ICHCA International Limited

INTERNATIONAL SAFETY PANEL

SAFETY BRIEFING PAMPHLET SERIES #35

Provision for the Safe Lashing of Deck Containers

Application of Annex 14 of IMO's Cargo Stowage and Securing Code

ICHCA INTERNATIONAL PREMIUM MEMBERS:

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Other titles in many of the series are in preparation

This publication is one of a series developed by the International Safety Panel ("Safety Panel") of ICHCA International Limited ("ICHCA"). The series is designed to inform those involved in the cargo-handling field of various practical health and safety issues. ICHCA aims to encourage port safety, the reduction of accidents in port work and the protection of port workers' health.

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ICHCA International Limited - INTERNATIONAL SAFETY PANEL

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ABOUT THE PUBLICATION

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PROVISIONS FOR THE SAFE LASHING OF DECK CONTAINERS

APPLICATION OF ANNEX 14 OF IMO's CARGO STOWAGE AND SECURING CODE

1. Introduction

1.1 In a report to IMO in 2005, the United Kingdom included the following Executive Summary - "Although containerisation has greatly improved the safety of cargo-handling, cargo-related accidents to ship's crews and dockworkers continue. Research in the United Kingdom has shown that some 40% of accidents to dockworkers occur on board ships and the majority of these are related to lashing activities on container ships. In many cases the design and layout of lashing arrangements on such ships take insufficient account of the safety of the crew and dock workers required to handle the lashing equipment".

1.2 It also said that "The world container vessel fleet is around 3,000 ships, approximately 6% of the entire trading fleet (source: Lloyd's Register Fairplay, January 2002). The United Kingdom has found that new and existing ships often present inadequate access and work platforms for the purpose of securing and lashing containers and cargo. This places seafarers and dockworkers at a substantial risk of accidents with the potential for serious injuries or fatalities. Risk assessments on some 248 container vessels at one United Kingdom port between1998 and 2002 revealed that, of these, 61 vessels failed to provide any form of fall protection on outboard lashing pillars or gunwales. Dockworkers were forbidden to work in these locations unless fall arrest equipment could be used. It is also recognised that these tasks are often undertaken by the seafarers on board, who are expected in many cases to stand on platforms approximately 300 mm x 1600 mm and on average 20 metres above, either the quay or the water. Furthermore, 118 ships had defective lashing access arrangements, 22 had unprotected workplaces with a potential to fall greater than 2 metres in height and 21 had incompatible lashing and securing equipment".

1.3 As a result of this submission, which was most compelling and was accepted without question, an international set of guidelines in the form of Annex 14 of the Cargo Stowage and Securing Code (CSS Code) has been developed by IMO and has now been published. It applies to purpose designed container ships and addresses both the design of new ships and application to existing ships.

1.4 Some ships already provide adequate access and lashing positions. Some do not and many are somewhere inbetween. The new international guidelines recognise that certain changes cannot be expected to be made on existing ships, ie changing the superstructure, whilst accepting that other provisions should be made and some should be made where as far as practicable. The purpose of this Briefing Pamphlet is to advise terminals, lashing companies and their employees as to how to deal with existing purpose designed container ships once the IMO guidance is published.

1.5 The new IMO guidelines also refer to working on top of container stacks and a parallel Briefing Pamphlet (BP#34) deals with that aspect.

2. General

2.1 When containerisation began, there were few deck containers carried and even in 1972 lashing was not an issue (see fig 1).

Figure 1 – Asia Freighter 1972

2.2 However, as container movements increased, the size of ships expanded and deck stowages grew. The ships became longer and wider and the stowages higher. This led to increasing use of lashing equipment which partly had to be applied/ removed from the deck and partly locked/unlocked from above. Stowages extended to the sides of the ship by placing containers partly or completely on pedestals.

2.3 In turn, the lashing equipment became heavier and longer and needed more space to stow it and also to work with it (see figure 2). However, with a pressure to maximise carrying capacity some ship designs and layout failed to reflect these changes and failed to provide safe access and adequate workplace provisions.

2.4 In recent years, lashing gantries have emerged as a way of achieving lashing rod securement at higher stack levels and they have improved the situation.

2.5 Although hatchcoverless ships and those with substantial above deck guides meant that lashing was not needed, these designs proved to be unpopular with shipowners and charterers and the bulk of purpose-built container shipping continued to require deck lashing to be carried out.

Figure 2 – Container Ship of the 1990s

2.6 However, it was not until 2005 when ILO produced the third edition of its Code of Practice on Safety and Health in Ports that a minimum space for lashing activities was specified and it has remained the situation that on many container ships' provision for this crucial activity is less that satisfactory.

