



SIP008 – GUIDANCE ON THE STORAGE OF DRY BULK CARGO



DISCLAIMER

This guidance has been produced by the ports industry, with assistance from the Health and Safety Executive, to help those who owe duties under health and safety legislation to identify key risks. This guidance also gives examples of good practice, which duty holders can use to inform their risk assessments and procedures.

Ports and the activities which take place there vary. Employers and any other duty holders must comply with the legal duties imposed on them by health and safety legislation, including the Health and Safety at Work Act 1974. This will also involve careful and continuing risk assessments to enable duty holders to plan, implement, manage and review policies and procedures which address the risks associated with the conduct of their business.

Although this guidance refers to existing legal obligations, duty holders are not obliged to follow it. However, a duty holder which does follow the guidance will normally be doing enough to help it to meet its legal obligations.

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1 INTRODUCTION

- 1.1 This guidance document has been developed for use by companies operating in the UK ports industry, with responsibility for the safe design, construction, operation and maintenance of port facilities and management of port activities. The guidance is not exhaustive, but is intended to make the reader aware of current regulation and best practice, and to support the production of company and site specific safety policies, safe systems of work, asset maintenance and renewal and ongoing training and competence.

2 REGULATORY FRAMEWORK AND GUIDANCE

- 2.1 The two principal statutes governing the application of health and safety law in the UK are the Health and Safety at Work etc Act (HSWA) 1974, and the Management of Health and Safety at Work Regulations (MHSWR) 1999, which set out the basic requirements to ensure, so far as is reasonably practicable, the health, safety and welfare of all involved.
- 2.2 Other port specific legislation includes the Docks Regulations 1988 (much of which has been repealed and replaced by more recent generic legislation), the Dangerous Substances in Harbour Areas Regulations (DSHAR) 1984 and the Loading and Unloading of Fishing Vessels Regulations 1988.
- 2.3 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 1999.
- 2.4 Further advice and guidance on specific topics can be found on the HSE website at www.hse.gov.uk and includes specialised advice on the following:
- The Dangerous Substances and Explosive Atmospheres Regulations (DSEAR) 2002
<http://www.hse.gov.uk/fireandexplosion/dsear.htm>
 - The Control of Major Accident Hazards Regulations (COMAH) 1999
<http://www.hse.gov.uk/comah/>
 - The Electricity at Work Regulations 1989 and guidance on electrical safety
<http://www.hse.gov.uk/electricity/index.htm>
- 2.5 Reference can also be made to the International Labour Organization's (ILO) Code of Practice on Safety and Health in Ports (ILO 152)
<http://www.ilo.org/public/english/dialogue/sector/techmeet/messhp03/messhp-cp-b.pdf>

3 HEALTH

- 3.1 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 (COSHH) 2002, the Noise at Work Regulations and the Manual Handling Regulations.
- 3.2 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 <http://www.hse.gov.uk/docks/index.htm>
 - Control of Substances Hazardous to Health <http://www.hse.gov.uk/coshh/index.htm>
 - Noise at Work <http://www.hse.gov.uk/noise/index.htm> and
 - Musculoskeletal disorders (MSDs) <http://www.hse.gov.uk/msd/index.htm>
 - Control of Vibration at Work Regulations 2005
<http://www.hse.gov.uk/pubns/indg175.pdf>
 - HSE Whole Body Vibration in Ports Information Paper
<http://www.hse.gov.uk/vibration/wbv/ports.pdf>

4 RISK ASSESSMENT

- 4.1 Risk Assessments must be undertaken in accordance with the Management of Health and Safety at Work Regulations 1999. 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 and anyone else that may be affected by the work activity. The appropriate control measures must then be put in place and should consider collective measures ahead of personal or individual measures.
- 4.2 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.
- 4.3 The risk assessment should record the significant hazards of the operation together with the relevant control measures.

- 4.4 Planning and work execution is discussed in the HSE Publication HSG177, Managing Health and Safety in Dockwork.

