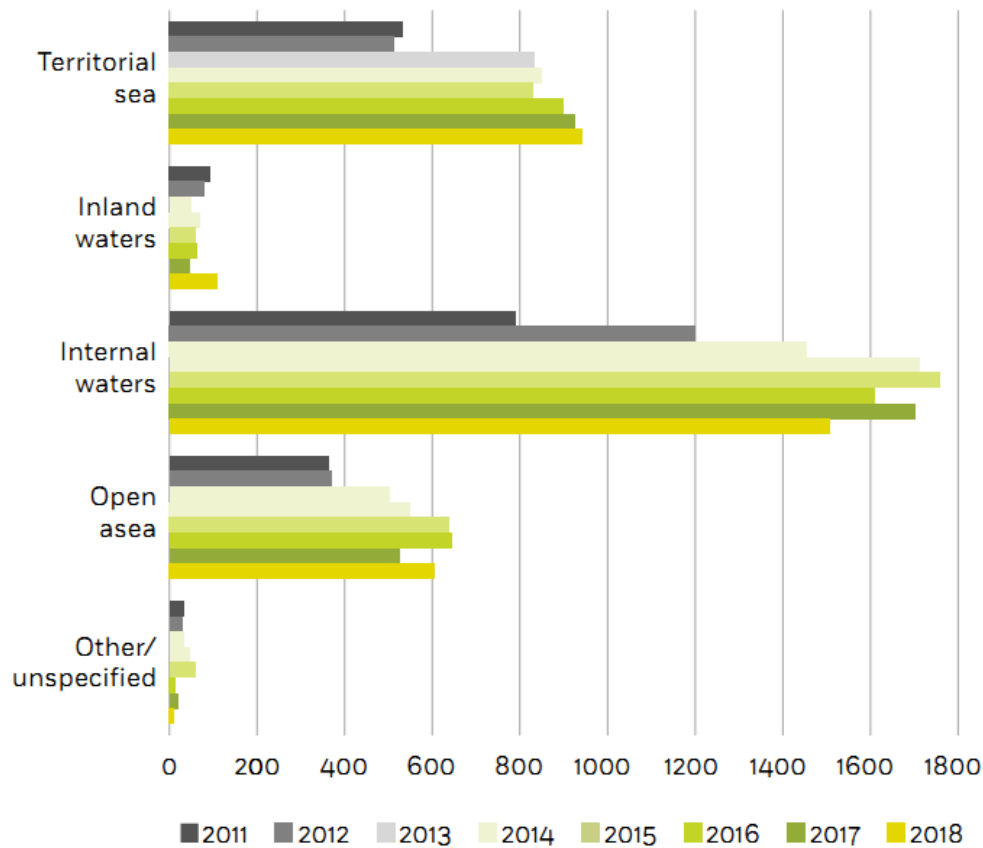
The varied nature of marine facilities, together with location, tides, approaches, product varieties, and vessel vocation patterns to introduce myriad operational practices that build a particular legislative framework for safety among the business troublesome. A versatile and responsive framework, maintained within the non-mandated PMSC, is so efficient and fascinatingly different. (Port Marine Safety Code)

A freight safety report revealed by the International Transport staff Federation (ITF) found that the most threats to work-related safety were related to heavy equipment and also the huge loads that are dealt with in the port area. High risks also includes inadequate or old infrastructure and lack of information. (Pat Brownlee)

FACTS AND FIGUERS

One of the most dangerous places to work in the world is the port, it has been proved that its “very difficult” to obtain precise figures concerning the number of accidents for dockworkers or port workers in Egypt, because of the local and international classification systems that do not identify port labor or Port workers as separate categories and also the diverse nature of employment relationships, which includes various forms of casual, occasional and temporary work.

Figure 1 Geographical Position of Ship’s Accidents 2011-2018



Source: European Maritime Safety Agency, Annual Overview Of Marine Casualties And Incidents 2019

Figure 1 shows, the statistics of ship’s accident share in several geographical positions as a sign of the bad places, 50.9% of the marine casualties or incidents occurred in internal waters whereas the sub-category port space delineates forty-one .7%. Territorial ocean and Open Ocean created up twenty seven.4% and 18.2% of the overall, severally. It’s clearly obtained that the port has the foremost extreme high risk or the number of accidents than the ocean, anchorage, coast, island, canal, and ocean, from the ship’s business purpose of reading that, reflects the bad share that the port labor engaged in.

