

Health and Safety Authority

Draft

Code of Practice for

Health and Safety in Dockwork

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Foreword

The Health and Safety Authority, with the consent of Richard Bruton TD, Minister for Jobs, Enterprise, and Innovation, and following public consultation, publishes this Code of Practice, titled “Code of Practice for Health and Safety in Dockwork”, in accordance with Section 60 of the Safety, Health and Welfare at Work Act 2005 (No. 10 of 2005). This Code of Practice provides practical guidance on observing the provisions of the Safety, Health and Welfare at Work Act 2005 and the Safety, Health and Welfare at Work (General Application) Regulations 2007 (S.I. No. 299 of 2007) as amended by the Safety, Health and Welfare at Work (General Application)(Amendment) Regulations 2007 (S.I. No. 732 of 2007) for the control of hazards in the Docks & Ports Industry.

This Code of Practice comes into operation on xxxx.

Notice of issue of this Code of Practice was published in the Iris Oifigiúil of YYYY.

On the use of codes of practice in criminal proceedings, Section 61 of the 2005 Act provides as follows:

“61.—(1) Where in proceedings for an offence under this Act relating to an alleged contravention of any requirement or prohibition imposed by or under a relevant statutory provision being a provision for which a code of practice had been published or approved by the Authority under section 60 at the time of the alleged contravention, subsection (2) shall have effect with respect to that code of practice in relation to those proceedings.

(2) (a) Where a code of practice referred to in subsection (1) appears to the court to give practical guidance as to the observance of the requirement or prohibition alleged to have been contravened, the code of practice shall be admissible in evidence.

(b) Where it is proved that any act or omission of the defendant alleged to constitute the contravention

(i) is a failure to observe a code of practice referred to in subsection (1), or

(ii) is a compliance with that code of practice, then such failure or compliance is admissible in evidence.

(3) A document bearing the seal of the Authority and purporting to be a code of practice or part of a code of practice published or approved of by the Authority under this section shall be admissible as evidence in any proceedings under this Act.”

Robert Roe

Assistant Chief Executive Officer and Secretary to the Board

Health and Safety Authority

2. INTRODUCTION

Ports and docks can be hazardous workplaces. Some hazards are unique to docks and ships, while others are common in many workplaces, but manifest themselves in unique ways in the docks environment. While every port is itself unique in terms of its physical configuration and range of activities, all work in ports and docks can be carried out safely provided the appropriate risk assessments have been carried out and the necessary control measures are communicated to those concerned and implemented by them.

2.1 Safety In Ports And Docks

The docks industry is generally considered to be one of the most dangerous sectors in industry. Merchant seafaring is also rated as one of the most hazardous occupations worldwide, and port workers and seafarers work together at the ship / shore interface in our ports and docks.

International statistics indicate that the main causes of accidents in ports are slips and trips, being hit by moving or falling objects, falls and manual handling. Threats to the health of persons working in ports and docks include back and other musculoskeletal injuries, noise and dust related injuries. A high proportion of accidents to port workers occur on ships.

There is also an increasing trend in the number of accidents involving port cranes and other port mobile equipment which have resulted in serious injuries and fatalities.

Contributing factors have been identified as inadequate risk assessment and operations management, inadequate operating procedures, lack of training and awareness, bigger and faster port equipment, bigger ships, increased port throughputs, faster ship turnarounds and more extreme weather conditions.

The Code covers common work activities in commercial ports and dock premises, harbours and canals, where goods and passengers are transported, handled or held for the purpose of loading or unloading on or off ships from ships. This includes container terminals, dry and liquid bulk terminals, ro-ro, ferry and passenger terminals and general cargo docks, with the exception of port facilities already subject to COMAH regulations. It does not apply to passenger only vessels.

It includes work incidental to loading or unloading activities in the port area, but does not cover work activities already covered by general legislation, including:

- Work activities in offices, warehouses, maintenance work on port premises or equipment and similar activities not directly related to ship loading /unloading operations.
- Any industrial, construction, administrative or other work activity carried on within a port premises that is not involved with the loading and unloading of ships, as defined herein.
- The operation of refineries, chemical plants, factories, warehouses, workshops or similar industrial activities with the port area.
- Port marine operations, including pilotage, workboat and tug operations, operation of dry dock, rail interconnections, ship repairs in port, dredging, vessel traffic management and similar marine activities.

3. SCOPE

This Code of Practice is aimed at providing practical guidelines, based on a risk management framework, to help employers, employees and others with duties under the ***Safety, Health and Welfare at Work Act 2005***, the ***Safety, Health and Welfare at Work (General Application) Regulations 2007***, and associated regulations to identify, assess and control the risks specific to their operations within port and docks facilities. It's objective is to :

- Set out the basic roles and responsibilities of those who have duties in relation to ensuring health and safety in port operations.
- Give practical guidance on how health, safety and welfare at work can be achieved in the ports and docks sector, in accordance with the various legislative requirements.
- Help in the assessment of risks arising in docks operations and the identification of appropriate control measures.
- Increase the awareness of the hazards associated with the transfer of cargo between ship and shore and all related activities on the dock.
- Encourage consistent application of safe practice in all Irish ports and docks facilities.
- Address dock safety issues and regulatory requirements not specifically covered by general legislation.
- Provide a basis upon which safety training programs can be developed and implemented.



This Code of Practice is for anyone directly involved in work activity in port and docks facilities, including:

- Port employers , self-employed people and sub-contractors
- Port authority management, workers, harbour masters, port engineers, ships' pilots
- The management and employees of companies responsible for operating berths and cargo handling facilities, including privately owned facilities
- The management and employees of companies who carry out work in docks
- Cargohandlers engaged in work shoreside or shipside
- Port workers engaged in:
 - Port plant and equipment operations and driving
 - Port facility and equipment maintenance personnel
- Port Service Providers
 - Truck drivers and delivery drivers
 - Hauliers and trucking companies
 - Suppliers of labour for dock work or stevedoring
 - All contractors working for port companies within the port area
 - All users of port and docks, including shippers and receivers

- Warehouse and storage facility operators, management and employees
- Companies involved in cargo groupage and container packing
- Owners /occupiers of buildings within port and docks facilities
- Port and docks equipment maintenance personnel
- Employees' safety representatives and safety officers
- Refuse collectors
- Suppliers of materials and equipment materials to ports and docks
- Utility companies such as electricity and telecoms providers carrying out work within port and docks facilities
- Safety consultants and advisers
- Ship Service Providers
 - Ships' agent
 - Chandlers, provisions and bunker suppliers
 - Marine surveyors
 - Classification society surveyors
 - Ship maintenance service providers
 - Mooring services providers
- Official Visitors
 - Government employees on official business
 - Port authority officials
 - Emergency services
- Ships' masters, officers and crews
- Ship owners and operator

4. DEFINITIONS

- **Access** includes egress and gangways.
- **Banksman** is a trained slinger and signaller
- **Berth** means any section of a dock, jetty, terminal, quay, wharf or similar structure at which a ship is moored (tied up), and the adjacent dock area used for the loading /unloading of cargo of cargo to/from that vessel. For the purpose of this document, the term berth shall be used to refer to the area on which cargo loading / unloading operations and related activities are being carried out.
- **Berthing** means the process of bringing a ship alongside a jetty and securing it thereto.
- **Cargo:** means the entire load carried on the ship, or in the process of being handled to/from the ship.
- **Dangerous Cargoes** are as classified by the International Maritime Solid Bulk Cargoes Code (IMSBC Code)
- **Cargo Handlers** means any person engaged in work shipside and/or shoreside. Docker and Stevedore, for the purposes of this document, means any person engaged in handling cargo on/to/from a ship on the dock. Different definitions and local interpretations of the terms "docker" and "stevedore" exist but for the purposes of this document, they are defined as cargohandlers.

- **Cargo interests** means any shipper, receiver, consignor, forwarder or other persons or body responsible for preparing cargo for receipt by a port and for shipment by sea.
- **Container** means rigid, rectangular, reusable cargo units intended for intermodal road, rail or sea transport of packaged or bulk cargo by one or more means of transport without intermediate reloading.
- **Dock work** means the loading, unloading, handling, checking and inspecting of cargo directly into or from ship within the confines of a port. It also includes ship bunkering and storing work, and authorised activities by crew member on the dock, including embarking / disembarking, tending moorings, checking ships draughts, checking cargo and similar activities.
- **Goods** means the individual or different materials/substances within that cargo on board the ship, or held anywhere else away from the ship.
- **Dangerous Goods** are products that are classified as Dangerous for Storage and Transport: these products are allocated a UN No., with accompanying Class, Pack Group, and Sub. Risk classification, as required. Products that do not have a specific description under the IMDG Code, but have low flash points, or other risks, must be classified under their most significant risk, eg. Flammable Goods N.O.S. (Not Otherwise Specified). Dangerous substances are a sub-set of dangerous goods. Dangerous goods and substances are those which present an immediate threat to safety e.g. explosives.
- **Hazardous substances** are substances or materials which do not present an immediate threat, but could present either an immediate or longer term danger under certain circumstances e.g. dust, carcinogens.
- Materials are not defined as hazardous substances due to any potential risk because of misuse e.g. flammability or explosion if heated and ignited.
- **Hatch** means an opening in a ship's deck used for the purpose of loading, unloading, moving or handling cargo.
- **Hatch cover** means a removable component of ship's equipment used to open or close a hatch.
- **IMO** means the *International Maritime Organisation*, which is an agency of the United Nations with responsibility for developing conventions and protocols governing every facet of shipping. These are adopted into law by national governments, and apply to safety, marine pollution prevention and seafarer training standards.
- **IMDG Code** means the *International Maritime Dangerous Goods Code*.
- **ISM Code** means the *IMO's International Safety Management Code*, which provides an international standard for the safe management and operation of ships.
- **Jetty, dock, quay, pier, terminal or wharf** means any structure in a port which is used for berthing a ship in connection with (but not exclusively for) the loading or unloading of cargo or passengers.
- **Loading/Unloading equipment** means dock cranes, grabs, ramps, hoppers, bins, conveyors (including direct feeds from ships), chutes, loading /unloading booms or arms and similar equipment used to load cargo to or from ships. It does not include the equipment used to transfer the cargo to or from the dock to any separate industrial premises, warehouse, storage tank, silo, stockpile or laydown area.

- **Lifting equipment** means work equipment for lifting, lowering loads, and includes anything used for anchoring, fixing or supporting such equipment.
- **Master**, in relation to a ship, means the person having, for the time being, the command or charge of the ship.
- **Owner**, in relation to a ship, means the person registered as its owner or, if no person is so registered, the person who owns the ship, and includes any part owner, charterer, manager or operator of the ship.
- **Port** means any port and surrounding area that is used for purposes incidental to the loading and unloading of cargo onto or from ships. Such areas may include factories or other enterprises unrelated to cargo-handling operations. This code is not intended to apply to the operation of such enterprises.
- **Port Authority or harbour authority** means any person or body of persons empowered by statute to exercise effective control of a port.
- **Port facility** means any location defined as a port, and can be an individual berth, wharf or terminal. For the purposes of this document the term applies to the dock premises in which cargoes are loaded, unloaded, transported or held for the purpose of changing the mode or means of transport. It does not apply to any industrial premises, factories, warehousing or storage and distribution facilities within the port area.
- **Port, dock or berth operator** means the organisation or person with responsibility for dock operations such as mooring, cargo loading, unloading, handling and storage at particular facility. Operators may be owners or lessors of the facility, or may be contracted by the owner to operate it on their behalf. They may carry out all or any of the dock operations themselves, or may employ contractors to carry out certain activities as required.
- **Port work** covers all and any of the part of the work of loading or unloading of any ship, as well as any work incidental thereto
- **Port worker** means any person employed to carry out cargo handling, storage, maintenance and related activities on port premises.
- **Seafarer** means a person, including the master, who is employed or engaged or works in any capacity on board a sea-going ship other than a ship of war or a ship engaged in fishing or in operations directly connected therewith.
- **Ship** means any kind of ship, vessel, barge, lighter or hovercraft.
- **Ship's derrick** is an item of lifting equipment having a boom which can be raised, lowered or slewed while supporting a load by means of wires operated by winches, including hydraulic and electrical drives.
- **Shipping agents** work on behalf of the ship to handle all documentary and vessel entry procedures, arranging ancillary activities and assisting the master and owner in dealing with issues arising during the ship's stay in port. Shipping agents may also provide stevedoring services to ships.

- **Stevedoring company** means an individual or firm that employs dockers, dock workers, stevedores, cargohandlers or port workers to load and unload cargoes, and may also provide all or any of the necessary services and equipment to do so. Stevedore services may be provided by the port authority, the facility operator or by independent contractors.
- **Terminal means** a port facility with one or more quays dedicated to the handling of a particular type of cargo e.g container terminals, ro/ro terminals, bulk terminals.
- **Vessel** means any ship used for the carriage of cargo.
- **Warehouse** means any open, partially enclosed or enclosed storage area within the port facility.
- **Work equipment** means any machinery, appliance, apparatus, tool or installation for use at work.

5. BACKGROUND

Port facilities and their owners and operators, are subject to the same safety, health and welfare legislation and related European Union directives as any other work place in the State.

When a ship is en route to, and involved, in cargo loading /unloading operations in any port within the State, then additional statutory requirements encompassing national maritime legislation and the State's obligations under various international maritime conventions also apply. This legislation also imposes a range of obligations on port operators, employers and other duty holders involved in ship and cargo handling operations in port.

While legislation in relation to shipping is fully unified internationally, legislation in relation to port operations is not yet unified to the same extent. However the existing general legislation, together with relevant aspects of maritime legislation, international conventions and industry Codes of Practice serve to ensure that working practices and procedures are well harmonised in ports worldwide.

6. GENERAL LEGISLATION

The two principal pieces of legislation are the Safety, Health and Welfare at Work Act 2005 and the Safety, Health and Welfare at Work (General Application) Regulations 2007. Other relevant legislation enforced by the Health and Safety Authority which may be relevant to the Docks Industry includes:



- Safety, Health and Welfare at Work (Confined Spaces) Regulations 2001
- Safety, Health and Welfare at Work (Chemical Agents) Regulations 2001
- Safety, Health and Welfare at Work (Biological Agents) Regulations 1994, as amended
- Safety Health and Welfare at Work (Construction) Regulations 2006, as amended
- ADR Regulations (Transport of Dangerous Goods by Road) Regulations
- CLP Regulations (Classification, Labelling and Packaging of substances and mixtures)
- REACH Regulations (Registration, Evaluation, Authorisation and Restriction of Chemicals)
- Dangerous Substances (Oil Jetties) Regulations

These Regulations above will be referred to in more detail under specific hazards within this Code of Practice.

6.1 THE SAFETY, HEALTH AND WELFARE AT WORK ACT, 2005 (S.I. No.10 Of 2005)

The Safety, Health and Welfare at Work Act 2005 sets out the framework legislation relating to safety, health and welfare at work with which employers, employees, self-employed, contractors, designers, manufacturers and those with any degree of control over a place of work must comply.

Section 2: Application

The Act is based on the application of hazard identification and risk assessment to safety and health at work. It is framework in nature, focusing on the general duties and organisational and structural arrangements required to ensure a safe and healthy workplace. It sets out:

- The requirements for the control of safety and health at work.
- The management, organisation and systems of work required
- The responsibilities and roles of employers, employees, self-employed and others.
- The enforcement procedures needed to ensure that the goals are met.

Section 3: Employers's Duties

Employers (including self-employed persons) are primarily responsible for creating and maintaining a safe and healthy workplace. An employer's duties include:

- Managing and conducting all work activities so as to ensure the safety, health and welfare of people at work (including the prevention of improper conduct or behaviour likely to put employees at risk).
- Designing, providing and maintaining a safe place of work that has:
 - Safe access and egress
 - Uses plant and equipment that is safe and without risk to health.
- Prevention of risks from the use of any article or substance, or from exposure to physical agents, noise, vibration and ionising or other radiations.
- Planning, organising, performing, maintaining and, where appropriate, revising systems of work that are safe and without risk to health.
- Providing and maintaining welfare facilities for employees at the workplace.

- Providing information, instruction, training and supervision regarding safety and health to all employees, whether permanent, temporary or fixed-term. This must:
 - Be in a form and language that they are likely to understand
 - Be revised and repeated as required
 - Take account of the capabilities of employees to ensure they can work safely.
- Ensuring any contractors they employ are competent.
- Cooperating with other employers who share the workplace so as to ensure that safety and health measures apply to all employees (including temporary and fixed-term workers) and providing employees with all relevant safety and health information.
- Providing appropriate protective equipment and clothing to the employees (at no cost to the employees).
- Appointing one or more competent persons (internal or external) to specifically advise the employer on compliance with the safety and health laws.
- Preventing risks to other people at the place of work.
- Protecting the safety and health of all persons in the work place by providing information on any risks associated with the employer's activities to:
 - All other employers in multi-occupier work places who likely to be affected
 - The employees of all other employers in the workplace, as required
 - Temporary and fixed term employees, before commencement of work
 - Contractors or service providers.
- Ensuring that reportable accidents and dangerous occurrences are reported to the Health and Safety Authority.

Section 4: ' Employees Duties

The Safety, Health and Welfare at Work Act 2005 also imposes certain duties on employees, including the requirements to:

- Comply with safety and health legislation
- Co-operate with their employers and other duty holders
- Take reasonable care to protect his or her own safety, health and welfare and that of any other person who may be affected by his or her acts or omissions at work
- Not to be under the influence of alcohol and/or or drugs in the workplace
- Not to engage in improper conduct or other behavior such as violence, bullying or horseplay
- Submit to any appropriate and reasonable tests by a medical practitioner
- Participate in safety and health training provided by the employer
- Take account of the training and instructions given by the employer
- Correctly use any protective clothing and equipment provided
- Report immediately any defect in the place of work, systems of work or any substance likely to endanger safety and health.

