PLVAC Paper No. 19/2004

PROVISIONAL LOCAL VESSELS ADVISORY COMMITTEE

Draft Code of Practice for Shipboard Container Handling (August 2004)

Purpose

1. This paper aims at providing practical guidance and recommendations on safety and health in shipboard container handling being engaged on the vessels in the waters of Hong Kong. Shipowners, ship captains or coxswain, in charges of works, stevedoring contractors, works supervisors, safety personnel, employers and the employed engaging in shipboard container handling should read this Code of Practice.

Background

2. Presently, vessels in the waters of Hong Kong engaging in shipboard container handling are under the control of the Shipping and Port Control Ordinance, Cap 313. However, when the Merchant Shipping (Local Vessels) Ordinance, Cap 548, comes into force, local vessels engaging in the shipboard container handling will be governed by the Merchant Shipping (Local Vessels) Ordinance. The non-local vessels engaging in the shipboard container handling will remain under the ambit of the Shipping and Port Control Ordinance. With regard to the Chinese coastal vessels arriving in Hong Kong, if the vessel obtains permit issued by the Director of Marine, the vessel will be under ambit of the Merchant Shipping (Local Vessels) Ordinance.

3. This Code of Practice is applicable to both local vessels and non-local vessels engaging in shipboard container handling, but inapplicable to land-based container handling. Approval and issue of this Code is rested in the Director of Marine in pursuant to the Section 45A of the Merchant Shipping (Local Vessels) Ordinance, Cap 548 and the Section 44A of the Shipping and Port Control Ordinance, Cap 313.

4. The “Draft Code of Practice for Shipboard Container Handling” was first scrutinized by the Department of Justice. With its Chinese and English versions ready, the Code of Practice was distributed to the industry for consultation in 2000. Upon completion of consultation and subsequent amendments, Marine Department has published this Code in form of Safety Guide and distributed to the industry since December 2001. Since then, the Safety Guide, in the name of “Safety Guide for Shipboard Container Handling, has been accepted and adopted by the industry.

Code of Practice for Shipboard Container Handling

5. This Code explicitly highlights the duties of the employers, in charges of works and the employed; spells out the safe system of work for safety and health at work; jots down the practical guidelines for container loading and unloading; confirms a system of mandatory safety training for workers and appointment of works supervisor; compiles procedures of an emergency and first aid box maintenance.

6. The Code further depicts the necessity of work planning, the awareness of the likely affected dangers in actual working environment. It also emphasizes the need of conducting risk assessment during work planning, and demonstrates an example of a risk assessment for a case of container handling.

7. The Code also delineates the safe practices on working atop a container, midstream container operation, working inside container, handling dangerous goods container. In addition, it gives pictorial explanation of minimum working area required for working on tops of containers.

Advise sought

8. The industry had been consulted with and had accepted this Code of Practice. Members are welcome to comment and endorse the Code.

Marine Industrial Safety Section, Marine Department
Hong Kong SAR Government
September 2004

[September 2004]

DRAFT CODE OF PRACTICE FOR

Shipboard Container Handling

(This CoP is approved and issued under Section 44A of the Shipping and Port Control Ordinance, Cap 313 Section 45A of the Merchant Shipping (Local Vessels) Ordinance), Cap 548.

MARINE INDUSTRIAL SAFETY SECTION
MARINE DEPARTMENT, HKSAR

Record on Updating and Amendments

This Code of Practice is issued under Section 44A of the Shipping and Port Control Ordinance and Section 45A of the Merchant Shipping (Local Vessels) Ordinance through the Gazette Notice. Subsequent updating and amendments would be notified to the industry through further notice in the Gazette from time to time. This record sheet is intended for good record keeping of this Code of Practice.

Amendment No	Gazette No.	Gazette Date	Effect Date	Topic Areas / pages

FORWARD

In Hong Kong, the first legislation governing the shipboard cargo handling is "Shipping and Port Control Ordinance" and its subsidiary regulation, "Shipping and Port Control (Cargo Handling) Regulations" which were legislated in 1978, with a view to implementing the relevant Convention according to the International Labour Organization.

Ensuing the continuous growth of Hong Kong economy, the container throughput in the transport industry has been soaring rapidly. As the above legislation is originally devised for handling the general cargo, it is no longer serving its purpose as far as the enduring expansion in container handling is concerned.

This Code of Practice aims to provide practical guidance on the aspect of Safety and Health to those serving in the container transport trade. Furthermore, this Code has certain level of legal binding to those engaging in this trade for their observance on every aspect stipulated therein.

This Code of Practice is applicable to all vessels engaging in container handling in the waters of Hong Kong, including local vessels, Chinese coastal vessels and other foreign vessels. After the Merchant Shipping (Local Vessels) Ordinance, Cap 548, has come into force, cargo handling on the local vessels fall into the ambit of this Ordinance. Nevertheless, cargo handling being proceeded in non-local vessels remains to be governed by the Shipping and Port Control Ordinance, Cap 313. With regard to the Chinese coastal vessels arriving in Hong Kong, if the vessel obtains permit issued by the Director of Marine, the vessel will be under ambit of the Merchant Shipping (Local Vessels) Ordinance and considered as a local vessel.

For easy reference, the relevant regulations from either Ordinance and its subsidiary regulations are jotted down on the left column of this Code.

.

CONTENT

1. INTRODUCTION

1.1 Purpose

1.1.1 This Code of Practice provides practical guidance and gives recommendations on the safety and health practices at work for freight container handling carried out on board vessels in the waters of Hong Kong. It is intended to be read by owners and masters or coxswains of vessels, persons in charge of works, stevedoring contractors, supervisors, safety personnel, employers and persons employed involved in shipboard container handling.

1.1.2 Legal requirements to ensure the safety and health of shipboard container handling are given in Part V of the Shipping and Port Control Ordinance, Cap. 313, and the Shipping and Port Control (Works) Regulations, Cap. 313 sub. leg. B. and in Part VIII of the Merchant Shipping (Local Vessels) Ordinance, Cap 548 and the Merchant Shipping (Local Vessels)(Works) Regulations, Cap 548 sub leg ??.

SAPCO Section 44A & MS(Local Vessels) Ord. Section 45A.

1.13 This Code of Practice is approved and issued by the Director of Marine under Section 44A of Shipping and Port Control Ordinance and under Section 45A of Merchant Shipping Ordinance. The recommendations contained in the Code of Practice should not be regarded as exhausting those matters that need to be covered by the relevant safety legislation. Compliance with the Code of Practice does not confer immunity from relevant legal requirements.

1.1.4 The Code of Practice has a special legal status. Although failure to observe any guidelines given in the Code of Practice is not itself an offence, failure may be taken by a court in criminal proceedings as a relevant factor in determining whether a person has breached the relevant safety legislation under the Shipping and Port Control Ordinance or its subsidiary legislation or the Merchant Shipping (Local Vessels) Ordinance or its subsidiary. It will then be open to that person to satisfy the court that he has complied with the legislation in some other way.

1.1.5 This Code of Practice may be revised or amended from time to time, or revoked by the Director of Marine by notice in the Gazette. The statutory provisions summarised or referred to in the Code of Practice are enforced on the issued date of Gazette.

1.1.6 Throughout the Code of Practice, we will quote the relevant safety standards of the British Standards Institution. However, other national, international standards or provisions that are equivalent to the British Standards may be acceptable as alternatives.

1.2 Scope

1.2.1 This Code of Practice recommends safe practices for shipboard container handling work carried out on board vessels in the waters of Hong Kong where hazards to workers exist.

1.2.2 This Code of Practice does not apply to land-based container handling work.

2. INTERPRETATION AND ABBREVIATION

Unless otherwise defined in this Code of Practice, the terms used in this Code of Practice have the same meaning as those in the Shipping and Port Control Ordinance and the Shipping and Port Control (Works) Regulations, and also in the Merchant Shipping (Local Vessels) Ordinance and the Merchant Shipping (Local Vessels)(Works) Regulations--

2.1 Interpretation

"container" (**貨櫃**) means a freight container.

"land-based container handling work" (**陸上貨櫃處理工作**) means any container handling work carried out at a place on land or any container handling work carried out with lifting appliances used from a place on land.

"shipboard container handling work" (**船上貨櫃處理工作**) means any container handling work carried out on board a vessel or any container handling work carried out with lifting appliances carried on board a vessel.

2.2 Abbreviation

"DGSR" is the abbreviation for Dangerous Goods (Shipping) Regulations, Cap. 295 sub. leg. C.

"HKSAR" is the abbreviation for Hong Kong Special Administrative Region.

"IMDG Code" is the abbreviation for the International Maritime Dangerous Goods Code.

“MS(LV)O” is the abbreviation for the Merchant Shipping (Local Vessels) Ordinance, Cap. 548.

“MS(LV)(W)R” is the abbreviation for the Merchant Shipping (Local Vessels)(Works) Regulations, Cap 548 sub leg ??