2.7 There is now, however, an internationally agreed set of guidelines (Annex 14 of the IMO's CSS Code) which reflect and build on the ILO Code's provisions and comprehensively deal with the subject and this document is based upon them.

2.8 In this document, these guidelines are referred to as "Annex 14".

3. International Guidance

3.1 Ports and shipping operate internationally and they can only function properly if their activities are based upon international standards applied by the national laws of the relevant port states and flag states.

Figure 3 – a current 14,000 teu container ship

3.2 The United Nations Agencies that are concerned with the safety of dock workers and the safety of seamen, together with the cargo ships that they both work on, are the International Labour Office (ILO), based in Geneva and the International Maritime Organization (IMO), based in London.

3.3 Together, they provide the international standards which form the basis for national legislation.

3.4 International Labour Office (ILO)

3.4.1 The ILO has three instruments which relate to dock working –

- Convention 152 – Occupational Safety and Health in Dock Work -This lays down principles to be observed and was adopted in 1979. It is also the basis for national legislation on this subject.

- Recommendation 160 – Technical recommendations that supplement the provisions of the Convention.

- Code of Practice on Safety and Health in Ports – Practical guidance on the application of the provisions of the Convention and Recommendation. The latest edition was published in 2005.

3.4.2 Article 31 of the Convention provides that “In the case of ships carrying containers, means shall be provided for ensuring the safety of workers lashing or unlashing the containers”.

3.4.3 The Code of Practice advises that when lashing operations are to be carried out –

- Safe places of work should be provided to enable port workers to carry out securing work

- Shore-side management should ensure that safe access is provided by the ship to any place on the ship where stevedores have to work, and that the place of work is safe

- The placing and removal of lashing equipment on the ends of containers should be carried out in the athwartship gaps between container stows

- The space provided between the container stows for port workers to carry out such work should provide –

    - A firm and level surface

    - A working area, excluding lashings in place, preferably of 1m and not less than 750mm wide to allow clear sight of twistlock handles and the manipulation of lashing gear

    - Sufficient space to permit the lashing gear and other equipment to be stowed without causing a tripping hazard

3.4.4 These provisions have no coming-into-force date but are generally applicable. The ILO Convention is the basis for the requirements of national laws. The Code of Practice is a summary of good practice for the guidance of all ports and terminals.

3.5 International Maritime Organization (IMO)

3.5.1 IMO has a number of instruments that relate to the general safety of seamen and ships' crew engaged in securing operations face dangers similar to those to dock workers who carry out securing operations.

3.5.2 In 2010, after a concerted effort by its Dangerous Goods, Solid Cargoes and Containers Sub Committee (DSC), IMO published a new Annex 14 to its CSS Code. This deals specifically with the safe lashing of deck containers on purpose built container ships and it is aimed at all those who carry out lashing and unlashing work in ports and at sea, and the designers, builders and operators of these vessels.

3.5.3 The status of the CSS Code is that it is recommendatory but that its provisions have to be taken into account when the ship's Cargo Securing Manual (CSM) is prepared. The CSM is a mandatory document approved by the flag state for each relevant individual cargo ship and carried by it.

3.5.4 A lead-in time of 12 months from the date of publication of the relevant Circular (30 June 2010) was approved by IMO to enable current CSMs to be amended to conform to Annex 14.

3.6 New Ships

3.6.1 Annex 14 will apply in full to new container ships whose keel is laid on or after 1 January 2015 or which is at a similar stage of construction on that date.

3.6.2 These requirements are principally concerned with design issues and the preparation of a Cargo Safe Access Plan (CSAP).

3.7 Existing Ships

3.7.1 This Briefing Pamphlet deals with advice regarding existing ships.

3.7.2 Circular 1352 encourages shipowners and terminal operators to apply the guidance in Sections 6 (design) and 7.2 (operational procedures) of Annex 14 to existing ships whose keels were laid before 1 January 2015 as far as is practicable. These are reflected in the appendix and are shown in *italics*.

3.7.3 The Circular also provides for its Sections 4.4 (training and familiarisation), 7.1 (operational procedures - introduction), 7.3 (maintenance) and Section 8 (specialised container safety design) to be applicable to existing ships. These are reflected in the appendix and are shown in CAPITALS.

3.7.4 The Pamphlet builds upon those provisions and offers practical advice on how to bring about improvements where the current provisions are less than satisfactory.

3.8 The International Standards Organisation (ISO)

3.8.1 ISO publishes many standards which relate to freight containers but the one most relevant to this subject is ISO 3874:1997 Series 1 Freight Containers - Handling and Securing.

