



Safe working on top of containers on board ship

Docks Information Sheet No 7

Introduction

This information sheet is one of a series issued by the Health and Safety Executive's Docks Unit. It gives practical guidance about working safely on the top of containers on board ship. It is intended to help dock and harbour authorities, terminal operators, stevedoring companies, contractors, ship's masters, and other people involved with these operations.

This guidance is aimed at work with container cranes. The arrangements it describes may not always be reasonably practicable in situations where containers are loaded onto or unloaded from ships using other equipment, such as jib cranes. In such cases the risk assessment required under the Management of Health and Safety at Work Regulations 1999 may show the need to develop other methods for ensuring that the work is carried out as safely as is reasonably practicable.

As the use of freight containers for transporting cargo at sea has grown, larger ships have been introduced which carry containers not only in holds, but also stacked six or more high on hatch covers above the deck. The top of such a stack could be as much as 18 m above the deck or over 30 m above the bottom of the hold. A fall from a stack would almost certainly result in serious injury or death.

Cargo handlers often need to work on the top of a container stack or 'stow', for example when they are:

- coning out - placing locating cones on the top of each layer of containers before loading the next;
- inserting or removing twist-locks - used to lock a container to the one above it;
- locking or unlocking twist-locks by the use of long poles over the edges of containers;
- lashing - securing above-deck loads to points on the deck; and
- fitting bridging units - devices which lock together adjacent containers at the top of a stack.

Legal requirements

Regulation 5 of the Docks Regulations 1988 requires dock operations to 'be planned and executed in such a

manner as to ensure, so far as is reasonably practicable, that no person is exposed to danger'.

Regulation 7 of the Docks Regulations deals with means of access. In particular:

- paragraph (1) requires safe means of access to be provided;
- paragraph (3) prohibits the use of portable ladders to gain access to stacks of containers on board ship unless no other safer means of access is reasonably practicable; and
- paragraph (6) recognises that fencing some places where a person might fall more than 2 m may be impracticable.

In addition, section 2 of the Health and Safety at Work etc Act 1974 applies. Among other things, this requires employers to provide 'safe systems of work', 'a place of work ... that is safe', and 'means of access ... that are safe ... so far as is reasonably practicable'.

Therefore employers must critically examine operations where people work on top of containers and develop safe methods of working and access.

Avoiding container-top working

The best option is to avoid container-top working altogether wherever possible, and to minimise it in other circumstances, for example by the use of semi-automatic twist-locks (SATLs), dual function twist-locks (DFTLs), or fully cell-guided ships. However, these options will not always be available. They are not generally within the control of the terminal, but are dependent on the ship or shipping line.

This guidance sets out examples of precautions for when container-top working cannot be avoided.

Access

All means of access to container tops must be safe. Examples of safe means of access include a suitable access platform provided on the spreader of the gantry crane, or a suitable personnel cage hoisted by the crane.

Portable ladders must not be used for access to the tops of containers on ships, except where no safer means is reasonably practicable.

Safe systems of work

People must not work at or near the unprotected edge of a container stack unless there are suitable precautions to prevent them falling. This is particularly relevant to container-top work such as the use of twist-lock lashing or rigging poles, and the insertion or removal of twist-locks, bridging screws, cones etc.

Where container-top working has to be carried out, two strategies can be used to minimise the risk of people falling. These are:

- fall prevention, for example working from within a safety cage; and
- fall arrest, for example the use of full harness, inertia reel line and anchor points.

It is for employers to determine which methods are best suited to their particular operations. Because of the variety of work and ships, most dock operators will need to have more than one system of work available. Supervisors and workers need to know that a safe system must be used at all times and which system to use in which circumstances. Some systems may involve the use of both fall prevention and fall arrest devices.