"SAPCO" is the abbreviation for the Shipping and Port Control Ordinance, Cap. 313.

"SAPCWR" is the abbreviation for the Shipping and Port Control (Works) Regulations, Cap. 313 sub. leg. B.

3. RESPONSIBILITY

3.1 General

3.1.1 It is the duty of any person, including employer and person in charge of works, who has responsibility for or control over a shipboard container handling operation to ensure that the work is, so far as is reasonably practicable, safe and is carried out in a safe and healthful manner.

3.1.2 Securing safety and health at work requires full commitment and cooperation of all parties concerned. The following summarizes the responsibilities of various parties directly involved in shipboard container handling operations, namely employers, persons in charge of works, works supervisors and persons employed who are required to comply with the duty imposed under SAPCO and SAPCWR, or MS(LV)O and MS(LV)(W)R.

3.1.3 It must be pointed out that every employer, person in charge of works, works supervisor or employee engaged in shipboard container operations is required to comply with the requirements imposed under SAPCO and SAPCWR or MS(LV)O and MS(LV)(W)R and will be liable to be prosecuted for any breach of the law.

3.2 Responsibilities of employer

SAPCWR Reg.15D(a) & MS(LV)(W)R Reg 23

3.2.1 It is the responsibility of an employer to ensure that any machinery, equipment or appliance provided for use in a workplace by the persons employed in the works shall be in safe working conditions.

SAPCWR Reg.15D(b) & MS(LV)(W)R Reg 23(4)

3.2.2 It is the responsibility of an employer to ensure the provision of such information, instruction, training and supervision as is necessary to ensure, as far as is reasonably practicable, the health and safety at work of all persons employed.

SAPCWR Reg.15D(a) & MS(LV)(W)R Reg 21(1)

3.2.3 It is the responsibility of an employer to provide each person employed with a suitable safety helmet and, so far as is reasonably practicable, other protective clothing and equipment as are appropriate to prevent bodily injury; and to ensure these protective clothing and equipment are properly used and maintained.

SAPCWR Reg.15D(b) & MS(LV)(W)R Reg 57

3.2.4 It is the responsibility of an employer to ensure that no person is employed in any shipboard container handling work unless that person holds a valid certificate of mandatory basic safety training.

SAPCWR Reg.15B(1) & MS(LV)(W)R Reg 72(1)

3.2.5 It is the responsibility of an employer to maintain or cause to maintain a record of all persons employed.

3.3 Responsibilities of person in charge of works

SAPCWR Reg.15D(a) & MS(LV)R Reg. 23(1)

3.3.1 Apart from an employer, it is also the responsibility of a person in charge of works to ensure that any machinery, equipment or appliance provided for use in a workplace by the persons employed in the works shall be in safe working conditions.

SAPCWR Reg.15D(b) & MS(LV)(W)R Reg 23(4)

3.3.2 Apart from an employer, it is also the responsibility of a person in charge of works to ensure the provision of such information, instruction, training and supervision as is necessary to ensure, as far as is reasonably practicable, the health and safety at work of all persons employed.

SAPCWR Reg.15B(1) & MS(LV)(W)R Reg 21(1)

3.3.3 Apart from an employer, it is also the responsibility of a person in charge of works to provide each person employed with a suitable safety helmet and, so far as is reasonably practicable, other protective clothing and equipment as are appropriate to prevent bodily injury; and to ensure these protective clothing and equipment are properly used and maintained.

SAPCWR Reg.31A& MS(LV)(W)R Reg 57

3.3.4 Apart from an employer, it is also the responsibility of a person in charge of works to ensure that no person is employed in any shipboard container handling work unless that person holds a valid certificate of mandatory basic safety training.

SAPCWR Reg.53A& MS(LV)(W)R Reg 72(1)

3.3.5 Apart from an employer, it is the responsibility of a person in charge of works to maintain or cause to maintain a record of all persons employed.

SAPCWR

3.3.6 It is the responsibility of the person in charge of works to appoint

Reg.15A(1) & MS(LV)(W)R Reg 19(1)

in writing one or more works supervisor to supervise the works carried out on board a vessel to assist him to carry out his duties under the law.

SAPCO Section 43 & MS(LV)(W)R Reg 44

3.3.7 It is the responsibility of a person in charge of works to provide, for the carrying out of works, machinery, equipment or appliance that is so constructed that it can be used without unnecessary risk of accident or bodily injury.

SAPCO Section 44 & MS(LV)(W)R Reg 45

3.3.8 It is the responsibility of a person in charge of works to carry out any works in a condition or manner that provides adequately against unnecessary risk of accident or bodily injury.

SAPCWR Reg.5, Reg.6 & MS(LV)(W)R Reg 4, Reg 6.

3.3.9 It is the responsibility of the person in charge of works to provide safe means of access to and egress from vessels. Such safe means of access shall be provided for the use of persons employed at such time as they have to pass between a vessel and the shore or a place on land, or between two vessels.

SAPCWR Reg.5(2A)(a), Reg.7& MS(LV)(W)R Reg.5(1), Reg7

3.3.10 Where works are to be carried out on a vessel, it is the responsibility of the person in charge of works to provide safe means of access to any workplace on the vessel.

SAPCWR Reg.5(2A)(b) & MS(LV)(W)R Reg.5(2)

3.3.11 It is the responsibility of the person in charge of works to ensure, as far as practicable, all breaks, dangerous corners and other dangerous parts of any workplace, be securely fenced so that the height of the fence is in no place less than 1000 mm and that the fence is maintained in good condition ready for use.

SAPCWR Reg.8 & MS(LV)(W)R Reg 9(1)

3.3.12 It is the responsibility of the person in charge of works to ensure that, when any works are being carried on a vessel, all workplaces, the means of access to vessels and workplaces, and all parts of the vessel to which persons employed may be required to proceed in the course of their employment, shall be efficiently lighted.

SAPCWR Reg.9 & MS(LV)(W)R Reg 10

3.3.13 It is the responsibility of the person in charge of works to ensure that at every workplace, or other place on a vessel to which person employed are permitted access, or are required to have access, in the course of their employment, the atmosphere is safe and the ventilation is adequate.

3.3.14 When containers carrying dangerous goods are being handled, it is the responsibility of the person in charge of works to inform persons employed about the type of dangerous goods, the potential hazards and the safety and emergency measures needed to be observed when handling the containers.

3.4 Responsibilities of works supervisor

SAPCWR Reg.15A(3) & MS(LV)(W)R Reg 20(1)

3.4.1 It is the responsibility of a person employed in any works to:

(i) take reasonable care for the health and safety of himself and of other persons who may be affected by his acts or omissions at work;

(ii) to carry out his duties under the relevant safety legislation.

3.5 Responsibilities of person employed

SAPCWR Reg.15E & MS(LV)(W) Reg 24(1)

3.5.1 It is the responsibility of a person employed in any works to:

(i) to ensure that works are being carried out safely and free from unnecessary risk of accident or bodily injury;

(ii) as regards any duty or requirement imposed on an employer, a person in charge of works or any other person by the relevant safety legislation for securing the health and safety of persons employed, co-operate with that person so far as is necessary to enable that duty or requirement to be performed or complied with; and

(iii) wear a suitable safety helmet and use other appropriate protective clothing and equipment provided to him by an employer or person in charge of works.

4. MANAGING SAFETY AT WORK

It is the responsibility of an employer and the person in charge of works to provide a safe system of work for the safety and health at work of the persons employed. To achieve this, it calls for a good safety management system. Among other things, the following actions should be taken.

4.1 Work Planning

4.1.1 A shipboard container handling operation should be planned with safety in mind. It is possible to eliminate or minimize work hazards by proper planning of the equipment and manpower requirement, stowage and stacking orders of containers, allocation of duties, co-ordination, etc.

4.1.2 Potentially hazardous or unfavourable working conditions that will likely affect the safety of container handling operation should be considered in the work planning. These may include the following:

(i) vessel berth with strong winds, swells or waves;

(ii) inclement weather;

(iii) narrow or cramped cargo hold;

(iv) non-standard container;

(v) dangerous goods container;

(vi) listing of vessel during heavy lifting;

(vii) other operations on the same vessel;

(viii) adjacent maritime activities.

4.2 Risk assessment

4.2.1 Risk assessment is the overall process of estimating the magnitude of risk and deciding whether or not the risk is tolerable or acceptable. Its main purpose is to determine whether the

as-planned or existing controls are adequate so that risks are controlled and harm can be avoided.

4.2.2 Employer and person in charge of works should conduct risk assessments for each type of operations, such as operations between ocean-going vessel and lighter, between lighter and another lighter or river trade vessel, between lighter and shore. Before each shipboard container handling operation starts, assessment should be made to identify any unusual working condition or environment that may require addition risk assessments to be made. Employer and person in charge of works should continually review the need for fresh risk assessments to be conducted should there be any changes in the operating environments or modes of operation in the industry. The process of risk assessment should be carried out by suitably experienced personnel, using specialist advice if appropriate.

