# Safety in Ports Guidance

## SiP 003: Container Handling

PORT SKILLS & SAFETY
IMPROVING STANDARDS THROUGH COLLABORATION

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Produced in conjunction with the Health and Safety Executive.

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## Contents



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## 1. Disclaimer

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Regulations in this document are referred to by title but not year, as they may have been amended post publication. The reader should always seek the current version.

Following this guidance is not a legal requirement, however, by following the guidance, users may ordinarily expect to be doing enough to comply with the law. HSE and other government-appointed inspectors who seek to secure compliance with the law and may refer to this guidance in their investigations.

This document provides guidance only and due care and attention must be given to any operation being conducted.

The Safety in Ports Guidance is made available to all interested parties for the general improvement of safety in ports. However, members of PSS will find supplementary resources in the members section of the website.

## 2. Introduction

The guidance covers the handling of containers and whilst it makes reference to legislative requirements and general operations (e.g., lifting operations and work equipment practices) the overall application details of such legislative expectations are provided within SiP000.

The following SiP guidance are referenced within this document and should be used in conjunction with this SiP:

- SiP000 Regulatory Framework.
- SiP005 Guidance on Mooring Operations.
- SiP009 Lighting.
- SiP015 Confined Spaces in Ports.
- SiP016 Emergency Planning in Ports.

This SiP is for container handling, the following cargoes are covered in a specific SiP:

- SiP002 General cargo
- SiP004 Timber handling
- SiP007 Loading & unloading of dry bulk cargo
- SiP022 Biomass wood pellet and chip

The Safety in Ports guidance suite is available from the PSS website: www.portskillsandsafety.co.uk.

## 3. Containerised cargo

Containerised cargo refers to goods that are transported in intermodal containers (commonly known as shipping containers) and includes:

- Standard dry containers (20ft, 40ft, 45ft) carrying a wide range of general cargo.
- Refrigerated containers (reefers) for perishable goods such as food or pharmaceuticals.
- Tank containers for transporting bulk liquids, including chemicals and foodstuffs.
- Flat racks and open-top containers for oversized or irregularly shaped cargoes.
- High cube containers for lighter, high-volume goods.
- Containers carrying dangerous goods, subject to additional regulations.
- Out-of-gauge cargo using specialist container frames and lifting equipment.

Containerised cargo may be stowed on deck or in the hold, and operations may involve ship-to-shore cranes, straddle carriers, reach stackers, and other specialist port equipment. Container handling also includes critical activities such as lashing and unlashing, twistlock operations, and inspection of container condition and documentation.

The capacity of container ships and terminals is commonly measured in twenty-foot equivalent units (TEU), a standard based on the volume of a 20-ft container.

## 4. Hazards

Hazards associated with the loading and unloading of containers include but are not limited to:

- Being struck by work equipment involved in the operation such as lifting equipment, moving containers, or moving vehicles.
- Being crushed against a fixed object such as a ship's bulkhead, a deck support pillar or the container stow itself, by containers being lifted or moving vehicles.
- Slips, trips or falls while working on surfaces which may be uneven, unstable or slippery due to the presence of substances such as oils, ice, water.
- Access/egress to and from deck and hold cargo.
- Falls from height:
    - during ship or cargo access/egress.
    - through gaps between adjacent container stacks.
    - from container stacks at varying heights.
    - when working near the edge of holds.
- Poor or potentially dangerous atmosphere affecting the air quality caused by, for example, carbon monoxide, oxygen deficiency, dust, fumes from machinery or cargo. See also SIP015 - Confined Spaces in Ports.
- Potentially explosive or hazardous atmospheres.
- Contact with chemicals or other substances hazardous to health.
- Lifting, carrying, handling.
- Temperature, noise, vibration.
- Fatigue.

## 5. Management of container terminals

Effective management of the terminal environment is essential to ensure the safe and efficient handling of containerised cargo. Terminal operations typically involve the movement of a wide variety of plant and equipment, often operating in close proximity to other vehicles, infrastructure, and personnel. The specific hazards associated with each type of plant must be identified, and appropriate controls implemented to manage these safely.

Traffic management arrangements must clearly define routes for port plant, container handling equipment, and visiting hauliers; with physical or procedural measures in place to segregate operational vehicle movements from pedestrian areas. Personnel access to storage areas, the quayside, and other operational zones must be strictly controlled, with briefings, communication systems, and signage used to ensure all workers and visitors are aware of current site operations and potential risks.

Terminal operators must also manage interactions with a range of external parties, including Border Force and other regulatory or enforcement agencies. Maintenance works conducted in operational areas present additional risks, and these should be tightly managed through effective planning, supervision, and the use of permit-to-work systems.

Adverse weather conditions may require the suspension or modification of terminal activities to maintain safety. High winds can significantly affect lifting operations, and procedures should define the wind thresholds for plant operations. Terminal management teams should monitor weather forecasts and on-site conditions, and ensure that weather-related risk assessments are integrated into routine planning and shift briefings.

Container parks should be regularly reviewed to ensure stacks are secure and configured to withstand foreseeable wind conditions.

Refuelling of plant must only take place in designated areas that offer suitable environmental protection, and vessel mooring operations must be managed in accordance with the relevant guidance.

Additional considerations include the provision of adequate lighting throughout the terminal, especially in areas used during hours of darkness or in poor weather. See SiP009 Lighting for information.

## 6. Management of road transport for containers

Large volumes of containers arrive at and depart from port terminals by road, involving frequent vehicle movements and the presence of multiple third-party operators. This requires robust planning, control measures, and clear communication to maintain safety, security, and efficient terminal operations.

Access to the terminal should be managed through an effective booking system to control traffic flow and reduce congestion. Gate procedures should comply with ISPS requirements.

All hauliers entering the site should complete an appropriate induction process, which may include the issue of driver induction cards. Inductions should be designed to reinforce safe behaviours and ensure drivers remain segregated from operational vehicles and equipment. For examples of best practices for haulier inductions see the PSS Port to Haulier campaign https://www.portskillsandsafety.co.uk/about-us/campaigns/port-to-haulier-communications-2024/ (PSS members only).

Terminals should be planned to allow for essential checks while keeping vehicle movements flowing and minimising driver exposure to operational hazards, this may include designated routes for loaded and empty containers, the use of one-way systems, and clearly marked inspection areas where drivers can check their loads for signs of damage.

Where required, designated statutory inspection areas should be provided for activities such as gas testing, with adequate space for containers to vent safely if needed. Welfare facilities for hauliers should be available, including access to shelter, toilets, and rest areas.

Effective communication is critical. Telephones positioned at entry barriers and parking zones can enable drivers to contact terminal staff in case of issues, while PA systems may be used by the control room to give clear, timely instructions. Security staff play a key role in enforcing port rules and managing any contraventions, which should be reported and acted on in accordance with the terminal's procedures.

