

SIP004 - GUIDANCE ON TIMBER HANDLING





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SIP004

GUIDANCE ON TIMBER HANDLING

INTRODUCTION

The Health and Safety Executive provided support to Port Skills and Safety in producing this guidance, which is aimed at improvements within the Ports industry. This guidance may go further than the minimum you need to do to comply with the law with regard to health and safety.

It is for companies operating in the UK ports industry with responsibility for the safe design, construction, operation, management and maintenance of ports and terminal facilities and management of port and terminal activities. It will also be useful to employees and their representatives.

Following the guidance is not compulsory and you are free to take other action. But if you do follow the guidance you will normally be doing enough to comply with the law. Health and safety inspectors seek to secure compliance with the law and may refer to this guidance. If the guidance goes beyond compliance, then this will be clearly identified.

Regulations in this document are referred to by title but not year, because they are amended from time to time and the reader should always seek the current version. Acts are given a year as they tend to change less frequently. The list of references at the end of this document however does include a year that was correct at the time of publication.



1. REGULATORY FRAMEWORK AND GUIDANCE

- 1.1. The two principal relevant pieces of law are the Health and Safety at Work etc. Act (HSWA) 1974, and the Management of Health and Safety at Work Regulations (MHSWR), which set out the basic requirements to ensure, so far as is reasonably practicable, the health, safety and welfare of all involved.
- 1.2. Port specific, Merchant Shipping and other legislation applies and should be referred to.
- 1.3. Approved Code of Practice (ACOP) L148 'Safety in Docks' was introduced on 6 April 2014: www.hse.gov.uk/pubns/books/l148
- 1.4. The PSS/HSE Safety in Ports guidance suite, available from the PSS website at: www.portskillsandsafety.co.uk/resources is an important supplement to Safety in Docks ACOP L148.
- 1.5. The guidance is aimed at routine operations and does not cover some of the specialised and high-risk activities associated with handling dangerous goods and hazardous cargoes, or major hazards sites which are subject to the Control of Major Accident Hazards Regulations for which specialist advice may be required.
- 1.6. Reference can also be made to the International Labour Organisation's (ILO) Code of Practice on Safety and Health in Ports (ILO 152): www.ilo.org/sector/activities/sectoral-meetings/WCMS_546257/lang--en/index.

2. HEALTH

- 2.1. The wide range of activities in ports can give rise to possible health risks such as exposure to dusty cargoes; back injuries, sprains and strains from lifting and handling, pushing and pulling; noise and vibration. There is specific legislation including the Control of Substances Hazardous to Health Regulations, the Control of Noise at Work Regulations, the Manual Handling Operations Regulations and Personal Protective Equipment at Work Regulations.
- 2.2. While there is reference to some specific health risks in these guidance documents, it is not possible to cover all the issues. Further information and guidance on the identification, assessment and reduction or avoidance of such risks can be found on the HSE website at:
 - Ports web pages: www.hse.gov.uk/ports/index
 - Control of Substances Hazardous to Health: www.hse.gov.uk/coshh/index
 - HSE Whole Body Vibration in Ports Information Paper: www.hse.gov.uk/vibration/wbv/ports
 - Musculoskeletal disorders (MSDs): www.hse.gov.uk/msd/index
 - Noise at Work: www.hse.gov.uk/noise
 - Personal Protective Equipment: www.hse.gov.uk/toolbox/ppe
 - Vibration at Work: www.hse.gov.uk/vibration