4.2.3 Risk assessment can be divided into five basic steps as follows:

Step 1 - Identify hazards in the workplace.

Step 2 - Identify who or what may be harmed, and how such harm may occur.

Step 3 - Assess the risks arising from the hazards based on the probability and the possible consequences of the hazardous event, and assess whether the existing safety precautions are adequate and what more should be done.

Step 4 - Record the findings of the assessment.

Step 5 - Review the working environments from time to time; conduct fresh risk assessment if necessary.

Further guidance on how each step may be accomplished is in Appendix I.

4.2.4 Common hazards of shipboard container handling include:

(i) making access to or egress from tops of container stacks;

(ii) working on tops of container stacks;

(iii) uncontrolled movement of lifting sling ropes or containers;

(iv) containers handled are heavy and bulky; or

(v) derrick cranes of lighters are used to lift containers at mid-stream.

4.2.5 Past accident statistics indicate that the followings are the major causes of shipboard cargo handling accidents:

(i) struck by swinging lifting slings or container;

(ii) slip, trip or fall on same level;

(iii) fall of person from height; and

(iv) manual handling.

Items (i) and (iii) in particular are the major causes of fatal accidents.

4.3 Safe working procedures

4.3.1 Persons in charge of works should draw up safe working procedures for shipboard container handling works and related activities in order to reduce the risk of accident or bodily injury.

4.3.2 The safe working procedures should contain written instructions regarding how works can be carried out safely. It should be well documented to ensure that everybody involved in the works is aware of what to do. It should be distributed to all parties concerned in the language understood by them when they are first employed.

4.3.3 Safe working procedures should where appropriate include:

(i) arrangement for co-ordination, responsibilities and authority of management/supervisory personnel during the progress of the work;

(ii) use of suitable plant and equipment;

(iii) sequence of work;

(iv) provisions for prevention of fall into water, including safe means of access and egress, and safe working environment;

(v) prevention of fall of materials, cargoes and tools;

(vi) use of suitable personal protective clothing and equipment;

(vii) correct stacking orders to facilitate safe access to tops of container stacks;

(viii) guidelines for more hazardous works such as tackling operations; and

(ix) contingency plan in case of adverse weather or emergency including rescue arrangement.

4.3.4 Safe working procedures should be reviewed and updated from time to time to suit any change to the working practices and environment. Such updated version should be distributed to all parties concerned as soon as practicable.

4.4 Co-ordination, communication and supervision

4.4.1 There should be effective liaison among all parties concerned including master or officer in charge of a vessel, stevedoring contractor and sub-contractor, works supervisor, signaller, and workers. Only competent personnel for co-ordination and supervision should be selected to ensure effective communication in the work process.

4.4.2 Adequate stowage plans, manifests, and related documents for container handling work should be made available to the management personnel responsible for work planning in good times. On the basis of the documents, the person responsible for managing or controlling the work can then assess the risk involved and ensure the competence of his workforce.

4.4.3 The employer and person in charge of works should ensure that all his supervisory personnel including foremen, works supervisors, and gang leaders possess the necessary information about the work before the work starts. This information includes the number of containers to be handled and their sizes, special containers (such as those carrying dangerous goods, heavy machineries or of special sizes), and container stowage instructions.

4.4.4 Sufficient number of supervisory staff should be arranged to be present at the workplace to exercise effective control over the activities. The supervisory staff should be suitably trained and experienced in the activities.

4.5 Contingency plan for adverse weather conditions

4.5.1 Employers and person in charge of works must develop guidelines stating when work is to be stopped due to adverse weather such as heavy swell, heavy rain, strong wind, fog, etc.

4.5.2 The person in charge of works should monitor the weather and sea conditions. Sea and weather conditions that could have an adverse effect on the work include rain, strong wind or typhoon, heavy swell or wave, and those causing poor visibility, such as fog, mist or glare.

4.5.3 If a decision is made to stop work, then measures should be taken to maintain the stability of equipment and containers on the vessel. All personnel should be kept safely on board or if necessary be safely and efficiently evacuated. Before resuming work, all equipment should be checked whether they are in safe order.

4.6 Training

SAPCWR Reg.31A, Reg.15A(2), Reg.29A & MS(LV)(W)R Reg 57, Reg 19(2), Reg 53

3.5.1 SAPCWR and MS(LV)(W)R require all persons engaged in shipboard cargo handling works, works supervisors appointed to supervise any works and operators of cranes on vessels to receive mandatory safety training. They are required to hold valid certificates in respect of the relevant safety training courses. The relevant safety training courses include:

(i) "Shipboard cargo handling basic safety training course";

(ii) "Works supervisor safety training course"; and

(iii) "Shipboard crane operator safety training course".

4.6.2 Detailed guidance on the content of the curricula, the process and requirement for the accreditation of certificate issuing authorities are provided in the following codes of practice issued by the Director of Marine:

Code of Practice for Shipboard Crane Operators Safety Training, Code of Practice for Shipboard Cargo Handling

(i) "Code of Practice for Shipboard Cargo Handling Basic Safety Training";

Basic Safety Training,

Code of Practice for Works Supervisor Safety Training

(ii) "Code of Practice for Works Supervisor Safety Training"; and

(iii) "Code of Practice for Shipboard Crane Operators Safety Training".

4.6.3 The mandatory safety training courses are designed to provide persons engaged in shipboard cargo handling works with basic safety knowledge and to raise their safety awareness at work with an aim to reduce work related accidents. These courses are not intended to replace any skills training or job specific safety training required of the workers to carry out their works safely and effectively.

4.6.4 The employer and person in charge of works should assess the training needs of the workers and provide adequate training to all workers before they are assigned to work. The training may include general induction on working procedures and more specific job related training, and may be met by a mixture of on-the-job and off-the-job training.

4.6.5 All personnel should also be trained to be familiar with the emergency procedures laid down by the employer and person in charge of work. They should be provided with the necessary information to enable them to act effectively and efficiently in an emergency situation. They should also know where to get the emergency equipment and how to use the equipment.

5. SAFE PRACTICES

5.1 General

5.1.1 It is the duty of every person engaged in shipboard container handling to follow these safe practices. Basically, the employer and person in charge of works are responsible for taking all necessary steps to protect the safety and health of persons employed. Persons employed, for their part, are required to take all reasonable and necessary precautions to ensure their own safety and health as well as that of their fellow persons employed.

SAPCWR Reg.47D & MS(LV)(W)R Reg 66

5.1.2 The person in charge of works should ensure that unless the crane operator has an unrestricted view of the load at all times during loading or unloading by a fall at a hatchway, the loading or unloading should only be carried out when:

(i) a signaller is assigned for each crane used in the loading or unloading; and

(ii) the signaller is clearly visible to the operator of the crane.

5.1.3 The crane operator should have a clear view of the assigned signaller at all times during loading or unloading and should obey signals only from the signaller and from no other person, except that every stop signal should be obeyed regardless of who gives it.

5.1.4 The crane operator should not lift or lower containers unless signalled by the assigned signaller. The signaller should only signals the crane operator to lift or lower a container when he is satisfied that the operation would not put any person at risk.

5.1.5 When a signaller has not been assigned because the crane operator has an unrestricted view of the load, the crane operator must ensure that all slingers have vacated the top of the container being lifted and have vacated to a safe place before the container is lifted. Likewise, the crane operator must not lower a container unless all workers attending to the cargo fall are in safe position.

5.1.6 The person supervising a container handling operation on board a vessel should make suitable arrangements to ensure that before the crane operator lifts up a container, the container is not locked to another container or other deck fittings, and power cords if any connected to the container have been unplugged.

5.1.7 A container should not be hoisted hastily, instead, the crane operator should take up the strain of the cargo fall and lifting gear in a gradual manner. After the lifting gear has taken up the load, the container should be inched up a few centimetres and be temperately held in position. Only after it is ascertained that no abnormal conditions that would jeopardize the safe hoisting of the container are present, the hoisting operation could be continued at normal speed.

5.1.8 After a container is lowered into position, the crane operator must ensure that all hooks or devices are detached from the container before raising the lifting gear. The container should only be locked to another container or other deck fittings after the lifting gear have been completely detached and move away from the container.

5.1.9 The person in charge of a container handling operation should ascertain the weight of containers being handled and that the lifting appliances and lifting gear to be used have the adequate safe working load before cargo handling operation is commenced.

5.1.10 A container should not be lifted whenever the weight is beyond its maximum operating gross capacity or exceeding the safe working limit of the lifting appliance or lifting gear being used. A container should not be lifted if its weight is unknown.

5.1.11 In handling containers, care should be taken against the possibility of uneven loading and poorly distributed or incorrectly declared weight of contents.

5.1.12 Care should be taken when lifting a container the centre of gravity of which is mobile or eccentric, e.g. a tank container, a bulk container, a container with a liquid bulk bag, a container with hanging cargo or a thermal container with a refrigerating unit, to minimize any unsteady condition.