5 LIFTING AND SLINGING OPERATIONS

- 5.1 All lifting operations in ports are subject to specific legislation including The Lifting Operations & Lifting Equipment Regulations (LOLER) 1998, The Provision & Use of Work Equipment Regulations (PUWER) 1998, The Merchant Shipping and Fishing Vessel (Lifting Operations & Lifting Equipment) Regulations (MSLOLER) 2006, and The Merchant Shipping & Fishing Vessels (Provision and Use of Work Equipment) Regulations (MSPUWER) 2006.
- 5.2 In the main, LOLER replaced existing legal requirements relating to the use of lifting equipment, such as The Docks Regulations 1988 and The Lifting Plant and Equipment (Records of Test and Examination etc) Regulations 1992. On board vessels, MSLOLER replaced The Merchant Shipping and Fishing Vessels, (Lifting Hatches and Lifting Plant) Regulations, 1988.
- 5.3 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 or machinery for lifting or lowering loads and includes the attachments used for anchoring, fixing or supporting it
 - "*accessory for lifting*" or "*lifting accessories*" means work equipment for attaching loads to lifting equipment or machinery for lifting
- 5.4 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
- 5.5 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
- 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

5.6 It is good practice to identify that all lifting equipment and lifting accessories are within the correct inspection period by use of colour tags.

5.7 If there is any doubt as to the suitability of lifting appliances and lifting accessories, they must be removed from use. The term “load” within LOLER includes lifting a person and it is good practice prior to lifting personnel to undertake a daily pre-work inspection of the equipment and accessories concerned.

5.8 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.

5.9 Further general advice and guidance can be found on the HSE and MCA web pages – see A simple guide to LOLER <http://www.hse.gov.uk/pubns/indg290.pdf> and the references at the end of this document

6 STORAGE AND MANAGEMENT OF DRY BULK CARGO

6.1 Ports in the UK handle a wide variety of dry bulk cargoes in shipments of varying sizes from hundreds to many thousands on tonnes. These cargoes and their safe handling and storage present a number of challenges if these operations are to be safely conducted and in a manner that complies with legislative requirements. In addition to safety considerations the impact of such cargoes on the environment can be significant.

6.2 The loading and unloading of a ship remains an area of the operation presenting many hazards and is dealt with in a separate guidance document (SIP007). However, the storage forwarding and receiving of the cargo as well as its monitoring, present hazards which require managing safely.

7 HAZARDS

7.1 Typical hazards to personnel when engaged in storing and forwarding dry bulk cargoes include:

- the cargo itself may be classified as hazardous
- in other cases whilst not necessarily classified as hazardous the cargo may have characteristics that make its handling more dangerous, for example spontaneous ignition, explosion, reduction of oxygen in the atmosphere, production of or release of toxic or flammable gases
- the conditions under which the cargo is stored, a shed, silo or bin may be a confined space
- the cargo may be stored whilst under fumigation
- access/egress to and from cargo may present a problem such as gaining access to scrap metal stock piles or access for sampling free flowing bulk cargoes
- handling may involve the use of, grabs, loading shovels, bull dozers, chutes, conveyors, throwers, suction devices, augers and other methods of handling that may create impact, entrapment or entanglement hazards
- moving vehicles (road, rail) plant and equipment and the risk of collisions with pedestrians fixed objects (structure of shed, grid covering etc) or other moving vehicles
- operation of bagging plants, screening equipment, grading or processing plants and associated hazards
- items of cargo falling from lifting equipment
- working at height on top of stacks of bulk cargo
- forwarding & receiving cargo to road, rail or barge transport
- fires caused by dusty cargoes building up on heated surfaces such as plant engines and electrical light fittings
- fires caused by cargoes decomposing, heating up and self-igniting
- exposure to dusty cargoes and to hazardous substances can cause significant risks to health and lead to long term ill-health such as Chronic Obstructive Pulmonary Disease (COPD). In order to manage any such risks, consideration should be given to the nature of the cargo and the Material Safety Data Sheets, and specialist advice sought where necessary. Further advice can be found on the HSE website at

<http://www.hse.gov.uk/coshh/index.htm> and <http://www.hse.gov.uk/copd/index.htm>

- insects, rodents, pigeons and any other vermin which may be present

7.2 The above list is not exhaustive and therefore it is important that the qualities and characteristics of the cargo product and design of the store and method of the handling operation are carefully considered to ensure that the operation is carried out in a safe manner as is reasonable practicable. It should also be a prerequisite that a Material Safety Data Sheet (MSDS) be supplied by the shipper for the cargoes to be handled.

8 PLANNING OF OPERATIONS

8.1 In order to ensure that operations are conducted safely they need to be properly planned. When planning operations consideration should be given to the nature and hazards of the cargo, the nature and hazards of the activity and any possible external factors such as visitors (authorised or otherwise) or contractors. Also the impact of these activities on other operations which may be on going, in the vicinity. The HSE publication Managing Health & Safety in Dockwork HSG177 provides detailed guidance on how to co-ordinate such activities.