3.8.2 Amendment #1 of the Standard was published in 2000. This consists of four annexes each of which specifies the function, dimensions, strength requirements and testing of the following securing equipment -

- Annex A – Twistlocks for securing of containers
- Annex B – Latchlocks for securing of containers
- Annex C – Stacking Fittings for securing of containers
- Annex D – Lashing Rod systems, including tensioning devices

4. General Advice

4.1 The aim must be to work with the shipping company customers of the terminal in order to reach a situation where existing ships coming to the terminal reflect the provisions of those parts of Annex 14 of the CSS Code that are applicable. Those provisions are detailed in the Appendix.

4.2 Whilst many existing ships already comply with those provisions, others may not and it must be the intention of all parties to improve the safety of the lashing of deck containers

on those vessels. Whilst Annex 14 accepts that there are limits to what changes can be expected with existing ships, there are many relatively simple and low cost changes that can be made that will enhance safety.

4.3 It is not expected that lashing bridges will be altered.

4.4. However, it is expected that, if any lashing positions as defined in the Appendix are either deficient or non existent in terms of access, working place and fencing, this will be remedied and the discussions with the shipping company should be aimed at effecting those improvements.

4.5 There are also a number of other possible improvements, indicated in italics in the Appendix, which should be considered.

4.6 In addition, certain provisions that Annex 14 considers should be implemented are shown in capitals in the Appendix.

4.7 The joint aim must be to achieve a standard of safety concerned with the lashing of deck containers on all existing purpose built container ships consistent with Annex 14.

5. Solutions to existing problems

5.1 Annex 14 advises that upon arrival of the ship, a safety assessment of the lashing positions and the access to those positions should be made before securing work commences and this is included as an action that should be implemented*.*

5.1.1 A suitable form that could be used for such an assessment is included as Appendix 2.

5.2 Where the lashing positions (see 5.4 below) are either deficient or non existent, the advice contained in the appendix, which is intended for new ships, should be applied as far as practical.

5.2.1 In particular, safe access, safe place of work and fencing, where applicable, should be satisfactory.

5.3 There will be many variations and situations covering ship designs over many years. Based upon experience, this Chapter illustrates some practical ways of improving the provisions of an existing ship.

5.4 Lashing positions include positions –

- In between container stows on hatch covers
- At the end of hatches
- On outboard lashing stanchions/pedestals
- Outboard lashing positions on hatch covers

- Any other position where people work with container securing

5.5 In between container stows on hatch covers

5.5.1 The situations found inbetween container stows do not lend themselves too much to improvement without redesigning and reconfiguring the deck stowage arrangements.

5.5 2 Figure 4 shows a container stowage that is not a good design and results in a bad working area.

5.5.3 Figure 5 shows a stowage that is a better layout and clearly results in much easier and safer working conditions

Figure 4 showing a bad design

Figure 5 showing a better layout

5.6 At the end of hatches

5.6.1 Figure 6 shows two ends of hatches that need different improvements

Figure 6: this situation calls for a wider working space and edge protection

Figure 7 showing sockets fitted to hatch covers to provide fall prevention

Figure 8 shows additional grating and sockets for fall prevention that have been added to improve the end of the hatch