Employee Entitlements

Employees have the right to make representations to and consult their employer on matters relating to their health , safety and welfare at work.

They are entitled to select a safety representative to represent them on safety and health matters in consultations with their employer. Arrangements are set out in the Act for this

consultation on a range of safety and health issues at the workplace. A properly informed safety representative can play an important role in preventing accidents and ill-health, therefore it is in the employer's interest to ensure that safety representatives and safety committees are supplied with all relevant information.

By pooling knowledge and experience through active employee participation, the employer gains their commitment and greater involvement and ensures that safety and health really becomes everybody's business.

Further information on safety representatives and safety consultation¹ can be obtained at: http://www.hsa.ie/eng/Publications_and_Forms/Publications/Safety_and_Health_Management/Guidelines_Safety_Representatives.pdf

Section 5: Other People with Duties

Persons who have control over:

- A non-domestic place of work that has been made available to the employees of another person
- The means of access to or egress from that place of work, or
- Any article or substance provided for use at that place of work (other than employees of the person in control) have a duty to ensure, so far as is reasonably practicable, that the place of work, the access to and egress from it, and any article or substance so provided, is safe and without risk to health.

For example, a person in control of a port or a port facility has a duty to ensure that a stevedoring company authorised to work in the port is provided with safe access and egress and, in particular, that any port equipment provided is safe to use. The cargohandler's duties in relation to his or her employees also apply.

Manufacturers, importers and suppliers (including designers, installers and erectors) of equipment, machinery, articles, or substances used at work have the duty:

- To ensure the safety and health of such materials.
- To provide information on the correct and safe use of the materials or equipment
- To ensure that it is designed and capable of being constructed and maintained without risk to safety and health.

¹ Separate safety consultation requirements exist for every ship registered in the State. These requirements are enforced by the Marine Survey Office and not the HSA. Further details can be found in Merchant Shipping (Safety Officials and Reporting of Accidents and Dangerous Occurrences) Regulations, 1988. (S.I. No. 110/1988).

6.2 Safety, Health and Welfare at Work (General Application) Regulations 2007

The General Application Regulations 2007 set out the duties of employers in relation to health and safety requirements which apply to all employers and self employed. Regulations contained within, with specific application to port operators and employers, are set out in the following table.

	General Application) Regulations 2007 Examples of Applications to Dock Work
Part 2 (Ch.1) Workplace	<p>The Workplace provisions prescribe minimum standards to be implemented by an employer in relation to ensuring the suitability of buildings and premises as safe places of work. Ports and docks are included in these Regulations by definition, and are undertakings having “places of work” to which an employee has access in the course of his or her employment.</p> <p>These Regulations are very broad in scope, but in terms of their specific application to ports and docks, employers must ensure that:</p> <ul style="list-style-type: none"> • Any separate doors or gates that are provided for pedestrians and for vehicle traffic, must be safe for both to use. • Traffic routes within the facility are designed, located and identified so as to ensure the segregation and safe movement of pedestrians and vehicles. • Loading bays are safe and suitable for the loads being handled. • Facilities are equipped with appropriate fire-fighting and detection equipment, as required. • Appropriate and well illuminated emergency routes and exits are provided, and these are kept free from obstructions. <p>Specific duties apply in relation to the provision of welfare facilities for employees, including:</p> <ul style="list-style-type: none"> • Provision of adequate and suitable restrooms, facilities for taking meals and sanitary and washing facilities. • Ensuring places of work are kept clean and free of accumulated rubbish. <p>Employees working outdoor must, as far as possible:</p> <ul style="list-style-type: none"> • Be protected against weather conditions. • Not exposed to gases, vapours or dusts, in compliance with the relevant statutory provisions. • Be protected from risk of slipping or falling.
Part 2 (Ch.2) Use of Work Equipment	<p>General Equipment</p> <p>Work equipment is defined as “any machinery, appliance, apparatus, tool or installation for use at work” and is all-inclusive. In terms of port equipment it includes everything from the cargo loading, unloading and handling equipment to hand tools such as a hammer.</p> <p>These provisions detail the requirements to ensure work equipment can be used without risk. Specific applications to work equipment used in ports and docks include:</p> <ul style="list-style-type: none"> • Selection and use of work equipment Equipment must be suitable for the work and the workplace. • The provision of information and instruction This also applies to abnormal and emergency situations. • Inspection and examination Work equipment exposed to conditions causing deterioration, such as occurs

	<p>in the marine port environment must be periodically inspected and tested by a competent person.</p> <ul style="list-style-type: none"> ● Maintenance Where possible, equipment should be shut down and made safe before maintenance work commences. ● Equipment Control devices, including : <ul style="list-style-type: none"> ○ The safe identification, location and operation of Stop/Start controls, emergency stops, interlocks, and start-up alarms ○ Control devices which affect safety including load cells, anemometers, proximity switches. ● Guards and protection devices, including: <ul style="list-style-type: none"> ○ Protection from falling objects, where required ○ Protection from hazardous emissions of gas, liquid or dust, including the use of containment or extraction devices ○ Protection from contact with moving parts ○ Provision of robust and safe guards which cannot be easily by-passed. ● Mobile work equipment <ul style="list-style-type: none"> ○ Combustion engines should not be used in working areas unless exhaust gases can be vented to open air ○ Implementation of appropriate traffic rules, including restrictions on pedestrian access in areas where mobile equipment is operating ● Lifting equipment and lifting accessories and their examination and testing. <ul style="list-style-type: none"> ○ Lifting Equipment must be tested before 1st use and after any substantial repair or alteration. Mobile cranes must be tested every 4 years. Pulley block, gin wheel or sheer legs or supporting systems for same, used in the raising or lowering of any load weighing 1,000 kg or more must also be tested before 1st use. Periodic thorough examination must be carried out on certain equipment and accessories and records and registers kept. These requirements are highly detailed and should be evaluated carefully to ensure compliance ○ It does not apply to any work equipment on board ships, including crane and derricks, but does require the master of a ship to comply with the relevant Regulations for examination and testing of lifting equipment .
<p>Part 2 (Ch.3)</p> <p>Personal Protective Equipment (PPE)</p>	<p>Applies to the selection, assessment, conditions of use and compatibility, maintenance and replacement of PPE. The basic principle is that PPE should only be used as a last resort.</p> <p>Employers must supply PPE in workplaces, such as port and docks, where risks cannot be eliminated or adequately controlled.</p> <p>All PPE must be CE marked and be assessed for suitability for use in the particular workplace. Typical PPE used in dock work includes:</p> <ul style="list-style-type: none"> ● Safety helmets, boots and gloves ● Eye or face protection, respiratory protection and hearing protection ● Weatherproof and/or high visibility clothing ● Safety harness ● Personal flotation devices for persons working over water <p>Information and training must be provided to employees on the safe use of the equipment and employees must use the PPE in accordance with the training provided.</p>

<p>Part 2 (Ch.4)</p> <p>Manual Handling of Loads</p>	<p>Dock work is centered on the transporting, lifting, carrying, moving, putting down, pushing and pulling of loads. Cargoes of many different types and characteristics are manually handled in differing ways and working condition in ports.</p> <p>Other routine tasks such as mooring operations, lashing containers and ro-ro cargoes, shovelling and sweeping bulk cargo also involve manual handling work. Employers must avoid or reduce the need for any manual handling that involves a risk of injury and must carry out assessments to identify all the risks and the controls required.</p> <p>This must be done in consultation with staff, recorded, controls put in place, and the findings communicated to staff.</p> <p>Any training needs identified must be specific to the tasks carried out.</p> <p>Training is not a substitute for the reduction or avoidance of manual handling risks.</p>
<p>Part 3</p> <p>Electricity</p>	<p>This section deals with safe use of electrical equipment and installations and work on or near electrical equipment. It also imposes duties on persons who design, install, maintain, use or are in control of electrical networks.</p> <p>All electrical equipment used in the ports and docks must be intrinsically safe for use in hazardous environments, including wet, dirty, dusty or corrosive conditions. Equipment such as reel mounted power cables on dock cranes must be protected where there is risk of mechanical damage. It must also be safe for use where there is a risk of exposure to flammable or potentially explosive atmospheres arising from dangerous goods or hazardous cargoes being handled.</p> <p>Portable equipment must be maintained and fit for safe use, visually checked before use and periodically inspected by a competent person. Portable equipment exceeding 125v should not be used in damp environments.</p> <p>Electrically operated equipment or machinery must be made dead before any work is carried out and precautions taken to prevent it becoming live while work is being carried out.</p> <p>Where it is unreasonable to make live equipment dead, Regulation 86 outlines three conditions which must be met before live working is allowed. The precautions taken need to be appropriate to the risk involved and a safe system of work must be implemented.</p>
<p>Part 4</p> <p>Work at Height</p>	<p>Work at height means working in a place where a person could be injured by falling, even at or below ground level. It also includes access and egress from such places. Deaths and injuries caused by falls from height are a significant percentage of workplace fatalities and serious injuries each year.</p> <p>Many activities in docks involve work at height, including mounting /dismounting vehicle cabs and trailers, accessing reefers, working on container tops, on deck cargoes and on cargo stowed in ships' holds. It also includes the use of gangways, hold ladders and stairs on board ships.</p>
<p>Part 5 (Ch.1)</p>	<p>Workers may be exposed to noise from machinery and mobile equipment operating on the dock and in ships' holds.</p>

Noise	Employers must ensure that noise assessments are carried out and the required actions taken if the exposure levels exceed the exposure action values set out in regulations.
Part 5 (Ch.2) Vibration	<p>Dockworkers operating heavy plant e.g dock cranes, forklifts, payloaders and stackers may be exposed to whole body vibration (WBV). Regular, long term exposure can cause injury to the back and spine as a result of vibration and shock to the body while driving the machines.</p> <p>Employers must ensure that vibration assessments are carried out where there is any risk of WBV occurring, and the appropriate actions taken as required</p>
Part 6 (Ch.1) Children and Young Persons	<p>Ports and docks are highly hazardous workplaces for children and young persons. The detailed requirements in the legislation must be carefully assessed to ensure complete compliance before the employment of any such persons is considered.</p> <p>A “child” means a person who is resident in the State who is under 16 years of age.</p> <p>A “young person” means a person who has reached 16 years of age but is less than 18.</p>
Part 6 (Ch.3) Night work and shift work	Port and docks operations frequently involves night work, shift work and irregular hours. Employers of persons working at night or on shift must carry out risk assessments to identify any special hazards arising, and must put in place appropriate measures to protect the health of such night workers or shift workers.
Part 7 (Ch.1) Safety signs at places of work	<p>Applies to the provision of signs for the protection of employees and others where hazards cannot otherwise be avoided or reduced. The regulation applies to acoustic, verbal and hand signals as well as signs.</p> <p>Safety signboards should not contain text, as the graphical symbol provided on the sign are intended to be understood by all, regardless of language or literacy skills. Supplementary signboards containing appropriate text may be provided as required. Appropriate safety signs for road, sea or rail transport should be used where required.</p> <p>It is particularly important that adequate and appropriate signage is provided in ports and docks due to the presence of ships’ crew members and visitors of many nationalities.</p> <p>Acoustic signals e.g travel alarms on certain types of dock cranes and emergency alarms, must be distinct and audible above ambient noise, taking into account the operating environment. Neighbour intelligent systems can be used.</p> <p>Hand signalling is an essential means of communication in ports, both between shore workers themselves and also between ship and shore workers. There must be a safe system of work that ensures that crane drivers and signallers are trained in the use of standard banksman / signaller signals, as these are also the signals used by ships’ crews internationally.</p> <p>Spoken messages must be clear and simple. English is the language of international shipping and standard shipping words and terms are understood</p>

	<p>by most experienced seafarers.</p> <p>Pipelines used in ports for transporting dangerous substances should be labelled at most dangerous points.</p> <p>Traffic and pedestrian routes should be permanently marked with the prescribed traffic signs and obstacles and dangerous locations must also be marked by appropriate signs.</p>
<p>Part 7 (Ch.2)</p> <p>First Aid</p>	<p>First aid equipment must be provided at all places of work, depending on the working conditions and the type and size of the facility. Trained occupational first aiders and a properly equipped first aid room may also be required, depending on the specific hazards in the work place. Hazards to be considered include those identified in this Code of Practice and the organisation's Safety Statement.</p> <p>Organisations with responsibility for the control of port facilities must also take account of the risks to non employees and in a multi employer facility may make arrangements with other employers for the provision of first aid services, as required.</p>
<p>Part 8</p> <p>Explosive Atmospheres</p>	<p>Applies where there is any risk from explosive atmospheres or fire arising from the storage or use of flammable substances in the workplace. <i>It does not apply to the handling, use, storage and transport of explosives or chemically unstable substances, e.g. where such substances are in transit through ports and docks, as other regulations apply.</i></p> <p>A range of regulations apply to the handling of dangerous goods in solid bulk, liquid bulk and packaged form in port, and also to particular fertilizer cargoes.</p>

6.3 Maritime Legislation

National maritime legislation comprises various Merchant Shipping Acts (1894-2009) and associated Statutory Instruments. It includes a range of legislation implementing national and international safety standards in relation to the safety and security of ships, their cargoes, those involved in their manning and handling, and the protection of the environment.

The following lists a range of maritime legislation applicable to activities in ports and docks but it is not intended to be a full and complete list. The Department of Transport (Maritime Safety Directorate²) has responsibility for developing, promoting and implementing this legislation and for enforcing compliance.

- Sea Pollution Prevention Regulations
- Harbour Authority - Harbours Acts, as amended
- Merchant Shipping Bill 2009
- Maritime Safety Act 2005
- Code of Safe Working Practices for Merchant Seamen
- MS (Code of Safe Working Practices) Regulations

² <http://www.transport.ie/marine/MaritimeSafetyDirectorate>

- ISPS Code: International Ship and Port Facility Security Code
- IMDG Code: International Maritime Dangerous Goods Code
- IMSBC Code: Code of Practise for Solid Bulk Cargoes
- BLU Code: Code of Safe Practise for the Safe Loading and Unloading of Bulk Carriers
- MLC: The Maritime Labour Convention
- EU Directives applicable to:
 - Control of international shipping using Community ports
 - Requirements for ships carrying dangerous or polluting goods
 - Ship and cargo waste management
 - Vessel traffic monitoring
 - Port State Control: control and inspection of shipping in Community ports

6.4 Local Regulations

In addition to national legislation, Harbour Masters have the power to create bye-laws within the limits of their port areas, principally in relation to the safety of navigation, pilotage, berthing and unberthing and related activities. Details are published in the port bye-laws. Under the Harbours Acts, Harbour Masters have the power to create bye-laws within the limits of their port areas applicable to both commercial shipping and recreational craft. Relevant bye-laws apply to:

- Safety of navigation
- Mooring and berthing
- Dangerous Goods
- Estate Management



6.5 Regulatory Bodies

Health and Safety Authority

The Health and Safety Authority is the national statutory body with responsibility for enforcing occupational safety and health law, promoting and encouraging accident prevention, and providing information and advice to all companies, organisations and individuals.

They inspect health and safety conditions and also investigate work related accidents that occur in a port. They may issue improvement or prohibition notices, or can prosecute those responsible for offences under the Safety, Health and Welfare at Work Act 2005 and the relevant statutory provisions.

Marine Survey Office

The Marine Survey Office deals with the inspection, survey, certification and licensing of vessels and vessels radio equipment; the examination and certification of seafarers competencies; the enforcement of standards by way of audits on organisation and facilities and prosecutions for breaches of regulations.

Port State Control (PSC) is a means of enforcing compliance with safety regulations where the owner and flag State have failed to do so. PSC Inspectors visit foreign ships in port on a targeted basis to check that they comply with international rules on safety, pollution prevention and seafarer living and working conditions.

Marine Casualty Investigation Board

Marine Casualty Investigation Board's function is to carry out investigations into marine casualties that take place in Irish waters with the involvement of the flag state or involving Irish registered vessels.

7. RESPONSIBILITIES

7.1 Ownership and control of port properties, premises and facilities.

All ports differ in their geographic layout, infrastructure and ownership and/or control of all of the port landside area or of different areas within the port.

All ports within the state with significant commercial traffic are, with one exception, 100% owned by the Irish Government³ and governed by publically controlled port authorities⁴. There are high levels of private sector involvement in the provision of infrastructure and services, with four principal port business models in operation:

1. Full service publicly owned ports where the infrastructure, superstructure and most services are delivered by a single public undertaking
2. Tool ports, where some of the services are outsourced to private companies or which contain both private and publicly owned port installations
3. Landlord ports, where the land and infrastructure is leased to private companies
4. Fully privately owned and operated ports.

7.2 Port Authorities

Port authorities have a range of legal duties in relation to the safety of both their own employees and to other users of both the waters within their jurisdiction and the port facilities, berths, landside property and premises within their control. These duties apply regardless of the size of the port or the amount and type of business conducted and port authorities and harbour masters have certain statutory powers to enable them meet those obligations.

³ Strategic Review Of Irish Maritime Transport Sector (IMDO)

⁴ Harbours Acts 1996- 2009

7.3 Multi-Operator Ports

Where a number of berth and terminal operators exist within the one port, they are required to work together, in cooperation with the port authority, to ensure an integrated approach to safety, environmental management and emergency response across the entire port.

7.4 Shared and Common User Port Facilities

Operators and employers using common user facilities and shared areas, including roads, within a port have a duty to co-operate with each other in ensuring a safe workplace for all concerned. There should be documented protocols/rules and procedures in relation to the safe operation and management of these facilities and areas.