8.2 Where possible agreement should be reached with customers, shippers, forwarders or receivers of cargoes to establish how long products will be required to be stored. In addition information on temperature management should be exchanged and should include critical temperature information such as the temperatures at which the product becomes unstable. This will enable temperature management plans to be developed to enable product to be safely stored. Such plans should detail the types of actions required to mitigate a situation such as spreading the cargo out thinly across a safe area to allow it to cool.

8.3 If possible plans for how, when and by what mode cargo will be collected, forwarded and handled should be agreed and documented to avoid any confusion.

8.4 Consideration should be given to stock rotation. A first in first out (FiFo) protocol should be adopted where possible. This means ensuring that product does not remain in the back inaccessible area of the shed for prolonged periods whilst further cargo is stored in front of and preventing access to this cargo. However with products where this is not a requirement this should be documented.

9 RECORDS & PRODUCT INFORMATION

9.1 A record should be made for each cargo which may include: storage arrangements; records of any monitoring undertaken; personnel, plant and equipment involved; any specific traffic

routes and any other hazards. Where appropriate information should be given to the personnel involved as part of a “tool box talk”.

9.2 The Customer should provide the Operator with the following written product safety data information for each type of cargo to be handled:

- Material Safety Data Sheet (MSDS)
- any additional Environmental characteristics of the product and details of any specific environmental controls that must be applied
- typical moisture content
- typical product density
- typical angle of repose, to enable the operator to establish the area required for the cargo
- characteristics of the product under storage conditions that may be excluded from the MSDS, including confirmation if the product has a tendency to self-heat

9.3 Prior to the arrival of each shipment of product, the Customer will also provide the Operator with the following information:

- Bill of Lading quantities
- Statement of Facts from the Load Port which may include information on where, how and in what conditions the cargo was loaded, which could affect its condition
- Phytosanitary certificate (if applicable) to determine if wood products meet the entry criteria

Upon the arrival of each shipment of product, the vessel’s Master or representative should provide any additional information, such as the voyage temperature, as appropriate.

10 DANGEROUS GOODS

10.1 Where bulk cargo is also a hazardous substance, the requirements of the Dangerous Substances in Harbour Areas Regulations 1987, the International Maritime Solid Bulk Cargoes Code, the International Maritime Dangerous Goods Code and other relevant legislation, which may apply to the transport, storage or handling of the cargo, must be considered.

10.2 Terminal operators should also consult the appropriate Material Safety Data Sheets for the commodities handled.

- 10.3 Storage of some commodities in specified amounts may require compliance with the Control of Major Accident Hazard regulations 1999 (COMAH).

11 INSPECTING THE CARGO

- 11.1 Prior to receiving cargo to store, the cargo should, where possible be inspected, tested, and sampled. Such an inspection should ensure that the cargo is in a safe condition to be handled. Some bulk cargoes may spontaneously combust, develop hot spots, emit dangerous gases, liquefy, develop biological-hazards and become unstable. Therefore reading the supplied documentation is essential to ensure correct controls are adopted.
- 11.2 Depending on the physical characteristics of the cargo, there may be a requirement to monitor aspects such as temperature (particularly biomass, grain, animal feeds etc) radiation (scrap metals, yellow cake) build up of toxic fumes (e.g. carbon monoxide) reduction of oxygen levels (e.g. wood chip, wood pellets) and spontaneous combustion (biomass).
- 11.3 Many cargoes when in store should be monitored for infestation from vermin and pests.
- 11.4 Where food grade products are being stored there is a legal requirement to be registered with the local authority and to apply appropriate controls.
- 11.5 Where animal feed products are being stored, industry codes of practice (e.g. sampling) may also apply.

12 SITE CONDITIONS

- 12.1 The condition and location of the site chosen for cargo storage must be fit for purpose. It should be suitable to accept the weights and configurations of the cargo and also to accept vehicles used in the operation.
- 12.2 Consideration should be given to the design of storage facilities. Sheds, bins, silos and other equipment used for the storage of dry bulk cargoes should be suitable for their intended use. This may include, subject to assessment of products to be stored, use of approved electrical installations and other equipment. Directive 94/9/EC also known as “ATEX 95” or “ATEX Equipment Directive” equipment and protective systems for use in potentially explosive atmospheres <http://www.hse.gov.uk/fireandexplosion/atex.htm#whatatex>
- 12.3 The impact of cargo residue or dust on the environment should be considered and controls measures such as dust suppression may be required. Many dry bulk cargoes will be subject to licensing approval by the Local Authority and/or Environment Agency before they can be handled on the port.