5.1.13 If a container is found damaged, workers should stop handling the container and report the defects to the person in charge at once, and obtain instructions on the appropriate way to handle the container safely.

5.1.14 Container lashing gears and stacking cones should be handled with care; and should not be thrown from height.

5.1.15 Any worker observing an oil or grease spill at a workplace must immediately clean it up or report it to the person in charge who must arrange for it to be cleaned up.

5.1.16 All lifting appliances and lifting gear used for handling containers must be properly inspected and maintained in good working conditions.

5.1.17 Containers carried on deck should be properly secured in such a manner as to take account of the appropriate strength features of the container and the stresses caused by the stacking of one or more upon the other.

5.1.18 Heavy items of machinery or plant and bagged bulk products that are stored on flats may need to be further secured by additional lashings.

5.1.19 Workers employed in shipboard container handling should be given adequate breaks for rest, including but not limited to those for meal, to reduce the risk of accident due to fatigue.

5.1.20 Excessive drinking of alcohol or misuse of drugs affects a person's fitness for duty and harms his health. It may also increase the risk of accident. Workers engaged in shipboard container handling should not work under the influences of alcohol or drugs.

5.1.21 Regardless of whether an empty or a loaded container is being handled, the person in charge of works should ensure that the handling method and equipment used would not give rise to any detrimental effects to the structural integrity and strength of the container.

5.2 Handling container by top lift slings

5.2.1 Lifting containers by four legged slings hooked to the four top corner fittings has been widely used in shipboard container handling operations in Hong Kong. This is especially true for shipboard container handling at mid-stream where the special working environment renders the use of conventional container handling equipment not feasible.

5.2.2 A container should normally be lifted with a suitable lifting equipment that applies a vertical force to all its four corner fittings. Applying out-of-vertical lifting force will apply stresses to the containers that they are not designed to withstand and horizontal compression stresses will be imposed on the container structure. The danger of this practice is that certain weight bearing parts of a container could be so over stressed that it fails - not necessarily at the time but perhaps at a later date. In addition, in this mode of

operation slingers have to work along unguarded edges on container tops where a fall hazard exists.

5.2.3 Because of the unique local situation, until automatic container handling equipment that can eliminate slingers working on tops of containers is developed for mid-stream operations, containers may be handled by top lift slings provided the following guidelines are strictly observed.

SAPCWR Reg.17(a) BS 6166: Part 3 & MS(LV)(W)R Reg26(1)(a), Reg27(1)(a)

5.2.4 The lifting slings and hooks used must be of adequate design strength. British Standard BS 6166: Part 3: 1988 (Lifting slings, Part 3. Guide to selection and safe use of lifting slings for multi-purposes), gives guidance to the person in charge of works in selecting the appropriate lifting slings for use. The lifting hooks should comply with British Standard BS 4654: 1970 (Specification for hooks for lifting freight containers of up to 30 tonnes).

BS 4654

5.2.5 It is important to note that when a container is loaded with cargo the centre of gravity is seldom at the centre of the container, so the stresses acting upon each sling would be different. Furthermore, when a multi-legged sling is used with the sling legs at an angle, the load in the legs increases as the angle between the legs increases. To ensure safe operation, the safe working load of a four-legged slings is to be determined in accordance with British Standard BS 6166: Part 1: 1986 (Lifting slings, Part 1. Methods of rating).

BS 6166: Part 1

SAPCWR Reg.20& MS(LV)(W)R Reg 30

5.2.6 When first put into use any lifting equipment must have been tested and examined in good order by a competent examiner; and thereafter the equipment must be periodically examined or inspected in accordance with SAPCWR or MS(LV)(W)R. Guidance on the test and examination of derrick cranes are given in the Code of Practice for Strength Calculations, Test and Examination of Derrick Cranes on Local Vessels issued by the Director of Marine.

Code of Practice for Strength Calculations, Test and Examination of Derrick Cranes on Local Vessels

5.2.7 To ensure proper load bearing of the sling hook and to reduce the risk of the hook detaching from the corner fitting when any sling is momentarily slacken, lifting slings must be properly engaged to the corner fittings with hooks placed in an inward to outward direction.

5.2.8 If there is any possibility of jamming containers in cell guides, hook slings should not be used to lift or lower containers through cell guides. Suitable equipment such as spreaders or slings with special lifting keys should be used. Never attempt to lift containers improperly by wedging hooks into their corner fittings.

5.2.9 To prevent folding, an aluminum container or an extraordinary heavy container should be lifted with a suitable lifting equipment that applies only a vertical force to all four corner fittings of the container.

5.3 Working on container top

SAPCWR Reg.41A & MS(LV)(W)R Reg 64

5.3.1 Shipboard container handling, especially when top lift slings are used, requires workers to work on tops of containers. It is essential that safe systems of work are developed and used in order to protect workers from severe hazards, including that of falling.

5.3.2 The person in charge of works should make necessary arrangements to ensure the safety of workers when gaining access to the tops of container stacks.

5.3.3 When workers cannot effect an access to or egress from the top of a container stack that is two or more tiers high by a series of single tier ascend or descend, then a suitable access platform or cage should be provided to transfer workers to and from the top of the container stack. An access platform or cage should comply with the following:

(i) It should be of good construction, sound material and adequate strength, which is properly maintained. The maximum rated capacity of the platform or cage and its own weight should be permanently marked on each side.

(ii) Except to the extent necessary for drainage, the floor should be either closely boarded, planked or plated with sound material.

(iii) It should be enclosed on all sides by fencing and a gate or gates. Top guard-rail of the fencing should not be less than one metre above the surface of the interior floor. At the floor level, toe boards at least 200mm high should be provided on all sides. Intermediate guard-rail should be

provided so that the clearance between guard-rails or between the lowest guard-rail and the top of the toe board is not more than 500mm.

(iv) It should be attached to a fall, or lifting frame at four points, by shackles, safety hooks or twist locks with a secondary means of attachment, in a manner that will prevent accidental disconnection. Suitable measures should be taken to prevent spinning or tipping in a manner dangerous to any occupant.

(v) It should have handholds and anchor points for lifelines inside the platform or cage fencing.

5.3.4 A personnel carrying platform or cage should be used to carry only personnel, their tools and necessary materials and equipment to perform the work and not for other purposes.

5.3.5 Platforms, cages or devices used to carry personnel should be inspected for defects before each day's use and should be removed from service if found defective. Arrangement should be made to prevent them from being used accidentally before the defects are rectified.

5.3.6 Workers being carried by an access platform or cage should remain in continuous sight of and communication with the crane operator or signaller.

5.3.7 Crane operators must remain at the crane controls when workers are carried by access platforms or cages. When the crane is not equipped with automatic braking mechanism an additional operator is required to standby at the crane controls when the crane is used to carry personnel.

5.3.8 No one should ride on top of containers or on sling hooks while the containers or slings are being hoisted or lowered.

5.3.9 To minimize risks to workers working on tops of container stacks, the stacking height of containers on board local vessels should preferably be not more than seven tiers high. If the person in charge of works decided to stow a stack higher than seven tiers, he shall ensure that adequate measures are taken to prevent workers falling from the tops of containers. Furthermore, to reduce the risk of falling injury to workers, the containers above the seventh tier should be stowed in a staircase fashion.

5.3.10 It must be emphasized that when planning the stowage of containers on a vessel, its loading capacity and stability must be carefully considered. To prevent containers from collapse, stacked containers should be adequately secured by stacking cones and lashing equipment.

5.3.11 To minimize hazards to workers working on tops of containers, loading and unloading operations should be carried out in such a manner that no container is stacked more than one level high immediately adjacent to the next containers. To accomplish this, containers should be loaded or unloaded in consecutive tiers; and single stacks or canyons between containers must be avoided. This should be achieved by careful planning of the loading or unloading operations by the person in charge of works.

5.3.12 When containers are being lifted from or lowered to container stacks, slingers should not be allowed to stay on tops of adjacent containers at the same level unless there is an adequate area on the container tops for the slingers to work safely. If the working area is not adequate, slingers should ascend or descend to a next level prior to the containers being lifted or lowered. The minimum area on which workers could safely remain on the top of a container when an adjacent container at the same level are being lifted or lowered is a size equivalent to the floorage of three containers the same size as the container being lifted or lowered. The figures in Appendix II illustrate this requirement.

5.3.13 Workers should use a suitable ladder to gain access to or egress from tops of single tier containers or when ascending or descending to the next tier level on container stacks. Portable ladders should not be use for accessing container stacks more than one tier high on board vessels.

5.3.14 Whenever practicable, portable ladders should be secured to prevent them from slipping. When it is not practicable, they should be steadied by a second person. Ways to help prevent portable ladders slipping include the use of safety feet, rubber lined feet or stabilizing legs. Securing an angle piece to the ladder will also increase its sideways stability as well as helping to ensure it is used at the correct angle.