7.5 Port, Dock or Berth Operators

The operators of leased or privately owned facilities within a port are normally responsible for their safe management and operation, including the loading and unloading of ships at berths under their control. They have a duty to ensure that all plant, equipment or infrastructure that they control is maintained in a safe condition and to notify others likely to be affected by their activities of relevant safety and health information.

The port authority remain responsible for shipping movements to and from the facility and for the control of dangerous cargoes. They may also be responsible for related marine operations e.g. provision of tugs or mooring personnel, depending on arrangements with the berth operator.

7.6 Port Employers

Companies employing or managing persons who work in ports include harbour authorities, port, dock and berth operators, stevedoring companies, labour providers, logistic services providers, shipping agents and other employers and contractors. Every employer has a duty to protect the safety, health and welfare of employees, whether permanent, temporary or fixed-term contract basis in accordance with the Safety, Health and Welfare at Work Act 2005 and associated regulations.

7.7 Employment Agencies and Labour Suppliers

A port employer who hires temporary or fixed-term employees through a temporary employment business must inform the employment agency or labour supplier about the occupational skills or qualifications required for the job and the specific features of the work. The employment agency or labour supplier is obliged to give this information to employees, and the port employer must ensure that this information is provided to the employee's

concerned. Fixed-term employees include any workers employed for a specific purpose, e.g for the loading or unloading of a ship.

Health and safety and other relevant information must also be provided by a port employer to any stevedoring contractors or other companies involved in the operations and this information must be passed on to all employees concerned.

The port operator, labour supplier or stevedoring company providing cargo handling services to a ship has a duty to ensure that all employees concerned are:

- Physically / medically fit for the work
- Appropriately trained
- Provided with relevant information regarding any hazards or risks to their safety and health, and the control measures in place in relation to:
 - The cargo they will be handling
 - The port facility, the berth or the ship and they will be working on
- Working in accordance with a safe system of work
- Properly supervised
- Provided with a means of reporting any hazards or defective equipment
- Provided with appropriate welfare facilities
- Provided with the appropriate PPE

7.8 Self-Employed

Self employed persons have a duty to take care of their own safety, health and welfare and that of others working with them and to co-operate with others sharing the same workplace. Self employed persons carrying out work within a port or on a berth have to prepare a safety statement containing risk assessments for the particular tasks they are carrying out to ensure the operation can be carried out safely. They must also comply with all port authority and berth operator safety procedures and safety instructions.

Employers who hire self-employed persons or contractors to carry out work in ports or on berths should ensure they are aware of all the relevant health and safety issues in relation to the port, the berth, the work to be carried out and the materials to be handled, as required.

7.9 Employees who Visit Ports and Docks in the Course of their Work

This group of workers includes shipping agents, hauliers, government officials, contractors, service providers to either ships or to the port, cargo interests and others.

Port management and port, terminal and berth operators all have a duty to take all practicable steps required to ensure that any hazards arising from their activities does not present a risk to such persons. This includes the duty to warn authorised visitors of any significant risks to their safety in the port and on the dock.

Those who visit ports and ships in the course of their work have a responsibility to ensure their own safety and that of others working with them. They should develop and use a safe system of work appropriate to the particular port facility they are working in and potential hazards it contains, as advised by the port authority and/or the berth operator.

7.10 Responsibility of Cargo Interests

Shippers, cargo brokers, freight forwarders / consolidators, shipping lines and others within the transport chain have a responsibility to ensure that dangerous goods are correctly classified, packaged, labeled, stowed, and segregated, as required.

7.11 Equipment Hire

Providers of equipment such as cranes, lifting equipment, lifting accessories, fork lift trucks and other mobile equipment for use in dock work must ensure that all such equipment is safe and properly maintained, unless the hire contract transfers such responsibility to the user.

A person or organisation providing lifting equipment for hire is responsible for complying with the statutory requirements regarding its examination and testing, and for keeping the required records and registers. Those who hire out equipment need to be aware of the detailed requirements set out in the Safety, Health and Welfare at Work (*General Application*) Regulations 2007.

7.12 Responsibilities of Ships' Masters

Masters are responsible at all times for the safety of their ships, and for the safety of those working on board their ships. They have a duty to ensure that:

- Safe means of access is provided to the ship or where this is impractical, by the Port Authorities
- Safe means of access is provided to all working areas on board where shore workers are required to go in the course of their duties
- Access and working areas are kept clear and free of slip, trip and fall hazards and are properly illuminated
- Access to hazardous areas on board is restricted
- Ship's equipment is well maintained and safely operated by the crew
- Ship's crew members keep clear of cargo work being carried out by shore workers



- There is an agreed ship/shore communication system in place
- The register of the ship's lifting equipment is available for inspection

Ship's masters, operators or agents are responsible for notifying the port authority in advance of arrival in any Irish port and for providing information on dangerous or polluting goods carried on board, in accordance with the regulations.

7.13 Responsibility for the Safety of Ships

Responsibility for ensuring that ships comply with relevant safety standards rests upon their owners, masters and the flag States. While the majority of ships are safe and comply with agreed international maritime conventions, a significant minority of ships continue to operate in an unsafe condition. Such ships can put the safety of those who work on board such ships, including cargohandlers and other shore workers, at significant risk.

8. MANAGING SAFETY AND HEALTH IN PORTS

8.1 Port Safety Management

The duty to identify and manage risks to health and safety is the same for ports as for any other business. It applies regardless of the port's ownership and management structure, and also applies to all companies operating within a port facility. The process of identifying and managing these risks include:

- Identification of hazards and risks from ships, cargoes, work activities, facilities, equipment and the environment
- Collection of adequate information on risks arising from the activities of others who share the port premises
- Implementing adequate measures to control the risks
- Identification and allocation of responsibility for carrying out the requisite actions
- Ensuring management at all levels are clear about their role and responsibility for health and safety
- Provision of adequate induction training to all those working on the premises
- Provision of adequate and appropriate training to employees, including competency assessment, where applicable
- Proper planning and supervision of all work activities
- Accident reporting arrangements put in place
- Communicating the hazards, risks and required control measures to everyone likely to be affected by those activities, including:
 - Port employees, cargo handlers and related activities

- Contractors and service providers
- Official visitors
- Neighbouring organisations and individuals
- Inspections and audits to ensure:
 - Controls and precautions are properly controlling the risks
 - Employees, contractors and visitors are following them
- Regular reviews of port health and safety management system
- Consultation with safety representatives and employee representatives
- Setting annual health and safety objectives

8.2 Port Authorities

Safety management systems should be established by Port Authorities for both the control of shipping in their jurisdiction and the control of activities on landside properties and premises under their control.

These should be based on formal risk assessments involving consultation with other port users and employers, where required. All activities and hazards in the port should be identified and the required control measures agreed and implemented. The agreed health safety and environmental protection systems should be integrated in a comprehensive management programme.

Port authorities must monitor and enforce the port's safety procedures and regulations to ensure compliance by both employees, contractors and port users.

The coordination and control of shared user areas should be led and managed by the Port Authority.

A port authority, as owner of port infrastructure and as controller of a multi-employer and multi-occupant work place, shall take all reasonably practicable steps to provide a safe place of work in areas under their control, including ensuring that all relevant responsibilities as set out in the Safety, Health and Welfare at Work Act 2005 and the General Application Regulations 2007 are complied with.

These include ensuring that:

- The common user areas under the control of the port authority are laid out and operated in a safe manner.
- Walkways, roadways, lighting, access ramps and storage areas are laid out so as to provide for the safe movement of pedestrians, vehicles and workplace transport in the port
- Road and surfaces used by cranes, cargo handling equipment, or for storage of goods is suitable and fit for purpose
- The transit, handling and storage of dangerous and hazardous goods in areas under the control of the port authority are safely controlled.
- Adequate emergency response procedures and equipment are in place
- Port and berth operators and lessors, owners and occupiers of premises and storage facilities within the port comply with all relevant safe operating practices, including ensuring:

- The safe movement of goods within the port area
- The safe storage and handling of goods and materials
- Safe access, egress, routes, roads and pasageways for all relevant types of mobile equipment and workplace transport used within the facility
- The provision of adequate signage, warning signs and lighting
- Adequate inspection and maintenance of all work equipment
- The protection of employees and others in the workplace from exposure to toxic or harmful substances or agents or oxygen-deficient or flammable atmospheres
- Compliance with confined space legislation.

8.3 Port Employers

Any employer engaged in works covered under this Code, must ensure, as far as is reasonably practicable, that they manage and conduct work activities so as to ensure the safety and health of their employees and contractors, whether working on the dock or involved in cargo handling work on board a ship. Particular hazards arising in ports require employers to ensure the following are provided either by themselves or by other duty holders:

- Safe means of access and egress
- Safe plant, equipment and machinery
- Safe systems of work, e.g. operating procedures
- Adequate means to control risks to health from any article or substance (including plant, tools, machinery, equipment and chemical substances.
- Appropriate information regarding identified hazards to everyone likely to be affected by them
- Clearly defined responsibilities for controlling risks in a shared workplace
- Regular audits and reviews to make sure the identified precautions are controlling the risks and that all employees and visitors within the port facility are complying with them
- Appropriate instruction, training and supervision, including induction training for new employees
- Regular consultation with employee representatives and safety representatives
- Suitable protective clothing and equipment
- Emergency response plans, with designated staff assigned to emergency duties.

The bulk of goods and materials transported by sea to and from Irish ports are shipped in unitised loads, usually by the same or similiar ships on regular, scheduled services. The shipment of liquid and solid bulk cargoes is basically a standardised operation, as it usually involves ships of the same class or type, even though the ship themselves may be different. The ships used to transport both break bulk and project cargoes also have similar general characteristics and operating procedures.

Port facilities, docks and berths are designed and built to handle particular types of ships and cargoes. All organisations operating within a port facility,



or providing any services at a facility, must develop a safety statement which identifies the risks arising in the particular workplace, in terms of:

- The operations that they they carry out and also any carried out by other port users which could present a risk to their employees.
- The port facilities infrastructure and layout
- The cargoes loaded / unloaded
- The types of ships handled
- The work environment

Any assessment carried out must provide a suitable and sufficient assessment of the risks. These must take account of the fast moving, constantly changing nature of the work, and the fact that every arriving ship and cargo has the potential to present new risks to personnel working on both ship and shore.

Employees must be given adequate instruction, information and training to enable them to carry out their assigned duties in accordance with the safe systems of work. Competent supervision must be provided to ensure that the work is carried out safely.

8.4 Port Risk Management

The management of risk in ports has to take account of the marine element of the port's operations, as well as all other relevant activities carried out on the port premises. This includes the ships handled, the cargoes loaded/unloaded, the cargo handling methods used and the marine environment in which it operates.

8.5 Ship Risk Management

Apart from the IMO and the other bodies already mentioned, companies involved in the shipment of goods also have a duty to ensure that the ship is a safe place for all those who will work on them in port.

Despite the range of rules, regulations and inspections that ships are subject to, variations in both safety and operational standards require prudent port or berth operators to carry out their own risk assessments of nominated ships that load /unload at their facilities.

8.6 Cargo Risk Management

All cargo transported by sea must be correctly loaded, segregated as required and secured so that it does not present a risk to the safety of people, the environment or to the ship. Specific maritime regulations apply to the maritime transport of dangerous goods in packaged form (IMDG Code) and to goods carried in bulk (IMSBC code). These regulations are primarily aimed at protecting the safety and security of ships and seafarers, but they also apply to shoreside personnel involved in the handling of dangerous cargoes in port. Port employers handling cargoes to which these Codes apply must take account of the relevant information

provided when carrying out the required risk assessments. Further information on these Codes can be found in Appendix 1.

8.7 Safety Statement

Section 20. (1) *Every employer shall prepare, or cause to be prepared, a written statement (to be known and referred to in this Act as a “safety statement”), based on the identification of the hazards and the risk assessment carried out under section 19, specifying the manner in which the safety, health and welfare at work of his or her employees shall be secured and managed.*

The Safety, Health and Welfare at Work Act 2005 requires that employers and the self employed produce a written programme, known as a safety statement, to safeguard the health, safety and welfare of their employees and other persons who may be placed at risk by their activities.

The first step in safeguarding safety, health and welfare is to identify hazards arising from work activities, equipment used and operated, hazardous substances handled and the environment. The employer and those who control workplaces to any extent are required to systematically examine the workplace and work activities to identify workplace-generated hazards.

This includes the assessment of all risks in the workplace that could cause harm to an employer’s own employees, the employees of other employers sharing the workplace, self-employed persons and other people, including customers, visitors and members of the public. The results of any risk assessments should be documented and form part of the safety statement.

Where an employer controls different types of work activity or changing work situations (as in different types and standards of ships or different types of cargoes), the safety statement should set out procedures for the handling of the ships, the cargoes and the associated activities both on the docks and on the ships. To enable the hazards and risks from the facilities and work activities to be identified and risks to be controlled appropriately, employers should consider:

- Their own knowledge and experience, in consultation with their employees and their safety representatives
- Relevant legislation or standards applicable to the hazard
- Any risks arising from the activities of other port users and employers
- Records of accidents, ill health and insurance claims

A typical risk assessment for a port should cover the total port area as defined in accordance with legislation. It includes the areas that the port authority directly controls and the areas under the control of port facility operators, berth operators and port service providers. The operators of dedicated port facilities and private terminals are responsible for risk assessing their own operations.

The port authority should take the lead in managing and coordinating the risks and vulnerabilities within the port. including berth facilities, berths, common user berths, the

operations of the port service providers within the port and specific areas directly connected to cargo handling activities.

The assessment of the risk profile of the shipping activities and associated activities being carried out in the various areas of the port will involve consultation with regular port users, other port employers and duty holders.

8.8 Risk Assessment and Port Operations

Every port facility and every dock is unique in terms of its physical layout, infrastructure, environmental conditions, range of ships and cargoes handled and organisational structure.

This Code of Practice recognises that these variations exist and is intended to be flexible enough to accommodate these differences while still facilitating the responsible organisations in meeting their statutory obligations.

The matrix in Fig.1 below sets out the relative risks to key groups of workers involved in typical port activities. The matrix in Fig.2 sets out the relative risks arising from exposure to different types of ships and the cargo or passenger handling operations concerned.

These are not to be considered to be definitive and individual port and docks employers and employees should consider the actual risks arising in the facilities in which they work and the degree to which they are exposed.

8.9 Main Hazards in Ports

The main hazards arising in ports are listed in Fig.1, as are the range of people and work groups at risk from those hazards. The degree of risk depends on the type of work and particularly the exposure to cargo handling activities both on the berth and on the ship.

The persons most at risk are the cargohandlers who carry out loading/unloading operations on board ship, the dock workers handling the cargo on the berth, and any other person who has to transit those areas while the activities are taking place.

Significant factors in assessing the risks include the type of ship and the type of cargo being handled. Fig. 2 sets out the generic risk exposures to different work groups arising on different ships.

However there are also other hazards which pose some degree of risk to the diverse range of people who work in ports or have duties to carry out in them. All these hazards can be difficult to identify by persons not familiar with the port environment and taking action to avoid one hazard may put the untrained person at risk from something else. Many port facilities also operate at night and are even more hazardous for unfamiliarised persons during the hours of darkness.





9. (Fig.1) Risks to Persons Working in Ports				Low Risk	Medium Risk	High Risk
HAZARDS	Ship Visitors	Ship Services	Port Services	General Port Workers	Cargo handler shoreside	Cargo handler shipside
Slips, Trips			<i>Review</i>			
Fall of persons from height						
Fall of material from heights						
Workplace Transport						
Working over Water						
Work at Heights						
Lifting Operations						
Ship / Shore Access						
Manual Handling						
Work in Ships' Holds						
Hazardous Cargoes						
Hazardous Atmosphere						
Confined Space						
Mooring Operations						
Cargo Handling Equipment						
Housekeeping						
Vibration						
Dust						
Noise						
Lighting						
Weather, wind and tide						
Release of a dangerous substance						



8.10 Types of Port Operations

Port operations are divided into the following sectors:

- **Container terminal operations:** loading/unloading of container ships at both privately operated and common user terminals using large, fast, equipment.
- **Ro/ro: roll-on/roll-off** means wheeled cargo e.g. cars, trucks, construction vehicles that can drive on and off the ship under their own power or on special trailers.
- **Lo/lo:** lift-on/lift off means cargo that has to be lifted on/off by means of shore or ship cranes. Usually refers to containerised cargo.
- **Liquid bulk:** means liquid substances carried in bulk in ships' tanks, including oil, oil derivative and chemical cargoes.
- **Solid bulk:** means solid substances carried in bulk in ships' holds, including iron ore, coal, grain.
- **Breakbulk or general cargo** means any loose materials or items that must be loaded individually, such as steel plate or coils, packaged lumber, heavy machinery.

Fig.2 below sets out a matrix of generic risk exposures to different groups of workers in relation to port operations for different types of ships. According to international statistics, cargohandlers have the greatest exposure, while container ship operations are the highest risk.

10. (Fig.2). Generic Risk Exposures on Different Ship Types					
SHIP TYPES	Persons Exposed to Hazards				
	Official Visitors	Ship Services	General Port Workers	Cargohandler shoreside	Cargo handler shipside
Passenger / Ferry 	Yellow	Yellow	Yellow	Red	Red
Ro-Ro 	Yellow	Yellow	Yellow	Red	Red
Lo-Lo 	Yellow	Yellow	Red	Red	Red
Bulk Carrier 	Green	Green	Green	Yellow	Red

HAZARD

A hazard is anything with the potential to cause harm such as work materials, equipment, work methods / practices, poor work design, fatigue or exposure to harmful agents such as chemicals, noise or vibration.