Typical site conditions to be considered include:

- ground condition and suitability – the ground should be of suitable construction and well maintained
- cargo size, weight, height and size of stows/heaps and quay/ground loading
- angles of repose, stack integrity and likelihood to flow
- obstructions in the handling area - waste materials/plastic banding, unused bearers, discarded packaging, other cargo and fixed immovable objects, such as lighting towers, bollards and pillars, which may present additional risks
- overhead power lines and/or roof structures being struck when tipping trailers or using long reach excavators
- vehicle fumes in bulk storage areas
- lighting conditions; working in close proximity to other operations or activities, for example, public rights of way and third party premises/activities and adverse weather conditions
- equipment such as overhead or ground level conveyer systems, storage bins, hoppers, stacker reclaimers

13 STORAGE

- 13.1
- The store(s) should be suitable for the cargo to be stored and properly maintained to ensure that the product is protected from/not affected by the elements or any other potential sources of contamination at all times
 - The store(s) or access to the site should be suitably secured and should be closed at all times when the product is not being worked. This is to prevent unauthorized access
 - Separate products must not be stored together or allowed to blend together in storage unless this has been agreed in advance with the Customer
 - In large open stores it is good practice to maintain a minimum of 1m gap between cargoes for allowing access for temperature monitoring and/or taking of samples. In stores fitted with Individual bays, the walls of the bay will provide the required segregation of the product and protect the integrity. The product should be stored to a level below the top of the wall to avoid product spilling over
- 13.2 Store design should be suited where possible to the commodities likely to be handled. Design criteria should include items such as the electrical installation, access and egress

arrangements for both operational and emergency situations, traffic routes, requirements for permanent or movable bulk walls and maintenance cleaning requirements such as reducing or eliminating the amount of internal horizontal surfaces. Design should address requirements under the Dangerous Substances and Explosives Atmospheres Regulations 2002 and the “ATEX Equipment Directive” as appropriate.

14 WORKING AT HEIGHT

14.1 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) can be found on the HSE website at <http://www.hse.gov.uk/falls/index.htm>, and in the brief guide to the Regulations <http://www.hse.gov.uk/pubns/indg401.pdf>

14.2 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.

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

14.3 There are several types of personal fall protection systems and equipment. Users of these systems require high levels of training and appropriate close supervision and should refer to the guide to Selecting, using and maintaining personal fall protection equipment to ensure that the right type of fall protection equipment is used. <http://www.hse.gov.uk/falls/downloads/ppe.pdf>

14.4 Personnel should not be put at risk from falls from height when working on stacks of bulk cargoes. If a safe means of access is not available, consideration should be given, subject to a suitable and sufficient risk assessment, in accordance with the Working at Height Regulations 2005, to the provision and use of alternative access arrangements. An appropriately rated man-cage, secured in accordance with the requirements of the Lifting Operations and Lifting Equipment Regulations 1998 is an example of a suitable alternative

access arrangement.

14.5 Personnel required to work on cargo may be presented with stows or stacks to work on that are difficult to access or to prevent fall from height risk. This may include the working of mobile plant such as bulldozers or excavators at height on stacks of cargo or sampling cargoes or testing cargoes for temperature/moisture content etc.

14.6 The risks of slips and falls when walking across cargo stows may be increased in adverse weather where high temperatures, snow, ice and rain conditions prevail. The risk of slipping/falling in these conditions may be reduced by wearing appropriate footwear. It may also be appropriate to de-ice/clear cargo tops or to wait for improved climatic conditions.