From this conclusion, all the port hazards and risks will be described in this paper.



HAZARDS IN PORT AND DOCK OPERATIONS

I. Falls From Height

Lots of the activities distributed in ports may lead to a fall from height. These activities might even be throughout routine operations or throughout incidence maintenance activities. In ports, any hazard of operational near water suggests that a fall would possibly end in the prospect of drowning. Falls from a height can occur whereas concluding trimming, material and instrumentality lashing, securing a whole lot, accessing ships, aboard a ship or operational on heavy high cranes.

Falls from Height Hazards in Ports

- Access to and from vessels by accommodation ladders and gangways.
- Container-top operational – lashing and unlashings containers, use of slewing jib cranes.
- Access to and from places of labor aboard vessels (holds, hatches, decks, etc.).
- Falls from vehicles throughout loading/unloading and material.
- Falls from automobile transporters.
- Maintenance work.
- Unloading some types of merchandise, like associate degree pipework, timber packs, etc., could end in open edges from ships’ decks, passages and from the merchandise itself.
- operating adjacent to open edges of docks, wharves, etc.

Reducing Risks

- Do a risk assessment for any work distributed at height. Choose and use appropriate work instrumentation.
- Avoid work height wherever attainable, e.g. performing from the bottom employing a long tool.
- If work height can't be avoided, you ought to use work instrumentation or alternative measures to stop falls, e.g. guardrails, mobile elevating operating platforms (MEWPs).
- If there's still a risk of falls, you ought to use work instrumentation that minimizes the gap and consequences of a fall, e.g. nets, airbags, fall arrest systems.
- All work height ought to be properly planned and arranged.
- Workers concerned in work height ought to be competent.
- Equipment for work height should be properly inspected and maintained.
- When operating over or close to the water
- Provide secure and adequate fencing wherever a risk assessment has found this to be necessary.
- People ought to wear appropriate personal protecting instrumentation, e.g. lifejackets or buoyancy aids.
- Provide dock premises with adequate and appropriate rescue and saving instrumentation and suggests that to flee from danger, e.g. handholds on the quayside at water level, ladders on wharf age walls and life-saving appliances.
- Take the risks to lone staff into consideration.
- Edge protection should be in situ on all open edges wherever there's a risk of falling from a height.
- Falls through openings in holds or from the product should be prevented.



- All-access or lashing cages should be befittingly protected with guard rails and toe boards and have strong gates or doors. Documented directions for his or her safe use ought to be obtainable.
 - Wherever attainable, avoid the necessity for folks to climb onto vehicles. If folks cannot work from the bottom, applicable safe access should be provided.
 - Appropriate documented safe systems of labor should be in situ for the stacking of full and empty containers. Empty containers mustn't be stacked among seven meters of occupied buildings.
 - Stacks adjacent to buildings and perimeter fences ought to be stepped back.
 - If linking containers along, a secure system of labor should be in situ to change the attachments that link the containers to be placed in position and removed, safely.
 - Appropriate ship to shore access should be provided and may accommodate Marine Notices.
- Appropriate measures and safe systems of labor should be in situ to stop falls from heights and to make sure compliance with half four of the security, Health, and Welfare at Work (General Application) laws 2007.

II. Falling Objects

During cargo operations and stacking and storage there's a risk of falling objects. Things could also be loose and incorrectly or poorly slung or stacked. Fittings and fixtures used throughout lashing operations could also be born. Different objects might collapse or fall having become unstable throughout transport or having been poorly loaded.