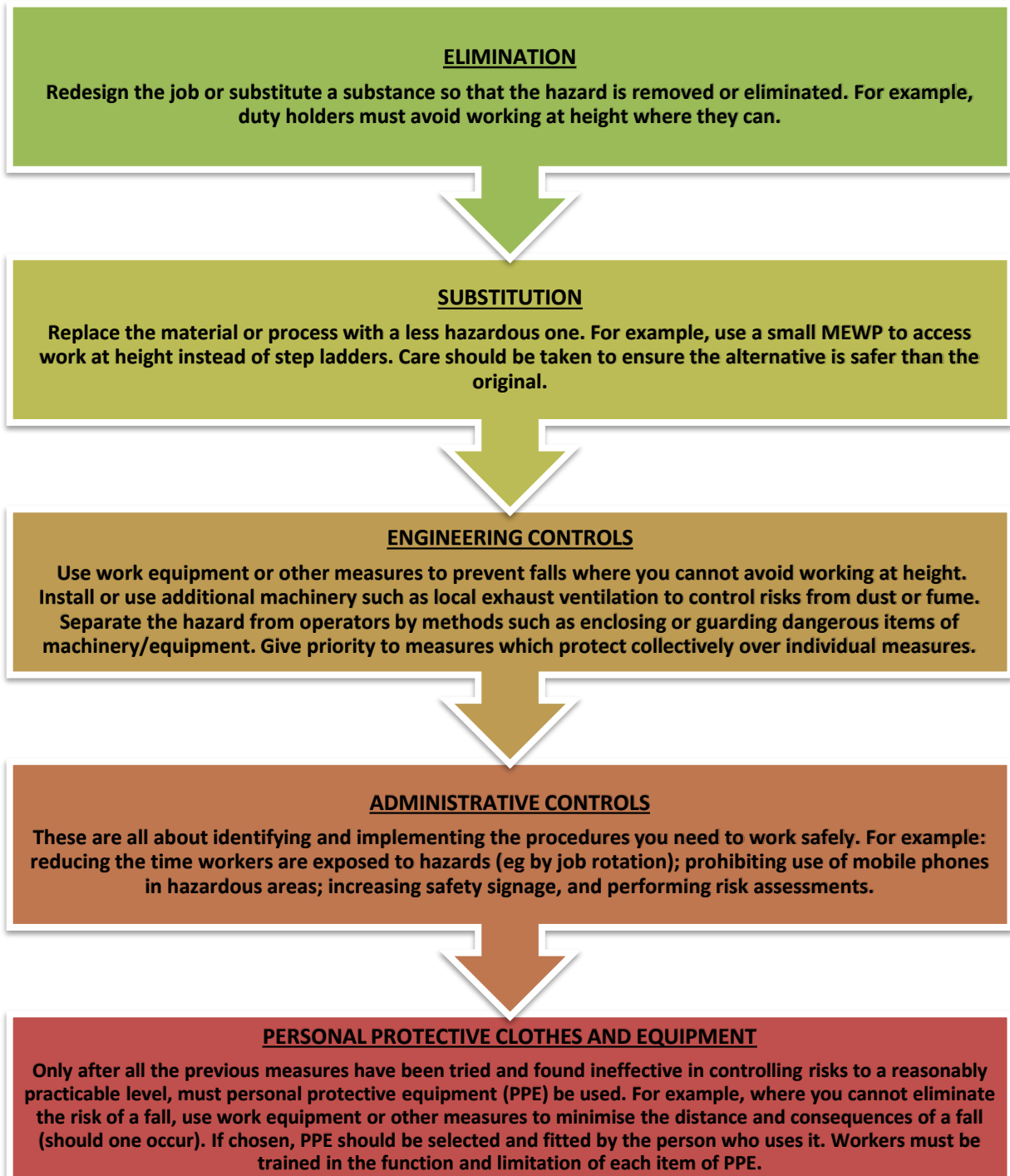


3. *RISK ASSESSMENT*

- 3.1. Risk Assessments must be undertaken in accordance with the Management of Health and Safety at Work Regulations. The risk assessment must consider the risks, not only to permanent employees but also to others including non-permanent employees (NPE's), ship's crew, passengers and visitors that may be affected by the activity. The appropriate control measures must be introduced and should consider collective measures ahead of personal or individual measures.
- 3.2. Risks should be reduced to as low as is reasonably practicable by taking preventative measures in order of priority below. The diagram on page 4 sets out an ideal order to follow when planning to reduce risk.
- 3.3. Risk assessments must be reviewed regularly and immediately after any incident or when there are significant changes to the operation. Most accidents and near misses can be avoided if the risks from the work are suitably and sufficiently assessed and appropriate control methods are adopted.
- 3.4. The risk assessment should record the significant hazards and the risks of the operation together with the relevant control measures. In port operations risk assessments should consider changes such as tidal changes, weather, trim, list, load/cargo and vessel dynamics.
- 3.5. Planning and work execution is discussed in HS(G) 177, Managing Health and Safety in Dockwork: www.hse.gov.uk/pubns/books/hsg177.
- 3.6. The Health and Safety at Work Act 1974 applies on board a ship when shore-based workers are engaged in cargo handling or other tasks on board. Cargo handling may include, but is not limited to, loading, unloading, stowing, unstowing, pouring, trimming, classifying, sizing, stacking, unstacking as well as composing and decomposing unit loads; and also services in relation to cargo or goods such as tallying, weighing, measuring, cubing, checking, receiving, guarding, delivering, sampling and sealing, lashing and unlashng.
- 3.7. The Health and Safety at Work Act 1974 also applies to the Master and ship's crew when working with shore-based personnel on board ship.
- 3.8. Cooperation and coordination between shipside and landside employers is required. Employers must therefore carry out risk assessments and develop safe systems of work (in consultation with the workers involved) that all parties agree to, so that the respective employers can co-operate effectively with each other.
- 3.9. A signed agreement or an agreed and recorded system of work with the master of each vessel is recommended - this is not a legal requirement but may help to ensure effective co-ordination with other parties.



HIERACHY OF CONTROLS



Reference: HSE Leadership and Worker Involvement Toolkit. Available at www.hse.gov.uk/construction/lwit/assets/downloads/hierarchy-risk-controls

3.10. The regulations made under the Health and Safety at Work Act 1974; such as The Management of Health and Safety at Work Regulations; The Lifting Operations and Lifting Equipment Regulations and The Provision and Use of Work Equipment Regulations, do not apply to a master or crew of a ship, or any persons employing them, in relation to safe access, plant and equipment which remain on board the ship and for any undertakings or work which



are carried out on board ship solely by the master and the crew. Instead, the Merchant Shipping Act 1894 and related Merchant Shipping Regulations impose similar duties on board ship in UK territorial waters.

- 3.11. A ship's master has duties under the Health and Safety at Work Act 1974 in relation to the ship's crew who are put ashore to perform their own tasks (for example loading ship's stores or carrying out maintenance work on their ship). Those duties also extend to plant and equipment (for example a forklift truck) which is under the master's control that is used ashore by ship's crew, or when used by shore-based workers ashore or on-board ship

4. *CONSULTATION, COOPERATION AND COORDINATION*

- 4.1. Consultation: Employers have a duty to consult with their employees, or their representatives, on health and safety matters. By gaining worker involvement on health and safety through two-way communication, concerns can be raised and solved together, and views and information can be sought and exchanged in a timely manner.

See HSE pages: Consulting and involving your workers www.hse.gov.uk/involvement/index.

- 4.2. Cooperation and Coordination: Cooperation and coordination between shipside and landside employers is required. Employers must therefore carry out risk assessments and develop safe systems of work (in consultation with the workers involved) that all parties agree to, so that the respective employers can co-operate effectively with each other.

5. *VESSEL ACCESS*

- 5.1. The requirements for safe access to and on vessels are contained within the ACOP Safety in docks (L148) and *SIP014 Safe Access and Egress*.
- 5.2. In general access onto the vessel should be provided by the ship's accommodation ladder or by the ship's gangway. This should be properly rigged and if over water include a safety net. Safe access and egress to the ladder should be maintained shore-side throughout the working of the vessel.
- 5.3. The Supervisor should check that access to/from the vessel and to/from the ships hold or onto deck cargo is in good repair, correctly positioned and in working order before commencement of the operation.

6. *SLINGING AND LIFTING OPERATIONS - GENERAL*

- 6.1. All lifting operations in ports are subject to specific legislation including: The Lifting Operations & Lifting Equipment Regulations (LOLER), The Provision & Use of Work Equipment Regulations (PUWER), The Merchant Shipping and Fishing Vessel (Lifting Operations & Lifting Equipment)



Regulations (MSLOLER), and The Merchant Shipping & Fishing Vessels (Provision and Use of Work Equipment) Regulations (MSPUWER).

- 6.2. So as not to cause confusion with the different terms used to describe lifting equipment, LOLER clearly 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
- 6.3. In the port industry accessories for lifting are sometimes referred to as 'lifting accessories'.
- 6.4. The Regulations aim to reduce risks to people's health and safety from lifting equipment provided for use at work. Generally, the Regulations require that lifting equipment provided for use at work is:
- strong and stable enough for the particular use and marked to indicate safe working loads
 - positioned and installed to minimise any risks
 - used safely, i.e. the work is planned, organised and performed by competent people
 - subject to ongoing thorough examination and, where appropriate, inspection by competent people
- 6.5. Equipment and accessories that are exposed to conditions that can cause deterioration and that could lead to dangerous situations must:
- be thoroughly examined
 - in the case of lifting equipment for lifting persons, or an accessory for lifting, at least every 6 months [note: this also applies to ship's lifting equipment]
 - in the case of other lifting equipment, at least every 12 months
 - in either case, in accordance with an examination scheme; and each time that exceptional circumstances which are liable to jeopardise the safety of the lifting equipment have occurred
 - if appropriate for the purpose, be inspected by a competent person at suitable intervals between thorough examinations
- 6.6. It is essential to identify that all lifting equipment and lifting accessories are within the correct inspection (thorough examination) period. One way of doing this is by using a system of colour coding.
- 6.7. All equipment should be checked by a competent person before use. If there is any doubt as to the suitability of lifting equipment and lifting accessories, they must be removed from use.
- 6.8. 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.