RISK

A risk is the chance, high or low, that somebody may be harmed by the hazard

8.11 Risk Assessment Process

There are 3 basic steps to risk assessment:

1. Identify the hazards:

- Look at what could cause injury or harm

- 2. Assess the risks of injury or harm:**
- Consider who could be harmed
- How they could be harmed
- The possible degree of harm that might occur

3. Control the risks:

- Put in place control measures to eliminate or reduce the risk to as low a level as reasonably practicable.



Once the above are done, you need to record your findings and review regularly.

9. GENERAL ARRANGEMENTS FOR PORT WORKPLACE SAFETY

Safety, Health and Welfare at Work Act 2005 - Section 2: Duty of employers to co-operate: Where employers share a place of work, they shall, in relation to safety, health and welfare at work, cooperate in complying with and implementing the relevant statutory provisions.

9.1 Coordination

Port authorities, port operators and other port employers sharing a place of work, are obliged to:

- Take into account the nature of the work
- Co-ordinate their actions in relation to prevention and protection of employees
- Inform each other, their respective employees, safety representatives and others of all risks arising from their activities, including the exchange of safety statement and relevant extracts relating to hazards and risks.

Port authorities and port operators are obliged to establish, implement and maintain effective safety, health and environmental management system for the port area and for the port operations for which they are responsible. The safety, health and welfare systems developed by port operators should be in line with the overall system developed by the authority for the port.

All employers with control of work activities carried out by their employee's or contractors within the port should inform other employers of any operations they are carrying out that could affect them, so that they can co-ordinate their actions and control measures.

9.2 Port Access Control

Safety, health & Welfare at Work Act 2005 Section 8.(1) "Every employer shall ensure, so far as is reasonably practicable, the safety, health and welfare at work of his or her employees.

(2) Without prejudice to the generality of subsection (1), the employer's duty extends, in particular, to the following:(a) managing and conducting work activities in such a way as to ensure, so far as is reasonably practicable, the safety, health and welfare at work of his or her employees"

Unauthorised personnel should not be permitted into the port area where there is a risk to both their health and safety and to others who may be affected by their acts or omissions. As far as is reasonably practicable, there needs to be strict control of points of entry and of all vehicles and persons entering the port. Where this is not practicable, appropriate restrictions must be put in place to prevent the public accessing areas when work activities are taking place.

The International Ship and Port Facility Security Code (ISPS) set similar measures although these relate to the security of ships and ports facilities. See 2 for further details on this.

9.3 Port Facility Infrastructure, Plant and Equipment

The authority or operator in control of the port or port facility is responsible for ensuring that the port infrastructure, including roadways, lighting, plant, equipment, storage facilities and other elements are suitable, fit for purpose and properly maintained, in so far as this duty is within their respective control.

9.4 Lighting

Each part of a port premises where work activities are being carried out shall be suitably and adequately lighted, including:

- Pedestrian access routes
- Roadways, vehicle parks and operating areas where people, plant and vehicles mix.
- Hazardous areas such as steps, walkways, ship/shore gangways, dock edges or where any work is being carried out at night or in enclosed areas.

9.5 Dangerous Cargoes

The term “dangerous cargoes” applies to oils, noxious liquid chemicals and to hazardous and harmful solid bulk and packaged substances. Dangerous cargoes handled in ports⁵ and transported by sea are classified as being either in packaged or in solid bulk form.

The term “packaged” applies to cargo transport units (vehicles, containers, portable tanks, IBC’s), parcels, boxes, drums, pallets and similar forms of containment. The term includes cargoes that may present a hazard to the safety of people or to the marine environment. The operators of ports and berths handling such cargoes must have a safety management system in place to ensure their safe handling and transfer, in accordance with both HSA and marine legislation.

9.6 Cargo Arriving In Port By Ship


Standard information to be assessed by the berth operator or stevedoring company responsible for loading /unloading dangerous goods includes:

- Name of ship / IMO Number/Agent /ETA as required by authorities
- Proper shipping names of goods to be loaded or unloaded
- Nature and stowage of cargo already on board UN number / Class
- Risks associated with the cargo
- Stowage plan for cargo to be loaded
- Location and condition of dangerous cargo on board
- Any known defects on board the ship which could affect safety of the port area or the ship.
- The condition of the cargo



⁵ See IMO guidelines “Recommendations on the Safe Transport of Dangerous Cargoes and Related Activities in Port Areas”.

Basic Pre-Checks for Packaged Dangerous Goods	Basic Pre-Checks for Bulk Cargoes (Solid or Liquid)
<ul style="list-style-type: none"> No., type, weights of packages Container No. if applicable Additional information as required by IMDG Code Signed / dated “Dangerous Goods By Sea” Documentation received from consignor All shoreside personnel involved, including port personnel, must have the appropriate function specific IMDG Code training. SDS if available 	<ul style="list-style-type: none"> Cargo quantity and stowage plan by hatch, Additional information as required by IMSBC and BLU Codes Code from the shipper Solid bulk cargoes should have a “Form for Cargo Information”, and SDS if available. For non IMSBC Code listed cargoes: <ul style="list-style-type: none"> Details of characteristics of cargo from shipper Confirmation from competent authority that cargo is safe to load, where applicable. Bulk liquid cargoes should have relevant SDS information

<p>Class 1: Explosives Class 2: Gases Class 3: Flammable liquids Class 4: Flammable solids Class 5: Oxidizing substances and organic peroxides Class 6: Toxic and infectious substances Class 7: Radioactive material Class 8: Corrosive substances Class 9: Miscellaneous dangerous substances and articles</p>		<ul style="list-style-type: none"> Group A: Bulk cargoes which may liquefy if shipped with moisture content in excess of their transportable moisture limit. Group B Bulk cargoes which possess a chemical hazards. Group C Bulk cargoes not liable to liquefy (Group A) and do not possess chemical hazards (Group B).
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9.7 Traffic Management

Traffic and pedestrian safety is a serious issue in port and docks areas, where a range of large, fast equipment is used in the loading and unloading of ships and in moving goods within the port area.

The Safety, Health and Welfare at Work Act 2005⁶ requires that transport hazards that exist in the workplace must be assessed as part of the overall risk assessment of the workplace and

⁶ Other relevant legislation, e.g carriage of dangerous goods by road, may also be applicable to work activities in ports.

appropriate steps taken to eliminate or reduce any risks found. Employers and duty holders with responsibility for the safe use of mobile equipment and road safety in the workplace must carry out risk assessments and implement traffic safety systems for both vehicular and pedestrian safety. They should:

1. Consider all activities involving the movement of vehicles within the port area and every category of worker at risk. These include equipment operators and truck drivers, cargo handlers, maintenance and administrative personnel and all those who visit ports in the course of their duties.
2. Implement a process of consultation and cooperation between the port authority and other port operators and employers to prioritise and establish collective measures and agreed traffic management systems and rules for the safe and efficient operation of the facility they share. In addition to meeting security requirements, port traffic control measures must also provide for the management of safety, health and environmental protection.

9.7.1 Traffic Safety Procedures

The traffic management and general safety rules for a port facility apply to all persons entering the facility, including the management, staff and employees of every undertaking operating within the port area, government employees on official business, hauliers, contractors, pilots and harbour authority personnel, suppliers, ships' crew, and all visitors to ships. Employers and port operators have a duty to ensure:

- Access is restricted to authorised persons only. Policies are in place in relation to children⁷ travelling in goods vehicle cabs.
- The traffic management and safety rules are made known to all persons entering the facility.
- Safe means of access and egress to the place of work. This includes cooperating with other port employers where required, and also with ships' masters to ensure safe access to ships.
- Provision of safe work equipment, including its suitability, safety features, safe use, inspection and maintenance.
- Safe work practices and safe systems of work for mobile equipment operation
- All port vehicles and mobile equipment selected, maintained and checked to same standards as applicable on public roads.
- Compliance with statutory requirements applicable to maintenance and inspection of certain mobile equipment, including forklifts, reach stackers, mobile cranes, mobile elevating work platforms.
- Compliance with port regulations and with statutory safety and health requirements for traffic and pedestrian routes, emergency routes and exits, loading bays, docks, danger areas, hazardous goods storage areas.
- Adequate lighting and signage in accordance with health and safety legislation⁸, including signs advising drivers of the side of the road on which they should drive.

⁷ Ship's crew members may have family members accompanying them on board ship or seeking to visit their ship. Special arrangements may have to be made to facilitate their access through facility, if safe to do so.

- Strict control of road haulage, commercial and visitor traffic.
- Safety awareness is provided to commercial drivers before being allowed enter any operational area.
- Contractor activities co-ordinated with other berth and port activities to ensure they can be carried out safely.
- Consultation with employees.
- Appropriate personal protective equipment provided to employees.
- All drivers, both internal and external, wear appropriate high visibility clothing and PPE.
- Visible management focus on traffic control and driver, vehicle and equipment safety.
- Use of driver / operator selection and training procedures to ensure they:
 - Are capable of working safely.
 - Competent to operate their vehicles and carry out daily maintenance.
 - Are medically fit, with good mobility, hearing and vision and not fatigued.
- Appropriate supervision and provision of information to operators.
- Workplace inspections and audits, followed-up as required when non-conformances are identified.

Critical Risks:

- Cargo handling equipment e.g forklifts (cause of very high proportion of accidents in ports)
- Road haulage drivers
- Internal haulage equipment, loading shovels, mobile cranes
- Cars, vans and pick-up trucks used by workers within the port
- Delivery and collection vehicles
- Visitors, including those going to port offices and attending ships
- Workers on foot
- Ships' crew members on foot
- Night time deliveries

9.7.2 Risk Assessment of Vehicle Operations

The risk assessment process should include:

- Identification of hazards associated with activities involving workplace vehicles - e.g. reversing operations, loading and unloading. Ask *'What might go wrong and why?'*
- Identification of who might be harmed by each hazard, including drivers, other port workers, visitors and members of public
- Evaluation of the risks for each hazard and checks re the adequacy of the existing precautions
- Setting priorities for action and implementing them
- Provision for periodic reviews of the risk assessment
- Provision for reviewing risk assessments daily, or as and when required, due to both short-term increases in risk e.g. increased traffic volumes, conflicting activities or temporary traffic diversions, or due to more permanent changes.

⁸ See Ch. 1 / Part 7 and Schedule 9 to the General Application Regulations 2007 which sets out requirements on the safety signs and signals
http://www.hsa.ie/eng/Publications_and_Forms/Publications/General_Application_Regulations/Safety_Signs_at_a_Place_of_Work_2010.pdf

9.7.3 Safe Vehicles

- Selection of suitable machines for the tasks to be carried out
- Maintenance of all mobile equipment, in accordance with manufacturers instructions
- Provision of safety and warning devices as per best practice, including cctv on large vehicles, convex mirrors, reversing alarms, flashing beacons
- Daily pre-operations check on basic controls by operators
- Periodic thorough checks by a competent person
- Tyres checked regularly for defects and kept at the appropriate air pressure

9.7.4 Safe Pedestrians:

Pedestrians in ports and docks premises should always:

- Assess the area in which they walking for hazards and take appropriate action to control any risks to their safety
- Wear high visibility clothing, be aware of traffic hazards and use the identified pedestrian walkways
- Stay out of “No Pedestrian” areas
- Consider that drivers cannot see them, and keep clear of driver blind spots and danger areas, particularly where machines are reversing or turning.
- Never approach a moving vehicle without first making contact with the operator and ensuring that the operator acknowledges their presence before they approach the equipment.



9.7.5 Safe Workplace and Safe Systems of Work

Traffic movement and the loading and unloading of vehicles is a high risk activity in docks. The two most significant risks are:

- Pedestrians being struck by vehicles
- Collisions between vehicles

Port authorities, port operators and employers should aim at providing collective measures to eliminate risks of traffic accidents, including or ensuring:

- Complying with port security regulations for vehicle and pedestrian access
- Clear guidelines for visitors who are not familiar with the port environment and could be distracted by their surroundings e.g private vehicles, deliveries, taxis and external services providers
- Segregation of pedestrian and vehicle traffic routes where possible, including clearly separated pedestrian and vehicle routes at entrances to port and at warehouses, storage sheds, trailer parks and loading yards to protect pedestrians and drivers. This includes provision of:
 - Speed limits that are clearly signposted and enforced
 - Suitable, adequate and well defined roads for the type and volume of traffic
 - One way traffic systems and minimising of need for reversing, where practical
 - Safe procedures for parking and reversing
 - Footpaths, where possible, or marked pedestrian walkways and crossing points

- Well surfaced, marked, illuminated and maintained roads, footpaths, pedestrian walkways and mobile equipment operating areas
- Arrangements for highlighting road features and hazards that might not be apparent, especially during darkness.
- Edges of loading bays and ramps, and sections of non-working dock edge, clearly marked and fitted with barriers, where practical
- Adequate and well maintained traffic and driver information and warnings signs
- Procedures and control measures to prevent persons on foot accessing vehicle working areas, or to protect them from being injured if it is not otherwise avoidable.
- Exit points or appropriate refuges at vehicle loading bays, as required
- Safe refueling, parking, queuing and lay-by areas
- Safe area to allow drivers comply with their legal obligation to secure loads before they leave the port
- Restricting vehicle access to facility at peak pedestrian traffic times, where required
- Documented safe systems of work, including procedures for providing clear instructions to drivers re:
 - Staying in or out of cab
 - Safety on the ground, fall protection and PPE requirements
- Loading/unloading vehicles, securing loads during movement to/from the dock
- Sheeting, coupling/uncoupling trailers, disengaging twistlocks, access to tankers
- Enhancing vehicle and plant visibility, e.g headlights on, flashing beacons
- Operation of lift trucks and stackers in storage sheds and yards
- Personnel who have to enter areas where vehicles and plant are operating , such as stacking areas or bulk storage warehouses
- Carrying out maintenance work in operational areas e.g tyre repairs or reefer repairs
- Notifying drivers and others who may be affected of any changes to traffic routes
- Adequate supervision to ensure compliance with procedures.

9.7.6 Safe Driving and Work Practices

Mobile equipment should only be operated by people who have been selected, trained and certified in accordance with relevant requirements for the machine they are operating and authorised to do so.

Drivers who are trained and qualified to operate a particular type of mobile equipment must always be familiarised with the operating procedures and controls for any different model of the same machine they may be asked to operate. Drivers and equipment operators have a responsibility to ensure that:

- They are trained, certificated, authorised and familiarised for the equipment they use
- They operate the equipment in accordance with instructions and wear seat belts
- They are always aware of other machine and crane operations, ground workers and pedestrians in their operating area.
- They carry out their equipment pre-use safety checks, and that weekly, 6 monthly and annual inspections of equipment are carried where required
- They report any faults with their equipment

- They comply with port traffic and parking rules and speed limits
- Mobile phones are not used while driving
- They have adequate visibility, and that all aids provided are in good working order.
- They are not under the influence of alcohol or drugs
- They are not suffering from fatigue
- Keys are never left in any port vehicles or mobile equipment when the driver is away from it.

9.8 Transport of Dangerous Goods by Road

The Carriage of Dangerous Goods by Road Act and Regulations (transposing the relevant Directive/ ADR annexes) apply to dangerous goods being transported on public access roads and is enforced by the Health and Safety Authority.

The Regulations apply from the point goods are loaded/packed/filled on/in to a vehicle e.g. specific filling requirements for tankers, packaging/vehicle choice/suitability, labelling etc even when carried out on private facilities when the vehicle will be moving on public access roads.

The movement of dangerous goods exclusively within private premises may be carried out without the application of ADR.

If the area is accessible by the public then ADR applies, if it is secure/private but the goods are moved via public access roads to temporary storage then ADR applies. If this activity to temporary storage is in a secure/private area then only when the goods are moved from the port/storage private areas would ADR apply.

HGV's on dock side would be subject to ADR if moving dangerous goods and the vehicle is not operated exclusively in a private/ secure area, i.e. any logistics company operating the vehicle on public roads, the vehicle will be required to hold an ADR annual vehicle certificate of approval for qualifying vehicles. Tractor units and trailers operated exclusively on private premises are not required to hold this certificate

Training for operators involved in any activity involving dangerous goods must be carried out prior to engagement in that activity. Training record must be kept by the employer and made available to the employee and Competent Authorities (CA) on request. The enforcement of this is carried out by the Health and Safety Authority for all hazardous classes except class 7 radioactive substances and class 1 explosives.

All issues concerning class 7 radioactive substances should be referred to the Radiological protection Institute of Ireland (RPII) and issues relating to Class 1 Explosives should be referred to the Department of Justice. The HSA has no responsibility for these areas regarding ADR.

Storage issues, is generally not an issue for ADR until the point of loading/transport (however, stacking limits are



specified for certain containers that may be applied during static storage). Depending on the substance and quantity there may be Seveso issues to be considered, otherwise the Gen Apps/ Chemical Regs may apply.

9.9 Accident Reporting

Accidents, where an employee or self employed person is injured at a place of work and cannot perform their normal work for more than 3 consecutive days, not including the day of the accident, are reportable to the HSA.

Road traffic/ vehicle accidents involving employees and self-employed are reportable if the person was injured while driving or riding in the vehicle in the course of work, and cannot perform their normal work for more than 3 consecutive days, not including the day of the accident.

Accidents related to a place of work or a work activity where a member of the public requires treatment from a medical practitioner are reportable.

Road traffic accidents involving members of the public are only notifiable if they relate to vehicle loads or to the construction or maintenance of roads or structures adjacent to roads.

In the case of an accident involving an employee at work, the employer is responsible for reporting the accident.

If the injured person is self-employed or a member of the public, the person responsible for reporting the accident is the person having control of the place of work at which the accident occurred including persons providing training (in the case of death or injury of a person receiving training for employment).