5.3.15 Slingers working on tops of containers should keep a safe distance from approaching slings. The slings should be lowered and rest on the deck or container top before slingers approach to avoid being hit by swinging hooks.

5.3.16 Once the lifting gear is attached or detached, all slingers must immediately vacate the container top and move well clear of the container. The slingers must ensure that there is a safe means of escape before the container is lifted.

5.3.17 Employers and persons in charge of works should establish and implement procedures to retrieve personnel safely in case of a fall.

5.4 Mid-stream container operation

5.4.1 During mid-stream container handling operations, vessels, lighters in particular, would always be in motion due to actions of the sea on the vessels and due to movement of containers by the cranes of the vessels. Utmost care should be exercised by observing proper working procedures and taking adequate safety measures while working under such circumstances. Never act in a hurry as that would easily lead to an accident.

5.4.2 When carrying out mid-stream container handling operations, cranes fitted on board ocean-going vessels should be used as far as practicable, as such equipment are more stable than derrick cranes of lighters.

5.4.3 When containers are loaded onto lighters, stacking cones should be placed properly between stacked containers. To prevent the collapse of containers carried on lighters, stacked containers should be adequately secured with suitable lashing arrangements.

5.4.4 Care muse be taken when lifting or lowering containers through cell guides in cargo holds to avoid containers being jammed due to deformation or severe tilting of containers.

5.4.5 Workers should always stay alert while engaged at works. Never stand in a "dead spot" where there is no safe means of escape or the means of escape is difficult to gain access to. Examples of dead spots are the narrow space between a container in suspension and a stationary container, another object or the hatch boundaries.

5.4.6 Workers should keep a safe distance from the travelling path of a container and should not stay underneath a hoisted container.

5.4.7 When working containers on small vessels such as lighters, river-trade or coastal-going vessels, workers should avoid staying in the narrow cargo holds while containers are being lifted or lowered. Whenever practicable containers should be guided into

position with tag lines or other suitable means, instead of by workers pushing the containers directly with their hands.

5.4.8 When hoisted containers have to be guided manually to position, workers should take care to prevent their hands from being crushed. When it is necessary to handle devices, such as stacking cones, at bottom of containers in suspension, ample clearance should be maintained below the containers; and workers must not go underneath the containers to handle the devices.

5.5 Working inside container

5.5.1 Care must be taken when opening doors of containers. Do not stand in the path of an opening door. Open one door at a time to minimize injury hazard should cargoes in the container suddenly collapse.

5.5.2 Working in a container could only be carried out safely on land. If for practical reasons, it is necessary to open up a container on board a lighter for handling cargoes inside, proper preventive measures to secure cargoes firmly for avoidance of accident must be provided. However, cargo work inside a container should be stopped in the event of bad weather.

5.5.3 When someone is working inside a container on board a lighter, the lifting of containers or other heavy cargoes by the lighter's crane should be suspended. This is because excessive movement of the lighter due to the crane actions could cause inadvertent movement of the container or the cargo inside that would endanger the person working inside.

5.5.4 When a fork lift truck is required to enter a container, ensure the slope of ramp is appropriate, and positively secured to entrance of the container.

5.5.5 Do not enter into a container that has been posted with dangerous goods labels without checking for evidence of leakage or damage to the dangerous goods. The atmosphere in the container could be hazardous.

5.5.6 If a container has a label or placard on the door indicating that it has been under fumigation during the voyage, open the doors, allow the container to be adequately ventilated and check the air quality before entering.

5.6 Handling dangerous goods container

5.6.1 Vessels conveying dangerous goods containers in the waters of Hong Kong should comply with the requirements imposed under Dangerous Goods (Shipping) Regulations, Cap. 295 sub. leg. C.

DGSR

5.6.2 Containers, including tank containers, carrying dangerous goods should not be loaded onto a vessel without the correct documentation and placarding complying with IMDG Code.

IMDG Code

5.6.3 Containers containing incompatible dangerous goods should be stowed in separation in accordance with the IMDG Code.

IMDG Code

5.6.4 Containers contaminated with chemicals should only be cleaned by trained personnel in a segregated area ashore. Even in an exceptional circumstance when a contaminated container has to be cleaned on board a vessel, no attempt to clean the container should be made until the person in charge of works has identified the type of contaminant present and the appropriate method of treatment has been determined.

5.6.5 Chemicals should always be handled with the utmost care. Eyes, skin and respiratory system should be protected from accidental exposure or contact. Cleaning work should always be carried out under close supervision.

5.6.6 No approach should be made to any container containing or suspected of containing dangerous goods that is leaking or smelling of fumes. Such situations should be referred to the officer in charge of the vessel immediately.

5.6.7 While awaiting any instruction from the officer in charge of the vessel, the person in charge of works should take the following immediate steps:

(i) evacuate persons from the area;

(ii) ensure no smoking;

(iii) ensure that all engines operating in the close vicinity are stopped; and

(iv) ensure that any naked lights are extinguished.

5.6.8 When it becomes necessary to summon assistance from the emergency services after a spill or leakage of dangerous goods from a container, the correct location of the vessel, the container

number and its location on board, and, if available, the United Nations Number of the substance, the IMDG Code hazard class, types of packages and the quantity of the substance in the container should be conveyed clearly.

6. PERSONAL PROTECTIVE CLOTHING AND EQUIPMENT

Investigations into accidents indicate that a lot of occupational injuries can be avoided or their seriousness mitigated if proper personal protective clothing and equipment are used by workers. However, protective clothing and equipment should be used only to supplement safe systems of work, engineering and administrative controls, and should not be used as a substitute for these controls.

6.1 The employer and the person in charge of works should provide every worker with suitable and well-maintained personal protective clothing and equipment for his use. The worker provided with protective clothing and equipment should be given adequate instructions on the functions and limitations of each piece of equipment, and be trained on how to use it properly. When provided with any protective clothing and equipment the worker should use them all the time during a shipboard container handling operation.

SAPCWR Reg.15B & MS(LV)(W)R Reg 21

6.2 SAPCWR and MS(LV)(W)R require employers and persons in charge of works to ensure that each person employed who carries out works on a vessel is provided with a suitable safety helmet and, so far as is reasonably practicable, other protective clothing and equipment as are appropriate to prevent bodily injury to the person employed during carrying out the works.

SAPCWR Reg.15B & MS(LV)(W)R Reg 21

6.3 The employers and persons in charge of works are required to take all reasonable steps to ensure that no person employed remains on board a vessel during works are being carried out unless the person employed is wearing a suitable safety helmet and using other appropriate protective clothing and equipment provided.

6.4 Employers and persons in charge of works should carry out hazards assessment on the work processes and identify the need to provide the appropriate protective clothing and equipment to the workers at work.

6.5 Personal protective clothing and equipment can be classified as follows: head protection (safety helmets, hair protection); hearing

protection (ear-muffs, ear plugs); face and eye protection (face shields, goggles and spectacles); respiratory protective equipment (dusk masks, respirators, breathing apparatus); hand and foot protection (gloves, safety boots and shoes); body protection (safety suits, safety belts and harnesses, aprons); protection against drowning (lifejackets, buoyancy aids, life buoys), and high visibility garment (high visibility gloves, vests, body straps).

6.6 Signallers should wear high visibility gloves or similar items to facilitate crane operators to locate them and their hand positions.

6.7 Workers should wear high visibility vest or body straps to ensure that they are visible to the signallers and crane operators.

SAPCWR Reg.41A(2) & MS(LV)(W)R Reg 64(2)

6.8 Workers carrying out lashing works on the tops of containers should whenever practicable be suitably protected against the danger of falling.

6.9 When container handling operations are carried out in wet weathers, under strong winds or on vessels in choppy waters, every worker having a foreseeable risk of falling into the sea should wear a lifejacket. Whenever practicable, lifejackets which inflate automatically on immersion in the sea should be used to allow workers falling into the sea to be more easily rescued and for unconscious workers to remain afloat.

6.10 Safety helmets used should be short peaked or no peaked with strap to avoid impaired visibility and will protect workers against blows to the head.

6.11 Workers should wear safety shoes while handling containers on board vessels. Safety shoes with steel toe caps in the front and a flexible upper sole to allow for easy movement should be used. Suitable safety shoes would provide adequate grip to avoid slipping and the steel caps would avoid injury to the foot in the case of relatively minor accidents.

6.12 Acceptable standards and more specific recommendations for the use of personal protective clothing and equipment will be found in the Code of Practice for Using Protective Clothing and Equipment at Works on Vessels issued by the Director of Marine.

Code of Practice for Using Protective Clothing and Equipment at Works

7. SELECTION AND SUPERVISION OF STAFF

7.1 Not all persons are suitable to carry out work on the tops of containers. Container top workers should be carefully selected. They should be able to demonstrate an aptitude to work at heights in a safe manner. The work is arduous and those who carry it out need to be physically fit.