- 6.9. Always have lifting equipment thoroughly examined following 'exceptional circumstances', e.g. if it is damaged or fails, is out of use for long periods, or if there is a major change in how it is used which is likely to affect its integrity.
- 6.10. The frequency of inspection might need to be increased for other reasons for example environmental factors, high frequency of use, etc. This should be identified as part of the risk assessment.
- 6.11. 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.
- 6.12. Further general advice and guidance can be found on the HSE and MCA web pages – see Lifting equipment at work - A brief guide to the law: www.hse.gov.uk/pubns/indg290 and the references at the end of this document.

7. *TIMBER*

- 7.1. Timber cargo may be packaged or loose. Packages may vary in length, weight and size. Packs do not always contain uniform lengths. There are specific terms, used in the docks, for packaged timber including:
 - setts of timber which includes pallet wood, plywood setts etc.
 - truck bundles are packs that consist of sawn timber of varying length. It is normal practice to square off one end to give a flush face. The other end will be irregular, where the differing lengths protrude.
 - length packs have a flush face at each end

8. *HAZARDS*

- 8.1. Hazards associated with the loading and unloading of general cargo include but are not limited to:
 - being struck by work equipment involved in the operation such as lifting equipment, moving cargo, or moving vehicles
 - being crushed against a fixed object such as a ship's bulkhead, a deck support pillar or the cargo stow itself by shifting/falling cargo 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 cargo residue, oils, ice, water, or protective wrapping



- access/egress to and from deck and hold cargo
- falls from height:
 - during ship or cargo access/egress
 - through gaps between adjacent cargo stows
 - from cargo stows at varying heights
 - when working near the edge of cargo stows
- falls on the same level into voids between cargo and bulkheads or wells formed in the cargo stowage
- collapse or shifting of the cargo stow, either before or during handling
- 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*
- potential explosive or hazardous atmospheres
- contact with chemicals or other substances hazardous to health
- being struck by falling objects such as “dunnage” or the cargo itself
- lifting, carrying, handling
- temperature, noise, vibration
- fatigue

8.2. Additional assessments may be required during discharge to take into account things such as damaged or moved cargo, changes in the quality of lifting strops or any other previously unseen condition. Changes to, or further control measures may then be required.

9. *PLANNING FOR SAFE LOADING AND DISCHARGE*

- 9.1. 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, ideally the first time that a new cargo is consigned to a port. 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.
- 9.2. Specific sections of the Approved Code of Practice L148 Safety in Docks address “Planning and Organising of Lifting Operations” and should be consulted. Further information on planning and managing dock operations can also be found in Managing Health & Safety in Dockwork (HSG 177).
- 9.3. 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 co-ordinated, 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

- 10.1. A vessel loading/discharge plan should be available for all but the simplest of loading operations. Plans are usually prepared in consultation with the Master or Chief Officer of the ship and/or 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.
- 10.2. 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 ship's holds at all stages of loading; i.e. there may only be hold ladders fitted at one end of the hold and the load plan should therefore be designed to ensure that access to it does not become restricted or blocked during the cargo handling operation
 - safe means of access and egress to and from the top of cargo stows
 - walking on the top of cargo stows and the transfer of personnel from one stow to another
 - 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
 - all cargo has known weight
 - the 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
- 10.3. It is good practice to consider how the cargo will be discharged in the receiving port. It may be necessary to provide a "key", so that cargo handlers at the port of discharge can break into the stow. This is often a section of cargo that has been "pre-slung" to facilitate safe "breaking in".
- 10.4. The pre-stowage plan should be reviewed and amended as appropriate throughout the operation to reflect possible changes/additions to the cargo or vessel or conditions.



11. SHORING THE CARGO

11.1. The type and quantity of dunnage required for the stow will vary according to the type of cargo and handling equipment. For example, if all cargo is pre-slung then dunnage may not be required. However, in most cases some dunnage will be required, and the following should be considered:

- the suitability of softwood dunnage and its ability to support the weight of heavy or dense loads
- the requirement to provide suitable and sufficient packing or spacers to prevent cargo damage or to cover/fill gaps in the cargo stows
- the suitability of dunnage to protect awkward shaped cargo, e.g. flanged pipes, from contacting the bulkheads and coamings
- the suitability of dunnage and shoring to facilitate safe and secure stowage in non-box shaped holds
- the suitability of dunnage to allow the safe withdrawal of lifting equipment
- provision and maintenance of safe access routes taking into account any shoring and chocking that may be required to leave access to hold ladders/other egress points
- any activities involving the cutting or shaping of dunnage (e.g. use of chainsaws, circular saws etc.) should be undertaken safely following an assessment of the task, see also: www.hse.gov.uk/treework/safety-topics/chainsaw-operator.

12. SPECIFIC ASPECTS OF DISCHARGING

12.1. Ships often arrive for discharge without providing the cargo handler prior notification of how the ship is stowed. Possible factors to be included in a subsequent risk assessment include:

- safe access to and across the cargo
- working at heights due to the cargo being stowed in isolated high stows
- working on uneven cargo stowage, void areas, unstable shoring and dunnaging
- shifted cargo during sea passage
- the potential for cargo shift during discharge
- the condition of lifting accessories associated with pre-slung cargo
- the safety, adequacy and security of dunnage and shoring
- over tensioned securing systems



13. RECORD KEEPING

- 13.1. The risk assessment should record the significant hazards of the operation together with the risk and the proposed relevant control measures.

14. INSPECTING THE LOAD AND LIFTING EQUIPMENT CERTIFICATES

- 14.1. The way in which deck cargo is stowed and secured greatly affects the loading and discharging method and the safety of operatives, especially when deck cargoes of timber tend to be very high and extend across the full width of the deck.
- 14.2. The load should be inspected by the supervisor in control of the operation from a safe vantage position before handling operations commence. The ship's passage to the port should be discussed with the ship's Master (or appropriate ship's officer) before unloading begins to determine if the cargo moved in transit.
- 14.3. If the load has moved or become unstable in some way, for example overhanging the hatch lids, it will need careful consideration of how it can be unloaded safely. There should be a review of the risk assessment and the loading/discharging arrangements. The final decision to commence loading/unloading will remain with the supervisor in control of the cargo handling operation.
- 14.4. In some cases, it may be possible to obtain advanced information about the vessel, the nature of its cargo spaces and any cargo stows from the previous port(s) or from the ship's agent(s). This information should be obtained where appropriate, to facilitate pre-planning of the safe loading and unloading operations.
- 14.5. If ship's lifting equipment is to be used during the cargo operation then before any employer of shore workers authorises their employees to use ships' equipment and accessories, they should arrange for it to be checked before and check any associated certificates of test or thorough examination.