Fall prevention systems

Safety cage and anchor points

This involves working in or from cages suspended from gantry crane spreader frames (see Figure 1). Flaps provided in the floor at each end of the cage give access to container-top fittings. Such cages provide almost total security when lifted

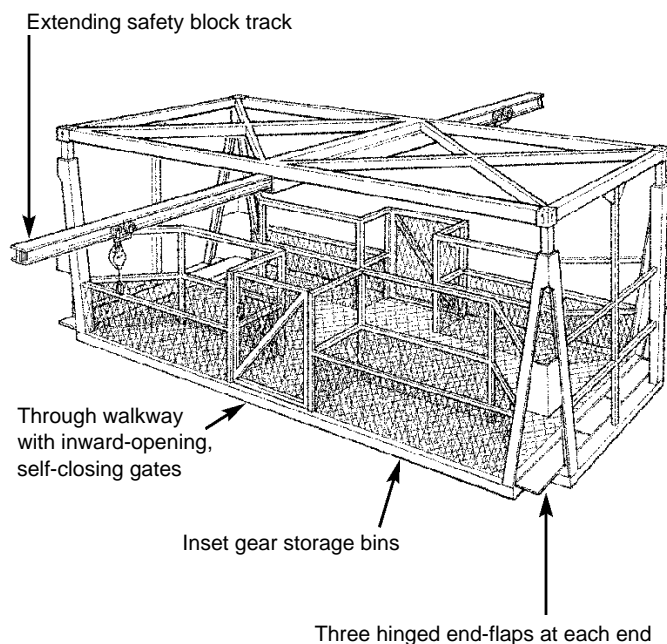


Figure 1 Safety cage and anchor points

onto the stow and used as a base point or anchor for fall arrest devices, and also when traversed across the top of a stow (floated) to enable the workers to reach the fittings through the floor flaps.

The cage ends and floor flaps need careful design to avoid creating trapping points when the cage is traversed across the stow top. This risk can be aggravated by ship movement, particularly on small vessels and if more than one container crane is in use. It is recommended that the floor is rubber-covered or padded at each end if workers kneel to reach the container top fittings. Alternatively, knee pads may be used.

Half-height container and guard-rails

This involves use of a short safety line and body belt attached to a half-height container suspended from the gantry crane spreader frame. The container incorporates fold-out guard-rails (see Figure 2).

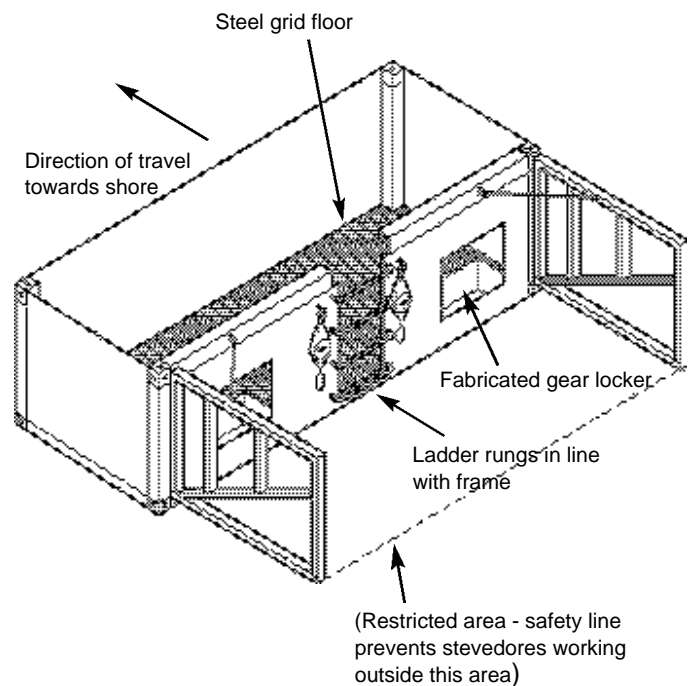


Figure 2 Half-height container and guard-rails

This system is traversed across the stow by the crane. The fold-out guard-rails provide a protected area within which workers are free to work relatively unencumbered. Body belts and safety lines, anchored to the container, keep workers within the protected area and prevent falls over the edge.