- Safe systems of labor should be in situ to make sure that pre-slung and lose hundreds are often raised safely.
- All securing instrumentation, like twist locks and lashing bars, should be adequately inspected and maintained.
- Loads should be befittingly secured particularly throughout movement around the dock.
- Marked safe areas ought to be provided for lorry drivers throughout loading and unloading operations, particularly in instrumentality terminals.
- Marked safe areas ought to be provided for customs officers to hold out examination and protection of containers.
- Good ship to shore liaison and cooperation is needed for the loading and unloading of solid and rigid bulk cargoes.
- All lifting instrumentation should be inspected, tested and records of such tests unbroken in accordance with the security, Health, and Welfare at Work (General Application) laws 2007, as amended.
- A register of lifting instrumentation and lifting accessories should be maintained.
- Appropriate procedures should be in situ to verify that a ship's lifting instrumentation, has been inspected and tested, in accordance with legal necessities, before permitting staff to use it, together with product lifts.
- All lifting instrumentation should be capable of lifting the desired load.



III. Fatigue

Dock operations are often exposed to sudden events and delays over that there could also be very little management. Fatigue will develop slowly and cannot continually be obvious. It will increase the chance of accidents through poor perception or physical exhaustion.

- Measures should be in situ to make sure those rest periods are applicable.
- Managers, shift staff, and night staff should be educated concerning the necessity for correct sleep and also the dangers of fatigue.
- Work time organization

IV. Mooring Hazards

Mooring is a dangerous activity as there's a risk of someone getting caught by a line or a winch. The lines are terribly dangerous and heavy significantly if they're wet, and may break and snapback.

- All mooring staff operations should be trained.
- They ought to wear applicable personal protecting equipment.
- They should stand away from lines being thrown however be able to pick them up.
- They have to clear the snapback area and never enter unless needed.
- They have to keep all their body parts clear from getting tangled or trapped by the lines

(Hazards in Port and Dock Operations)

EFFICIENT MANAGEMENT OF HEALTH AND SAFETY IN PORTS

Port work involves a variety of employers and/or contractors and will all have an effect on each other's activities. These might embrace harbor authorities, port operators, stevedoring corporations, ships' masters and crew.

Ports ought to have strict and effective health and safety systems. These ought to guarantee co-operation, co-ordination, and communication between all parties.

“The Management of Health and Safety at Work Regulations 1999” launched a variety of necessities for employers to make sure they're adequately managing health and safety. These include:

- A risk assessment of their activities. This could establish the measures they have to possess in situ to accommodate their duties below health and safety law and reduce risks to a safe level.
- Making certain there's effective designing, organization, control, observance, and review of the measures they conduct
- Appointing a competent person to manage health and safety.
- A competent person is somebody with the required capabilities to manage health and safety;
- Providing staff with the knowledge they need to conduct safe operation and provide translation as required.
- Co-operation and co-ordination with different entities sharing the same job or place of work. (HSE)



REDUCE TRANSPORT RISKS

These are often classified under: ‘Safe work area, Safe vehicle, and Safe driver’..

I. Safe Work Area

- Each area must be checked to be safe for workers.
- Provide applicable road signs and markings.
- Vehicles and pedestrians must be separated wherever they may meet. This could involve restricting pedestrians from special areas or providing separate pedestrian routes.

II. Safe Vehicle

- Vehicles ought to be safe, supplied with appropriate visibility aids, often maintained, repaired and inspected.

III. Safe Driver

- All drivers ought to be work and competent to control all the vehicles they use at work.
- Workers ought to follow safe operating practices.

CARGO OPERATIONS

Loading and unloading at ports involve the employment and the usage of many heavy and lifting equipment; e.g. cranes, slewing cranes, self-propelled vehicle trucks or alternative similar machinery. Poorly planned lifting operations will result in vital risks to any directly or indirectly involved personnel.

I. Hazards from lifting Operations

Accidents have occurred due to:

- Failure of lifting equipment;
- Falling loads; and
- Workers being crushed by a moving load or lifting operations.

Reducing Risks from Lifting Operations

- Plan the lifting operation.
- Use the right equipment that can carry and deal with the load.
- Use a competent person to operate the equipment,
- Avoid moving the load over persons.
- All lifting instrumentation and accessories ought to be properly inspected and examined.
- Ensure staff and supervisors are trained, competent and practiced in safe lifting.
- If a ship’s cranes is to be used, make sure that it's appropriate and subject to a pre-use examination. Check the ship’s documentation and certificates.