15. CARGO STORAGE AREAS

- 15.1. The condition and location of the site chosen for cargo storage should be fit for purpose and included as part of the risk assessment for the operation. It should be suitable to accept the weights and configurations of the ship's cargo as well as vehicles and equipment used in the operation. It should be checked before unloading begins to make sure it is safe to proceed.
- 15.2. Factors to consider include but are not limited to:
- the ground should be suitable for purpose, of sound construction and well maintained
 - cargo size, cargo weight and the loading this places on the quay



- the characteristics of the cargo being handled such as permissible stack height, quantities and stability
- obstructions in the handling area, waste materials/plastic banding, unused bearers, discarded packaging, other cargo and fixed immovable objects, such as bollards and pillars
- pedestrians being struck by moving vehicles and moving cargo in the handling area; it is essential that all non-authorized personnel are controlled
- lighting conditions
- working in close proximity to other operations or activities, for example, public rights of way and third-party premises/activities
- adverse weather conditions
- means of ignition including smoking, which should be prohibited or controlled according to the risk assessment and cargoes being handled.

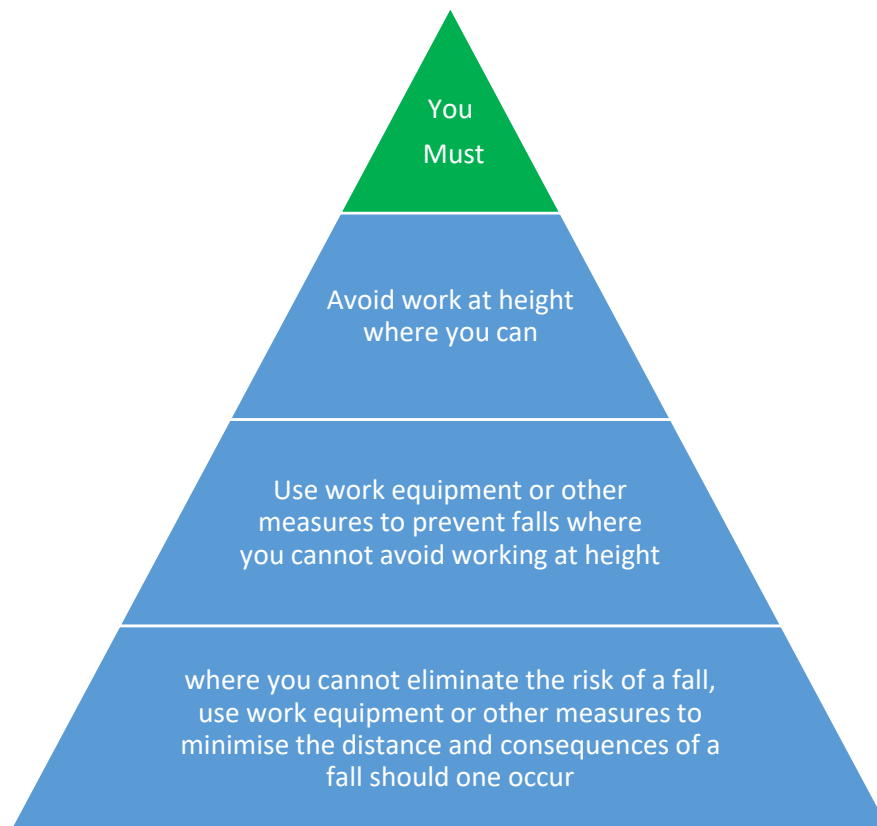
16. *DANGEROUS GOODS*

- 16.1. The requirements of the Dangerous Goods in Harbour Areas Regulations (DGHAR), the International Maritime Dangerous Goods Code, and other relevant legislation, which may apply to the transport, storage or handling of the cargo, must be taken into account.

17. *WORK AT HEIGHT HIERARCHY OF CONTROLS*

- 17.1. *Comprehensive* guidance on reducing risks from work at height, the hierarchy of controls and the use of personal protective equipment such as work restraint systems (fall arrest, fall prevention or work positioning systems) can be found on the HSE website at: www.hse.gov.uk/toolbox/height and in the brief guide to the Regulations www.hse.gov.uk/pubns/indg401, also refer to ACOP Safety in Docks (L148).
- 17.2. The Regulations set out a simple hierarchy for managing and selecting equipment for work at height and for determining how to work at height safely. The hierarchy has to be followed systematically and only when one level is not reasonably practicable may the next level be considered. It is not acceptable to select work equipment from lower down the hierarchy (e.g. personal fall arrest, such as harnesses and lanyards) in the first instance.
- 17.3. Duty holders must:
- avoid work at height where they can
 - use work equipment or other measures to prevent falls where they cannot avoid working at height
 - where they cannot eliminate the risk of a fall, use work equipment or other measures to minimise the distance and consequences of a fall should one occur

- devise a suitable rescue plan



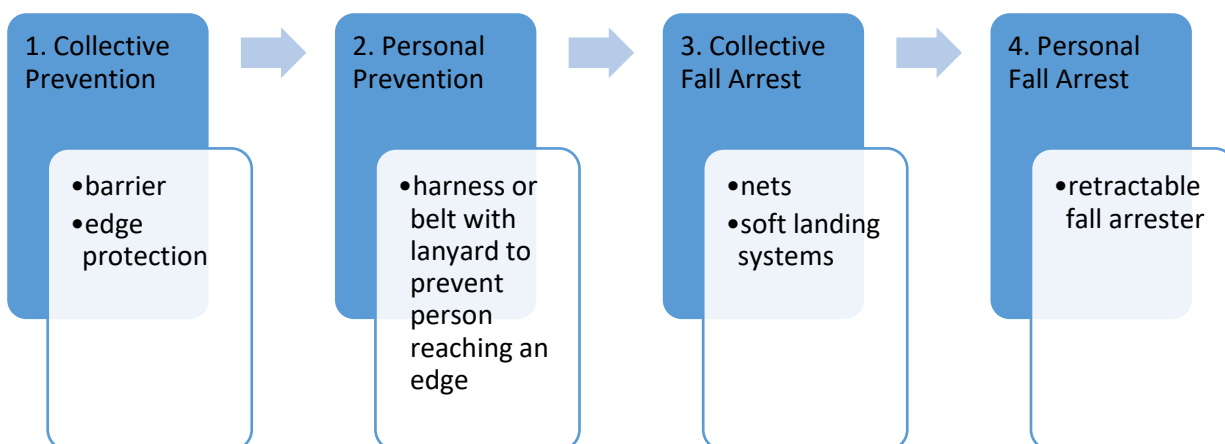
- 17.4. Give consideration to minimise the amount of exposure time and the number of people exposed to work at height.
- 17.5. **Planning:** discussions with customers and ships’ agents at the early planning stage can often reduce or eliminate the risks from working at height. Consideration should be given to the type, shape and size of vessel, the configuration of cargo stows at point of loading, splicing cargo to eliminate gaps at the end of stows.
- 17.6. The ship should be loaded or discharged in such a manner to reduce the risk of falls to the lowest level reasonably practicable. It should be borne in mind that the height and configuration of the cargo stow is constantly changing and therefore so is the risk. When loading, consideration should be given to aid safe discharge at the next port.