## 7. Management of rail transport for containers

Many container terminals interface directly with the rail network. The safe and effective management of rail transport within port environments requires close coordination between operational teams, infrastructure managers, and third-party rail operators.

Port operators should establish Joint Working Agreements (JWA) with Network Rail and freight operating companies to clarify roles, expectations, and emergency procedures. Where required, track access agreements should also be in place with rail operators to ensure the legal and safe use of infrastructure. These agreements define responsibilities for infrastructure maintenance and operational safety, and set out the terms of use, such as permitted movements, access rights, and any restrictions or conditions.

Rail terminals should be managed by trained staff using a dedicated panel or system to control and monitor rail movements in and out of the facility. Clear and ongoing communication between the terminal's Person in Charge (PIC) for rail and the container operations team is essential to coordinate train arrivals, departures, and loading or unloading activities. Ground staff working in the rail environment must be trained in personal track safety and follow safe systems of work when near or on the line.

Well-defined responsibilities are required for all rail-related activities, including shunting, unlocking or locking containers, and overseeing the safe loading of trains using equipment such as gantry cranes, straddle carriers, or reach stackers.

Procedures must be in place for non-routine operational incidents, such as wagon lifts where twistlocks have not been released, and re-railing activities following derailments. Inspections of container tops before loading should be carried out to identify and remove any loose debris that may pose a risk during transit.

Vehicle and pedestrian crossings across rail tracks must be risk assessed and fitted with appropriate controls, such as lights, gates, and signage.

Any damage to infrastructure or collisions involving rail movements must be reported and investigated in line with existing port and rail procedures. Rail terminal infrastructure must be properly maintained, including points, crossings, and signalling systems. A suitable permit to work system, aligned with wider terminal procedures (see section 5, Management of container terminals) should be in place to control access for maintenance or inspections.

Additional guidance on rail operations can be found on the Office of Rail and Road (ORR) website: https://www.orr.gov.uk/rail-guidance-compliance.

## 8. Pre-arrival and pre departure considerations

Berthing plans should be communicated to port operations, the vessel, tug operators, and mooring personnel, to ensure all parties are aware in advance of the intended plan, procedures, and any operational constraints. Consideration should be given to bollard loading. See SiP005 – Guidance on Mooring Operations for information.

Terminal operators should ensure that the risks associated with vessel arrival are assessed, including the potential for collision with quayside cranes. Control measures may include positioning cranes at midships with booms raised, setting procedures for vessel approach angle and speed, specifying tug requirements, and accounting for weather and tidal conditions.

Effective communication between all parties is essential. A formal procedure requiring positive confirmation from all parties during berthing is preferable, including agreed “stop dead” points if criteria are not met. For examples of best practices for ship to port communications see the PSS Ship to Port to campaign https://www.portskillsandsafety.co.uk/about-us/campaigns/ship-to-ports-communication-23-29-october-2023/

## 9. Planning for safe loading and discharge

Effective planning is one of the key elements of safe loading/discharge operations. Most accidents and near misses which occur could be avoided if the risks from the work are considered and plans for safe handling are made at an early stage. The shipping operator and the port handling company should agree on the equipment and systems that will be used to ensure the load is handled safely. Both parties should keep each other informed of any significant changes that may introduce new risks.

Specific sections of the Approved Code of Practice L148 Safety in Docks address "Planning and Organising of Lifting Operations" should be consulted. Further information on planning and managing dock operations can also be found in Managing Health & Safety in Dockwork (HSG 177).

Under the SOLAS Convention, the Verified Gross Mass (VGM) of a container must be provided before loading; this requirement helps ensure containers are safely stowed and handled based on accurate weight data. Further details can be found in the IMO guidelines on VGM requirements, including methods for verification and responsibilities of shippers and operators. Verification of the gross mass of a packed container, and MSC.1 Circ.1475.pdf

A written record should be made for each ship visit including:

- The ship stowage plan.
- Landside stowage arrangements.
- Personnel.
- Plant and equipment involved.
- Any specific traffic routes and any associated hazards.

This information needs to be cascaded down to all those involved, preferably in written form to the supervisor who will then in turn pass this down to the operatives, enabling all activities to be coordinated, it should also clarify the interface between ship and shore-based personnel. This can be achieved by a pre-shift briefing or toolbox talk.

## 10. Vessel loading / discharge plan

A vessel loading/discharge plan should be available for all operations. Plans are usually prepared in consultation with the Master or Chief Officer of the ship and the cargo handling supervisor. The plan should be communicated to all personnel involved in the loading operation. This can be done as part of the toolbox talk.

A vessel loading/discharge plan should consider but not be limited to:

- The risks to the health and safety of personnel involved in the cargo handling operation including the risks associated with cargo securing or un-securing in the loading and discharge ports.
- Safe means of access and egress to and from the top of container stacks.
- The safety of third-party personnel not involved in the cargo handling operation including the safety of the ship's crew.
- Safe means of access and egress for lashing/rigging gangs.
- Safe means of access and egress for cargo surveyors or inspectors.
- Working on the top of containers and the transfer of personnel from one container stack to another.
- Known weight of cargo.
- Stability requirements of the vessel.
- Whether it may be necessary to temporarily remove other cargo from the vessel in order to make the operation safer.
- Dangerous goods.

## 11. Freight container safety

Under the International Convention for Safe Containers (CSC), it is the responsibility of the container owner to ensure that containers are properly maintained and subject to periodic examination in accordance with procedures approved by the government of the relevant contracting state to the Convention. In the UK, the requirements of the Convention are covered in legislation by the Freight Containers (Safety Convention) Regulations.

Under the Convention and these regulations, each freight container is required to display a Safety Approval Plate (CSC plate), detailing relevant safety information including country of approval, date of manufacture and maximum operating gross weight. The plate may also display the date of the next periodic examination, unless the container is under an Approved Continuous Examination Programme (ACEP) in which case details of the ACEP registration are displayed and there is no requirement to display an examination due date.

There should be procedures covering the reporting and quarantine of defective containers or containers where the CSC plate is missing.

## 12. Slinging and lifting operations - general

All lifting operations in ports are subject to specific legislation as referenced in SiP 000 Guidance Framework.

So as not to cause confusion with the different terms used to describe lifting equipment, the Lifting Operations & Lifting Equipment Regulations (LOLER) uses the following definitions:

- "Lifting equipment" means work equipment for lifting or lowering loads and includes its attachments used for anchoring, fixing or supporting it.
- "Accessory for lifting" means work equipment for attaching loads to machinery for lifting.

In the port industry accessories for lifting are sometimes referred to as “lifting accessories”.