The key aspects are:

- the workers stay in the cage on the spreader beam as the system is lifted onto the ship (the half-height container is not designed for carrying people);
- the safety lines on the inertia reels are only long

enough to allow the wearer to the end of the guard-rails (about 3 m);

- the half-height container is put down on the container tops to allow the workers to disembark from the cage on the spreader frame (ladder rungs on the converted container act as extension to the ladder down from the cage on the spreader frame) and attach their safety lines to the container which remains held slightly clear of the container tops on the ship so that it can be traversed slowly from the outboard side to the quayside; and
- the person in charge stays in the cage, where he or she can see the ship workers and instruct the crane driver by radio. There is an emergency stop button for the crane in the spreader cage.

The system eliminates the discomfort of wearing a full harness and makes it much easier and quicker to use a locking/unlocking pole, by providing a safe support against which the stevedores can lean when reaching over the stack edge.

Narrow cage

This involves the use of a narrow cage called a torpedo or gondola (see Figure 3). It is suspended rigidly or on wire ropes from one end of the container crane lifting frame, and traversed between container stows to give access to the container ends in those stows. Good communication with the crane driver is essential.

Fall arrest systems

Four wire suspension

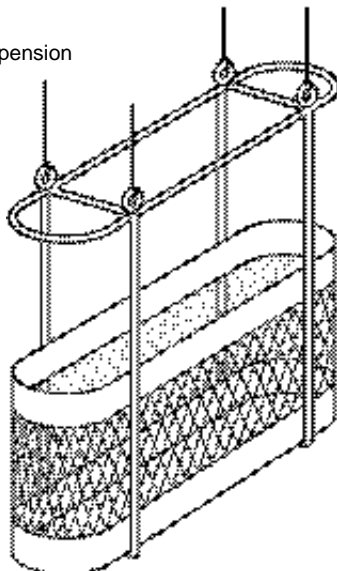


Figure 3 Narrow cage

All these systems apply the same principle - tethering workers to an anchorage point by means of a safety line and full harness while they walk around the top of the container stow removing twist-locks etc. Variations include:

- use of a spreader frame or cage landed on the stow

as the anchorage point for the safety line; or

- working out from the spreader frame or cage traversing across the stow, as a mobile anchor point which is followed across the ship.

Safety lines should normally be of the inertia reel type and incorporate some form of shock-absorbing link.

These systems do not prevent the worker from falling over the edge, but aim to limit the distance of fall and thus eliminate, or reduce the severity of, injury.

Adverse weather conditions

Procedures for working on the top of containers need to take account of adverse weather conditions, for example high winds, fog and ice. The system of work should:

- include provision for adequate warning of adverse weather; and
- specify the conditions under which work should stop, for example maximum safe wind speed and minimum safe visibility.

As well as addressing the hazards to those working on the containers, the system of work should take into account any restrictions on the use of gantry cranes, personnel carriers etc specified by the manufacturers.

Training and instruction

It is important that stevedores and supervisors are thoroughly trained and instructed in the systems of work to be followed and the correct use and maintenance of any equipment.

Construction, maintenance and use of access and safety equipment

Any deficiency in a cage, other equipment or devices and the lifting arrangements is likely to have serious consequences, particularly if someone is relying on them at the time. All equipment must therefore be suitable for the purpose, sufficiently robust and reliable, and the arrangements for lifting must be safe. In particular:

- If twist-locks are used to secure a cage to a container crane spreader, there need to be adequate secondary attachments to the spreader which are capable of supporting the cage on their own, such as chains, heavy-duty latches or bolts, or an extra pair of twist-locks with a totally independent control system from that for the main twist-locks. So far as is reasonably practicable, the secondary attachments should be under the control of the workers in the cage.