18. *USE OF WORK EQUIPMENT FOR WORK AT HEIGHT*

- 18.1. Where work at height cannot be avoided, for example stows for load or discharge with one or multiple sheer drops, the next level in the hierarchy of controls is use of work equipment or other measures to prevent falls. The risks associated with working at height must be assessed and:

- fall **prevention** should be applied in **preference** to fall **arrest**
- **collective control measures** such as physical barriers or other types of edge protection **should be used in preference to personal control measures**

- 18.2. Where collective prevention is not reasonably practicable, consider personal methods of preventing falls, such as a harness or belt in conjunction with lanyard of fixed or adjustable length, which prevent a person from reaching an unprotected edge.
- 18.3. If access to the edge cannot be prevented then fall **arrest** systems must be considered, with priority given to collective measures such as soft-landing systems and nets before retractable personal fall arresters.
- 18.4. Order of consideration when using work equipment or other measures to prevent falls where work at height cannot be avoided:



- 18.5. All fall prevention/arrest systems and equipment should be adequately maintained in line with the manufacturer's recommendations and inspected before use, including soft landing systems.
- 18.6. Users of personal fall prevention/arrest systems and equipment require higher levels of training and appropriate close supervision. Refer to HSE and manufacturers' guidance on selecting, using and maintaining personal fall protection equipment to ensure that the right type of fall protection equipment is used.

19. COLLECTIVE FALL ARREST MEASURES

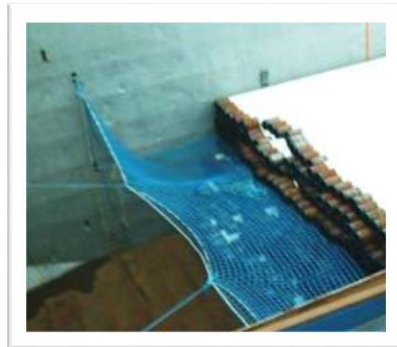
- 19.1. Where it has been necessary to provide fall arrest measures priority should be given to collective methods, such as nets/soft landing bags, over personal arrest methods. It may be appropriate to leave these measures in place to assist the safe discharge of the cargo at the discharge port. Where you are the discharge port then the documentation for the fall arrest equipment should be checked and an appropriate examination of its condition and anchorage points should be undertaken by a competent person before discharge commences.

20. *USE OF NETS*

20.1. The use of nets often creates additional Work at Height issues during erection, adjusting of height and removal, which also have to be included as part of the overall risk assessment when deciding if they are the most appropriate control method to be used.

20.2. Factors to consider when using nets include:

- anchor points – these should all be tested and certified
- tension required and fall height – this is determined through calculation and may require specialist advice
- how to adjust the height – if the cargo is being built up or discharged
- means of rescue – if somebody falls into the net



Examples of safety nets in place

21. *SOFT LANDING SYSTEMS*

21.1. There are a number of different types of soft-landing systems available. Points to consider when choosing the appropriate soft-landing system include:

- the manufacturer's recommended maximum fall height onto soft landing system. When considering any fall arrest system, you should aim to reduce the fall height as much as possible
- safe positioning of equipment in the ship's hold
- linking soft landing bags together to prevent movement in the event of a fall
- safe retrieval of soft-landing equipment – if used during loading then consider leaving them to aid a safe discharge
- the ability to store the system as per manufacturer's specifications
- Inspection and maintenance requirements



Examples of soft-landing systems in place

22. PERSONAL FALL ARREST SYSTEMS

- 22.1. Many retractable type fall arresters are only designed to work in the vertical plane, where the anchor point is directly above the user. Any force on the fall arrester then acts in a direct vertical line between the user and the anchor point.
- 22.2. If a vertical plane device is used in a plane other than vertical there is a risk of:
- the braking mechanism not working
 - the anchor line passing over an angular or sharp edge that could cause the line to part (break)
- 22.3. Where there is a risk of a fall arrest line parting as result of a fall over an edge, additional controls must be considered, for example protecting the edges and lines themselves.
- 22.4. Some retractable type fall arresters may be suitable for use in non-vertical planes (where the anchor point is not directly above the user). It is the responsibility of the duty-holder to ensure that the equipment is suitable for use. In case of doubt the manufacturer should be consulted.
- 22.5. Fall arrest blocks **do not** act as a safe means of restraint and will not prevent a fall over an edge unless they are at their full extension. If using this technique, careful consideration should be given to the dimensions of the workplace so that a fall cannot occur. Remember that in the hierarchy of controls means of fall prevention, such as a fixed and suitable length lanyard to prevent a fall, are preferred over fall arrest.
- 22.6. Other hazards and risks apply to the use of anchor line and harnesses in association with fall arrest systems including:
- hitting the ground in the event of a fall if the lanyard is too long for the height being worked.
 - swinging from side to side after a fall (sometimes known as the pendulum effect); hitting the side of an object or lifting equipment causing impact injuries. The longer the length of the fully extended anchor line, the greater the risk of the pendulum effect occurring.



- injury may be sustained through an incorrectly fitted and adjusted harness.
- being left suspended in mid-air following a fall can affect blood circulation and can be fatal. For more information, please visit: www.HSE.gov.uk/firstaid/whats-new/harness.

22.7. A suitable onsite rescue plan covering emergency measures must be in place to ensure a prompt response to a fall situation. The plan should not solely rely on the Emergency services. Ensure that those involved in the rescue are not put at risk. See also *SIP016 Emergency Planning in Ports*.

23. *SAFE BY POSITION*

- 23.1. The Work at Height Regulations do not set a minimum safe distance from an open edge where there is a risk of persons falling.
- 23.2. 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 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.
- 23.3. If you are 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, e.g. uneven cargo stowage
 - increasing the level of supervision
 - human factors
- 23.4. Human factors research has found that people cannot concentrate on any task for 100% of the time and that during those lapses in concentration they can inadvertently encroach too close to an open edge with the risk of falling.
- 23.5. All personnel involved in working at height are required to be competent. This means that they need to have the necessary knowledge, skills and experience to do the work. This should include adequate instruction and training in how to work safely at height and in the selection and use of appropriate control measures. Training should be a combination of theoretical and on the job training.