The term “load” within LOLER includes lifting a person. Equipment used for lifting people must be designed for such use and checked prior to lifting any personnel. If using ship’s equipment for lifting people, the certification and condition of the equipment must be checked by a competent person prior to use, as is the case with landside equipment.

Hired equipment should be received with all maintenance and inspection records up-to-date. Where the length of hire extends past the inspection date, the individual responsible for the hiring should be responsible for ensuring inspections are completed and recorded.

**Communication**

Clear lines of communication must be established and maintained between all those involved in the lifting operation. Visual and/or voice communications from the person directing the lifting operation (usually known in the port industry as the banksman, signaller or hatchway man) to the crane operator must be clear, agreed and understood. Where voice communication cannot be established then an agreed system for the use of hand signals must be followed, see Health and Safety (Safety Signs and Signals) Regulations – schedule 1.

Guidance on crane signals can be found in BS 7121 – “Code of Practice for Safe Use of Cranes – Part 1, General”. The banksman should stand in a safe position, where they can see the path of the load and also be in a position, wherever possible, where they can be clearly seen by the crane operator, especially in situations where the lifting operation requires the use of hand signals. In situations where the banksman cannot be seen, radio communications or two banksmen should be used.

Where a banksman is actively involved in slinging/unslinging it is important that during the actual lift the banksman is focused solely on the lifting operation. The banksman should be clearly identified to the crane operator so there is no doubt as to who is providing the instructions.

The crane driver should normally only accept instructions from the banksman, whether by voice or through hand signals. The exception to this rule is the stop signal, which any operative may give at any time to override the previous signal.

## 13. Vessel lifting equipment and accessories

The merchant shipping version of LOLER applies to all British registered vessels and all foreign registered vessels whilst in UK territorial waters, therefore similar standards as stated above are imposed on all vessels in UK ports.

Before using ships' lifting equipment or accessories, the ships' documentation must be checked to confirm that thorough examination, inspection and testing of the lifting equipment and accessories concerned complies with LOLER. It is also prudent for a competent person to undertake a visual examination of ship lifting equipment and accessories where possible.

Employers should make pre-use checks concerning the safety of the ships lifting equipment so far as it is within their control.

Where appropriate there should be a period of familiarisation on the specific equipment concerned before putting into use.

## 14. Loading containers with cranes

Quayside cranes, ship's cranes or derricks and mobile cranes are commonly used to load and unload freight containers, as well as hatch lids covering the holds of container vessels. Additional HSE guidance is available in *Handling Containers with Slewing Cranes*: www.hse.gov.uk/foi/internalops/sims/cactus/5_05_09

Risk assessments associated with lifting operations should consider the following, but not be limited to:

- The safe working load (SWL) of the equipment being used.
- Pedestrian walkways over which containers will be lifted.
- Traffic routes to and from the crane.
- The possibility of a vessel moving along or away from the quay (ranging) during cargo operations.
- The trim and list of the vessel - this can cause crane spreaders to become stuck in cell guides.
- Weather conditions.
- Position of personnel on board ship - this includes ship's crew, port operatives and other authorised personnel.
- The centre of gravity of loads secured to flat racks, and the security and suitability of devices locking "bundles" of flat racks together.
- Problems associated with over height or over width cargo.

The removal and positioning of hatch covers requires a suitable risk assessment and safe system of work. These can present a risk to port vehicles and personnel if not stored correctly on quayside.

The procedures to be followed for the selection, interchange and use of suitable lifting equipment to safely lift containers should also be considered. Lifting equipment includes but is not limited to:

- Over height frames.
- Equipment for use with slightly distorted containers (pots).
- Top lifting attachments.
- Bottom lifting attachments.
- Manual spreaders.
- Powered spreaders.
- Twin and quad lift spreaders.

It is important to carry out pre-use checks on all equipment and ensure that damage is reported and acted on promptly, isolating equipment where appropriate.

Specialist training and/or advice may be required for certain lifting operations, including:

- Overweight containers.
- Eccentric weight containers.
- Damaged containers.
- Jammed containers.
- Jammed twistlocks.
- Crane spreaders jammed in cell guides.

Equipment operation parameters should be consulted and lifting plans produced accordingly.

A risk assessment should be carried out to determine the position of the driver when containers are loaded or unloaded.

A suitable traffic management plan should be in place to limit the risk of collision between plant and equipment.

## 15. Spreader configurations

In order to increase operational efficiency, crane spreaders have evolved to handle more than one container per lift cycle. Such configurations include:

- Single lift spreaders.
- Twin lift spreaders.
- Tandem lift spreaders.

Hazards associated with these spreaders include:

- Being crushed between containers as the units close up.
- Being struck by a damaged spreader component, for example, a “flipper” falling as the spreader is being landed on or is removed from a container.

### Vertical tandem lifting (NOT considered safe practice)

Vertical tandem lifting is where two containers are locked one above the other and lifted in one operation. Vertical tandem lifting is **NOT** considered safe practice by the UK port sector.

There is no specific UK regulation prohibiting vertical tandem lifting, and the practice is carried out in some other countries. However, when twistlocks are used as the connection point to lift one container beneath another, they effectively become part of the lifting equipment and must therefore be subject to inspection under the Lifting Operations and Lifting Equipment Regulations (LOLER).

The prevailing UK industry position is that vertical tandem lifting is not considered safe practice, primarily because:

- The safety of the lift depends on the twistlocks, which are not routinely inspected and certified as lifting accessories, under LOLER.
- The integrity of container corner castings — which would bear the load during the lift — cannot easily be verified in operational settings.
- Both containers and twistlocks may have been damaged in transit, making them unsuitable for use in lifting operations.

While vertical tandem lifting may appear to offer time-saving benefits, in order to comply with LOLER, the twistlocks used between containers would need to be certified lifting equipment. This would require containers to be lifted individually, joined using verified twistlocks, and then lifted again — negating any time advantage and introducing additional handling steps. In practice, it is usually quicker, safer, and more straightforward to lift containers individually.

## 16. Securing containers in vessel holds

Most container vessels are equipped with cell guides below deck – these vertical guide rails assist the crane driver in lowering containers into the cells in the hold and secure the container stacks below deck.

Some container vessels have the capability to stow either 40ft containers in a hold, or two 20ft containers end to end in the same space or a combination of the two arrangements with 20ft containers below 40ft containers. Where 20ft containers are stowed in a 40ft hold, the ends of the containers away from the hold bulkheads are not secured by any cell guide structure. Under deck stacking cones are therefore fitted in the bottom corner castings of the container, prior to it being loaded and are utilised to secure the containers.

These are generally fitted by personnel on the quayside. In the absence of cell guides, additional ship's equipment may be used to allow containers to be placed and properly secured in accordance with shipping requirements.

If access to the hold for personnel is required, monitoring should confirm that the atmosphere is safe for entry. See SIP015 - Confined Spaces in Ports.