- When people are being lifted or suspended or are using a suspended cage, frame etc as an anchorage, it is essential that there is good communication between the crane driver and those in the cage and working on the stow, for example by radio.
- Any relevant legal requirements need to be complied with. The Lifting Operations and Lifting Equipment Regulations 1998 and the Personal Protective Equipment at Work Regulations 1992 are particularly relevant. The former impose extra requirements in relation to the lifting of persons.
- Any relevant standards should be taken into account. For example, there are design standards and instructions for the use of fall arrest systems in BS EN 354-6 and 361-5.

References

A guide to the Health and Safety at Work etc Act 1974. Guidance on the Act L1 (Fifth edition) HSE Books 1992 ISBN 0 7176 0441 1

Management of health and safety at work. The Management of Health and Safety at Work Regulations 1999. Approved Code of Practice L21 (Second edition) HSE Books 2000 ISBN 0 7176 2488 9

Safety in docks. The Docks Regulations 1988. Approved Code of Practice and Guidance COP25 HSE Books 1988 ISBN 0 7176 1408 5

Safe use of lifting equipment. The Lifting Operations and Lifting Equipment Regulations 1998. Approved Code of Practice and Guidance L113 HSE Books 1998 ISBN 0 7176 1628 2

Personal protective equipment at work. The Personal Protective Equipment at Work Regulations 1992. Guidance on Regulations L25 HSE Books 1992 ISBN 0 7176 0415 2

Personal protective equipment against falls from a height – lanyards BS EN 354: 1993 BSI

Personal protective equipment against falls from a height – energy absorbers BS EN 355: 1993 BSI

Personal protective equipment for work positioning and prevention of falls from height – work positioning systems BS EN 358: 1993 BSI

Personal protective equipment against falls from a height – retractable type fall arresters BS EN 360: 1993 BSI

Personal protective equipment against falls from a height – full body harnesses BS EN 361: 1993 BSI

Personal protective equipment against falls from a height – connectors BS EN 362: 1993 BSI

Personal protective equipment against falls from a height – fall arrest systems BS EN 363: 1992 BSI

Further information on safe systems for container top working can be found in:

Container top safety (Safety Panel Research Paper No 4) ICHCA 1999 ISBN 1 85330 0225 and *Safe working on container ships* (Safety Panel Briefing Pamphlet No 8) ICHCA 1994 ISBN 1853300365. Both published by ICHCA (International Cargo Handling Co-ordination Association), 71 Bondway, London, SW8 1SH. Tel: 020 7793 1022.

Recommendations for the safe operation of container cranes British Ports Federation 1991. Available from PSO (Technical Services) Ltd, Room 220, Africa House, 64-78 Kingsway, London, WC2B 6AH. Tel 020 7242 3538.

While every effort has been made to ensure the accuracy of the references listed in this publication, their future availability cannot be guaranteed.

Further information

HSE priced and free publications are available by mail order from HSE Books, PO Box 1999, Sudbury, Suffolk CO10 2WA. Tel: 01787 881165 Fax: 01787 313995. Website: www.hsebooks.co.uk

HSE priced publications are also available from good booksellers.

British Standards are available from BSI Sales and Customer Services, 389 Chiswick High Road, London W4 4AL Tel: 0181 996 7000 Fax: 0181 996 7001.

The Health and Safety at Work Act is available from the Stationery Office (formerly HMSO) at The Publications Centre, PO Box 276, London SW8 5DT. Tel: 020 7873 9090.

For other enquiries ring HSE's InfoLine Tel: 08701 545500, or write to HSE's Information Centre, Broad Lane, Sheffield S3 7HQ. Website: www.hse.gov.uk

This leaflet contains notes on good practice which are not compulsory but which you may find helpful in considering what you need to do.

This publication may be freely reproduced, except for advertising, endorsement or commercial purposes. The information is current at 05/00. Please acknowledge the source as HSE.