5.7 Outboard lashing pedestals

5.7 Figures 9 and 10 illustrate the lack of working platform and also a situation in which one has been provided.

Figure 9: Lack of working platform

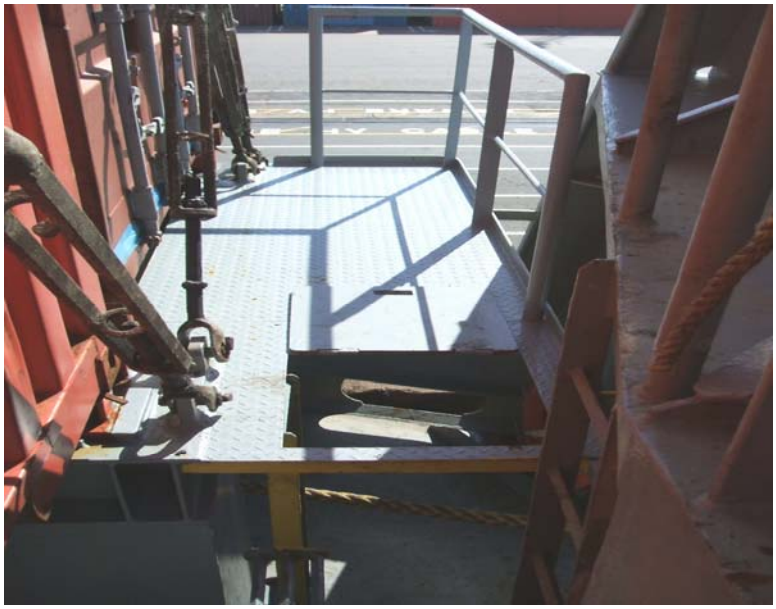

Figure 10 After improvements

5.8 Outboard lashing positions on hatch covers

5.8.1 Illustrations are given of poor examples and how some improvements can be made.

Figure 11: a poor example

Figure 12: another poor example

Figure 13: Example of improvements with extra working space and fall prevention

5.9 What if no safe method can be found

Annex 14 gives the following advice if no safe method can be found and there is no fall protection.

5.9.1 Where there are lashing and unlashing locations on board ship where no fall protection, such as adequate handrails, are provided and no other safe method can be found, the containers should not be lashed or unlashed and the situation should be reported to shore side supervisor and the master or deck officer immediately.

5.9.2 If protective systems cannot be designed to provide safe protected access and lashing work positions, in all cargo configurations then cargo should not be stowed in that location.

5.9.3 Neither crew nor shore workers should be subjected to hazardous working conditions in the normal course of securing cargo.

6. Lloyd's Register Notation

6.1 Lloyd's Register (LR) is a major classification society and has worked with ICHCA International in developing a special "Notation" for existing container ships based on the new Annex 14.

6.2 To qualify for such a Notation, a ship must satisfy an LR Surveyor of compliance with a range of requirements based on the provisions of the Annex.

6.3 Whilst it is accepted that not every situation can be changed, many can be improved, often at very little expense and effort. Lloyd's Register has carried out research to determine a standard which might reasonably be expected for existing container ships. Lloyd's Register classed container ships which meet the minimum specified standard will be eligible for the Special Features Notation **ECL** (Ergonomic Container Lashing), which will be shown in the Register of Ships. The Notation will remain provided the ship passes annual inspection.

6.4 To be eligible for the Notation, a ship must satisfy a minimum specified standard for certain key items, such as fencing, ladders and the dimensions of working spaces. Other items which are not as good as might normally be expected are highlighted in a report. The **ECL** report identifies aspects of the ship design and maintenance, and particular locations and lashing arrangements, which need to be specially considered by those engaged in lashing operations on the ship. In addition, the report identifies for owners the aspects which they should be considering if they wish to improve the quality of the ship.

6.5 The purpose is to assert that a ship having such a Notation can be shown to have met with the essential provisions of the Annex and terminals having such ships arriving can take that into account when inspecting the ship before discharge.

6.6 The Notation cannot reflect any damages that might have been occasioned and an inspection should still cover that possibility and, if found, its repair.

6.7 However, the fact that a ship has such a notation is a very positive indication and it is hoped will encourage existing ships, where necessary, to bring themselves up to the necessary standard.

7. Training and Familiarisation

7.1 Personnel engaged in cargo securing operations should be trained in the lashing and unlashing of containers as necessary to carry out their duties in a safe manner. This should include safe systems of work and –

- The different types of lashing equipment that are expected to be used
- The identification and handling of defective securing gear
- The knowledge and mental and physical manual skills necessary to do the job safely

7.2 Annex 14 also recommends that such personnel should be familiarised with each ship's unique characteristics and any potential hazards which may arise in the course of the work.

7.3 Specific training should be given in respect of refrigerated units and especially in recognising defective cables, receptacles and plugs.

8. The Future

8.1 From one year after the publishing of Annex 14 (30 June 2010), the Cargo Securing Manuals of purpose built container ships should reflect the provisions of the Annex. This should assist terminals in working with their shipping company customers in effecting changes to existing ships where such changes are necessary.

8.2 From the beginning of 2015, new ships should be designed so as to implement the whole of Annex 14 of CSS and this will include the provision of a Cargo Safe Access Plan (CSAP).

8.2.1 An approved CSAP for all areas where containers are secured should be carried on board.

8.2.2 The Guidelines for the preparation of the Cargo Securing Manual require stakeholders, including, but not limited to shipowners, ship designers, ship builders, administrations, classification societies and lashing equipment manufacturers, to be involved at an early stage in the design of securing arrangements on containerships and in the development of the CSAP.

8.2.3 The CSAP should be developed at the design stage in accordance with chapter 5 of the Annex to MSC.1/Circ.1353.

8.2.4 Designers should incorporate the recommendations of Annex 14 of CSS into the CSAP so that safe working conditions can be maintained during all anticipated configurations of container stowage.