## 17. Securing containers – twistlocks

The most common device for securing containers is the twistlock, of which there are principally three different types as follows:

**Manual twistlocks** are locked and unlocked by means of pushing a lever from one side to the other. Depending on type, the twistlock may be either left or right-handed in its operation.

Manual twistlocks are used to secure containers to the deck of the vessel. When used above the first tier, manual twistlocks are fitted at height into top corner castings prior to the next container being loaded onto the stow. They are then locked or unlocked and removed before discharge of the next container from the vessel. Additionally, at the top of the stow, bridge fittings connected at height between adjacent tiers of containers may be required to be fitted to prevent separation of container stacks during sea passage.

**Semi-automatic twistlocks** are unlocked by operating wire toggle(s) or a handle on the unit and lock automatically when a container is landed onto it, or the container in which it is inserted is landed onto a container stow. Semi-automatic twistlocks should not be used inverted unless specifically designed to be used in that manner safely.

**Fully automatic twistlocks** may be encountered on some container vessels. These twistlocks remain in the bottom corner castings of a container being discharged and do not require unlocking prior to unloading. Fitting of these twistlocks is undertaken prior to loading.

Both semi-automatic and fully automatic twistlocks are fitted prior to loading and removed before the container is landed – this operation may take place on board the vessel, but more typically occurs on the quayside, either at the crane or at a “station” remote from the crane.

Twistlocks are generally stored in bins on dedicated low height containers (gear boxes) which can be moved/discharged from the vessel using conventional container handling equipment. Some gear boxes may have higher sides making access hazardous – this can be mitigated by removal of the individual gear bins from the gear box using a lift truck. The integrity of gear bins and frames can vary and additional control measures may be required when lifting, such as an initial visual inspection, conducting a test lift and exclusion zone around the lifting area etc.

It should be noted that while twistlocks are rated, they are not certified pieces of lifting equipment and therefore should not be used as such.

**Midlocks** (sometimes called hooks) are increasingly being used to save space on deck by allowing pairs of 20ft containers to be loaded closer together and improving productivity as they do not require unlocking.

However, some types of midlock are vulnerable to falling out, and careful control of twin pick lifting operations is required. In particular:

- All hatches with midlocks should be identified on relevant paperwork, plans and work documentation.

- When twin-picking, only spreader frames with “floating” centre twistlocks may be used, to ensure that the containers can be pulled apart once lifted and allow the midlocks to be safely removed at quay level.
- Ports may wish to consider deploying additional personnel to assist crane drivers in safely discharging containers with midlocks.

The following should be taken into consideration when developing systems of work in relation to twistlock operations on the quay (the list is not exhaustive):

- Safe positioning of stevedores handling twistlocks on the quay: designated and protected areas away from vehicular traffic flows.
- Position of personnel in relation to suspended loads.
- Techniques for safe handling, fitting, and removal of twistlocks, including procedures for removing defective twistlocks and isolating them from further use.
- Personal protective equipment requirements.
- Safe access to storage of twistlocks within gear boxes, bins, or trolleys.
- Interaction between mobile plant or equipment when removing or replacing gear bins from gear boxes.
- Traffic control systems, i.e. hand signals for stop / go.
- Risk of musculoskeletal disorders (MSDs) associated with repetitive twistlock handling tasks. Considerations should include container height, accessibility of pin boxes, use of wheeled trolleys or mechanical aids, and opportunities to rotate tasks to reduce strain.

Automated systems have been developed for the removal and insertion of twistlocks – however, these still require a degree of manual intervention in their operation, and do not eliminate the hazards and must be assessed accordingly.

The main hazards to stevedores associated with the unlocking of twistlocks include, but are not limited to:

- Musculoskeletal injury resulting from carrying and using unlocking poles.
- Being struck by falling twistlocks or other objects.
- Falls from height when working or passing near to unprotected edges.
- Falls from height when unlocking twistlocks from above.
- Slips, trips and falls whilst working on surfaces which may be uneven, unstable or slippery due to the presence of substances such as leaking cargo residues, oils, ice or water.
- Electrical hazards from damaged power cables to refrigerated containers.
- Pinches, cuts, skin abrasions and bruising when assembling multi-part unlocking poles.

The main hazards to stevedores associated with handling container fittings (twistlocks etc.) include, but are not limited to:

- Personnel being struck by mobile plant or equipment, including quay cranes.
- Musculoskeletal injury resulting from handling twistlocks.
- Being struck by falling equipment or other objects.

- Slips, trips and falls whilst working on surfaces which may be uneven, unstable or slippery due to the presence of substances such as leaking cargo residues, oils, ice or water.
- Crush injuries between suspended container and gear box, or between containers on board ship, or between closing twin lift container spreaders.
- Cuts and skin abrasions from handling twistlocks.
- Falls from height when working or passing near to unprotected edges, especially when handling container fittings under deck.
- Collision between mobile plant or equipment utilised to remove and replace gear bins.
- When working from personnel carrying cages.
- Incorrect selection and use of fall protection equipment such as lanyards and harnesses.
- Entrapment between cage and container stow.
- Other falls from height.

Defective twistlocks or twistlocks that have not been fitted correctly may jam so that they do not release correctly. Any system of work for freeing of jammed container fittings must take into account the additional hazards of tension being built up in the crane hoist system due to vessel or tidal movements, and the potential for the jammed fitting to release without warning.

Procedures must therefore take into account issues such as:

- Communication between all parties involved in the operation.
- Access to assess the situation.
- Removal of all tension in the crane system.
- Means to free the problem fitting, for example by use of limited crane power, hand tools, or by applying controlled heat to remove the fitting (commonly referred to as burning out).
- Eye protection if the twistlock is to be struck with a hammer, or similar, to release.

If heat is to be applied to a fitting to release it (burning out), prior approval must be obtained from the vessel's master and the port. A Permit to Work (PTW) system is often required for hot work activities and should consider factors such as:

- The location and nature of the hot work.
- The nature and hazards of the cargo within the container and any adjacent containers that may also be affected by the application of heat.
- The proposed time and duration of the work.
- The limits of time for which the permit is valid.
- The means to prevent fire and to extinguish any fire which does occur.
- The person in direct control of the work.

Some vessels may supply twistlock clamps, which are attached between each of the bottom corner castings of the container to be discharged and the top corner castings of the container to which it is jammed. While such devices are advantageous in lowering the problem unit for ease of access, these clamps should only be used if they are marked with a safe working load (SWL), and valid certification can be supplied.

## 18. Lashing of freight containers

Freight containers in the lower tiers on deck, on board container vessels are required to be secured to the vessel's structure to ensure the stability of the cargo during the ship's voyage. Typically, these freight containers are arranged either lengthwise in a fore or aft stowage arrangement or stowed athwartships (at 90 degrees to the vessel), and, very occasionally, a combination of the two.