7.2 Employers should provide proper induction training for new workers. The provision of appropriate equipment, whether it is provided in accordance with a legal requirement or not, will not be adequate to ensure the implementation of safe working procedures. After such working procedures have been developed, it is essential that adequate training be given to the workers to ensure that it is fully understood.

7.3 Employers and persons in charge of works should ensure that workers are briefed at the beginning of each working day by their supervisors. This pre-work briefing may take the form of a briefing on the task for the day and any additional personal protective clothing and equipment that may be necessary. The supervisors should ensure that all workers are aware of the hazards they will face particularly from unusual cargo or working conditions, such as dangerous goods or "tackling operations".

7.4 On-going education, from time to time, is also necessary to ensure that unsatisfactory and unauthorized practices do not creep in and to deal with problems that arise but have not been anticipated. The use of posters, pocket leaflets and handbooks to highlight particular matters or remind those concerned of correct procedures can also be useful.

8. EMERGENCY

8.1 Emergency procedures

8.1.1 Accidents and emergencies require a quick response if they are to be prevented from becoming more serious. Before any shipboard container handling operation starts, the person in charge of works should make detailed planning and assessment for possible emergencies and the availability of emergency services.

8.1.2 Persons in charge of works should formulate emergency procedures to deal with emergency situations. The procedures should be expressed clearly in writing and should at least include the following:

(i) raising the alarm for emergency including calling the police by dialing telephone number '999';

(ii) activating rescue effort;

(iii) dealing with emergency situations including evacuation in case of fire or spillage of dangerous goods;

(iv) providing and using emergency and first aid facilities;

(v) stating routes for rescue operation if necessary; and

(vi) sending rescued persons to hospital for medical treatment.

8.1.3 The responsibility for co-coordinating and supervising emergency operations should be assigned to identified persons who are trained and competent to discharge it.

8.1.4 The emergency procedures and the name and location of the person responsible for co-coordinating emergency procedures on the vessel should be posted in prominent positions using words that will be understood by the workers.

8.1.5 All workers should be trained on the emergency procedures. Drills and practices should be held regularly so as to ensure that all workers are familiar with the emergency procedures. Employers and persons in charge of works should arrange such drills to be held at least once a year, and within a reasonable time for newly recruited employees.

8.1.6 The emergency procedures should be reviewed regularly to identify the areas of weakness for improvement or to match changes.

8.2 First aid equipment

SAPCWR Reg.15C & MS(LV)(W)R Reg 22

8.2.1 SAPCWR and MS(LV)(W)R require an employer and a person in charge of works to provide and maintain on every vessel where works are carried out so as to be readily accessible a first aid box for any persons employed on the vessels.

8.2.2 Every first aid box should be of adequate capacity and should contain the items stipulated in the regulations. All items kept in a first aid box should be maintained in good condition at all times.

Code of Practice for the Provision of First Aid Box for Works on Vessels

8.2.3 Detail guidance on the provision and maintenance of a first aid box is given in the Code of Practice for the Provision of First Aid Box for Works on Vessels issued by the Director of Marine.

APPENDIX I

Guidance on main elements of risk assessment

A1.1 Step 1 - Identify hazards in the workplace
Step 2 - Identify who or what may be harmed, and how such harm may occur

A1.1.1 A useful preliminary to risk assessment is to identify separate work activities, to group them in a rational and manageable way, and to gather necessary information (or collate existing information) about them. Infrequent maintenance tasks, as well as day-to-day operations, should be included.

Possible ways of classifying work activities include:

(i) location on board vessel;

(ii) stages of an operation or work routine;

(iii) planned and unscheduled maintenance;

(iv) defined tasks (e.g. loading/unloading cargo at mid-stream).

Information required for each work activity might include:

(i) tasks being carried out: their duration and frequency;

(ii) location(s) where the work is carried out;

(iii) who normally/occasionally carries out the tasks;

(iv) others who may be affected by the works (e.g. repair works, crew);

(v) training that personnel have received for the task.

A1.1.2 Asking these three questions should help to identify where there is a hazard:

- Is there a source of harm?
- Who (or what) could be harmed?
- How could harm occur?

A1.1.3 Hazards that clearly possess negligible potential for harm should not be documented or given further consideration, provided that appropriate control measures remain in place.

A1.1.4 To help with the process of identifying hazards it may be useful to categorise hazards in different ways, for example by topic, e.g.:

(i) mechanical

(ii) electrical

(iii) physical (e.g. gravitational force, temperature, noise, vibration, manual handling, etc.)

(iv) substances (e.g. harmful or dangerous substances)

(v) fire and explosion.

A1.1.5 A complementary approach may be to develop a 'prompt list' such as:

During work activities, could the following hazards exist?

(i) slips/falls on the level;

(ii) falls of persons from a height;

(iii) falls of tools, materials, etc., from a height;

(iv) struck by swinging object;

(v) inadequate ventilation;

(vi) hazards from plant and machinery associated with assembly, commissioning, operation, maintenance, modification, repair and dismantling;

(vii) hazards from manual handling;

(viii) hazards from embarking or disembarking vessels.

The above list is not exhaustive, and employers and persons in charge of works could develop their own 'prompt list' taking into account the particular circumstances.

A1.2 Step 3 - Assess the risks arising from the hazards based on the probability and the possible consequences of the hazardous

event, and assess whether the existing safety precautions are adequate and what more should be done

A1.2.1 The risk from the hazard may be determined by estimating:

- the potential severity of harm; and
- the likelihood that harm will occur.

These two components should be judged independently.

A1.2.2 When seeking to establish potential severity of harm, the following should be considered:

(i) part of the body likely to be affected;

(ii) nature of the harm, ranging from slightly to extremely harmful;

(a) slightly harmful, e.g.:

- superficial injuries; minor cuts and bruises; eye irritation from dust;
- nuisance and irritation (e.g. headaches); ill-health leading to temporary discomfort;

(b) harmful, e.g.:

- lacerations; burns; concussion; serious sprains; minor fractures; musculo-skeletal disorders;
- deafness; dermatitis; asthma; work related upper limb disorders; ill-health leading to permanent minor disability;

(c) extremely harmful, e.g.:

- amputations; major fractures; poisonings; multiple injuries; fatal injuries;
- occupational cancer; other severely life shortening diseases; acute fatal diseases.

A1.2.3 In order to establish the likelihood of harm the adequacy of control measures already in place should be considered. Legal requirements and guidance in this Code and other safety publications are good guides to adequate control of specific hazards. The following issues should then typically be assessed:

(i) number of personnel exposed;

(ii) frequency and duration of exposure to the hazard;

(iii) effects of failure of electric power or other sources of power;

(iv) effects of failure of plant and machinery component and its limitations;

(v) possibility of unsafe acts by persons for example, who:

(a) may not know what the hazards are;

(b) may not have the knowledge, physical capacity, or skills to do the work;

(c) underestimate risks to which they are exposed;

(d) underestimate the practicality and utility of safe working methods.

A1.2.4 The likelihood of harm can be assessed as highly unlikely, unlikely, or likely based on the scale below.

Highly unlikely	There is no likelihood of an accident occurring. Only under unusual conditions could there be a possibility of an accident. All reasonable precautions have been taken so far as is reasonably practicable.
Unlikely	When certain factors are present, accidents might occur, but the probability is low (e.g. lashing gears on deck, failure of derrick crane topping wire, folding of laden container, etc.)
Likely	If the work continues as it is, it is almost certain that an accident will happen (e.g. broken ladder, storm, unstable stowed cargo, etc.) Additional factors due to nature or human carelessness might precipitate the occurrence of an accident, but that is unlikely to happen without these additional factors (e.g. spilled oil or grease on walkway, ladder not secured, sudden swells or waves, etc.)

A1.2.5 Any given hazard is more serious if it affects a greater number of people. But some of the more serious hazards may be associated with an occasional task carried out by just one person, for example maintenance of inaccessible parts of lifting equipment.

A1.2.6 Decide if risk is tolerable

A1.2.6.1 Table 1 below shows one simple method for estimating risk levels and deciding whether risks are tolerable. Risks are classified according to their

estimated likelihood and potential severity of harm. However, employers may wish to develop other approaches according to the nature of their operations.

Table 1

Severity / Risk / Likelihood / level	**Slightly harmful**	**Harmful**	**Extremely harmful**
Highly unlikely	TRIVIAL RISK	TOLERABLE RISK	MODERATE RISK
Unlikely	TOLERABLE RISK	MODERATE RISK	SUBSTANTIAL RISK
Likely	MODERATE RISK	SUBSTANTIAL RISK	INTOLERABLE RISK

Note: Tolerable here means that the risk has been reduced to the lowest level that is reasonably practicable

A1.2.7 Prepare risk control action plan

A1.2.7.1 Having determined the significant risks, the next step is to decide what action should be taken to improve safety, taking account of precautions and controls already in place.