If a self-employed person is fatally injured, the person who is the owner or tenant in the place of work is responsible for reporting the accident. If the fatally injured person is the tenant or owner of the place of work, the next of kin has responsibility for reporting the accident.

Accidents and dangerous occurrences to persons employed or carried in a ship are reportable to the Marine Section of the Department of Transport under the *Merchant Shipping (Safety Officials & Reporting of Accidents & Dangerous Occurrences) Regulations 1988*. These regulations also require every dangerous occurrence which occurs to a docker on board a ship or during access which involved the failure of the equipment of the ship to be notified to the Department of Transport.

Further information can be found on the Health and Safety Authority and Department of Transport website.

10. HAZARDS ON THE DOCKS

10.1 Dock Edge Protection

In general, secure edge protection should be provided at all places from which a person could fall or where a vehicle could drive over the edge. However, the installation of fencing along the edges of working docks or quays where ships berth, mooring lines are handled and loading/unloading operations are carried out is normally not practical. Notwithstanding this, dock edge protection should be reviewed regularly and where appropriate, fenced off.

Suitable fencing or barriers should be provided at all dangerous corners and breaks in the edges of a dock or quay and at non-working ends of a dock, particularly if used for parking or by pedestrians.

Risk assessments should be carried out and appropriate controls implemented, in relation to any open quays where cargo handling operations are carried out, vehicles or mobile equipment operate, or where pedestrians pass close by.

Persons carrying out any work where they are at risk of falling into the water e.g handling mooring lines, should wear personal flotation devices (PFDs).

10.2 Working Over Water

All work in any unguarded areas over water must be properly risk assessed and appropriate safety measures identified and taken, including, as appropriate:

- Development of a safe system of work
- Provision of fall protection e.g safety guardrails, or fall prevention e.g safety harness or netting
- Ensuring the work area is free of slip, trip and fall hazards and has adequate lighting for night work
- Where there is a foreseeable risk of drowning which is not controllable by other means, suitable personal flotation devices (PFDs) must be provided to, and worn by, all persons involved in such work. Users must be trained in the correct pre-wear inspection checks and correct procedures for fitting, storing and maintaining the particular type of PFD they are provided with. PFDs must be CE approved and should be serviced periodically in accordance with the manufacturer's instructions.
- Provision of rescue equipment including lifebuoys and rescue lines
- Provision of a rescue boat, particularly over tidal or fast flowing water
- Provision of appropriate first aid arrangements
- Monitoring of weather forecasts

Suitable lifesaving equipment should be provided at regular intervals along the length of any dock or quay, including suitable lifebuoys and throwing lines. Ladders should be provided on quay walls.

10.3 Lifting Equipment

The Safety, Health and Welfare at Work (General Application) Regulations 2007 define:

- ‘Work Equipment’ as meaning any machinery, appliance, apparatus, tool or installation for use at work.
- “Lifting equipment” as meaning work equipment for lifting, lowering loads, and includes anything used for anchoring, fixing or supporting such equipment.

This definition applies to all types of ship loaders, ship unloaders, loading arms, chutes, spouts, power-operated ramps and other shore based equipment used in the loading and unloading of ships which involves the lifting and lowering of loads. This also includes work equipment which is not itself used as a lifting appliance but uses lifting appliances to position, suspend and stow it.

Employers shall ensure that:

- All shore based lifting equipment and appliances comply with the relevant requirements of the Safety, Health and Welfare at Work (General Application) Regulations 2007, as amended
- Master of a ship must comply with the requirements of Regulation 60 of the General Application Regulations with regard to reports and keeping records and registers of lifting equipment.
- All lifting equipment is inspected and tested and that records of such tests are kept.
- A register of lifting equipment and lifting accessories is maintained.
- All lifting operations are properly planned, appropriately supervised and carried out to protect the safety of both employees and other workers.
- Lifting equipment is operated by a competent person or by a person who is under the direct supervision of a competent person for the purpose of training.



10.4 Planning of Lifting Operations

The Safety, Health and Welfare at Work (General Application) Regulations 2007: Work equipment for lifting loads. Section 42. An employer shall ensure that all lifting operations are properly planned, appropriately supervised and carried out to protect the safety of employees

Lifting operations must be properly planned, appropriately supervised and carried out to protect the safety of workers and others who may be at risk. Risk assessments should be carried out to assess the hazards and risks of loading or unloading the cargoes routinely handled at the particular facility or by the particular employer. The risks to employees, contractors, ship’s crew members and others who may be affected by the work activity should be covered and the appropriate control measures put in place. The following issues should be considered in relation to the planning and control of all lifting operations:

- Allocation of responsibility for planning and control of the operation
- Cargo characteristics e.g containers, packaged timber, steel, breakbulk
 - Gross weights, dimensions, centers of gravity, handling requirements

- Cargo stowage plan; access, lashing / unlashng arrangements and load / unloading sequence
- Issues arising on sea voyage e.g cargo shifted or unstable
- Ship characteristics e.g type, configuration, restrictions
- Facility characteristics e.g layout, access, laydown/storage areas, ground bearing capacities, load bearing capacity of the dock area if mobile cranes are being used.
- Crane characteristics e.g shore cranes (gantry, mobile or slewing), or ship's cranes
- Procedures for checking its records and certificates and for initial and on-going checking of the integrity of the equipment
 - Checking, testing and using crane safety control features as per manufacturer's recommendations e.g interlocks, limit switches, load cells, anemometers, gates, limits, anti-collision protection, braking and anchoring systems, emergency stops
- Selection and checking of lifting accessories e.g. slings, pre-slung cargo, shackles, frames, spreaders, or other loose gear
- The personnel carrying out the work i.e. permanent, temporary or fixed-term
- Environmental restrictions: wind or tidal limitations; day or night work
- Risk assessment and development of lift plan, taking account of prior experience with the specific type of cargo or cranes and if risk assessments already carried out.
- Pre-operations inspection of cargo by responsible person to check:
 - The presentation and stowage of the cargo, any signs of damage or shifting, any awkwardly stowed cargo, or any risks of snagging
 - Arrangements for safe access to each hold, and/or to deck cargo
- Co-ordination of arrangements for responsible persons from ship and shore:
 - For pre-use inspections of lifting equipment and accessories
 - Plan loading / unloading activities
- Communications and signalling arrangements between:
 - Crane drivers / cargo handlers on ship and on shore by visual and/or radio methods
 - Ship and shore supervisors / management
- Consulting with or informing other port users
- Reporting defects, notifying those at risk, and taking appropriate control measures
- Procedures for stopping operations and storm anchoring the crane in high wind conditions, in accordance with the manufacturer's design operating limits.
- Crane operator training and experience in both the technical operation of the crane and the correct procedures for safely loading / unloading cargo in cooperation with the slinger / signallers, cargo handlers and ship's crew.

10.5 Banksmen

Banksmen must be trained and certified. Signallers are responsible for directing manoeuvres and ensuring the safety of persons in the vicinity of the operations. They must be clearly identifiable to the crane operator and cargo handlers and use clear signals recognisable by the shore and ship personnel involved in the operations. Signallers must always take care not to put their own safety at risk by standing too close to unguarded openings or in danger areas around the loads being lifted.

10.6 Dock Lifting Equipment

Dock cranes, ship loaders and unloaders should be designed and maintained so as to be suitable for the particular application(s) and for the marine environment in which they operate. Standard safety features on such equipment should include:

- Audible and visual alarms, travel alarms and warning horn or device.
- Anemometers to warn crane operator as wind conditions approach the design wind speed operating limits of the crane.
- Anti-collision protection where there is a risk of collision between two rail mounted cranes or where there is a significant risk of the shore crane contacting a ship's structure.
- Rail mounted cranes should be provided with deflector plates to remove any loose material from the rails.
- Storm anchoring arrangements to ensure safe securing of cranes when out of service, or in advance of forecast high winds.
- Service and storm braking systems on rail mounted cranes capable of controlling crane travel in storm conditions.
- Strength and stability during use must be assured.
- Safe working load is clearly marked and safe load indicator is fitted where appropriate.

10.7 Ships' Lifting Equipment

The Safety, Health and Welfare at Work (General Application) Regulations 2007 also impose duties on the masters of ships regarding the inspection and thorough examination of work and lifting equipment on their ships. All lifting equipment and accessories used on board a ship must be covered under that ship's safety management system and be duly recorded in the ship's register of equipment. Masters shall comply with the duties as set out in the Regulations re the:

- Examination and testing of lifting equipment (*Reg. 52 of General Application Regs. 2007*)
- Keeping of records and registers of lifting equipment (*Reg. 54 of General Application Regs. 2007*)

Prior to allowing workers to use ship's lifting equipment, a port employer must verify that it:

- Has been inspected, tested and certificated
- Is capable of lifting the required load
- Is physically checked as far as is reasonably practicable to ensure that it is in a safe condition and fit for purpose
- Is correctly set up for operation by port workers, and that the operators involved are familiarised as required with the controls and operating procedures for the particular crane
- That the above checks are also carried out where a ship's lifting equipment is operated by ship's crew members but shore personnel could be placed at risk by the lifting operation.



10.8 Ships' Derricks

Where ship's derricks are used to handle cargo, they must be set up properly in accordance with the ship's rigging plan for the loads to be handled, and be operated by persons who have the required skill, experience and competence.

Cargohandlers should be aware that the transfer and landing of a heavy load between ship and shore by ship's cranes or derricks can cause the ship to roll significantly. The planning of the lift, the safe systems of work employed, including provisions for fall protection where applicable, should take this into account.

The use of unsuitable or unsafe ships' lifting equipment has resulted in the death or injury of workers in ports worldwide. In the event of any doubt about the condition of the ship's equipment, expert advice should be sought or alternative lifting methods used.

10.9 Slinging And Lifting Of Cargo

Lift on/Lift off (lo-lo) cargo, whether containerised or breakbulk, has to be lifted on and off ships using either gantry or slewing cranes and various types of slings and spreaders.

The safe systems of work required for the slinging and lifting of cargo should include suitable arrangements to control the risk of falls from height and other associated risks, as well as details of the slinging and lifting gear being used.

The slings used may be chain, wire rope, fibre rope, flat woven webbing or round and may be pre-slung or single use slings. Personnel must be trained in the handling procedures of the various types of slings, what they need to look out for when inspecting them, the ways in which they can be safely applied to a load and the effect each method of use has on the ultimate Safe Working Load of the sling(s).

- **Pre-Slung Cargo:**

Certain cargoes may be pre-slung prior to being loaded to reduce need for cargo handlers to climb onto cargo to hook/unhook and to improve efficiency. Each sling used for pre-slinging cargo should:

- a. Have a test certificate and record of periodic inspection
- b. Have a Safe Working Load (SWL) adequate for the cargo being lifted
- c. Be inspected for visible defects prior to attaching the load
- d. Be replaced if unfit for use
- e. Be handled with great care, and never used to lift loads over the heads of any persons

- **Single Use Slings:**

These are disposable slings intended for the loading and unloading of one load only. They should be disposed of immediately to prevent them being re-used as they are not individually tested /certified or intended for repeated use.

- **Automatic Spreaders:**

Terminals handling containers on a regular basis by either gantry or shore slewing cranes should use automatic spreaders where it is reasonably practicable to do so. Similar standards and procedures should also apply when using ships' crane

- **Non- Routine Lifts:**

Non-routine lifts include project cargoes, heavy lifts, lifts that require non-standard slinging or rigging, or any lift not covered by the standard risk assessments. Cargo loading /unloading operations on specialised heavy lift and project cargo ships require careful planning by the master, crew members who may be required to operate the ship's specialised cranes and the cargohandlers concerned. Lifting plans should be prepared by a competent person and documented. It is the responsibility of the shipper or manufacturer to provide a complete and accurate description of the cargo to ensure its safe handling and lifting.

10.10 Work At Heights

General Applications Regulations 2007: An employer shall ensure that work at height is properly planned, appropriately supervised and carried out in a manner that is, so far as is reasonably practicable, safe and without risk to health;

Work at height is work in any place, including a place at, above or below ground level, where a person could be injured if they fell from that place. All such work shall be carried out in accordance with the General Application Regulations 2007 (Part 4) which require employers to ensure that:

- Work should only be carried out at height if there is no reasonably practicable alternative to doing so. Where a reasonably practicable alternative does exist, it should be adopted
- All work at height is properly risk assessed, planned and organised
- Control measures are in place to prevent falls from any height
- Appropriate work equipment is selected, used, inspected and maintained
- People working at a height are trained and competent
- Due account is taken of weather (rain, snow, ice, wind), darkness, lighting and tidal conditions

10.10.1 Work at Height in Docks

Falls from height is a common cause of serious accidents in ports, particularly in relation to the handling of containers. Serious risks to safety arise both on the dock and on board ship, and include:

- Mounting/dismounting from vehicles, sheeting trailers, securing loads, working around unfenced dock edges
- Using gangways to access ships, working on cargo on deck and in holds on board ships, accessing ships' holds, working on top of hatch covers, or alongside an open hatch or other deck openings
- Container lashing operations



- Hold cleaning during discharge of bulk cargo
- Working on bulk or breakbulk cargo with multiple gaps, drops and faces, e.g. timber, steel, scrap
- Working alongside an open hatch or other opening in ship's structure
- Working on deck cargo or containers close to the ship's side
- Working on tanker manifold connection platforms

Control Measures

A risk-based approach should be adopted to prevent falls where there is no alternative means of carrying out the work. This includes taking a sensible and pragmatic approach to addressing low falls, so that specific precautions need only be taken where the scope and duration of the work presents a risk of injury. This is frequently the case during cargo handling, loading/unloading operations where circumstances change rapidly e.g when handling general cargo, timber, steel pipe, coils and plate, etc. Typical control measures include:

- Application of the hierarchy of controls described in the Regulations
- Training of employees exposed to fall hazards on how to recognise and control such hazards
- Instruction and information, including tool-box talks, particularly for minor risks where higher level precautions are not reasonably practicable.
- Careful planning and supervision
- Wearing suitable non-slip safety footwear
- Ensuring personnel inserting/removing container twistlocks on the dock are protected from passing traffic
- Loading / unloading the cargo evenly to minimise steep drops or unstable stowage
- Handling containers using the following, where reasonably practicable:
 - Ships with cell guides
 - Automatic twistlocks or semi- automatic twistlocks
 - Man lifting baskets
- Fall prevention:
 - Collective systems such as fall preventors or fall arrestors e.g safety nets or soft fall protecton
 - Personal fall protection including lifelines, safety harnesses and fall arrestors appropriate to the identified hazards, used by properly trained personnel. Appropriate rescue plans must be put in place where this form of fall protection is provided including consideration of the risk of "suspension trauma" which is potentially fatal.

Work planning should address:

- A pre-operations inspection of the ship to identify any particular safety issues or hazards presented by its type, layout and overall condition, crew competence and their compliance with standard procedures
- Requirements for specialist lifting equipment, emergency response and rescue arrangements

- Procedures for notifying the master of any defects on board e.g poor lighting, unsafe access or defective equipment and for taking appropriate action to protect the safety of employees if deficiencies are not rectified immediately
- Handling of tools and equipment so that they do not fall on persons below, or create a trip hazard
- Arrangements for co-ordination of operations between cargo handlers, crane operators, banksmen/signallers, with personnel being lifted if man-basket is being used, and in coordination with the ship's master.

11.HAZARDS TO SHORE WORKERS ON BOARD SHIPS

Cargo handling operations on board ships is hazardous work. International statistics clearly indicate that the majority of accidents in the docks industry happen on board ships, primarily on board container ships. Risks to the safety of cargohandlers and other shore workers on board ships arise from the condition and safety standards of ship and crew and from cargo handling operations.

11.1 Ship Safety Standards

Ships are designed and built to be operated within specific sectors of the maritime transport industry, e.g container, solid bulk, break bulk, oil/chemical/gas, ferry, ro-ro, or passenger. While the cargo carrying and handling characteristics of the ships operating in each sector are very different, there are certain activities common to all types of ships e.g ship/shore access and gangways.

As all ships must comply with ISM Code requirements to have a safety management system to ensure safe practices and safe working environment on board, shore personnel working on board different ships should be able to expect a reasonably standardised approach to those activities common to all. However, the fact that safety standards on board ships varies considerably must be taken into account.

11. Common Risks to Shore Workers on All Ship Types	
Common Structural Hazards	Common Safety Management Hazards
<ul style="list-style-type: none"> • Poorly designed walkways, access ways, pipeline step-overs , gantries in working areas • Corroded and wasted walkways, access ways, gantries • Poorly designed, damaged or corroded hold access trunks, stairwells and ladders • Unsafe viewing positions for signallers controlling lifting operations in holds • Inadequate lighting on deck • Inadequate lighting in holds • Obstructions, ledges and fittings in holds that trap bulk cargoes and make them difficult and dangerous to unload • Access lids into tanks installed flush into decks with no means of fitting guard rails • Hatch covers with no means of fitting fall protection for personnel removing spillage • Unsafe and unusable gangway installations • Inadequate ship stores davits and cranes which put crew members lives at risk while handling stores on the dock 	<ul style="list-style-type: none"> • Gangways not rigged safely • Slip hazards due to oil leaks • Trip hazards caused by ship's gear left lying on decks and walkways • Fall hazards due to unguarded openings in decks and unguarded access and hold viewing platforms • Unsafe ship's lifting equipment • Poorly maintained lighting • No warning of corroded or damaged decks, gantries, walkway, ladders or stairs • Moorings not properly managed • Crew members not wearing PPE • Crew members walking under loads being lifted or accessing working holds without permission from cargohandlers • Unsafe operation of hatch covers • Hatch covers not properly secured

11.2 Safe Means of Access to Working Areas on Board

The ship is responsible for provision of a safe means of access from the gangway to the cargo holds, cranes or areas where work is to be carried out.