24. ACCESS TO CARGO

- 24.1. Personnel should not be put at risk of falling. If a safe means of access to the cargo or cargo hold is not available, consideration should be given, subject to a risk assessment and in accordance with the Work at Height Regulations, for the provision and use of alternative access arrangements. An appropriately rated personnel carrying cage, lifted by crane in accordance with the requirements of the Lifting Operations and Lifting Equipment Regulations is an example of a suitable alternative access arrangement.
- 24.2. Under normal circumstances people should not be lifted or travel on any suspended or moving load. There are some instances such as lifting a boat out of water where it may be acceptable.
- 24.3. Access across cargo stows presents the risk of slips, trips or falls. Particular care should be taken not to step into or jump over any gaps. When working on cargo that has a curved or uneven surface, for example, pipes, rails or constructional steel, consideration should be given to the use of suitable wooden staging boards (Youngman's type), aluminium walkways or other suitable methods.
- 24.4. The risk of slips, trips and falls when walking across cargo stows may be increased when adverse weather conditions prevail e.g. extremes of high temperature, snow, ice and rain. Cargoes arriving during the winter months or from Baltic Ports, for example, may be covered in ice. The risk of slipping / tripping / falling may be reduced by wearing appropriate footwear for example with studs or chains. The choice of footwear should consider individual circumstances and potential damage caused to the cargo. Other options may include: de-icing / clearing cargo tops or waiting for improved conditions. Particular care should also be taken when walking on wrapped cargoes, particularly when wet, as this type of stow can be very slippery.

25. SLINGING AND LIFTING LOADS – PREPARATION AND PLANNING

- 25.1. A formal lifting plan for the operations should be provided and maintained by an Appointed Person.
- 25.2. Fixed quayside cranes, ships cranes or derricks and mobile cranes are commonly used to load and unload cargoes; lifting equipment and lifting accessories should be included in lifting operation risk assessments.
- 25.3. Procedures should be established and followed for the selection and use of suitable lifting equipment and accessories; certain lifting operations may require specialist training and/or advice.
- 25.4. Lifting operations must be planned by a competent person, who should have adequate practical and theoretical knowledge and experience of planning lifting operations.



- 25.5. Lifting equipment and accessories should be suitable for the task and arrangements should be in place to ensure that necessary lifting equipment and accessories are available for the operation.
- 25.6. A competent person should ensure that the strength and stability of the lifting equipment and accessories continues to be adequate for the task for which the equipment is intended.
- 25.7. A visual check of all lifting equipment and accessories to be used should be carried out by a competent person prior to use. Lifting accessories which show signs of damage must be segregated from the operation for further examination, repair or disposal. If there is any doubt over the integrity of any lifting equipment or accessory, it should not be used.
- 25.8. When selecting lifting equipment and accessories to handle cargo that has been stowed unprotected, allowance should be made for products that may have absorbed moisture; absorbed moisture can significantly increase the nominal weight of the cargo/pack.
- 25.9. The weight of the cargo to be lifted should be confirmed or estimated so that the Safe Working Load (SWL) of the lifting equipment and accessories will not be exceeded.
- 25.10. Suitable lifting accessories should be selected where a cargo has sharp edges and there is a risk of the cargo cutting into the slings or the slings damaging the cargo.
- 25.11. Lifting accessories (including pre-slung cargo and one trip slings) should also be checked for damage by the slingers before attaching the load.
- 25.12. Before sending cargo or handling equipment into or out of a vessel the load should be test lifted so that the total weight is taken up by the lifting equipment. This will result in the load “floating” and a check can then be made of the balance, stability and general security of the load from a relatively safe position. If there are any doubts about the safety and security of the lift, then the load must be set down and the lifting accessories re-positioned followed by further “re floating” and re-checking.
- 25.13. Different methods of slinging (e.g. ‘knotting’) may reduce the SWL and should not be used.
- 25.14. Slingers should be competent in the selection and use of equipment and safe slinging methods appropriate to the cargo.
- 25.15. Slingers should be made fully aware that if there is any doubt over the integrity of any sling then it should not be used and the issue should be reported to the supervisor or person in charge of the operation.
- 25.16. A suitable landing site should be prepared as part of the pre-planning stage of any lifting operation. The site should be kept free of debris to minimise slips, trips and falls during the unloading operation and a final clear-up should leave the area clean and ready for future use.



26. *SLINGING AND LIFTING LOADS – OPERATIONS*

- 26.1. Loads must be held securely by the lifting accessories.
- 26.2. Loads should be slung so that they will not suffer collapse, change of form or posture or internal displacement when subjected to shock loading, swings or bumps.
- 26.3. Loads should not damage or be damaged by the lifting accessories.
- 26.4. As a general principle: “the load should be as safe in the air as it was on the ground”.
- 26.5. Lifting/spreader beams may be required where there is a danger of the lifting accessories coming together allowing the load to become dangerously unstable or where the angles created by the lifting accessories are so excessive as to exceed SWL and prevent safe lifting. The purpose of the spreader is to even the strain upon the single legs of the accessories, to avoid the effect of excessive angles and to protect the load from damage. Single items should not be lifted on one end of a spreader beam.
- 26.6. Lifting/spreader beams are also useful when lifting long pieces of cargo such as girders or pipes. The basic principle is that the lifting spreader beam should be at least one third the length of the cargo to be lifted.
- 26.7. Long pieces of cargo should always be lifted so that the lift is balanced; “dipped” lifts should be avoided.
- 26.8. Operatives involved in slinging must be in a place of safety during lifting operations.
- 26.9. No one should stand on or under the load at any time.
- 26.10. The lifting route should be planned to avoid cargo passing over hazardous plant and/or other material to minimise possible secondary hazards from impact.
- 26.11. If a crane operator or banksman are unsure that operatives are not in a safe position then the lift should be stopped until it is safe to continue.
- 26.12. The duty holder must take all practicable steps to avoid people being struck by loads or lifting equipment and do not lift over people. Lift should not take place over areas where people are likely to be working or passing where this can be avoided.
- 26.13. Loads must not be suspended over occupied areas.
- 26.14. Where the integrity of a load is compromised a safe method of re-slinging must be devised by a suitably competent person. The safe method should ensure that operatives are not put at risk while re-slinging is undertaken.
- 26.15. Housekeeping standards and arrangements should be included in the safe system of work to ensure that the work area is maintained clear of items which may present risks such as slips, trips and falls.