15 SLINGING AND LIFTING OF LOADS

Factors to consider in planning and carrying out slinging and lifting of loads include:

- Fixed quayside cranes, ships cranes or derricks and mobile cranes, often fitted with grabs, are commonly used handle bulk cargoes for stockpiling and storage purposes prior to or after loading or unloading of the ship. Lifting equipment and lifting accessories should be included in lifting operation risk assessments
- 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
- 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
- lifting operations must be planned by a competent person, who should have adequate practical and theoretical knowledge and experience of planning lifting operations
- 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.
- 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. It may be necessary to determine the density, specific gravity or stowage factor of the cargo to establish the weight of cargo within a grab
- lifting equipment and accessories should be suitable for the task
- slingers should be competent in the selection and use of equipment and safe slinging

methods appropriate to the cargo

- suitable lifting accessories should be selected for cargo with sharp edges where there is a risk of the cargo cutting into the slings or the slings damaging the cargo
- a visual check of all lifting equipment and accessories to be used should be carried out by a competent person prior to use. Lifting equipment/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
- lifting accessories (including pre-slung cargo and one trip slings) should also be checked for damage by the slingers before attaching the load
- 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
- all loads to be lifted must:
 - be held securely by the lifting accessories
 - be slung so that it will not suffer collapse, change of form or posture or internal displacement when subjected to jerks, swings or bumps
 - not damage or be damaged by the lifting accessories
- as a general principal: “the load should be as safe in the air as it was on the ground”
- port operatives involved in trimming or slinging must be in a place of safety during lifting operations. If a crane operator is unsure that operatives are in a safe position then the lift should be suspended until it is safe to continue. No-one should stand on or under the load while it is being lifted
- 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
- 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
- the lifting route should be planned to avoid cargo passing over hazardous plant and/or other material to minimise possible secondary hazards from impact
- 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

- when multiple packages are to be slung consideration should be given to the use of cargo nets, netted pallet trays or cargo bins
- “reeving” should be avoided and only used in exceptional circumstances as it damages the uniformity of the load. Moreover, the use of a single wire on a single pack should be avoided as there is a danger of the timber slipping from the sling (spearing)
- multi-bundle slinging should avoid varying sizes of bundle
- 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. In addition, any equipment or accessories used to lift personnel should have a daily pre-use check
- where an operator is familiar with the principles of a type of equipment but is unfamiliar with the specific piece of equipment, consideration should be given to providing the operator with a period of familiarisation on the specific equipment’s operation
- when lifting equipment such as loading shovels, bulldozers or excavators onto stockpiles, slingers should be competent in the selection and use of equipment and safe slinging methods appropriate to the lifts. Lifting points on handling equipment should be suitable, fit for purpose and inspected as required
- in some cases grabs are fitted with lifting points and tested for lifting equipment such as loading shovels. When using this type of lifting arrangement care should be taken when lowering off, to avoid the equipment being lifted being struck by the grab
- personnel should not be lifted into or out of ship’s holds in plant and equipment. If it is necessary to lift personnel into or out of a ship’s hold due to ships access being unavailable, a suitable personnel basket should be used along with a crane and ancillary equipment inspected as required by LOLER for lifting persons

16 COMPETENCE, INFORMATION, INSTRUCTION, TRAINING AND SUPERVISION

- 16.1 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.

- 16.2 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.
- 16.3 All persons involved in handling operations must know who is in charge. This is particularly important where NPEs are working alongside permanent employees.
- 16.4 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.
- 16.5 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 (LOLER regulation 8).
- 16.6 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

17 COMMUNICATION

- 17.1 Clear lines of communication must be established and maintained between all those involved in the lifting operation. Visual and voice communications from the banksman to the crane operator must be clear, agreed and understood. Where voice communication cannot be established an agreed system for the use of hand signals must be followed, see Health and Safety (Safety Signs and Signals) Regulations 1996 – schedule 1.

- 17.2 Guidance on crane signals can be found in BS 7121 – Code of Practice for Safe Use of Cranes – Part 1, General”. Banksmen should be trained and competent. A banksman should not be engaged in any other role during the lifting operation. 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.
- 17.3 Where a banksman is actively involved in slinging/unslinging it is important that throughout the lift, the banksman is focused on the lifting operation and the crane operator is in no doubt as to who is providing the instructions.
- 17.4 The crane driver should normally only accept instructions from one nominated person, whether by voice or through hand signals. The exception to this rule is the emergency stop signal (see Figure 14), which any operative may give at any time to override the previous signal.