A1.2.7.2 Risk categories form the basis for deciding whether improved controls are required and the timescale for action. Table 2 suggests a possible simple approach. This shows that the effort made to control risk should reflect the seriousness of that risk.

Table 2

RISK LEVEL	ACTION AND TIMESCALE
TOLERABLE	No action is required and no documentary records need be kept
MODERATE	No additional controls are required. Consideration may be given to a more cost effective solution or improvement that imposes no additional cost burden. Monitoring is required to ensure that the controls are maintained.
SUBSTANTIAL	Efforts should be made to reduce the risk, but the costs of

	prevention should be carefully measured and limited. Risk reduction measures should be implemented within a defined time period. Where the moderate risk is associated with extremely harmful consequences, further assessment may be necessary to establish more precisely the likelihood of harm as a basis for determining the need for improved control measures.
INTOLERABLE	Work should not be *started or continued* until the risk has been reduced. If it is not possible to reduce the risk even with unlimited resources, work has to remain prohibited.

Note: Tolerable here means that the risk has been reduced to the lowest level that is reasonably practicable

A1.2.8 The outcome of a risk assessment should be an inventory of actions, in priority order, to devise, maintain or improve controls.

A1.2.9 Controls should be chosen taking into account the following, which are in order of effectiveness:

(i) if possible, eliminate hazards altogether, or combat risks at source, e.g. use a safe substance instead of a dangerous one;

(ii) if elimination is not possible, try to reduce the risk, e.g. where risk is of electrocution, by using a low voltage electrical appliance;

(iii) where possible adapt work to the individual, e.g. to take account of individual experiences and physical capabilities;

(iv) take advantage of technical progress to improve controls;

(v) give precedence to measures that protect everyone;

(vi) if necessary, use a combination of technical and procedural controls;

(vii) introduce or ensure the continuation of planned maintenance, for example, of lifting appliances and lifting gear;

(viii) ensure emergency arrangements are in place;

(ix) adopt personal protective equipment only as a last resort, after all other control options have been considered.

A1.2.10 In addition to emergency and evacuation plans, it may be necessary to provide emergency equipment relevant to the specific hazards.

A1.3 Step 4 - Record the findings of the assessment

Step 5 - Review the working environments from time to time; conduct fresh risk assessment if necessary

A1.3.1 Any action plan should be reviewed before implementation, typically by asking:

(i) will the revised controls lead to tolerable risk levels?

(ii) are new hazards created?

(iii) what do people affected think about the need for, and practicality of, the revised preventive measures?

(iv) will the revised controls be used in practice, and not ignored in the face of, for example, pressures to get the job done?

A1.3.2 Before each shipboard container handling operation starts, assessment should be made to identify any unusual working condition or environment that may require addition risk assessments to be made. Employer and person in charge of works should continually review the need for fresh risk assessments to be conducted should there be any changes in the operating environments or modes of operation in the industry.

A1.3.3 Safe working procedures should be reviewed and updated from time to time to suit any change to the working practices and environment. Such updated version should be distributed to all parties concerned as soon as practicable.

A1.4 Risk assessment pro-forma

A1.4.1 Employers and persons in charge of works might wish to use a simple pro-forma to record the findings of an assessment, covering, for example:

(i) work activity;

(ii) hazards;

(iii) controls in place;

(iv) personnel at risk;

(v) likelihood of harm;

(vi) severity of harm;

(vii) risk levels (sometimes called "risk factor");

(viii) action to be taken following the assessment;

(ix) administrative details, e.g. name of assessor, date, etc.

The examples at Annex A1.1 and Annex A1.2 illustrate a two-stage approach, the first stage being to identify those risks that require further consideration and the second recording the assessment of those significant risks. This is a suggestion only, and is not intended to be prescriptive. A demonstration of the two-stage assessment is in Annex A1.3 and Annex A1.4.

Annex A1.1

INITIAL RISK ASSESSMENT

Name of company/vessel: _____

Work or activities assessed: _____

Record no.: _____

Task ID number	Work process / action undertaken on vessel	Hazards associated with activity	Controls already in place	Significant risks identified	Further assessment required (Yes/No)

Declaration:
Where no significant risk has been listed, I, _____, as assessor have judged that the only risks identified were of an inconsequential nature and therefore do not require a more detailed assessment.

Signed: **Position: _____**

_____ **Date: _____**

Annex A1.2 (Page 1)

DETAILED RISK ASSESSMENT

Name of company/vessel: _____

Record no.: _____

Current assessment date	**Last assessment date**

Work activity being assessed

Hazards

Hazard No.	Description of identified hazards

People at risk:

Existing control measures

Hazard no.	Control measures

Annex A1.2 (Page 2)

Assessment of Risk

To assess the risk arising from the hazard:

1. *Select the expression for likelihood which most applies to the hazard.*
2. *Select the expression for degree of harm which most applies to the hazard.*
3. *Cross reference using the above table to determine the level of risk.*

Severity / Risk / Likeli-hood Level	Slightly harmful	Harmful	Extremely Harmful
Highly unlikely	Trivial risk	Tolerable risk	Moderate risk
Unlikely	Tolerable risk	Moderate risk	Substantial risk
Likely	Moderate risk	Substantial risk	Intolerable risk

Hazard no.	Hazard severity[1]	Likelihood of occurrence[2]	Risk level[3]

Additional control measures

Hazard no.	Further action necessary to control risk	Remedial action date	Date completed

Additional comments:

Signed (name): _____ ( ) **Position:** _____

Date: _____ **Next review date:** _____

Annex A1.3

INITIAL RISK ASSESSMENT (DEMONSTRATION)

Name of company/vessel: ABC Container Stevedoring Company

Work or activities assessed: Mid-stream container handling by derrick lighter

Record no.: ABC0001

Task ID number	Work process / action undertaken on vessel	Hazards associated with activity	Controls already in place	Significant risks identified	Further assessment required (Yes/No)
A001	Transferring workers to the top of a container stack with two or more tiers high using a personnel carrying cage	Fall of person from height	Each worker carried by the cage must wear a safety harness with the lifeline tethered to an anchor point on the cage; when the lighter's derrick crane is used to carry personnel, an additional operator is required to standby at the crane controls; the cage and its lifting slings should be inspected by the competent person before their use	Workers are subjected to a hazard of falling when leaving the cage to assess the container top or when entering the cage from the container top	Yes
A002	Crane operator accessing the crane control platform	Fall of person from height; crane operator slip and fall on stairway	No. 1 lighterman should periodically inspect the handrails on the stairway to ensure in order, and maintain the steps clean and free from oily stain; crane operator should wear no slippery safety shoes; adequate lightings should be provided at the stairway during night work		No

Declaration:

Where no significant risk has been listed, I, Chan Tai-man**, as assessor have judged that the only risks identified were of an inconsequential nature and therefore do not require a more detailed assessment.**

Signed: D.M. Chan

Position: Stevedoring Foreman

Date: XX/XX/2000

Annex A1.4 (Page 1)

DETAILED RISK ASSESSMENT (DEMONSTRATION)

Name of company/vessel: ABC Container Stevedoring Company

Record no.: ABC0001-2

Current assessment date XX/XX/2000 **Last assessment date**

Work activity being assessed

A001- Transferring workers to the top of a container stack with two or more tiers high using a personnel carrying cage

Hazards

Hazard No.	Description of identified hazards
1	When the personnel carrying cage is being hoisted and laid alongside a container for the workers' access or egress, workers might risk falling from height if while they are entering or leaving the cage there were inadvertent movements of the cage.
2	When the personnel carrying cage is placed on top of a container for the workers' access or egress, workers might risk being stricken by the cage if while they are entering or leaving the cage there were inadvertent movements of the cage.

People at risk: slingers, lightermen

Existing control measures

Hazard no.	Control measures
1	Rely on the safe operation of the crane operator
2	Rely on the safe operation of the crane operator

Assessment of Risk

To assess the risk arising from the hazard:

1. *Select the expression for degree of harm which most applies to the hazard.*
2. *Select the expression for likelihood which most applies to the hazard.*
3. *Cross reference using the above table to determine the level of risk.*

Severity / Risk / Likeli-hood / Level	Slightly harmful	Harmful	Extremely Harmful
Highly unlikely	Trivial risk	Tolerable risk	Moderate risk
Unlikely	Tolerable risk	Moderate risk	Substantial risk
Likely	Moderate risk	Substantial risk	Intolerable risk

Hazard no.	Severity of harm[1]	Likelihood of occurrence[2]	Risk level[3]
1	Extremely harmful	Unlikely	Substantial risk
2	Harmful	Unlikely	Moderate risk

Additional control measures

Hazard no.	Further action necessary to control risk	Remedial action date	Date completed
1	When workers are making access to or egress from the lifting cage, the signalman must keep a good watch of the sea condition; he must stop the workers when there are large wave approaching that would cause inadvertent movements of the cage.	The control measure is added to the working procedures on XX/XX/2000.	The updated working procedures are distributed to all relevant persons on XX/XX/2000.
2	Workers should avoid approaching the lifting cage while the lighter is swaying heavily; workers should ensure that the cage has been rested properly on the container top before making access to or egress from the cage	The control measure is added to the working procedures on XX/XX/2000.	The updated working procedures are distributed to all relevant persons on XX/XX/2000.