- 26.16. Vessel roll should be included in the risk assessment, as this has the potential to affect cargo stability, particularly round cargoes such as pipes and coils. The potential for other cargo movement may be also exacerbated when heavy loads are lifted into or out of adjacent hatches or using ships lifting equipment Ranging of the vessel whilst on the berth e.g. longitudinal movement caused by other passing vessels should also be considered.
- 26.17. When multiple packages are to be slung consideration should be given to the use of cargo nets, netted pallet trays or cargo bins.
- 26.18. Both lifting equipment and lifting accessories must be monitored during use and if there is any doubt as to their suitability they must be removed from use. This is in addition to , any equipment or accessories used to lift personnel should have a pre-use check.
- 26.19. Where necessary, suitable and adequate bearers should be used for landing the cargo.
- 26.20. Pack integrity may be affected by damage to banding or insufficient banding. Such packs should be set aside for re-banding before being discharged.
- 26.21. ‘Reeving’ (passing a rope or rod through a ring or other aperture) a single wire or sling should be avoided where possible where there is a danger of the cargo slipping from the sling (spearing).
- 26.22. Where slings come in different lengths, one sling may be required to be shortened using an appropriate method, adding knots into a sling is not considered a safe method of shortening. When shortening is required, the lifting plan should be reviewed.
- 26.23. Multi-bundle slinging should avoid varying sizes of bundle.
- 26.24. Unless a suitable spreader is used, standard packs (e.g. of timber) should be lifted out side by side and not end on, as this can result in one pack swinging around with some force to lie alongside the other causing a trapping hazard. The exception to this is with pallet wood packs which are virtually square when looked at from above.
- 26.25. Endless slings are the preferred type for timber as this prevents the need to lean or climb over the load to find the eye.
- 26.26. When operators are removing slings from cargo, consideration should be given to where they are placed on the quay to prevent them being at risk from suspended loads and vehicle movement.
- 26.27. When handling cargo in packs, unloading of the cargo (especially on deck) should (whenever practicable) start from the middle packs, leaving the outside packs as a barrier to minimise the risk of a fall from the stow.
- 26.28. When removing the outside packs, cargo/slings should be suitable for the operation:
- endless slings are the preferred option
 - alternatively, sling eyes should be left in a retrievable position



- wire pull throughs' may be used

27. *VESSEL LIFTING EQUIPMENT AND ACCESSORIES*

- 27.1. 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.
- 27.2. 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.
- 27.3. Employers should make pre-use checks concerning the safety of the ships lifting equipment so far as it is within their control.
- 27.4. Where appropriate there should be a period of familiarisation on the specific equipment concerned before putting into use.

28. *MULTIPLE TRIP SLINGS*

- 28.1. Where multi-trip slings are removed and sent back to the consignor for re use then such slings must comply with LOLER and be subject to an examination scheme. When such a cargo arrives at the port, it is recommended that each sling be visually inspected by a competent person and subject to a test lift prior to unloading. If there is any doubt in the integrity of the slings, then the load should be re-slung.
- 28.2. Labels on multi-trip slings should include sufficient information to identify the slings and ensure a safe lift. Typically, the following information will be found on a sling:
- safe working load in straight lift in the case of single leg or endless slings, or for multi-leg slings having an angle of 0° to 45°
 - material, e.g. manila, polyester etc.
 - reference number of the sling and grade of fittings
 - nominal length in meters
 - manufacturer's name, symbol, trade mark or other unambiguous identification
 - a traceability code
 - number and part of BS, EN or similar compliant standard



29. *PRE-SLUNG CARGO AND SINGLE (ONE) TRIP SLINGS*

- 29.1. Pre-slung or one-trip slings travel with and are often permanently attached to the primary load carrying device, or the load itself. Examples include: bulk bags, big bags, forest products, steel, glass or specialised machinery.
- 29.2. Despite often displaying a SWL, one trip slings:
- do not tend to be labelled with the requirements of re-usable slings
 - do not typically match the international colour codes for the materials used
 - are often missing identification batch numbers
 - do not typically have traceability to relevant test standards (BS EN 1492; ANSI B30.9 etc.)
- 29.3. The test rating of multi-trip slings is 7:1 but one trip slings are often much less. As such, these slings must be destroyed on arrival at their final destination and neither re-used nor returned to the ship/consignor. If there is any question in the integrity of the slings, then the load should be re-slung by a person competent to do so.
- 29.4. One-trip slings should be disposed of at the end of the trip and should never be reused.

30. *HEAVY OR SPECIALISED LIFTS*

- 30.1. Whether lifted by ship's cranes, heavy-lift derricks, mobile harbour cranes or other cranes, heavy or specialized lifts require detailed planning. Points to consider include:
- availability of a lifting plan
 - the known or calculated weight of the load to be lifted
 - the load must be lifted evenly, taking into account the centre of gravity thus avoiding additional stress on the lifting equipment
 - knowledge of any size/shape restrictions for landing and subsequent transport from the loading area
 - the use of any specialised equipment or personnel
 - the safe working load of all lifting equipment and lifting appliances to be used
 - instructions for assembling lifting frames for awkward sized or shaped loads
 - test certification and/or method statements for lifting equipment supplied by the cargo manufacturers, shippers or receivers
 - the method of attaching the lifting equipment to the load
 - safe access and egress for personnel attaching and removing the lifting equipment
 - the effects of vessel roll and other cargo stability
 - the requirement for specialist transport
 - the management of vehicle movement on the quayside



- the load capacity of the quayside and storage area
- quayside pad loadings for large mobile cranes
- specialised safe systems of work for tandem lifting
- whether the lifting equipment has to remain with the load on voyage
- the need to review the risk assessment if operations have to be adjusted after the original planning stage

31. *INFORMATION, INSTRUCTION, TRAINING AND SUPERVISION*

- 31.1. All persons engaged in work must be trained and assessed as competent for the role that they are required to perform by a competent person. These persons must have their fitness for work assessed against the requirements for each task being performed and consideration should be given to the requirement for a drug and alcohol monitoring system to be in place.
- 31.2. All persons involved in handling operations must: be provided with adequate information, instruction, training and supervision. This is particularly important where Non-permanent employees (NPEs) are utilised who may be generally competent but have limited experience of the particular lifting operation or type of cargo to be handled.
- 31.3. All persons involved in handling must know who is in control of the operation. This is particularly important where NPEs are working alongside permanent employees.
- 31.4. The banksman is a crucial role within any lifting and slinging operation, it is important that they are trained, knowledgeable and have a thorough understanding of the task and activity to be deemed competent. The banksman should not be engaged in any other activities during any part of the lifting operations.
- 31.5. Supervisors should be trained, competent and experienced in the safe lifting and slinging practices associated with the load(s) to be handled and/or have access to relevant competent advice and assistance.
- 31.6. For routine lifting operations the planning of each individual lifting operation will usually be a matter for the people using the lifting equipment such as the slinger or equipment operator. The person carrying out this part of the planning exercise should have appropriate knowledge and expertise.
- 31.7. The “Load Handler” or “Slinger” should have the necessary competence to select suitable accessories. They should receive adequate information and have practical experience on the principles of:
- selection, use, care and maintenance of lifting accessories;
 - limitations of use
 - methods of slinging loads
 - methods of rating multi legged slings
 - interpretation of markings on lifting accessories

- de-rating of lifting accessories for particular weather conditions
- SiP13 Management of non-permanent employees

32. COMMUNICATION

- 32.1. 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.
- 32.2. 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 secure position, where he can see the path of the load and also be in a position, wherever possible, where he 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.
- 32.3. 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.
- 32.4. 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.