II. Dusty Cargoes



Typical cargoes that produce dust during operation e.g. grain, soya, animal foodstuffs, fishmeal, ores, coal and coke, cement, biomass, superphosphate, and fertilizers.

Risks from Dusty Cargoes

- During handling these will pollute the air with dust. In some cases, e.g. coal and aggregates, the dirt is just little particles of the material itself. In some cases it may include microorganisms and fungi.
- Different clouds of dirt have totally different effects on health, however the foremost vital effects of dusty cargoes are on the lungs. The chronic effects are usually permanent and disabling.

Reducing Risks from Dusty Cargoes

Reduce the exposure time. If it's not possible to reduce exposure, you ought to control their exposure to the dust. Some ways to control exposure include:

- Restrict employee's entry;
- Use special enclosed loading or discharging systems;
- Suppress dirt with sprays of water or alternative;
- Ensure all instrumentation accustomed cut back dirt exposure is correctly maintained;
- Design tasks to scale back the quantity of dirt generated;
- Provide appropriate dust-filtration systems to the cabs of all new loading shovels accustomed handle unclean cargoes;
- Provide appropriate respiratory PPE for the job (RPE); and
- Provide regular health checkups for workers.

THE PORT AND HARBOUR SAFETY MANAGEMENT SYSTEM

The introduction of an operating Port or Harbor Safety Management System is not an easy job or task and also the time required to attain this could be underestimated. From the expertise of harbors and ports typically, the method usually involves structure amendment which can solely occur if undertaken during a measured and planned method. The policy is ready at the highest of the organization, with known roles and responsibilities to discharge the policy being designed next. The new or modified risk management choices and procedures originating out of the chance assessment method then follow. A key component is associate degree intelligence, which is unbroken fresh by current consultation with users and from the results of audit or review. Feedback from users of the safety management system considerably enhances intelligence, however as long as there is cooperation between different organizations facilitates. If the feedback info attain the required goals, then the safety management system can be adapted and updated. (Port & Harbor Risk Assessment and Safety Management Systems)



DEVELOPING PORT SAFETY MANAGEMENT SYSTEM.

Any port setting a plan must go into the following phases.

- Plan Purpose.
- Plan Objectives.
- Responsibilities and Authority.
- Legislation and Standards.
- Management and Control.

PLAN PURPOSE

The plan purpose must cover the potential hazards and risks and how to mitigate these risks and the way of communication between related parties associated with these risks.

PLAN OBJECTIVES.

The plan objectives must be clear and measurable like

- Identifying work hazards.
- Developing risk assessment to mitigate these risks.
- Explaining the safe management system framework to different parties.
- Plan revision and development.
- Reporting procedures.
- Auditing plan.

RESPONSIBILITIES AND AUTHORITY

The plan must explain:

- Duties and responsibilities of port authority, employees and contractors.

LEGISLATION AND STANDARDS.

The plan must include detailed information about laws, health and safety obligations to fulfill related safety standards, codes and applicable legislations.

MANAGEMENT AND CONTROL.

The plan specifies which parties will be in control and management of the safety management system.



SAFETY PROGRAMS

There are different safety programs and perspectives that can be utilized for achieving port safe system of work these may include but not subject to:

- Safe System of Work. (SSOW)
- Person Responsibility for Safety. (PRFR)
- Safety Observation Program. (STOP)
- Quality Management System (QMS)
- Work Permit System (PTW)
-

All of these systems will achieve the safe work environment for port according to hazards identified in work activities in port obtained from SSOW risk assessment.

RISK ASSESSMENTS

Risk assessment is in advance planning for prevention, response and consequence of the risks. The risk assessment involves identification, measurement, prioritization, and how to manage and mitigate those identified risks and the emergency procedures to be taken in case of accidents.

The risk assessment process should be dynamic and depend on accident reports and failure reports to be updated periodically.

CONDUCTING RISK ASSESSMENT

To conduct a risk assessment there are steps to follow, if you manage to conduct an effective risk assessment it will mitigate risks and provide safe place for work and proactive work place which will lead to elimination of occupational accidents and ill health and increase productivity .

RISK ASSESSMENT STEPS

- 1- Hazards identification.
- 2- Who may be harmed and how.
- 3- Risks to be prioritized and take the necessary actions.
- 4- Record your findings.
- 5- Review and update as necessary.