Figure 1 – Emergency STOP Signal

18 DRY BULK MATERIAL HANDLING EQUIPMENT

- 18.1 Plant used in general cargo handling may include:
- loading shovels of varying sizes and attachments
 - tug-masters or lorries (internal shunt units)
 - excavators
 - bulldozers
 - hoppers

- conveyors
- stacker/reclaimers
- cranes and attachments
- skid-steer machines with various attachments
- ship loaders/unloaders
- suction unloading equipment
- screw/displacement unloading equipment
- screening equipment
- chutes/spouts/throwers

18.2 All plant used for the movement of cargo should be suitable for the intended task.

18.3 When using loading shovels for cargo handling it is essential to consider not only the lifting capacity of the truck but also the size of the bucket and the ground on which the truck is being used. Equipment drivers must be trained, competent and authorised.

18.4 Mobile machinery should only be operated on top of cargo where the risk of overturning, sliding, falling or becoming damaged has been assessed and controlled. A suitable area should be prepared prior to lifting the truck in to ensure it can be operated in a safe manner.

18.5 When cargo is being transported by tipper lorries or similar equipment then cargo stability and security must be considered. Tipper lorries should be sheeted and sealed where appropriate to control dust emissions unless the cargo does not require dust control.

18.6 Fixed mechanical handling systems such as conveyors, loaders/unloaders, etc present hazards during operations. When this equipment is maintained, systems such as permits to work, may need to be in place to ensure safety of staff involved.



Figure 2 – Loading shovel working on cargo in a bulk shed

- 18.7 Cargo handling equipment should be maintained and inspected in accordance with the Provision and Use of Work Equipment regulations 1998, The Lifting Operations and Lifting Equipment regulations 1998.
- 18.8 Access control to fixed plant installations maybe required to ensure safety of personnel.

19 RELEVANT LEGISLATION AND GUIDANCE

19.1 Relevant legislation and guidance includes:

- Lifting Operations and Lifting Equipment Regulations (LOLER) 1998
- Management of Health and Safety at Work Regulations 1999, Regulations 3 (Risk Assessment) and 11 (Co-operation and Coordination)
- Health and Safety (Safety Signs and Signals) Regulations 1996
- Provision and Use of Work Equipment Regulations (PUWER) 1998
- Code of Practice on Safety and Health in Ports (ILO 152) – International Labour Organisation (ILO) 2005
- International Maritime Dangerous Goods Code (IMDG)
- ICHCA guides – please refer to publication list at www.portskillsandsafety.co.uk;
- Managing H&S in Dockwork HSG 177
<http://www.hse.gov.uk/pubns/books/hsg177.htm>
- Dangerous Substances and Explosive Atmospheres Regulations (DSEAR) 2002

<http://www.hse.gov.uk/fireandexplosion/dsear.htm>

- Control of Substances Hazardous to Health Regulations (COSHH) 2002
<http://www.hse.gov.uk/coshh/index.htm>
- Control of Major Accident Hazards Regulations (COMAH) 1999
<http://www.hse.gov.uk/comah/>
- Dangerous Substances in Harbour Areas Regulations 1987
<http://books.hse.gov.uk/hse/public/saleproduct.jsf?catalogueCode=9780118839914>
- Port Marine Safety Code (PMSC)
<http://www.dft.gov.uk/pgr/shippingports/ports/pmsc.pdf>
- Maritime Coastguard Agency (MCA) Working at Sea
<http://www.mcga.gov.uk/c4mca/mcga07-home/workingatsea.htm>
- International Labour Organization's (ILO) Code of Practice on Safety and Health in Ports (ILO 152)
<http://www.ilo.org/public/english/dialogue/sector/techmeet/messhp03/messhp-cp-b.pdf>
- Chronic Obstructive Pulmonary Disease (COPD)
<http://www.hse.gov.uk/copd/index.htm>
- Control of Vibration at Work Regulations 2005
<http://www.hse.gov.uk/pubns/indg175.pdf>
- HSE Whole Body Vibration in Ports Information Paper
<http://www.hse.gov.uk/vibration/wbv/ports.pdf>
- Directive 94/9/EC also known as "ATEX 95" or "ATEX Equipment Directive"
<http://www.hse.gov.uk/fireandexplosion/atex.htm#whatatex>

DOCUMENT AUTHORS

This guidance document has been produced by Port Skills and Safety with the assistance of the Health and Safety Executive and representatives of the UK ports industry.

FURTHER INFORMATION

For further information please contact:

Port Skills and Safety, 4th Floor Carthusian Court, 12 Carthusian Street, London EC1M 6EZ

Tel: 020 7260 1790 Fax: 020 7260 1795 Email: info@portskillsandsafety.co.uk