The process of securing containers in this manner is generally known as lashing and is achieved by the use of metal lashing bars or rods hooked into the corner casting of the freight container, which are then connected to a threaded turn buckle or bottle screw attached to the vessel's structure. Tension can then be introduced into the lashing by way of rotating the turn buckle, thereby securing the container to the ship. Lashing bars are typically between 2.4 metres (one high bar) and 4.5 metres (three high bar) in length and 13.5kgs to 20kgs in weight respectively. On some container vessels, lashing chains are suitably tensioned to secure containers to the vessel structure.

Lashing requirements may vary between different classes of container vessel. Common arrangements include single cross-lashing using one-high lashing bars, double-cross lashing, or the use of three-high lashing bars across the deck. These configurations are designed to secure containers at different stack heights and under varying sea conditions. The specific lashing requirements for each vessel are detailed in its Cargo Securing Manual (CSM). In some cases, this information is also displayed on signage in weather deck walkways or near container bays. These requirements must always be followed.

Lashing is undertaken from walkways between container stows, either at or below the level of the hatch cover, or from raised lashing gantries accessed via ladder. Lashing is also undertaken between 20ft containers on deck in combination bays where either one 40ft or two 20ft containers may be stowed.

Some container vessels have been designed to accommodate containers that are 45ft in length.

However, both two 20ft and single 40ft containers may also be stowed in such locations, resulting in increased distance of the end of the container from any lashing gantry. This results in exacerbated risk of manual handling injury due to the greater outreach required to locate/remove lashing bars, or through handling of horizontal lashings between the lashing gantry and the container corner castings. These aspects should be addressed by risk assessment, vessel planning and systems of work developed accordingly to mitigate the risks so far as is reasonably practicable.

Lashing gear is typically designed for the stowage of 8ft6 high containers. However, the use of 9ft6 high (hi-cube) containers is becoming more prevalent. For this reason, lashing bars may be of insufficient length to reach the turn buckle, and in such cases lashing bar extension pieces are used to bridge the gap.

Where lashing bars are too short, stevedores should never stand on handrails or bypass fall protection in order to complete lashing activities.

Lashing gear may be stowed in designated storage bins or racks in walkways or lashing gantries between the container stows on board, or in storage bins in weather deck walkways. However, some older vessels have no facilities for lashing gear storage, with unused gear remaining in walkways.

The main hazards to stevedores associated with lashing activities include, but are not limited to:

- Musculoskeletal injury and fall from height resulting from lifting/manipulating. heavy/long lashing bars, often in awkward positions. This risk could be exacerbated when using lashing bar extension tubes.
- Being struck by falling lashing equipment or other objects.
- Falls from height when working or passing near to unprotected edges, open hatch ways or open holds.
- Slips, trips and falls whilst working on surfaces which may be uneven, unstable or slippery due to the presence of substances such as leaking cargo residues, oils, ice or water.
- Electrical hazards from damaged power cables to refrigerated containers.
- Personnel on the quay being struck by lashing gear falling from the vessel.

When developing safe systems of work for lashing/unlashing operations, the following should be taken into consideration (this list is not exhaustive):

- **Personnel requirements:** Best practice is for the task of lashing / unlashing to be undertaken by two operatives with one handling the lashing bar and one operating the turn buckle. Consideration should be given to the personnel requirements to complete lashing duties across the vessel(s), the type and condition of the lashing gear, size of the work area, vessel lashing requirements and the number of containers across the vessel to be lashed.
- **Personal Protective Equipment (PPE) requirements:** Typical PPE may include gloves, head protection, wet weather, cold weather, feet and ankle protection, light eye protection, hearing protection.
    - Consider gloves with knuckle protection, hard hats with chin straps, and safety boots with instep protection.
- Positions of personnel in relation to moving equipment and suspended loads: Cranes should not work hatches where lashing or unlashing activities are taking place.
- Lashing operations should be at least two bays away from crane operations.
- When using lashing bars and in particular extended bars, risk assessments should take into consideration factors such as the physical capabilities of the personnel, risks from work at height, manual handling, the requirements of the operations and the general working environment.
- Procedures for safe handling and operation of lashing equipment.
- Stowage of unused lashing equipment, and safe transfer of lashing gear from storage areas to areas of use.
- Physical measures to protect workers from falls from height.
- Alternative strategies for protecting workers from falls from height if physical protection is not available from the ship: For example, a container held flush against the side of a vessel can provide adequate fall protection for stevedore’s undertaking lashing duties at outboard positions. The use of fall restraint (or fall

arrest) equipment could be considered provided a suitable anchor point is identified.
- Arrangements to ensure sufficient lighting is available for safe lashing operations. See SiP 009 Lighting.
- Arrangements in the event that a lashing bar is jammed in the container corner casting and cannot be freed by the lashing gang.

Dynamic risks assessments should be used to manage the risks of non-routine situations.
Manual handling risk assessments should be supported by recognised tools such as the HSE MAC (Manual Handling Assessment Charts) and RAPP (Risk Assessment of Pushing and Pulling) to evaluate specific tasks and identify appropriate control measures.
A register of high-risk manual handling activities should be maintained and regularly reviewed to ensure that appropriate controls are in place and remain effective.

## 19. Handling refrigerated containers

Refrigerated containers, commonly referred to as reefers, are connected to a power supply on the vessel during transit to maintain sensitive cargo at a controlled temperature, typically below ambient. The responsibility for unplugging reefers should be agreed and confirmation given when containers are unplugged, cables stowed and ready for discharge.

Where there is no access to gantries for containers on higher tiers, a safe system of work for loading containers with cables hanging (to allow connection at deck level) should be developed.

Where discharge and loading is being carried out around connected reefers, cables should be reported if noted as damaged. The damaged cable should not be touched by port operatives. Housekeeping issues relating to cabling should be reported to the vessel before the bay is worked.

Safe systems of work should be developed for storage of reefers landside, to include

- Segregation between personnel and plant.
- Access and egress to and from gantries.
- Maintenance of grated walkways and gantries.
- Inspection of cables and plugs.
- Ensure trailing leads are as short as possible and do not present a trip hazard.
- Maintenance of electrical systems.
- Disposal of spurious items found in baskets.
- Cable management for reefers being loaded out.

Where spoiled contents are likely to leak, the container should be stored on a bund and the following issues addressed:

- Use control measures to prevent uncontrolled door opening.
- Appoint capable and licensed disposal contractor.
- Consider the supply of additional waste facilities.
- Requirements for confined spaces entry.
- PPE and clean up requirements.