APPENDIX ONE

Annex 14 of the IMO's Cargo Stowage and Securing Code (CSS Code) includes recommendations regarding existing ships. As they may be taken as relevant guidance to terminals and shipping companies seeking to bring the provisions of deck lashing up to the general standard of Annex 14, they are repeated in this Appendix. Those recommendations that the Annex says should be taken are in CAPITAL LETTERS whilst those that should be considered, dependent upon circumstances are in *italics*. All of the quotations used in this document are taken from the IMO's MSC Circ.1352.

A. General Advice

A.1 UPON ARRIVAL OF THE SHIP, A SAFETY ASSESSMENT OF THE LASHING POSITIONS AND THE ACCESS TO THOSE POSITIONS SHOULD BE MADE BEFORE SECURING WORK COMMENCES.

A.2 *Where there are lashing and unlashing locations on board ship where no fall protection, such as adequate handrails, are provided and no other safe method can be found, the containers should not be lashed or unlashed and the situation should be reported to shore side supervisor and the master or deck officer immediately.*

A.3 *If protective systems cannot be designed to provide safe protected access and lashing work positions, in all cargo configurations then cargo should not be stowed in that location.*

A.4 *Neither crew nor shore workers should be subjected to hazardous working conditions in the normal course of securing cargo.*

B. Lashing Positions on Deck and on Lashing Bridges

B.1 Lashing positions includes positions –

- In between container stows on hatch covers
- At the end of hatches
- On outboard lashing stanchions/pedestals
- Outboard lashing positions on hatch covers
- Any other position where people work with container securing

B.2 Annex 14 incorporates extensive provisions for the design of lashing positions and lashing bridges for new ships.

B.3 Although these provisions relate to new ships, if an existing ship does not have proper provision for a lashing position, Annex 14 should be taken as guidance in providing one (see chapter 9 and the appendix).

Fencing

B.4 *Where appropriate, lashing bridges and lashing platforms should be fenced. As a minimum, fencing design should take into consideration -*

- *The strength and height of the rails should be designed to prevent workers from falling*
- *There should be flexibility in positioning the fencing of gaps. A horizontal unfenced gap should not be greater than 300mm*
- *Provision for locking and removal of fencing as operational situations change based on stowage anticipated for that area*
- *Damage to fencing and how to prevent failure due to that damage*
- *Adequate strength of any temporary fittings. These should be capable of being safely and securely installed*

B.5 *The top rail of fencing should be 1m high from the base, with two intermediate rails. The opening below the lowest course of the guard rails should not exceed 230mm. The other courses should not be more than 380mm apart.*

B.6 *Where possible fences and handrails should be highlighted with a contrasting colour to the background.*

B.7 *Athwartships cargo securing walkways should be protected by adequate fencing if an unguarded edge exists when the hatch cover is removed.*

C. Safe Access

C.1 The Guidelines specify certain general provisions.

C.1.1 *The minimum clearance for transit areas should be at least 2m high and 600mm wide.*

C.1.2 *All the relevant deck surfaces used for movement about the ship and all passageways and stairs should have non-slip surfaces.*

C.1.3 *Where necessary for safety, walkways on deck should be delineated by painted lines or otherwise marked by pictorial signs.*

C.1.4 *All protrusions in accessways, such as cleats, ribs and brackets that may give rise to a trip hazard should be highlighted in a contrasting colour.*

C.1.5 *Transit areas should be safe and clear of cargo and all equipment.*

Ladders

C.2 *Where a fixed ladder gives access to the outside of a lashing position, the stringers (uprights or sides of ladders) should be connected at their extremities to the guardrails of the lashing position, irrespective of whether the ladder is sloping or vertical.*

C.3 *Where a fixed ladder gives access to a lashing position through an opening in the platform, the opening shall be protected with either a fixed grate with a lock back mechanism, which can be closed after access, or fencing. Grabrails should be provided to ensure safe access through the opening.*

C.4 *Where a fixed ladder gives access to a lashing position from the outside of the platform, the stringers of the ladder should be opened above the platform level to give a clear width of 700 to 750mm to enable a person to pass through the stringers.*

C.5 *Handholds should be provided at the top of the ladder to enable safe access to the platform to be gained.*

C.6 *A fixed ladder should not slope at an angle greater than 25^0 from the vertical. Where the slope of a ladder exceeds 15^0 from the vertical, the ladder should be provided with suitable handrails not less than 540mm apart, measured horizontally.*