Emergency Stop signal

33. GENERAL CARGO HANDLING PLANT

- 33.1. Plant used in handling general cargo may include:
- lift trucks of varying sizes and associated attachments
 - tractor units/internal movement vehicle (IMV)
 - roll-trailers



- 33.2. All mobile plant used for the movement of cargo should be suitable for the operation. Operators must be trained, competent to an agreed standard and authorised. This also includes the hiring of third parties.
- 33.3. When using handling plant such as lift trucks it is essential to consider:
- the type and capacity of the lift trucks including safe operating height as well as the size and spread of the forks
 - the height of the stow
 - hazards associated with working down to a halfway point in a stow
 - the suitability of the surface on which lift trucks will be expected to operate on
 - the provision of 'running in' plates where the operating surface is unsuitable for vehicle working
 - safe means of access and egress to the workplace
 - the construction of the vessel where hazards may be introduced by deep hatch wings, overhangs, 'tween decks, corrugated bulkheads, cargo lockers, deep tanks etc.
 - lighting levels.
- 33.4. Further information:
- Rider-operated lift trucks: www.hse.gov.uk/pubns/books/l117
- 33.5. Where cargoes are not pre-slung, or where slings are being applied on the quay, operators may use the forks of a suitably rated lift truck to raise the cargo high enough to allow slings to be placed underneath. This should be considered in the risk assessment.
- 33.6. In situations where handling equipment such as lift trucks have to be operated on top of cargo and there is a risk of overturning and/or damage to the trucks (caused by the gaps created in the cargo stows) then the gaps must be covered by suitable plates (often called "running in plates"). To minimize the possibility of vehicle skidding anti-slip materials can be used on the plates. It is also good practice to paint the edges of steel plates so they are more visible.
- 33.7. Where lift trucks or similar plant are lifted on board vessels for use on the vessel, they should be fitted with certified lifting points.
- 33.8. When cargo is being transported by roll-trailer or similar equipment, cargo stability and security whilst positioned on the trailer must be considered.
- When people and plant are working together in close proximity in the hold of a vessel or on a quayside, suitable controls should be in place to protect pedestrians from vehicle movement. It is essential that the driver remains aware of where operatives are and that operatives stay well clear of the plant working area.

RELEVANT LEGISLATION AND GUIDANCE

Relevant legislation and guidance include the following. Please note that these are the correct versions at the time of publishing but the reader should always seek out the most current version.

The current versions of other PSS Safety in Ports Guidance documents can be found at: www.portskillsandsafety.co.uk/resources

- BS 7121, “Safe Use of Cranes”, Code of Practice Part 1 – General
- Code of Safe Working Practices for Merchant Seafarers (COSWP): www.gov.uk/government/publications/code-of-safe-working-practices-for-merchant-seafarers
- Control of Major Accident Hazards Regulations (COMAH) 2015: www.hse.gov.uk/comah
- Control of Substances Hazardous to Health Regulations (COSHH) 2002: www.hse.gov.uk/coshh/index
- Control of Vibration at Work Regulations 2005: www.hse.gov.uk/pubns/indg175
- Confined Spaces Regulations 1997: www.hse.gov.uk/pubns/indg258
- Dangerous Substances and Explosive Atmospheres Regulations (DSEAR) 2002: www.hse.gov.uk/fireandexplosion/dsear
- Dangerous Goods in Harbour Areas Regulations 2016
- The Electricity at Work Regulations 1989 and guidance on electrical safety: www.hse.gov.uk/electricity/index
- Health and Safety at Work etc Act 1974: www.hse.gov.uk/legislation/hswa
- Health and Safety (Safety Signs and Signals) Regulations 1996; inc. schedule 1: www.hse.gov.uk/pubns/priced/l64
www.opsi.gov.uk/si/si1996/uksi_19960341_en_2
- HSE Whole Body Vibration in Ports Information Paper: www.hse.gov.uk/vibration/wbv/ports
- www.England-legislation.hmso.gov.uk/si/si1988/Uksi_19881637_en_1
- International Labour Organisation’s (ILO) Code of Practice on Safety and Health in Ports (ILO 152): www.ilo.org/safework/info/standards-and-instruments/codes/WCMS_107615/lang--en/index
- Lifting Equipment at Work: A Brief Guide: www.hse.gov.uk/pubns/indg290

- Lifting Operations and Lifting Equipment Regulations (LOLER) 1998: www.hse.gov.uk/pubns/priced/l113
- Lift Truck Guidance (HSE): www.hse.gov.uk/workplacetransport/lift-trucks/index
- Management of Health and Safety at Work Regulations 1999: www.hse.gov.uk/pubns/priced/l21
- Managing Health and Safety in Dockwork HS(G) 177: www.hse.gov.uk/managing/index
- Merchant Shipping and Fishing Vessel (Lifting Operations and Lifting Equipment) Regulations (LOLER) 2006: www.opsi.gov.uk/si/si2006/20062184
- Merchant Shipping and Fishing Vessel (Provision and Use of Work Equipment) Regulations (PUWER) 2006: www.legislation.gov.uk/uksi/2006/2183/pdf/uksi_2062183_en
- Merchant Shipping (Hatches and Lifting Plant) Regulations 1988: www.England-legislation.hmso.gov.uk/si/si1988/Uksi_19881639_en_1
- Merchant Shipping (Safety at Work) (non-UK Ships) Regulations 1988: www.opsi.gov.uk/si/si1988/Uksi_19882274_en_1
- Musculoskeletal disorders (MSDs): www.hse.gov.uk/msd/index
- Noise at Work: www.hse.gov.uk/noise
- Personal Protective Equipment: www.hse.gov.uk/toolbox/ppe
- Ports web pages: www.hse.gov.uk/ports/index
- Provision and Use of Work Equipment Regulations (PUWER) 1998: www.hse.gov.uk/pubns/priced/l22
- Rider-operated lift trucks: www.hse.gov.uk/pubns/books/l117
- Safety in Docks ACOP L148: www.hse.gov.uk/pubns/books/l148
- Safety in Ports (SiP) Guidance Suite: www.portskillsandsafety.co.uk/publications/safety_in_ports_sip_guidance_suite_all_18_documents
- Safe Stacking of Sawn Timber and Board Materials, HSE information sheet – Woodworking Sheet No. 2, 2001: www.hse.gov.uk/pubns/wis2
- Vibration at Work: www.hse.gov.uk/vibration
- WAIT - (Work at height Access equipment Information Toolkit): www.hse.gov.uk/work-at-height/wait/index

- Work at Height Regulations 2005 www.hse.gov.uk/work-at-height/index
- Work at Height Safety Association www.wahsa.org.uk/technical-guidance



Raising Standards in UK Ports

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