## 20. Handling Out of Gauge (OOG) cargo and containers

Out of Gauge (OOG) cargo refers to items that exceed the standard dimensions of a 20' or 40ft container, necessitating specialised handling and equipment. Proper management of OOG cargo is crucial to ensure safety and efficiency during loading, transport, and unloading operations.

General considerations include but are not limited to:

- **Pre-planning**: Early discussions with customers, ship planners, and logistics personnel are essential to identify OOG cargo requirements and plan appropriate handling strategies.
- **Equipment checks**: Regular inspections of lifting equipment, spreaders, and securing devices are necessary to ensure they are in good working condition and suitable for the specific OOG cargo being handled.
- **Safety protocols**: Implementation of comprehensive safety protocols, including risk assessments and method statements, tailored to the unique challenges posed by OOG cargo operations.
- **Training and competency**: Ensure that all personnel involved in OOG cargo handling are adequately trained and competent in their roles, with a clear understanding of the risks and procedures involved.

Flat racks are often used to carry oversized or over-height cargo and must be handled with specific care. When lifting flat racks — particularly those with tall or uneven loads — appropriate spreaders should be used to ensure even weight distribution and reduce the risk of structural damage or accidents. It is essential that flat racks are assembled in accordance with the manufacturer's instructions and that any cargo is securely fastened within the unit using suitable lashing equipment to prevent movement during transit. Additionally, when handling empty or "flat packed" flat racks, procedures must be in place to ensure stability during lifting and transport, including the correct use of lifting equipment.

Over-height frames are specialised lifting devices used to safely handle flat racks transporting tall or oversized cargo. By raising the lifting points, these frames help maintain the load's centre of gravity and improve overall stability during crane operations, significantly reducing the risk of swinging or tipping during the lift. Their use is essential for ensuring safety when conventional spreaders are not suitable.

Dedicated slinging areas should be established for handling out of gauge (OOG) cargo, typically positioned on top of hold cargo or beneath hatch lifts. These zones must be clearly marked, and free from obstructions to enable safe and efficient lifting operations. Only trained slingers and signallers should carry out these tasks, ensuring effective communication and coordination, particularly when using container cranes to lift heavy or irregularly shaped loads.

## 21. Work at height

When planning work at height, duty-holders must follow the hierarchy of controls as defined by the HSE:

- **Avoid work at height** wherever possible.
- Where work at height cannot be avoided, **prevent falls** by using suitable collective or personal fall prevention systems.
- Where fall prevention is not reasonably practicable, **minimise the consequences** of a fall through fall arrest systems.

Discussions with customers and ships' agents at the early planning stage can help reduce the need for work at height and associated risks. The vessel should be loaded and discharged in a manner that minimises the risk of falls, following the hierarchy of controls and ensuring that work at height is only undertaken where no safer alternative is reasonably practicable.

The height and configuration of the cargo stow changes throughout the operation, and so does the associated risk—this must be recognised during dynamic risk assessment. When loading, consideration should also be given to how the stow will affect discharge operations at subsequent ports.

Stowage planning plays a key role in reducing risk. For example, placing 40ft containers in 45ft bays often leads to increased manual handling for lashing crews. Planners should work with the shipping line to minimise such configurations wherever possible.

Where manual lashing is required, lashing crews should be properly trained and supervised. Unsafe practices, such as standing on handrails to reach twistlocks, must not be tolerated. In high-risk situations, consideration should be given to refusing to carry out the lashing task until a safe system of work can be established.

Personnel working on board ships may encounter situations where access via a personnel-carrying cage or gondola is not feasible. In these cases, the risks associated with working at height must be thoroughly assessed. Control measures to mitigate these risks can include the use of safety harnesses in combination with fall restraint or fall arrest systems, with fall restraint being the preferred option. If fall arrest is necessary, ensure there is adequate clearance for the fall arrest equipment to deploy. Additionally, when these controls are in place, consideration should be given to the rescue of any person who may fall and become suspended from their securing point. See section 30 for more information.

## 22. Personnel carrying cages as means of access

If there is no other suitable safe means of access, consideration should be given to the provision and use of alternative access arrangements. Access arrangements may include the use of:

- A personnel-carrying cage suspended from the crane spreader above the container stow.
- A gondola suspended from one end of the crane spreader passing between the container stows.
- A personnel-carrying basket fitted to the container crane head block.

Personnel carrying cages, gondolas and baskets must be suitably rated and secured in accordance with the requirements of Lifting Operations and Lifting Equipment Regulations. Where personnel carrying cages or gondolas are employed, a full assessment for their use should be conducted, considerations include but are not limited to:

- Use of suitably rated secondary securing chains/mechanisms and attachment points to the crane.
- Supervision of those within the personnel carrying cage.
- Communications between those in the personnel carrying cage
- Communication between the personnel carrying cage and the crane driver.
- The use of mesh to reduce the potential of entrapment if a stevedore tries to lean out or falls from access equipment.
- The use of fall restraint to prevent a fall from access equipment.

Cages should be suitable for the work being carried out; this may include:

- Provision of boxes for tools and equipment.
- Access flaps in the floor for twistlock poles.

## 23. Personal fall protection systems

Fixed-length lanyards or other forms of fall restraint that physically prevent a person from reaching a fall risk are preferred over fall arrest systems, as they prevent the fall from occurring in the first place.

Where fall arrest systems are used, it is critical that the equipment is suitable for the specific working environment. Many retractable-type fall arresters are designed only for use in the **vertical plane**, where the anchor point is directly above the user. In such a setup, the force is applied in a direct vertical line between the user and the anchor point.

If a device intended for vertical use is deployed in a **non-vertical plane**, there are significant risks, including:

- The braking mechanism failing to engage.
- The anchor line contacting angular or sharp edges, potentially causing the line to part (break).

Where this risk exists, additional precautions must be taken, such as edge protection or the use of fall arresters designed for horizontal use. It is the responsibility of the duty-holder to ensure the selected equipment is appropriate for the situation. If in doubt, consult the manufacturer's guidance.

Fall arrest blocks do not function as fall restraint systems and will not prevent a person from falling over an edge unless the line is fully extended and tensioned. Careful consideration must therefore be given to the workspace dimensions and layout to ensure the system operates effectively.

Additional hazards associated with fall arrest systems include:

- Ground impact if the lanyard is too long for the working height.
- Pendulum effect (swinging side to side after a fall), which can lead to impact injuries. The longer the extended line, the greater this risk.
- Improperly fitted or adjusted harnesses, increasing the risk of injury in the event of a fall.
- Suspension trauma, where a person left hanging after a fall may experience restricted circulation, which can be fatal if not promptly addressed.

Anchor points must be designed and tested to withstand the forces generated during a fall. Additionally, a rescue plan must be in place for any work involving fall arrest systems. This plan should enable a prompt recovery and must not rely solely on the emergency services. It is essential that those performing the rescue are competent and not placed at additional risk.