- Routes must not pass under cargo being handled and normally should be on the outboard side of the ship.
- Routes should be unobstructed and free from slip, trip and fall hazards and be adequately illuminated at night
- Shore personnel who go on board should:
 - Use any access routes on deck marked out by non-slip paint, where provided.
 - Use steps and walkways over pipelines and other deck equipment and not to take short cuts
 - Use the safe routes provided over and though cargo stowed on deck
 - Never pass under any cargo being handled overhead

Ships' masters have a duty to ensure that:

- Access to all cargo spaces is monitored and controlled in accordance with the ship's safety management system
- Any tank, cargo hold or space which has contained a liquid or which has been sealed is assumed to have a dangerous atmosphere and consequently is unsafe for entry
- Confined space entry procedures apply where there is any risk whatsoever of a hazardous atmosphere within the hold or space

- There is a safe and unobstructed means of access to the cargo to be handled
- Access ways, ladders and stairs are in a safe condition and adequately illuminated and ventilated in preparation for cargohandler entry.

11.3 Shipboard Operations – General

Some of the operations that have to be carried out by a ship's crew in port have the potential to present a risk to the safety of cargohandlers and other shore workers on board. These include:

11.3.1 Hatchcover Operations:

Ships' hatch covers vary in type and method of opening and closing. Break bulk and bulk carrier ships are usually either end or side rolling types or pontoon lift and carry types on some smaller ships. Most cellular container ships visiting Irish ports have mechanical type hatch covers.

All workers must keep clear when hatchcovers are being opened, closed or lifted due to the risk of being struck by the moving hatch cover or being injured by their chain or wire pull operating mechanisms.

Crew members must always warn nearby shore side personnel before operating a hatch cover and must never open or close one if there are personnel in the hold below.

The lifting, moving and stacking of pontoon hatch covers by ship's gantry crane is particularly hazardous and cargohandlers working in the hold must always exit the space before the pontoon is lifted.

11.3.2 Operation of Ships' Cranes

Where shore cranes are being used to load /unload ships, ship's cranes or gear that could interfere with the safe operation of shore equipment must be kept safely clear.

11.3.3 Ship's Rail Mounted Gantry Cranes

When working on ships with rail mounted gantry cranes, shore personnel must always be alert for the crane audible travel alarms and warning lights and keep clear so as to avoid the risk of being trapped between the crane and the ship's structure.

11.3.4 Main Deck Mooring Winches

Where a ship has mooring winches on the main deck, shore workers must keep clear when mooring ropes and wires are under tension and when crew members are adjusting such lines.

11.4 Cargo Handling Operations On Board Ship

11.4.1 Masters' Duties

Masters have a duty to cargohandlers working on board their ships in relation to ensuring that:

- The ship and its equipment are in such condition that they can carry out their work safely

- Any ship's equipment provided for use by others is safe e.g. gangways, ship's cranes
- Cargohandlers are warned of any hazards to their safety that ship's personnel are aware of and that the cargohandler might not otherwise know about e.g. hazardous atmosphere, damaged hold ladders
- Ship's personnel take appropriate action where they see an unsafe situation developing in relation to the cargo handling operations being carried out.

11.4.2 Employers' Duties

While it is the responsibility of the master to provide a safe place of work for cargohandlers and other shore personnel working on board ship, the employer has a duty to:

- Provide the employees concerned with information regarding any safety related conditions or hazards on the ship on which they will be working, the cargo they will be handling and the equipment they will be using.
- Inform them of the rules they are expected to comply with when working on board the ship
- Inform them of the methods and procedures to use when carrying out the work
- Ensure they have the required training for the work to be carried out
- Provide supervision to ensure the employees are complying with the requirements and that the ship is meeting its obligations to provide a safe place of work
- Take corrective action immediately if unsafe work practices or conditions are identified.

Employers must also ensure that where workers or groups of workers (gangs) are moved from one ship to another or are being assigned to different types of tasks, that there is an effective system of work that enables proper exchange of information. There should always be a proper exchange of information between gangs at shift changeovers. Crane drivers and equipment operators must always give proper handovers to those relieving them.

11.5 Risk Assessment of Stevedoring Operations

Port operators and employers, including stevedoring companies, involved in the loading and unloading of ships are obliged to carry out risk assessments of their operations. Relevant hazards and risks should be considered when there is a change to the work process e.g. a new shipping service is being established or there will be handling of a new type of cargo or the handling of a new or different type, size or class of ship is being planned. This should consider safety management systems, systems of work, procedures and equipment to be used, the potential hazards and risks and the required control measures.

Risk assessments of all existing operations and services should be reviewed periodically. Risk assessments should also be carried out for any new activities which have not been formally assessed and any changes to current risk control measures should be put in place.

Any such risk assessments should involve, as appropriate, the port authority, stevedoring companies, labour providers, the ship operator or shipping service provider and other

relevant parties as required. The relevant technical, operational, safety and security information regarding both the ship(s) to be used and the terminal to be considered includes:

- Relevant marine information – ship dimension and draft limitations, layout and operating characteristics
- Details of dock fendering and any obstructions or hazards that could affect safety
- Berthing and mooring requirement and procedures
- Access and security arrangements
- Port and/or port facility safety regulations
- Ship/shore communications procedures and contact details
- Emergency and firefighting arrangements
- Operation limits
- Cargoes to be handled, the equipment, methods and procedures to be used

All the parties involved should ensure that others who may be affected are kept informed of any significant changes that may introduce new risks.

11.6 Ship Specific Risk Assessment

It is critical that procedures for ensuring the safety of ship/shore operations are put in place for every cargo loading or unloading operation involving shore workers. While specific ship/shore interface safety checklists and risk control procedures apply on bulk carriers and in oil/chemical/gas terminal operations, the responsible shore and ship personnel involved in all routine cargo handling operations should assess and review relevant safety, operational and communications arrangements before operations commence to ensure adequate systems are in place to prevent injury.

Where required, the ship/shore safety checks and exchange of information should include, as appropriate to the particular operations:

- Written cargo distribution, load/unload, and ballast plan
- Types of cargo to be handled – e.g hazardous, heavy lifts, non-standard dimensions
- Relevant cargo safety documents between ship and shore
- Any known hazards or conditions on board that could put the safety of any shore worker or crew member at risk
- Responsibility for providing and maintaining the gangway and safe access between ship and shore
- Details of shore or ship lifting equipment to be used, including its capacity, travel and reach limitations, crane operating radius, crane/gangway interface
- Checks of ship's lifting equipment register and certificates
- Number of holds to be worked and number of cargohandlers to be working on board
- Hold access and cargo access arrangements
- Information regarding atmospheric conditions in holds and enclosed spaces, the testing and monitoring of any such spaces, and the identification of any fumigated cargo.
- Arrangements and contact details for:
 - Communications between ship and shore personnel controlling operations
 - Reporting accidents to ship

- Reporting defective equipment to ship
- Arrangements for :
 - Removing cargo residue from holds
 - Any work to be carried out by crew members in the holds
- Arrangements for keeping work areas on the deck clear and free of slip, trip and fall hazards and the safe stowage of loose equipment
- Management of moorings
- Water draft and air draft limitations that may affect the safety of the ship or the safety of shore cargo handling equipment
- Wind operating limits for shore cranes
- Port facility safety regulations and PPE requirements
- Arrangements for emergency contact details and ensuring adequate crew on board and staff in the port facility
- Any repairs or hot work on ship or dock that could create a risk to safety
- Procedures for reporting hazards, accidents or damage
- Ship's husbandry arrangements i.e. stores/bunkers deliveries, garbage reception, water
- Port facility access and egress, including the routes or arrangements for safe access for crew members between ship and main gate.

11.7 Visual Inspection

Visual inspections of workplace conditions relevant to cargo handling operations should be carried out on board ships by an experienced person before work commences. This is particularly important when handling ships or cargoes which they are not familiar with.

Inspections should assess the ship's access/egress arrangements, gangway, decks, holds, lifting equipment, housekeeping standards on ship and shore, areas where work at heights will take place, cargo stowage and condition, moorings and overall condition for compliance with good standards of operation and maintenance.

Intermittent inspections should be carried out as loading/unloading progresses to take account of changing conditions on board. Relevant information should be made known to the personnel carrying out the work and defects reported to the master for action.

11.8 Hazardous Situations

When cargoes are being handled and a dangerous situation arises e.g where notification is received from the master regarding an unsafe situation on board, then the berth operator or other duty holders must carry out a ship specific risk assessment. This may be required in situations where a spillage of hazardous cargo has occurred on board, or where cargo has shifted and is unstable.

Measures taken to control the risks should be determined on the basis of consultation with the employees or contractors involved and the master and be proportionate to the risk of harm.

11.9 Port Operations And Ship Types

11.9.1 Container Operations

The fast paced transport, handling and lifting of heavy containers to and from heights which are the equivalent of a multistorey building make container terminals hazardous workplaces. International accident data indicates that about 35% of injuries occur at the ship/shore interface during container handling and lashing operations. Some 25% of accidents happen in container storage yards, often involving trucks and mobile equipment and another 25% occur on the dock. The number of accidents occurring during maintenance activities in workshops and on site are also significant.

Container terminal operators should consider the following areas of operation when identifying the hazards and carrying out risk assessments for each place of work:

- Facility access and egress
- Vehicle and pedestrian traffic and workplace transport
- Visiting haulier control
- Safe operating procedures for mobile equipment operation e.g forklift trucks, cranes, straddle carriers, rubber tyred gantries, reach stackers, top lift loaders and similiar equipment, as relevant
- Road and yard layout and traffic systems, access control, lighting, surfacing and maintenance
- Mobile equipment refuelling and maintenance
- Container storage yard management
- Container lifting and handling methods, including signalling and communications arrangements between crane operator and both ship and shore personnel
- Container top access and work
- Hazardous cargo control
- Reefer container and electrical equipment care and maintenance
- Spreader frame exchange and maintenance
- Plant and equipment maintenance activities in workshops and in the field.
- Others likely to be affected by any aspect of their operations, including non-permanent employees, other port workers, visitors and ships crews
- Rail Interface
- Emergency procedures

11.9.2 Container Ship Loading / Unloading Operations

Companies that provides cargo handling services to the master or agent, are considered to be the employer and have primary responsibility for ensuring the use of safe systems of work by their employees on board ships. Container ships are extremely hazardous workplaces and employers must risk assess the operation and communicate the control measures and systems of work to their employees. Typical hazards arising include:

- Accessing containers on decks
- Container top access and work
- Working in holds
- Mobile equipment operation in holds
- Lashing and securing of cargo

- Manual handling of lashing equipment
- Freeing jammed containers
- Working with container cranes
- Working with slewing cranes
- Overhead loads and falling objects
- Operation and handling of ships' hatch covers

11.9.3 Manual Handling on Container Ships

The manual handling of heavy container lashing and unlash equipment accounts for many of the accidents experienced by cargohandlers. Hazards include:

- Handling heavy lashing bars, turnbuckles and twistlocks
- Working in restricted areas, often on cluttered decks and platforms at night in poor lighting and in bad weather
- Repetitious reaching, twisting and turning while lifting and lowering heavy gear.

Personnel must be trained in:

- The correct manual handling procedures for carrying out this work
- How to lift together when handling heavy lashing equipment
- How to risk assess different work on different ships, taking account of different equipment, environmental conditions, numbers required to do the work correctly and be able to take action to ensure hazards are reported and appropriate controls put in place.

11.9.4 Container Top Working

Work at heights on top of containers is also an extremely hazardous operation and where it cannot be avoided the employer must ensure that the employees are provided with a safe means of access and suitable fall protection or prevention controls.

Access to the tops of containers should be via a means of access in the ship's structure or by means of protected personnel platforms or cages in accordance with specified procedures for their use.

If work has to be carried out from the top of containers appropriate fall prevention measures must be used e.g. an approved full body harness fixed to a secure anchor point in accordance with specific instructions appropriate to the equipment being used. All personnel involved must be fully trained in the use of the safety harness and the methods of work used.

Where all persons are employed to lash/unlash containers or carry out work on top of containers there is a responsibility on the employers concerned to ensure that risk assessments are carried out, that the employees concerned are trained, physically capable of carrying out the work, provided with all relevant information and that PPE is provided and safe systems of work used to ensure their safety.

11.9.5 Containerised Dangerous Goods

Most dangerous goods are carried on deck. However, the atmosphere of any space containing dangerous goods may put the safety of any person entering the space at risk. Dangers include spilled material, flammable, toxic or corrosive gases and vapours that

displace oxygen. The same hazards may also be present in spaces adjacent to the cargo spaces.

To minimise the risks to their health and safety due to incorrect classification, declaration and marking of the goods and by poor packaging, cargo handlers dealing with dangerous goods should:

- Check that shipping containers and packages are in sound condition before they handle them
- Reject and report any damaged or leaking packages
- Handle all packages carefully themselves to avoid damage
- Ensure all documentary checks and requirements are properly carried out
- Wear the correct PPE, ensure safety, first aid and emergency procedures are in place
- Comply with confined space entry procedures

11.10 Ro-Ro Operations

11.10.1 Ro-Ro Terminal Operations

Ro-Ro operations are fast paced activities involving the movement of large volume of traffic in confined areas in all weather conditions, day and night. They require port workers, cargohandlers, ship's crew, vehicle drivers and passengers to comply with the safety rules and control systems for vehicle and pedestrian safety and to co-operate with each other.

When accidents occur during these operations, they are usually serious and occur in parking and marshalling areas on docks, ramps and car decks. Contributing factors include inadequate training, inadequate control of traffic and poor terminal or ship equipment maintenance.

The following are areas of operation that may be considered when identifying the hazards and carrying out risk assessments for places of work on ro-ro terminals on the dock and on board ship:

- Access and egress. Both employer and Master have obligations to ensure that safe means of access is provided and maintained to any place on the ship to which a person may be expected to go. Walkways should be well illuminated, permanently marked and clearly signposted. Suitable warning notices should be posted at all points of access to vehicle decks.
- Traffic managements systems
- Provision of signage, maps and safety instructions
- Control of traffic between ship and shore and at approaches to ramp
- Safety on ramps and on ships' decks:
 - Separation of people and moving vehicles
 - Personnel trained in safe operation of ramps
 - Minimising number of people working on ramps during operations
 - Restricting access to car decks to a minimum number of trained and competent persons
 - Maintenance of ramps to ensure adequate grip for HGV's in all weather conditions
- The control of people unaccustomed to vehicle deck operations, particularly car drivers and coach passengers
- Lashing / unlashng on car decks
- Provision of adequate ventilation and lighting on car decks

- Handling:
 - Heavy or abnormal loads, and provision of relevant information to the workers concerned
 - Large vehicles with restricted driver view, especially when reversing
 - Damaged cargo or vehicles or shifted loads
- Ensuring all vehicles are safely parked, in gear, with handbrakes on
- Ramp area side edge protection
- Plant and equipment maintenance activities in workshops and in the field.
- Matching of ships' ramps and shore structures, especially when a new ship enters a service

11.10.2 Ro-Ro Operations Safety

Port workers involved in ro-ro operations should:

- Keep vehicle ramps clear of obstacles and at a safe gradient
- Maintain strict control of traffic on-off vehicle ramps
- Work in teams and in sight of each other
- Wear appropriate PPE
- Never walk behind a reversing vehicle
- Use clear standardised signals to communicate with drivers
- Be trained and competent in lashing and unlashng procedures
- Comply with the safety procedures for operation of ship's cargo lifts and ensure fall hazards are controlled when decks are being operated
- Ensure terminal mobile plant pre-use checks are carried out and that the equipment is properly operated and maintained
- Keep working areas and walkways free of debris and keep lashing equipment stowed safely
- Be alert to the risk of tripping over lashing rings and fittings on ship's decks

11.11 Bulk Terminals

Specific issues to be considered when identifying hazards and carrying out risk assessments for work in docks and port facilities handling solid bulk cargoes, depending on type of facility, include:

- Cargo handling equipment
- Handling of hazardous, toxic, corrosive, flammable and oxygen depleting products
- Segregation of flammable cargoes e.g fertilisers, from contaminants, combustible materials and heat sources
- Traffic management and control
- Mobile equipment operation – loading shovels, skid steer loaders, excavators
- Conveyor belt operations:
 - Guarding arrangements
 - Permit to work procedures
 - Spillage clean-up
- Port and plant equipment maintenance procedures

- Ship specific risk assessments, ship/shore pre-arrival exchanges of information, ship/shore arrival meetings and completion of safety checklists.

11.11.1 Bulk Carrier Operations in Port

While bulk cargoes are normally carried on ships classified as bulk carriers, they may also be carried on ships classed as multi-purpose, general cargo or even container ships. These are usually box hold type ships, smaller but similar in most respects to the bulk carriers. Loading operations normally do not require cargohandlers to carry out any cargo handling work in ship's holds and so do not present the same risks as do unloading operations.

Unloading operations however, do require cargo handlers to enter ships' hold to remove cargo from areas not reachable by unloading grabs and equipment, thereby putting their safety at risk from a number of serious hazards. These hazards can occur on any type of ship during unloading - whether classified as a bulk carrier or not, and include:

- Access on deck - slips and trips
- Access to holds - falls
- Loads being lifted overhead by grabs
- Falling objects
- Slinging / lifting mobile plant into holds
- Operation of mobile equipment in holds:
 - Exhaust fumes
 - Fire
 - Musculoskeletal injury
- Work at Heights
 - Signaller working at heights over open holds on deck
 - Cargohandlers using/cleaning hold ladders, and removing cargo from high points on ship's sides and from hatch covers
- Shovelling and manual handling
- Dust
- Confined space
- Hazardous, toxic, corrosive and oxygen depleting cargoes

11.11.2 Solid Bulk Cargoes

The IMSBC Code applies to solid bulk materials likely to liquefy (*Group A cargoes*), or possessing chemical hazards (*Group B cargoes*), and also to solid bulk materials hazardous only in bulk (*MHBs*).