C.7 *A fixed vertical ladder of a height exceeding 3m and any fixed vertical ladder, from which a person may fall into a hold, should be fitted with guard hoops, which should be constructed in accordance with the following –*

- *The ladder hoops should be uniformly spaced at intervals not exceeding 900mm and should have a clearance of 750mm from the rung to the back of the hoop and be connected by longitudinal strips secured to the inside of the hoops, each equally spaced round the circumference of the hoop*

- *The stringers should be carried above the floor level of the platform by at least 1m and the ends of the stringers should be given lateral support and the top step or rung should be level with the floor of the platform unless the steps or rungs are fitted to the ends of the stringers.*

C.8 *As far as practicable, access ladders and walkways, and work platforms should be designed so that workers do not have to climb over piping or work in areas with permanent obstructions.*

Manholes

C.9 *There should be no unprotected openings in any part of the workplace. Access opening must be protected with handrails or access covers that can be locked back during access.*

C.10 *As far as practicable, manholes should not be situated in transit areas. If they are, proper fencing should protect them.*

C.11 *Access ladders and manholes should be large enough for persons to safely enter and leave.*

C.12 *A foot hold at least 150mm deep should be provided.*

C.13 *Manhole openings that may present a fall hazard should be highlighted in contrasting colour around the rim of the opening.*

C.14 *Manhole openings at different levels of the lashing bridge should not be located directly below one another, as far as practicable.*

D. Safe Working

D.1 *The company involved with cargo operations should anticipate, identify, evaluate and control hazards and take appropriate measures to eliminate or minimise potential hazards to prevent in particular harmful lumbar spinal damage and severe illness as a result of physical strain.*

D.2 *Openings that are necessary for the operation of the ship, which are not protected by fencing, should be closed during cargo securing work.*

D.3 *Any necessarily unprotected opening in work platforms (ie those with a potential fall of less than 2m) and gaps and apertures on deck should be properly highlighted.*

D.4 *The use of fencing is essential to prevent falls. When openings in safety barriers are necessary to allow container crane movements, particularly with derricking cranes, removable fencing should be used whenever possible.*

D.5 *It should be taken into account that when lifting lashing bars that can weigh between 11 – 21 kg and turnbuckles between 16 – 23 kg, there may be a risk of injury and severe illness as a result of physical strain if handled above shoulder height with the arms extended. It is, therefore, recommended that personnel work in pairs to reduce the individual work load in securing or releasing the lashing gear.*

D.6 *Personnel engaged in container ship cargo operations should wear appropriate Personnel Protective Equipment (PPE) whilst carrying out lashing operations. The PPE should be provided by the company.*

D.7 *Containers should not be stowed in spaces configured for larger sized containers unless they can be secured under safe working conditions.*

Lighting

D.8 *A lighting plan should be developed for –*

- *The proper illumination of access ways, not less than 10 lux (1 foot candle), taking into account the shadows created by containers that may be stowed in the area to be lit, for example, different length containers in or over the work area*

- *A separate fixed or temporary (where necessary) lighting system for each working space between the container bays, which is bright enough, not less than 50 lux (5 foot candle), for the work to be done, but minimises glare to the deck workers*

- *Such illumination should, where possible, be designed as a permanent installation and adequately guarded against breakage*

- *The illumination intensity should take into consideration the distance to the uppermost reaches where cargo securing equipment is utilised*

Maintenance

D.9 ALL SHIPS SHOULD MAINTAIN A RECORD BOOK, WHICH SHOULD CONTAIN THE PROCEDURES FOR ACCEPTING, MAINTAINING AND REPAIRING OR REJECTING CARGO SECURING DEVICES. THE RECORD BOOK SHOULD ALSO CONTAIN A RECORD OF INSPECTIONS.

D.10 LIGHTING SHOULD BE PROPERLY MAINTAINED.

D.11 WALKWAYS, LADDERS, STAIRWAYS AND FENCINGS SHOULD BE SUBJECT TO A PERIODIC MAINTENANCE PROGRAMME WHICH WILL REDUCE/PREVENT CORROSION AND PREVENT SUBSEQUENT COLLAPSE.

D.12 CORRODED WALKWAYS, LADDERS, STAIRWAYS AND FENCINGS SHOULD BE REPAIRED OR REPLACED AS SOON AS PRACTICABLE. THE REPAIRS SHOULD BE EFFECTED IMMEDIATELY IF THE CORROSION COULD PREVENT SAFE OPERATIONS.

D.13 IT SHOULD BE BORNE IN MIND THAT TURNBUCKLES COVERED WITH GREASE ARE DIFFICULT TO HANDLE WHEN TIGHTENING.