In each step of the risk assessment procedure there are various factors and activities to consider during the process. Each job or activity should be assessed by a competent person or a specialist to clearly describe these factors and how to deal with them and how they can affect work area and persons in the place of work and the consequences of these factors if it happen it can affect physical, mental, chemical and biological hazards. These effects can touch all personnel dealing directly with the job or even it can affect indirect personnel in work area or a bystander.

Also it may affect assets, environment, reputation ETC, all this will have a direct economic loss.

Economic loss may include compensation, disputes, loss of clients, loss of assets, environmental concerns, can be endless list.



The risk assessment should be available to all employees in all areas to help them reducing the risks and conducting a safe job or work. The dynamic risk assessment system will depend on employees for updating according to their work and newly identified hazards or through near miss report which will be a great help if all employees can participate and fill these reports. This will require training for employees to participate.

TRAINING NEEDS ANALYSIS

To initiate any training you have to identify different groups training needs. It's the requirement to have effective training that will fill the gaps rather than making general training which will not be effective.

- Analyze training requirements.
- Divide labor to groups according to training needs
- Define aims
- Identify objectives
- Select strategy and media
- conduct training
- Evaluate the results
- Improve as necessary

PORT PRODUCTIVITY THROUGH HUMAN RESOURCE

Productivity through port labor doesn't mean making labor work harder or faster because in developing countries labor work many hours and harder but with a minimum output however, operating smarter not harder may increase output easier.

This mean that labor to be trained and the authority would eliminate un necessary work and stress on the labor, develop skills, increase worker participation, raise commitment and develop safety culture, this can be obtained by the following. (Port Reform Tool Kit www.ppiaf.org)

Age of workers have effect on productivity age distribution must be kept in mind to have both experienced and young, to avoid having a lack of experienced port labor. Motivating labor will lead to increase productivity.

All this are good but if you couldn't keep these workers free of illness or accident and capable of work the port will loose and will need to have a new workers which will take time to develop a trained and experienced employees.



CONCLUSION AND RECOMMENDATIONS

- All employees or contractors must be aware of port safety management plan and updates.
- Port related parties must be aware of their roles , duties and responsibilities according to port safety management plan
- Risk assessment should be done for each job in port area.
- The output of risk assessment should be given to all persons working in this area or posted there.
- Occupational health and safety performance ought to be evaluated against internationally revealed exposure Limits, of that examples embrace Threshold Limit Value (TLV®)
- The operating setting ought to be monitored for activity hazards relevant to the precise project.
- Observance ought to be designed associate degree enforced by authorized professionals as a part of an activity health and safety computer program.
- Facilities ought to conjointly maintain a record of activity accidents and diseases and dangerous occurrences and accidents.
- All staff should receive adequate instruction, info, and training to change them to hold out their assigned duties safely.
- Every leader and any individual has the management of an area or labor that should perform a written risk assessment and take applicable steps to eliminate or cut back any risks found.
- The port should issue emergency plans.
- Emergency plans should include incidents like flooding, high winds, fires, explosions, chemical/solid bulk spillages, leaky containers, and product incidents, stranded or sinking ships.
- Consequences of accidents will be minimized and reports also will help in updating the system to prevent this accident from happening again.
- Any work equipment or vehicle required to work in job should be ready and well maintained.
- Employers are needed to arrange and, wherever necessary, revise plans, to follow take necessary actions in case of emergency
- Identify strengths, weaknesses, and gaps in national and port regulations/policies.
- Complete a comprehensive audit report, description any non-conformities detected.
- Prepare a planned action set up for the management to rectify detected nonconformities.
- Governments, employers, workers, and alternative stakeholders to reduce the chance of ports from the threats by unlawful acts.
- Increase employee's awareness that safety is everybody's concern.
- All staff should have proper PPEs, safety Signs should be placed.
- Any new employee or contractor should have internal induction about port safety system.
- Identify high risk area and operation and post restriction signs to nonoperational staff.
- Investigation should be carried out to know the root cause of any failure.
- Update risk assessment and safety management system if required.
- Allocate the competent person for the job.



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