Materials Hazardous in Bulk

MHB cargoes are defined as any solid cargo which may possess chemical hazards other than materials classified as dangerous goods in the IMDG Code.

These are often materials considered harmless in small quantities e.g. peat moss, saw dust, coal and many others.

The hazards of **peat moss** are described in the **IMSBC Code** as "*Oxygen depletion and an increase in carbon dioxide in cargo and adjacent spaces*".

A range of handling precautions are listed.

Many other cargoes, particularly biomass cargoes, fall into this category and should be considered hazardous in bulk unless confirmed otherwise.

Failure to comply with the appropriate precautions results in people being killed or seriously injured in ships' holds and adjacent compartments every year.

The *Code of Practice for the Safe Loading and Unloading of Bulk Carriers (the BLU Code)* is a supplement to the IMSBC Code and is mandatory under Irish and EU marine legislation.

These Codes are not mandatory under health and safety legislation. However, they should be considered, as while their purpose is to facilitate the safe stowage and shipment of solid bulk cargoes by providing information on the characteristics and any hazards of the cargo and instructions on its handling, they do have a knock on effect on the health and safety of dock workers.

The BLU Code applies to loading and unloading of solid bulk cargoes to and from bulk carriers. It does not apply to ships which are not classified as bulk carriers, even though they may sometime carry bulk cargoes, including hazardous Group B and MHB cargoes.

The BLU Code imposes statutory obligations on:

- The operators of terminals loading /unloading dry bulk cargo into or from bulk carriers
- The terminal representative appointed by the terminal operator to conduct and control those operations for a particular bulk carrier
- The terminal operator and the master in relation to their mutual responsibility for the safe loading or discharging of a bulk carrier.

In relation to the safety of personnel, the BLU Code⁹ specifically obliges both master and terminal representative to:

- Co-operate in exchanging information in relation to ship, terminal and cargo
- Agree and exchanges a cargo loading/unloading plan
- Complete a Ship/Shore safety Checklist before commencing operations, which includes ensuring arrangements for:
 - Provision of safe acces between ship and dock
 - Ship/Shore communications and liasion arrangements
 - Provision of port and terminal general information, safety regulations and emergency procedures to the ship
- Confirm that the shipper has provided the master with required information regarding the properties of the cargo to be loaded
- Confirm that checks regarding safe atmosphere in holds and enclosed spaces, fumigated cargoes and monitoring of atmosphere are carried out as required.

Marine legislation requires that terminal representatives and shore personnel involved in the loading /unloading of bulk cargoes are appropriately trained, in accordance with their

⁹ The IMO's *BLU Manual (Manual on loading and unloading of solid bulk cargoes for terminal representatives)* provides further guidance in relation to key safety issues at the ship/shore interface.

responsibilities and that all such terminals have an approved *ISO 9001:2000* quality management system in place.¹⁰

The IMSBC Code and BLU Code do not apply to ships carrying grain cargoes, to which separate IMO regulations apply (Grain Regulations).

It is recommended, nonetheless, that port operators handling such ships and cargoes implement the relevant BLU Code or similar procedures as a means of ensuring the safety of their operations.

Terminal operators responsible for the loading or unloading of bulk carriers are required by the BLU Code legislation to satisfy themselves as to the operational suitability of such ships for loading or unloading at their facilities. They must check that the bulk carriers comply with certain specified requirements, and should also satisfy themselves, as far as is reasonably practical, that the information provided is correct.

Similar assessments are carried out for oil and chemical tanker operations, although these are not mandatory.

11.12 Bulk Liquid Terminals

Vessels and port installations involved in the carriage and loading/unloading of dangerous oil and chemical products and gases are subject to a wide range of international, national and port authority regulations. These apply to their design, equipment, construction, certification, permits, area classification, pollution prevention, maintenance and operations and emergency response.

Terminals handling products classified as flammable or explosive are also subject to specific requirements regarding the zoning of hazardous jetty areas in relation to electrical equipment. Other regulations may also apply, including the COMAH Regulations and the Dangerous Substances Act.

In complying with their responsibilities under these regulations, terminal operators must carry out systematic risk assessments and analysis in order to reduce the identified hazards and ensure the appropriate control measures are in place. Significant hazards include:

- Fire and explosion on the tanker or on the terminal
- Release or spillage of flammable, hazardous or polluting substances
- Injury to personnel as a result of contact with hazardous chemical substances
- Confined spaces on board tankers and in tank farms

The operational issues to be risk assessed in a facility handling dangerous bulk liquids and gases include:

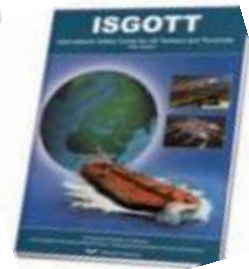
- Terminal cargo handling equipment
 - Ship / shore hoses or loading arms

¹⁰ S.I. No 347/2003.

- Pipelines and tank farm
- Operational procedures for the safe loading /unloading of hazardous, toxic, corrosive and flammable products
- Fire prevention
- Control of electrostatic hazards
- Environmental protection
- Port and plant equipment maintenance procedures
- Ship specific risk assessments (vetting), ship/shore pre-arrival exchanges of information, ship / shore arrival meetings and completion of safety checklists
- Environmental conditions – wind, tide, lightning
- Ships’ mooring arrangements
- Control of access to the berth
- Confined space and permit to work systems
- Product sampling and dipping of tanks

11.13 Oil and Chemical Tanker Operations in Port

The “International Safety Guide for Oil Tankers and Terminals “ (ISGOTT) is recognised internationally by both tanker and terminal operators as the definitive guide to best industry practice in the safe carriage and handling of oil and petroleum products on tankers and at terminals. It is also applicable to terminals handling bulk liquid chemicals.



11.13.1 Terminal Equipment

Terminal cargo handling equipment, including hoses and loading arms intended to be connected to ships’ manifolds must be fit for purpose and for their specific conditions of operation. They must be suitable for the particular products being handled and the intended flow rates and pressure limits.

Hoses must have the appropriate test certificates and be pressure tested as required by their particular operating conditions, with intervals between tests not exceeding 12 months. Hoses and fittings must be pre-inspected before every loading / unloading operation, and must be removed from service if found to be defective. They must be properly marked, identified and stored safely when not in use. They must always be handled, lifted and suspended with care, and not allowed to become kinked or strained when in service.

Metal loading arms and ship/shore pipelines must be inspected periodically and tested in accordance with relevant standards. Any lifting appliances or equipment used to position and support loading arms or hoses must be used, examined and tested in accordance with the requirements of the General Application Regulations 2007.

Safety critical devices, including out-of-range and overload alarms, fire alarms and atmospheric monitoring for explosive atmospheres and any pressure, flow, temperature or tank level monitoring instruments, should be subject to regular inspection and maintenance.

11.13.2 Specific Risks to Port Workers

The most significant risks to port workers involved in tanker terminal operations arise when connecting and disconnecting loading arms or hoses. The hazards and risks include:

- Access on deck - slips and trips
- Port workers working at heights on tanker manifold platforms while connecting loading arms or hoses.
- Port workers being injured while connecting hoses or hydraulic loading arms to ships' manifolds:
 - While manually positioning hoses or arms for connection
 - Due to contact with residue of hazardous cargo remaining in arms or hoses
- Leak of hazardous or polluting products caused by tanker moving out of safe operating limits of hoses or loading arms
- Leak of hazardous or polluting products from terminal pipelines
- Tank overflows
- Injury to marine surveyors and cargo inspectors while inspecting and ullaging tanks, and taking samples.

Port workers and cargo inspectors working on board any tanker must comply with the ship's safety procedures. They must never enter any cargo tanks or other spaces on board a tanker unless so authorised by the master and the space has been certified as safe for entry. Pump rooms must be well ventilated and safe for access.

The ISGOTT Ship/Shore Safety Checklist, or equivalent, should be completed jointly by representatives of both terminal and tanker before commencement of load/discharge operations.

The operators of bulk liquid terminals should comply with relevant ISGOTT guidelines, as appropriate and should have documented operating and safety procedures for its ship/shore operations. It should also have corresponding operating and safety procedures for its tank farm operations.

Port workers involved in these operations must be trained and competent in the relevant tanker terminal operational, safety and environmental protection procedures. They must be familiarised in the hazards of the cargoes they are handling and be provided with all the required personal protection equipment. All operations must be supervised by competent persons.

Terminals must have emergency response plans and resources in place and these should correspond with the port authority's contingency plans for the port.

11.14 Breakbulk Operations

Breakbulk or general cargo operations involves the handling of different types of ships and cargoes. This can increase the risks to the safety and health of cargohandlers as general cargo or multi-purpose ships can be very different in their design, lay-out, condition and equipment.

Breakbulk cargo includes timber, packaged lumber, steel (billets, bar, wire rod, coil, plate, pip, etc), pallets, bags, drums, vehicles and many other types of individually loaded cargo. It also includes heavy lift and project cargoes e.g. wind turbines.

Many of the general guidelines already described for container and ro-ro handling also apply to breakbulk operations and should be applied as required. Other hazards that arise on multi-purpose ships include:

- Tweeneck hatch covers:
 - All persons must keep clear when covers are being shifted
 - Open tween decks must always be properly guarded to prevent persons, or forklifts, falling into lower holds.
 - Cargo in tween decks must be stowed so as to allow safe access in the space, and be properly secured to prevent it falling into lower holds
 - Tween deck access ladder openings must be properly guarded
- Cargo handling operations:
 - Cargohandlers must never stand between the load and any fixed object and shall always face the load.
 - Cargohandlers must keep clear of bights and keep out of danger areas when cargo is being bulled from the wings into the hatch square. Bulling must always be done using a lead block, and never from the derrick or crane head block.
 - Falls from height when working near the edge of stows, or between gaps and spaces in the stow.
 - Struck by falling objects
 - Mobile equipment operating in restricted hold areas
- Dangerous Cargoes
 - Hazardous atmosphere due to dust, fumes or oxygen depletion
 - Contact with spilled chemicals
- Slinging and Lifting Loads
 - Oversized and abnormal loads
 - Lifting loads overhead
- Manual Handling -The loading and unloading of breakbulk cargoes requires considerable manual pulling, pushing, lifting and moving of heavy objects. Cargohandlers must be trained in:
 - appropriate manual handling techniques.
 - how to risk assess different work on different ships, taking account of different equipment and environmental conditions, so as to be able to work safely.

11.14.1 Breakbulk Cargo Handling Safety

Critical procedures required to ensure the safety and health of workers involved in loading and unloading breakbulk cargoes should be based on the risk assessment of the following information and the identification of the appropriate control measures:

- Characteristics of the ship:

- Age, configuration, operational restrictions e.g. draft and aircraft
- Type and characteristics of the cargo:
 - Weight, dimensions, volume, number of units, centre of gravity
- Cargo stowage:
 - On deck, in tween decks, lower holds or wings
 - Hot work arrangements for welding additional lashing points, if required
 - Lashing/unlashing operations
 - Work at heights
- Lifting arrangements:
 - Ship's gear or shore cranes gear
 - Lifting accessories
 - Development of lifting plans by a competent person, as required
- Shore side arrangements:
 - Berth lay-out and access, load bearing capacity, laydown area
 - Trucking and forklift arrangements for large loads, where relevant
- Employment of suitably experienced cargohandlers:
- Arrangements for co-operation and communications between relevant parties:
 - Cargohandlers, ship's master, transport provider, shipping agents

11.15 Means Of Access To Ships

Section 8(1)(c)(ii) of the Safety, Health and Welfare at Work Act 2005 requires an employer to provide safe means of access and egress. There have been a number of incidents involving access to ships in Irish ports which have resulted in serious injuries including fatalities, mainly due to to improperly rigged gangways or accommodation ladders.

A safe means of access must be provided before any person is permitted to board a ship. The means of access must be adequately monitored and adjusted and illuminated at night.

The duty to provide safe access is also required specifically under *Means of Access Regulations (S.I. No. 108 of 1988) enforced by Marine Survey Office.*

Where it is not reasonably practical for a ship to rig a safe means of access at certain berths, the authority with responsibility for the operation of the berth must provide it.

Gangway Deficiencies Which Can Lead to Accidents

- Gangway not secured to ship
- No safety net provided
- Safety net badly rigged, especially at top of gangway
- Unsafe access between top of gangway and ship's deck
- Gangway not adequately monitored and adjusted
- Missing, slack or unsecured hand ropes
- Gangway/accommodation ladder dangerously positioned on the quay or too close to loading / unloading operations
- Trip hazards due slings left on walkway
- Poor lighting
- Poorly maintained equipment
- No lifebuoy and line nearby

Shore workers should always check a gangway before using it, and refuse to use it if any deficiencies are identified.

11.16 Confined Space

S.I. No. 218 (Confined Spaces) Regulations, 2001: "A person shall not enter a confined space to carry out a work activity in that confined space unless an identification and evaluation of the risks to safety and health arising from such entry or such work activity have been made.

A confined space refers to any place, including any which, by virtue of its enclosed nature, creates conditions that give rise to a likelihood of an accident, harm or injury of such a nature as to require emergency action due to the presence or reasonable foreseeable presence of:

- Flammable or explosive atmospheres
- Harmful gas, fume or vapor
- Free flowing solids or an increasing level of liquid
- Oxygen deficiency or excessive oxygen.

Confined space conditions as listed above can arise in ports as follows:

1. In shore tanks, bunds, bins, silos and other spaces
2. In cargo containers under fumigation
3. On board ships

Practical guidance regarding the observance of the provisions of the *Confined Spaces Regulations 2001 (S.I. No. 218 of 2001)* is provided in the HSA's "*Code of Practice for Working in Confined Spaces*". The IMO's "*Recommendations for Entering Enclosed Spaces aboard Ships*"¹¹ sets out similar guidance for confined space entry on board ships.

Port workers involved in cargo handling operations on board ships are at risk of exposure to hazardous atmosphere due:

1. Oxygen depletion in cargo holds and confined spaces

¹¹ http://www.imo.org/includes/blastData.asp/doc_id=105

"SAGA SPRAY" Accident - 2006

Ship in Swedish port discharging wood pellets. A crew member and a bulldozer operator entered a hold access stairwell and collapsed inside. One man died and one was seriously injured. Eleven persons involved in the rescue had to be hospitalised.

Immediate Cause: Casualties overcome by high carbon monoxide levels due to failure to ensure proper ventilation of hold and adjacent stairs.

Root Causes:

- Non compliance with BC Code* re hazards of woodpellets (Group B/MHB cargo) by ship
- No compliance with ship's safety management system
- Assumption by crew members that because hold was almost discharged, and access way partly open for 40 hours, that it was fully ventilated
- Assumption by cargohandlers that ship's crew was complying with regulations and taking required measures to ensure their safety
- Failure of stevedore management to provide safe systems of work to ensure employees' safety on board ships.

2. Toxic gases emitted by cargo, including hydrogen sulphide (H₂S), carbon monoxide (CO) and carbon dioxide (CO₂)
3. Flammable vapours emitted by cargo
4. Leaking packages, hoses or pipelines, welding activities and engine exhaust fumes.



Any cargo hold or enclosed space on a ship that has been closed for days or weeks at sea is by definition a suspect space, but toxic gases or oxygen depletion can occur in a closed hold overnight under certain conditions, depending on the cargo.

Oxygen depletion in confined spaces and cargo holds is a significant cause of fatal accidents¹² involving both crew members and shore workers on ships worldwide. It occurs in unventilated spaces containing organic materials, flammable and combustible materials, and metals.

As well as causing lethal levels of oxygen depletion, toxic or flammable gases can also build up in cargo holds and adjacent spaces from cargoes such as:

- Wood, packaged lumber, logs;
- Wood products, including wood chips, wood pellets and other biomass cargoes
- Grains, vegetable fibres and other organic materials or their residues.
- Certain ores and ore concentrates, coal and coal products
- Scrap metal, swarf and other metal wastes
- Freight containers can be also confined spaces if inadequately ventilated after fumigation, or because of substances leaking within the container.

11.16.1 Fumigation

Ships arriving in port with cargo spaces under fumigation must provide all relevant details to the port authority and the berth operator, and should comply with the IMO *“Recommendations on the Safe Use of Pesticides in Ships”*. Spaces adjacent to fumigated spaces should be treated as if fumigated. Holds and spaces must be certified as gas free and suitable for work by an appropriately trained person.



11.16.2 Assessment of Risk

The atmosphere in holds or confined spaces containing dangerous cargoes listed in the *IMSBC Code* or the *IMDG Code*, or containing any organic products, and the spaces adjacent to them, should be presumed to be hazardous until the atmosphere has first been tested and analysed. A high proportion of accidents have occurred in rooms or spaces which workers have to pass through to reach hold access ladders or stairs, and in the hold stairwells and all such spaces must be carefully tested.

Measurement of oxygen content alone should not be taken as indicating a safe atmosphere, as toxic levels of carbon monoxide or hydrogen sulphide may be present in atmospheres

¹²Marine Notice No. 24 of 2009 (Department of Transport)

giving a normal oxygen reading. Opening of hatch covers will not provide adequate ventilation if the gases are heavier than air, or in hold accesses and stairwells.

11.16.3 Authorisation of Entry

Shore personnel, such as surveyors, ship repair and maintenance contractors and customs officers who may have to enter other confined spaces on board ships, including ballast and fuel tanks, void spaces, keel spaces, pump rooms, engine compartments and other spaces in the course of their work must also ensure a full risk assessment is carried out.

All such spaces are highly dangerous unless made first safe for entry and for the work that will be carried out in them.