D.14 STORAGE BINS AND THEIR CARRIERS SHOULD BE MAINTAINED IN A SAFE CONDITION.

Temperature controlled unit power outlets

D.15 TEMPERATURE CONTROLLED UNIT POWER OUTLETS SHOULD PROVIDE A SAFE, WATERTIGHT ELECTRICAL CONNECTION.

D.16 THE OUTLETS SHOULD FEATURE A HEAVY DUTY, INTERLOCKED AND CIRCUIT BREAKER PROTECTED ELECTRICAL POWER OUTLET. THIS SHOULD ENSURE THE OUTLET CANNOT BE SWITCHED “LIVE” UNTIL A PLUG IS FULLY ENGAGED AND THE ACTUATOR ROD IS PUSHED TO THE “ON” POSITION. PULLING THE ACTUATOR ROD TO THE “OFF” POSITION SHOULD MANUALLY DE-ENERGISE THE CIRCUIT.

D.17 THE CIRCUIT SHOULD DE-ENERGISE AUTOMATICALLY IF THE PLUG IS ACCIDENTALLY WITHDRAWN WHILE IN THE “ON” POSITION. ALSO, THE INTERLOCK MECHANISM SHOULD BREAK THE CIRCUIT WHILE THE PIN AND SLEEVE CONTACTS ARE STILL ENGAGED. THIS PROVIDES TOTAL OPERATOR SAFETY AND PROTECTION AGAINST SHOCK WHILE ELIMINATING ARCING DAMAGE TO THE PLUG AND RECEPTACLE.

D.18 OUTLETS SHOULD BE DESIGNED TO ENSURE THAT THE WORKER IS NOT STANDING DIRECTLY IN FRONT OF THE SOCKET WHEN SWITCHING TAKES PLACE.

D.19 POSITIONING OF THE TEMPERATURE CONTROLLED UNIT FEED OUTLETS SHOULD NOT BE SUCH THAT THE FLEXIBLE CABLING NEEDS TO BE LAID OUT IN SUCH A WAY AS TO CAUSE A TRIPPING HAZARD.

D.20 MEANS OR PROVISIONS SHOULD BE PROVIDED TO LAY THE TEMPERATURE CONTROLLED UNIT CABLES IN AND PROTECT THEM FROM LASHING EQUIPMENT FALLING ON THEM DURING LASHING OPERATIONS.

D.21 DEFECTIVE OR INOPERATIVE TEMPERATURE CONTROLLED UNIT PLUGS/ELECTRICAL BANKS SHOULD BE IDENTIFIED AND CONFIRMED AS "LOCKED OUT/TAGGED OUT" BY THE VESSEL.

E. Training and Familiarisation

E.1 *Personnel engaged in cargo securing operations should be trained in the lashing and unlashing of containers as necessary to carry out their duties in a safe manner. This should include the different types of lashing equipment that are expected to be used.*

E.2 *Personnel engaged in cargo securing operations should be trained in the identification and handling of bad order or defective securing gear in accordance with each ship's procedures to ensure damaged gear is segregated for repair and maintenance or disposal.*

E.3 *Personnel engaged in cargo securing operations should be trained to develop the knowledge and mental and physical manual handling skills that they require to do their job safely and efficiently, and to develop general safety awareness to recognise and avoid potential dangers.*

E.4 *Personnel should be trained in safe systems of work.*

E.5 *Personnel who are required to handle thermal cables and/or connect and disconnect temperature control units should be given training in recognising defective cables, receptacles and plugs.*

E.6 *Personnel engaged in container ship cargo operations should be familiarised with the ship's unique characteristics and potential hazards arising from such operations necessary to carry out their duties.*

E.7 STEVEDORES OR SHIPS CREW WHO ARE REQUIRED TO HANDLE TEMPERATURE CONTROLLED UNIT CABLES AND/OR CONNECT AND DISCONNECT REEFER UNITS SHOULD BE GIVEN TRAINING IN RECOGNISING DEFECTIVE WIRES AND PLUGS.

F. Lashing Systems

F.1 Annex 14 has a whole section on lashing systems including tensioning devices (section 6.3).