Refer to SiP016 Emergency Planning in Ports for more detailed guidance on developing and implementing effective rescue arrangements.

## 24. Safe by position

The Work at Height Regulations do not set a minimum safe distance from an open edge where there is a risk of persons falling.

Systems of work where an employee is simply instructed to stay away from an edge, sit at the bottom of the hierarchy of controls, this is known as “safe by position”. This should only be considered where there is a foreseeable risk of a person falling from height and if other control measures are not reasonably practicable, in such cases further measures such as additional supervisory control, instruction and training may be required. If employing this method of control, you must be able to robustly demonstrate that the risk has been fully assessed and that the implementation of no other method of control further up the hierarchy is reasonably practicable or necessary.

When using safe by position as part of your system of work, you should consider:

- The distance that work will be carried out from the open edge.
- Limiting the duration of exposure.
- Limiting the number of people being exposed.
- Environmental conditions, such as wind, ice, fog, etc.
- Nature of the work.
- Human factors.
- Adequate supervision.

Human factors research highlights that people cannot concentrate on one task for 100 per cent of the time, during those lapses in concentration they can inadvertently encroach too close to an open edge and increase the risk of falling.

In addition to the above considerations, ensure that a vessel condition report is conducted to identify any potential issues related to hatch covers or other exposed areas. Dynamic risk assessments should be applied to account for changing conditions, such as vessel movement or changes in weather.

All personnel involved in working at height must be competent. This includes having the necessary knowledge, skills, and experience for the specific tasks at hand. Training should combine both theoretical and on-the-job components, with a focus on how to work safely at height and how to select and implement appropriate control measures. See the PSS website for more information on competency assessment (PSS members only): https://www.portskillsandsafety.co.uk/skills/competency-framework/

## 25. Dangerous goods

Containerised cargo may include a wide range of dangerous goods, which must be handled in compliance with relevant legislation, including:

- The Dangerous Goods in Harbour Areas Regulations (DGHAR).
- The International Maritime Dangerous Goods (IMDG) Code.
- The Carriage of Dangerous Goods and Use of Transportable Pressure Equipment Regulations (CDG).

All personnel involved in the handling, storage, and transport of dangerous goods must be appropriately trained, and procedures should be in place to ensure compliance with labelling, documentation, stowage, and segregation requirements.

Specialist advice should be sought where appropriate. This may include:

- Dangerous Goods Safety Advisors (DGSAs).
- Radiation Protection Supervisors or Advisors.
- Explosive Security Officers (ESOs).

Segregation and terminal layout should be carefully managed to reduce risk:

- Designated areas should be provided for the storage and marshalling of containers carrying dangerous goods.
- Segregation rules from the IMDG Code must be followed to avoid incompatible goods being stored or handled together.
- Class 1 (explosives) containers may require additional precautions, such as being loaded last and discharged first or being sent straight to road transport rather than being stored.

Emergency response arrangements should be in place and clearly communicated to all relevant staff:

- Spill response trailers, kits, and bunded areas should be available and easily accessible.
- A terminal spill response plan should be maintained, regularly reviewed, and tested.
- Suitable fire-fighting equipment must be provided, with appropriate extinguishing media for the classes of goods handled.

Operators must ensure that documentation and declarations are accurate and verified before acceptance, in line with the IMDG Code and port procedures.

## 26. Plant and equipment

Plant used in handling containerised cargo may include:

- Quayside gantry cranes.
- Mobile cranes.
- Rubber tyred gantry cranes (RTGs).
- Straddle carriers.
- Reach stackers.
- Empty container handlers.
- Terminal tractors (often referred to as tugs).
- Container terminal trailers.

All mobile plant used for the movement of cargo should be suitable for the operation. Operators must be trained, competent and authorised by the port. This also includes the hiring of third parties. Members can find more details about measuring competency on the PSS website. (PSS members only):
https://www.portskillsandsafety.co.uk/skills/competency-framework/

In addition, large goods vehicles (often referred to as LGVs or HGVs) will operate collecting and delivering containers. These vehicles are often operated by third parties, and it is essential that instructions and information provided to hauliers and drivers in container parks are in a format that is easily understood.

Examples of good practice include:

- Use of pictograms.
- Information provided in different languages.
- Use of videos and other accessible formats.
- Verification of understanding through regular updates.

When people and plant are working together in close proximity on a vessel or on a quayside, suitable controls should be in place to protect pedestrians from vehicle movements. It is essential that the driver remains aware of where operatives are and that operatives stay well clear of the plant working area. Drivers should cease work if they lose sight of operatives working in the area and wait until they know it is safe to continue operations.

Cranes and container handling equipment such as RTGs cranes, straddle carriers, and mobile cranes have specific risks associated with their operations, including:

- Incorrect tyre ratings, risk of tyre failure, risk of rim failure especially with multi piece rims.
- Visibility issues for operators, particularly on the side away from the driver's cab.
- Container knock down if spreaders are not correctly controlled.
- Overloading, especially if twistlocks remain engaged during lifting.
- Collision with other cranes and equipment.
- Overturning on uneven ground or unsuitable gradients

To manage these risks, operational areas for container handling equipment must be clearly defined and segregated from pedestrian zones. Drivers exiting their vehicles should follow safe procedures, guided by signage that indicates safe standing positions. Traffic management systems should include clearly marked routes, give-way systems, and travel height indicators, with road surfaces maintained to accommodate heavy plant and account for gradients.

Engineering controls play a vital role in equipment safety. Tyre pressure monitoring systems can help prevent failures, and spreaders should be fitted with anti-collision sensors and overload protection to detect engaged twistlocks. Cameras and visibility aids, particularly on the blind sides of RTGs, are essential to reduce operator blind spots. Warning systems such as lights and klaxons can alert others to crane movements, while barriers should be used to prevent unauthorised vehicle access into crane operational zones.

The HSE has specific guidelines on handling containers with slewing cranes: https://www.hse.gov.uk/foi/internalops/sims/cactus/5_05_09.htm

Specific locations should be provided for activities such as unlocking twistlocks and adjusting trailer configurations. Environmental conditions also need to be factored into safe crane operation—high winds may necessitate the suspension of lifts, and all crane operations should comply with defined weather thresholds.

Driver monitoring systems, such as telematics, in-cab CCTV, and GPS tracking, can support safe operations by monitoring behaviour, identifying areas for improvement, and providing evidence during incident investigations.

Fire suppression systems are common on large plant and equipment. They work by detecting heat or flames and automatically releasing extinguishing agents—such as foam, dry powder, or gas—to control or extinguish the fire. These systems help to prevent escalation, protect operators, and reduce damage to equipment. Regular maintenance and inspection are essential to ensure systems remain operational and effective.