The master is responsible for ensuring that no one opens or enters any enclosed space at any time unless duly authorised by him/her and shore workers should not open or enter any enclosed space on a ship unless so authorised. Cargohandlers and other shore workers should:

- Never open or enter any enclosed compartment or access way unless the hold has been approved as safe for entry by a responsible member of the ship's crew
- Always check that they are using the correct access way (check hold number on hatch cover)
- Never enter a hold alone

11.16.4 Enclosed Space Entry Permit

Entry into holds and confined spaces identified as having a hazardous atmosphere, or likely to have one because of the cargo it is carrying, should be planned in accordance with the enclosed space entry procedure set out in the IMO's "*Recommendations for Entering Enclosed Spaces Aboard Ships*". Shore workers should not rely on oxygen measurement alone, as the space may also contain other toxic gases.

11.16.5 Rescue from Difficult Locations

Port employers should assess requirements for the provision of procedures and systems for the rescue of workers from locations which are difficult to access, e.g ships' holds, or from heights, should a person be injured or collapse while at work, or become trapped.

11.17 Musculoskeletal Disorders (MSD's)

Workers in ports and docks are at risk of musculoskeletal injury, including back pain, joint and muscle strain and repetitive strain injuries from two main causes:

- Manual handling, heavy physical work and frequent bending and twisting
- Whole body vibration (WBV) due to vibration transmitted to the body through the seats or floors of machines and vehicles. Long term exposure will lead to back pain, unless corrective actions are taken.

The risk of MSD's increases with the level of exposure and its magnitude and duration, the pace of work, operator posture, access arrangements, time spent on the job and a range of other factors.

Employers must provide training and information to employees about the relevant risks, their exposure levels, any risks to their health and the means by which that risk is controlled. Employers should refer to www.hsa.ie for further information.

Causes of back shoulder and neck pain in drivers include poor driver posture when driving large items of mobile plant. Crane drivers are particularly at risk where they have to lean forward and look down, and in some situations twist their body, in order to see the work area. Other contributing causes include sitting for long periods, difficult means of access, poor cab design and ergonomic lay-out. These can be compounded by manual handling of loads, WBV and non-occupational causes.

Employers should involve employees in evaluating and improving :

- Layout and ergonomics of controls and instruments
- Chair type and adjustability, especially when there are a number of drivers operating the machine.
- Support for arms and feet
- Type of windows and visibility of work area on ship and on dock
- Noise and vibration
- Heating and air conditioning

11.17.1 Manual Handling Regulations

The Manual Handling of Loads Regulation, which forms part of the Safety, Health and Welfare at Work (General Application) Regulations 2007, sets out four key duties for employers in relation to the management of manual handling:

- Avoidance of manual handling
- Reduction of manual handling
- Risk Assessment of manual handling tasks
- Provision of instruction and training for relevant employees

Manual Handling is a physical activity that takes place in every workplace and despite improvements in equipment, remains a significant potential workplace hazard in the ports industry. It is necessary to carry out a risk assessment of all manual handling tasks to determine how they should each be managed in accordance with the four key principles. The HSA website provides a range of advice on the approach that should be taken when carrying out task specific manual handling risk assessments.

Tasks	Hazards / Risks	Controls
Container Lashing and Stacking	High risk of injury due to lifting and manipulating of heavy lashing bars and twist-locks, often in awkward positions <ul style="list-style-type: none"> • Adverse weather conditions – wind, sun, heat, cold 	<ul style="list-style-type: none"> • Assessment of risk of each container ship for: <ul style="list-style-type: none"> ○ Adequate working area allowing room to check twist lock handles and manipulate lashing gear ○ Adequate lighting ○ Clear, safe and level work areas and good housekeeping on ship’s deck and on dock • Lightweight lashing rods, where practicable

	<ul style="list-style-type: none"> • Semi-confined work areas • Work at heights 	<ul style="list-style-type: none"> • Safe System of Work (SSW) <ul style="list-style-type: none"> ○ Training and instruction ○ Work in pairs ○ Keep control of rod at all times – walk them up / slide them down ○ Use correct manual handling techniques to lift them ○ Safe area on dock for insertion /removal of twistlocks • Task rotation • Regular breaks • Appropriate PPE, including heavy duty safety boots, gloves, helmets, protective (warm /hi- viz) workwear <p>Check http://www.hsa.ie for further information on Manual Handling</p>
Handling ro-ro cargo	Handling heavy lashing equipment and chocks in restricted area	<ul style="list-style-type: none"> • Work in pairs or teams • Stow lashing gear to prevent trip hazards • Aware of fixed trip hazards on decks • Slip hazards eliminated • Trained and competent in correct manual handling technique

Tasks	Hazards / Risks	Controls
Handling break-bulk cargoes e.g pallets, bags, drums, boxes	Manually lifting/placing cargo can cause injury due to: <ul style="list-style-type: none"> •Awkward posture •Repetitive action •Uneven surfaces •Weight, size, shape of goods 	<ul style="list-style-type: none"> • Work in pairs or teams • Use mechanical aids where possible
Cleaning in holds of bulk carriers	Back injury due manual shovelling and removal of cargo in holds	<ul style="list-style-type: none"> • Use mechanical aids where possible • Trained and competent in correct technique for shovelling
Mooring operations	Back and arm injury due handling heavy mooring lines	<ul style="list-style-type: none"> • Work in teams • Use mechanical aids e.g winches or capstans where possible • Trained and competent in correct team lifting techniques for handling lines

11.17.2 Whole Body Vibration

Whole body vibration (WBV) is due to vibration transmitted to the body through the seats or floors of machines and vehicles. Long term exposure will lead to back pain and other negative effects on health, unless corrective actions are taken.

The Safety, Health and Welfare at Work (General Application) Regulations 2007 (S.I. No. 299 of 2007) as amended, sets down the minimum requirements for the protection of workers from the health risks associated with vibration in the workplace.

Drivers of large mobile equipment such as dock cranes, fork lift trucks, top lift trucks, straddle carriers and loading shovels can suffer back pain unless:

- Track joints, roadways and paved areas are maintained in good condition
- WBV is taken into consideration when selecting machines so that they will be suitable for the work areas and surfaces and the tasks to be carried out.
- Suitable seats are selected and both seats and suspensions are properly maintained and replaced as required.
- Operators are trained in the risks of WBV and how to control them.

11.18 Dust

Irish ports handle a range of dusty products including coal, grain, animal feeds, aggregates, fertiliser, cement, biomass, ores, concentrates and minerals. All of these products generate dust while being handled and all dusts have the potential to cause damage to health. The nature and extent of the injury will depend on the type of dust, the particle size and the level of exposure.

Dust is hazardous to health when in concentrations in the air equal to or greater than 10 mg/m³ for inhalable dusts, or 4.0 mg/m³ for respirable dusts. Respirable dust consists of large particles which are captured in the nose and throat and inhalable dusts are very fine particles capable of penetrating deep into the lung. Dust from coal and aggregates consists of particles of the material itself, while dust from products such as grain, animal feedstuffs or cement contains other contaminants which can cause serious lung damage, such as asthma and silicosis.

Outdoor places of work, special provisions.

23. An employer shall ensure that when employees are employed at outdoor workstations, the workstations are, as far as possible, arranged so that employees—

- (a) are protected against inclement weather conditions,
- (b) are not exposed to harmful influences such as gases, vapours or dust, in compliance with the relevant statutory provisions, and
- (c) cannot slip or fall.

11.18.1 Control Measures

Where dust generated during ship loading /unloading operations and in materials handling facilities could be hazardous to health, the responsible employers are required to:

- Prepare a written risk assessment to identify the level of exposure to hazardous dust and the resultant risks to health. This should take account of guidance provided in the *Guidelines to the Safety, Health and Welfare at Work (Chemical Agents) Regulations, 2001*
- Based on the risk assessment, use safe systems of work to reduce the exposure, including:

- Handling techniques and equipment to minimise dusting
- Dust control or suppression systems
- As a last resort, provide personal protective equipment.
- Appropriate personal protective equipment includes:
 - Respiratory Protective Equipment (RPE) appropriate to the risks
 - This should be at least a P2 particulate filter, either a disposable type or one fitted to a half or full face mask
 - All RPE must be CE marked.
 - It is recommended that fit testing is carried out for all tight fitting respirators (See HSA guidelines “*A Guide to Respiratory Protective Equipment*”).
 - Suitable PPE such as coveralls and appropriate gloves.

11.19 Mooring Operations

Ship mooring and unmooring activities are an essential and inherently hazardous element of port operations. They involve the use of powerful winches and large ropes and wires under heavy loads, together with the manual handling of those ropes over water on the edges of exposed docks. Injuries incurred as a result of such activities are invariably serious and frequently fatal.

Personnel employed to carry out mooring and unmooring operations may be permanent employees of the port facility, private self employed contractors or contracted from a port labour supplier by a ship’s agent acting on behalf of the ship, or by the berth operator.

The safety competence of mooring contractors should be assessed by evaluating their safety policy, safety statement, induction and training procedures, site supervision and methods of work. They should have the necessary physical capability and knowledge to do their jobs, or be provided with the necessary training. They should be monitored and audited periodically to ensure standards are maintained.

11.19.1 Risk Assessments

All port facilities have different berth construction designs, layouts and mooring equipment, different activities going on and different local environmental conditions. Employers and duty holders are obliged to carry out risk assessments of the mooring operations they carry out or the berth facilities they provide. These risk assessments should ensure appropriate control measures are put in place to manage the hazards and risks identified. These include:

- The development of safe methods of carrying out mooring operations appropriate to the particular berth or facility
- Identification of danger areas to be avoided by all except those directly involved in the mooring operation when a ship is being berthed /unberthed
- Provision of adequate training in mooring practice and procedures, and adequate supervision
- Suitable winches or capstans, where practicable, to reduce manual handling
- Provision of appropriate PPE (safety helmet, gloves, high visibility clothing, boots with slip resistant soles, and personal flotation devices (PFDs) where required

- Establishment of limiting environment conditions for berthing operations and appropriate controls to be implemented under such conditions e.g additional personnel or tugs, or suspension of operations
- As ships and their mooring lines can also present hazards to shore personnel, cranes and equipment during the time they are berthed alongside, the berth operator should also have a procedures for monitoring ships alongside and ensuring their moorings are being safely managed by the crew. The following table lists some examples of typical hazards and risks that may be encountered.

MOORING OPERATIONS	
HAZARDS	RISKS
Berth	
<ul style="list-style-type: none"> • Dock edge working area, lighting, mooring dolphins, access arrangements, rescue arrangements • Cargo spillage or other slip and trip hazards 	Slip, trip, fall from height into water
<ul style="list-style-type: none"> • Passing traffic and moving cranes • Passing pedestrians in danger areas 	<ul style="list-style-type: none"> • Mooring team members struck by passing traffic or moving cranes • Pedestrians struck by breaking mooring line
Dock cranes in way of berthing ship	Struck by ship
Ships Handled	
Size and type of the typical ships handled at the berth and their: <ul style="list-style-type: none"> • Mooring line size, type, condition • Required deployment 	<ul style="list-style-type: none"> • Heavy ropes or wires • Worn or damaged ropes or mooring equipment • Different stretch and break characteristics
Handling of other ships or types of ships with significant differences to those typically handled.	<ul style="list-style-type: none"> • No prior knowledge of relevant differences leading to an inadequate assessment of risks
Crew competence	Insufficient or poorly trained and organised crews are a serious risk both to their own safety and that of mooring personnel by: <ul style="list-style-type: none"> • Heaving on line still being handled by linesmen • Incorrect operation of mooring winch • Unsafe handling of lines on board • Using weighted heaving lines (monkey's fist)
HAZARDS	RISKS
Berthing / Unberthing Operation	
Inadequate planning and preparation	Failure to provide or ensure: <ul style="list-style-type: none"> • Relevant information about the ship to be berthed to the employees or contractors concerned

	<ul style="list-style-type: none"> • Adequate number of trained and experienced mooring personnel, tugs and lineboats • Arrangements for co-ordination of operations and for communications with ship • Dock edge working area and access areas are clean and free of slip, trip or fall hazards • Lighting is adequate • Means of rescue are available • Correct PPE is being worn
Rope Handling	<ul style="list-style-type: none"> • Standing in bight or standing “outside the rope” • Cuts to hands from snags on wire ropes • Struck by monkey’s fist
Manual Handling of ropes	Back , shoulder and arm injury.
Working over water	<ul style="list-style-type: none"> • Linemen or boatmen not wearing PFD • Inadequate means of rescue
Snap-Back Zones	Danger areas around a bollard or winch through which a breaking mooring line will recoil with tremendous force
<ul style="list-style-type: none"> • Operating winches / capstans • Operating quick release hooks 	<ul style="list-style-type: none"> • Hand or arm injury to operator • Struck by release of rope under tension
Environment	
Wind, tide, current and sea swell conditions	Affect manouverability of ship approaching berth, resulting in additional or sudden loads on lines being handled by mooring team
Strong or extreme wind, tide, current and sea swell conditions	Attempting to berth ship in unsafe wind / tide conditions can result in injury to ship and shore personnel and damage to ship, berth and environment

11.20 Emergency Procedures In Ports

All organisations are required by the Safety, Health and Welfare at Work Act 2005 to establish and maintain the procedures and resources required to enable them respond to accidents and emergency situations, and to prevent and minimise the associated safety and health impacts. The procedures should take account of the risks:

- To the safety of port employees, contractors, visitors and local residents
- Of damage to the environment
- Of damage or loss to port facilities, plant and equipment, and to stored goods and materials
- Of damage or loss to the owners, occupiers or tenants of premises in the port, or to neighbours

Other legislation and regulations require port operators and organisations responsible for the operations of facilities within ports to have comprehensive, written and up-to date Emergency Response Plans available to ensure a rapid and efficient response to any emergency within the port or on board a ship in the port. These regulations include the *Sea*

Pollution Act (as amended), the *OPRC Convention* and other relevant regulations. These are not enforced by the Health and Safety Authority.

The '*COMAH Regulations*' apply in certain ports where significant quantities of dangerous substances are stored.

Specific regulations apply to emergency planning by ports and port facilities for marine pollution and salvage incidents. The Irish Coast Guard is responsible for ensuring compliance.

Port authority emergency response plans must take account of all the activities being carried on within the port estate, including the different berths and terminals and types of ships and cargoes. All personnel with assigned responsibilities in an emergency incident must fully understand their own role, and appreciate the roles of others, in effectively responding to incident.

The Emergency Response Plan should be based on a formal risk assessment of the potential scenarios that might arise, including:

- Major fire or explosion incident within the port, at a terminal, or on a ship
- Major escape or emission of flammable, hazardous or polluting oil, chemicals, gas or vapours
- Accidents involving tugs, lineboats or other marine activities where there is risk of loss of life
- Major accident involving ship to ship collision, ship /dock or ship / shore crane collision
- Significant breaches of port security

In addition to the major emergency situations, industrial and commercial organisations responsible for the operation of berths, cargo handling and storage facilities or premises within a port must also have appropriate emergency plans and resources in place. These plans should be in accordance with the port authority emergency plans and should provide the basis of a rapid response to situations such as:

- Injury to personnel on shore or ship
- Rescue on shore or ship
- Fire and marine pollution (Minor incidents should be controllable by internal resources)
- Fall into Water
- Hazardous cargo spillage
- Ship/shore oil or chemical pipeline damage
- Vehicle accidents
- Ship breakaway from a berth
- High winds, electrical storms or extreme tide or sea conditions

APPENDICES

Appendix 1

Information on hazardous packaged substances is contained in the **International Maritime Dangerous Goods Code (IMDG Code)**. It is the worldwide standard for shipping dangerous goods by sea, and details the requirements for individual substances, including packing, labelling, stowage, segregation, and emergency response. Appropriate training for shore-side staff involved with dangerous goods is now mandatory¹³. (effective from 1. 1. 2011 and is mandatory from 1.1.2012)



The term “solid bulk” cargo means any solid particulate or granular cargo loaded directly into a ship’s cargo spaces without any intermediate form of containment. Information on solid bulk substances is contained in the **International Maritime Solid Bulk Cargo Code (IMSBC Code)**.



Both the **IMDG Code** and the **IMSBC Code** provides a basis for the risk assessment of the cargoes concerned. The regulations specified in the Codes apply¹⁴ to all ships carrying such cargoes in Irish waters.

The IMO publication “**Recommendations on the Safe Transport of Dangerous Cargoes and Related Activities in Port Areas**” aligns the **IMDG Code, the IMSBC Code and the ISPC Code** by harmonising the rules within port areas with those applied to ships.



The objective is to aid in the consistent application of the regulations and the avoidance of misunderstandings between ship and shore, and to ensure safer operations.

¹³ S.I. No.391 of 1992.

¹⁴ S.I. 491 of 2009; Marine Notice No. 23 of 2009.

Appendix 2

The International Ship and Port Facility Security Code

The ISPS Code is a set of measures to enhance the security of ships and port facilities developed in response to the 9/11 attacks in the United States. They apply to ships and ports engaged in international trade worldwide.



All ports handling international shipping must carry out a comprehensive risk analysis and have an approved *Port Facility Security Plan*, in accordance with ISPS Code¹⁵ legislation. The plan includes strict control of points of entry to a port facility, and of all vehicles and persons entering the port, and obliges all employers and duty holders operating within the port to comply with its security and traffic management plans.

Directive 2005/65/EC on enhancing Port Security further extends the requirements for port security measures to cover areas adjacent to a port facility which are involved in maritime transport operations e.g. in-transit storage areas outside the designated port domain.

The legislation requires that all persons operating within a port facility must carry appropriate port or recognised photo ID.

¹⁵ *International Ship and Port Security Code*