F.2 *In general, such equipment should -*

- *Conform to ISO standards*
- *Be compatible with the planned container stowages*
- *Be compatible with the physical ability of persons to safely hold, deploy and use such equipment*
- *Be uniform and compatible, eg twistlocks and lashing rod head should not interfere with each other*
- *Be subject to a periodic inspection and maintenance regime*
    - *Non conforming items should be segregated for repair of disposal*
- *Be according to the Container Securing Manual*

F.3 *Manual twistlocks should only be used where safe access is provided.*

F.4 Twistlock Design

F.4.1 *Shipowners should ensure that the number of different types of twistlocks provided for cargo securing is kept to a minimum and clear instructions are provided for their operation. The use of too many different types of twistlocks can lead to confusion as to whether the twistlocks are locked.*

F.4.2 *The design of twistlocks should ensure the following –*

- *Positive locking with easy up and down side identification*
- *Dislodging form corner fitting is not possible even when grazing a surface*
- *Access and visibility of the unlocking device is effective in operational situations*
- *Unlocked positions are easily identifiable and do not relock inadvertently due to jolting or vibration*
- *Unlocking poles are as light as possible, of a simple design for ease of use*

F.5 Lashing Rod Design

F.5.1 *The design of container ship securing systems should take into account the practical abilities of the workers to lift, reach, hold, control and connect the components called for in all situations anticipated in the cargo securing plan.*

F.5.2 *The maximum length of a lashing rod should be sufficient to reach the bottom corner fitting of a container on top of two high cube (9'6") containers and be used in accordance with the instructions provided by manufacturers.*

F.5.3 *The weight of lashing rods should be minimised as low as possible consistent with the necessary mechanical strength.*

F.5.4 *The head of the lashing rod that is inserted in the corner fitting should be designed with a pivot/hinge or other appropriate device so that the rod does not come out of the corner fitting accidentally.*

F.5.5 *The rod's length in conjunction with the length and design of the turnbuckle should be such that the need of extensions is eliminated when lashing high cube containers.*

F.5.6 *Light weight rods should be provided where special tools are needed to lash high cube containers.*

F.6 Turnbuckle Design

F.6.1 *Turnbuckle end fittings should be designed to harmonise with the design of lashing rods.*

F.6.2 *Turnbuckles should be designed to minimise the work in operating them.*

F.6.3 *Anchor points for turnbuckles should be positioned to provide safe handling and to prevent the bending of rods.*

F.6.4 *To prevent hand injury during tightening or loosening motions, there should be a minimum distance of 70mm between turnbuckles.*

F.6.5 *The turnbuckle should incorporate a locking mechanism which will ensure that the lashing does not work loose during the voyage.*

F.6.6 *The weight of turnbuckles should be minimised as low as possible consistent with the necessary mechanical strength.*

F.7 Storage Bins and Lashing Equipment Stowage Design

F.7.1 Bins or stowage places for lashing materials should be provided.

F.7.2 All lashing gear should be stowed as close to its intended place of use as possible.

F.7.3 The stowage of securing devices should be arranged so that they can easily be retrieved from their stowage position.

F.7.4 Bins for faulty or damaged gear should also be provided and appropriately marked.

F.7.5 Bins should be of sufficient strength.

F.7.6 Bins and their carriers should be designed to be lifted of the vessel and restowed.

APPENDIX TWO - A SAMPLE VESSEL INSPECTION FORM

Annex 14 advises that upon arrival of the ship, a safety assessment of the lashing positions and the access to those positions should be made before securing work commences and this is included as an action that should be implemented*.*

A sample form that could be used for such an assessment is appended.

We are grateful to the Port of Felixstowe for its permission to reproduce its Vessel Condition Report.

Port of Felixstowe

Container Division - Vessel Condition Report

Lloyd's Register No.

Vessel:	Line:	Date:	

Vessel superstructure	Poor	Fair	Good
Gangway access			
Well decks (highlighting of obstructions)			
Access between hatches (safe access & working space)			
Lashing access (walkways & staging)			
Outboard lashing stations (fall protection)			
Ships lighting for lashing on deck			
Cell guides (condition)			
Walkways under deck			
Ships lighting for lashing under-deck			

Lashing gear *(use tick boxes as appropriate)*

Accessibility (stacking cones : twistlocks : bars)								
Compatibility	Bars with bottlescrews	☐	Bars & T/Ls	☐	Greased	☐		
Twistlocks	S/Auto	☐	Manual	☐	Mixed L/R	☐		
Stacking cones					S/Auto	☐		

Ship's crew			
Ship's general cleanliness			

Remarks

Does a VSI (restriction) form exist for this vessel? YES | NO

Vessel notification *(complete only if the stowage remarks have been brought to the attention of a Vessel Officer)*:

reported to: date: at hrs.

Print name:	Position:				
Signed:	Terminal:	LGD	✓	TTY	✓

Issued by the Port of Felixstowe, UK. White copy: Customer / Green copy: Safety Dept. / Yellow copy: Duty Officer