AI-based hazard detection systems can identify unsafe conditions—such as proximity breaches or unsafe driving—and trigger automated alerts or reports, supporting faster intervention and continuous improvement.

Drones can be used for certain inspection activities across container terminals, particularly where access to hard-to-reach areas—such as quay cranes—would otherwise require working at height. When used appropriately, drone technology can offer a safer and more efficient alternative to traditional inspection methods.

Drones can be used to carry out visual inspections of crane components such as fore and back stays, helping to identify issues like corrosion, cracks, or deteriorating paintwork. It is important that inspections are based on a full review of recorded drone footage by a suitably qualified person, rather than relying solely on the live view seen by the pilot.

Terminals adopting this technology should develop specific procedures for drone inspections, covering areas such as flight planning, risk assessment, data review, and coordination with other operations to ensure safety and compliance.

## 27. Crisis management

Container terminals must be prepared to respond effectively to unexpected incidents that may pose significant risk to people, the environment, operations, or infrastructure. For general emergency planning requirements see SiP016 Emergency Planning.

Terminals handling containerised cargo should ensure that procedures are in place to deal with incidents such as fires within stacks, flooding in container parks, or the discovery of leaking containers or tanks. These events may require cordoning off areas, engaging specialist response teams, and activating specific containment or evacuation protocols.

Business continuity risks should also be considered. Failures of IT systems, power outages, or communication breakdowns can severely impact container tracking, gate operations, and control room functions. Plans should identify how key functions can be maintained or recovered in such scenarios, including the use of manual workarounds where appropriate.

Regular testing of emergency procedures, including multi-agency exercises, will help ensure that staff understand their roles and responses are well-coordinated. Container-specific risks should be built into wider port crisis planning and regularly reviewed as part of ongoing risk assessment processes.

## 28. Appendix 1: Safety in Ports guidance

SiP000 Guidance framework
SiP001 Workplace transport – planning & terminals
SiP002 General cargo
SiP003 Container handling
SiP004 Timber handling
SiP005 Mooring operations
SiP006 Transfer of bulk liquids & gases
SiP007 Loading & unloading of dry bulk cargo
SiP008 Storage of dry bulk cargo
SiP009 Lighting
SiP010 Workplace transport – StoRo & RoRo operations
SiP011 Sources of occupational health information
SiP012 Ro-Ro passenger and cruise operations
SiP013 Management of non-permanent employees
SiP014 Safe access and egress
SiP015 Confined spaces in ports
SiP016 Emergency planning in ports
SiP017 Guidance on fitness for work and health surveillance
SiP018 Safety induction and training
SiP020 Water safety
SiP021 Access to small craft
SiP022 Biomass

## 29. Appendix 2: Links referred to in this document

The links contained in this SiP are provided here for ease of reference. Port Skills and Safety has no control over the content of external websites and the documents referred to may move or no longer be available from those organisations.

PSS Port to Haulier campaign materials (PSS members only):
https://www.portskillsandsafety.co.uk/about-us/campaigns/port-to-haulier-communications-2024/

PSS Ship to Port to campaign materials (PSS members only):
https://www.portskillsandsafety.co.uk/about-us/campaigns/ship-to-ports-communication-23-29-october-2023/

Office of Rail and Road (ORR) guidance:
https://www.orr.gov.uk/rail-guidance-compliance

Approved Code of Practice L148 Safety in Docks:
https://www.hse.gov.uk/pubns/books/l148.htm

Managing Health & Safety in Dockwork (HSG 177):
https://www.hse.gov.uk/pubns/books/hsg177.htm

Verification of the gross mass of containers
Verification of the gross mass of a packed container
MSC.1 Circ.1475.pdf

Freight Containers (Safety Convention) Regulations:
https://www.legislation.gov.uk/uksi/1984/1890/contents/made
Lifting equipment at work: a brief guide:
https://www.hse.gov.uk/pubns/indg290.htm

HSE guidance on Handling Containers with Slewing Cranes:
https://www.hse.gov.uk/foi/internalops/sims/cactus/5_05_09.htm

Safety signs and signals. The Health and Safety Regulations 1996. Guidance on Regulations L64:
https://www.hse.gov.uk/pubns/books/l64.htm

BS 7121 – Code of Practice for Safe Use of Cranes – Part 1, General:
Available for purchase from British Standards Institution.

International Maritime Dangerous Goods Code (IMDG):
The International Maritime Dangerous Goods (IMDG) Code (imo.org)

Dangerous Goods in Harbour Areas Regulations Approved Code of Practice and Guidance:
https://www.hse.gov.uk/pubns/books/l155.htm

The Carriage of Dangerous Goods and Use of Transportable Pressure Equipment Regulations (CDG).

Dangerous Substances and Explosive Atmospheres Regulations (DSEAR):
https://www.hse.gov.uk/fireandexplosion/dsear.htm

Measuring competency:
https://www.portskillsandsafety.co.uk/skills/competency-framework/

## 30. Appendix 3: Further information and guidance

These links are provided to enable members to find further information and are correct at the time of publication. Port Skills and Safety has no control over the content of external websites and the documents referred to may move or no longer be available from those organisations.

SiP003 version with photographs (PSS members only)
PSS Container operations hazard and operability (HAZOP) study (PSS members only)

HSE Whole Body Vibration in Ports Information:
https://www.hse.gov.uk/vibration/assets/docs/ports.pdf

Confined Spaces Regulations:
https://www.hse.gov.uk/confinedspace/introduction.htm

Control of Major Accident Hazards Regulations (COMAH)
https://www.hse.gov.uk/comah/

Control of Substances Hazardous to Health Regulations (COSHH)
https://www.hse.gov.uk/coshh/

HSE Docks / Ports page:
https://www.hse.gov.uk/pubns/dockindx.htm

HSE Docks Information sheet - DIS 1: Freeing of jammed containers and container fittings on ships:
https://www.hse.gov.uk/pubns/dis1.pdf

HSE Docks Information sheet -DIS 6: Hot work in docks:
https://www.hse.gov.uk/pubns/dis6.pdf

HSE SIM 05/2005/09 - Handling containers with slewing cranes:
http://www.hse.gov.uk/foi/internalops/sims/cactus/5_05_09.htm

HSE SIM 05/2008/05 – Container top safety frames:
https://www.hse.gov.uk/foi/internalops/sims/cactus/5_08_05.htm
Load Security HSE web page: https://www.hse.gov.uk/logistics/load-security.htm

Recommended minimum safety features for quay container cranes:
https://www.ttclub.com/news-and-resources/publications/article/crane-safety-recommendations/

PEMA paper on fire detection and suppression systems for mobile port equipment:
https://www.pema.org/wp-content/uploads/2024/12/PEMA-IP28-Fire-Detection-Suppression-Systems.pdf