Additional comments:

To combat Hazard No.1, the company should inspect all lifting cages to ensure that there is a strong handhold of at least 1 metre high at the top most step of all ladders inside the cage.

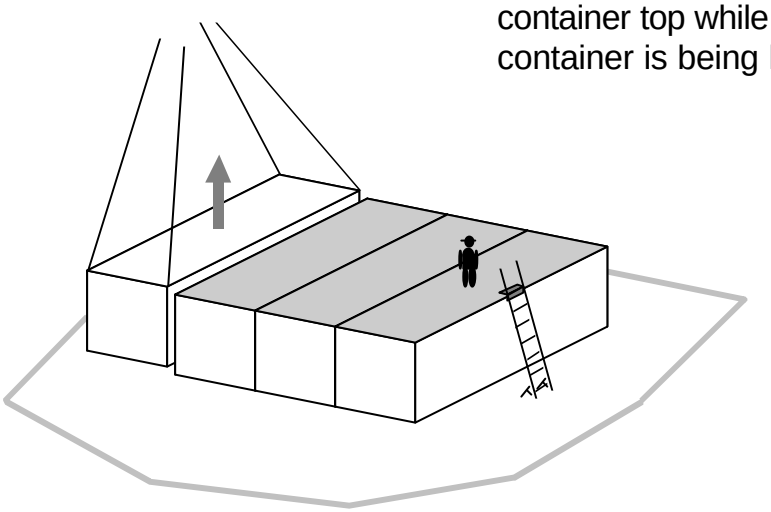
Signed (name): K.H. Lee (Lee **Position:** Safety Officer

Date: XX/XX/2000 **Next review date:** XX/XX/2001

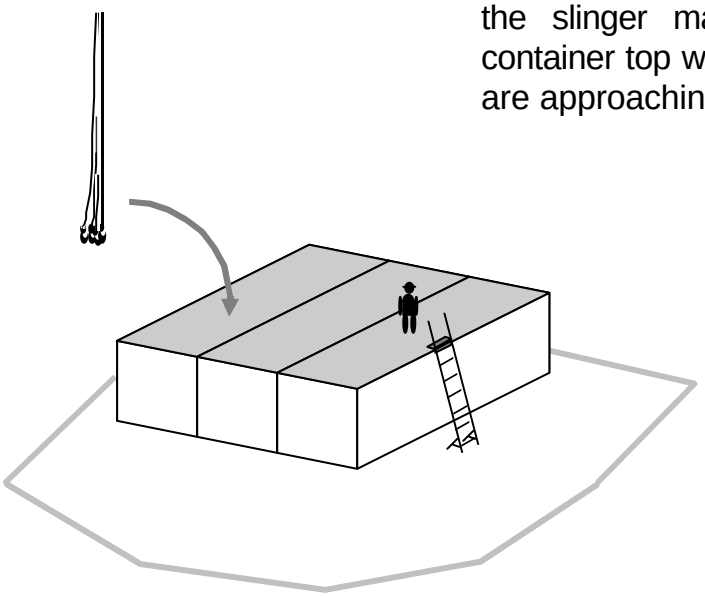
APPENDIX II

Minimum working area on tops of containers

Adequate working area on the container top -
the slinger may remain on the container top while the adjoining container is being hoisted. (Fig.II.1)

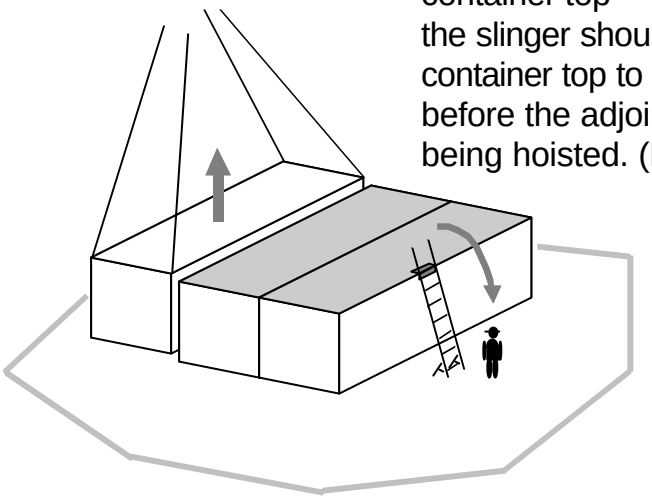


Adequate working area on the container top -
the slinger may remain on the container top while the lifting slings are approaching. (Fig. II.2)

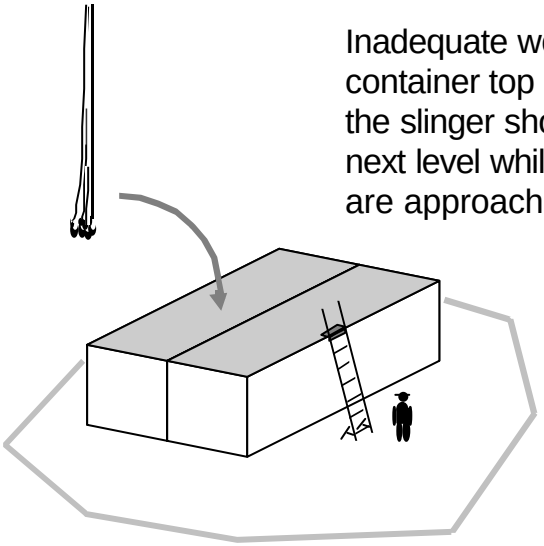


Unloading containers in a single row

Minimum working area on tops of containers



Inadequate working area on the container top -
the slinger should vacate from the container top to the next level before the adjoining container is being hoisted. (Fig. II.3)

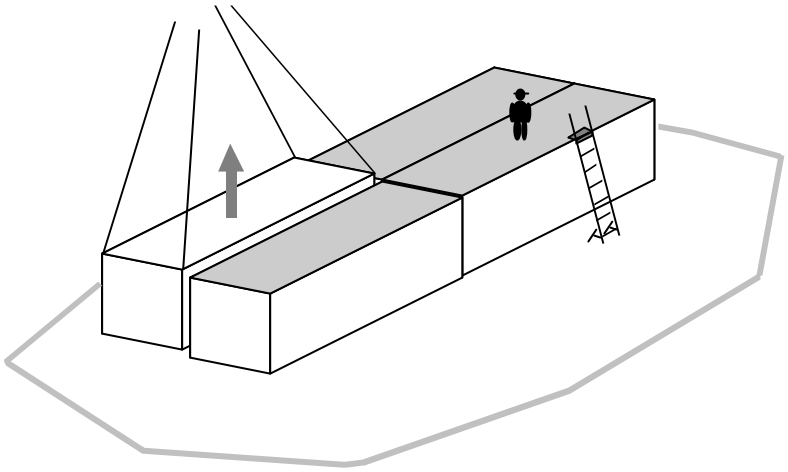


Inadequate working area on the container top -
the slinger should remain at the next level while the lifting slings are approaching. (Fig. II.4)

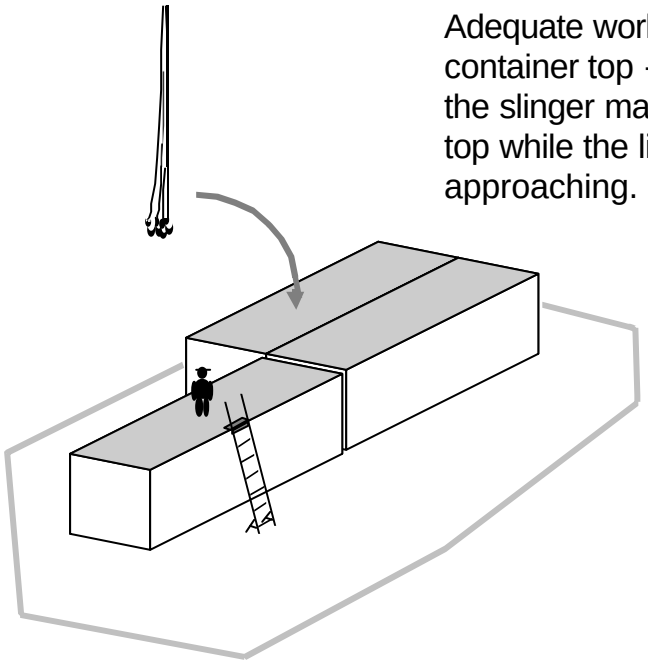
Unloading containers in a single row

Minimum working area on tops of containers

Adequate working area on the container top -
the slinger may remain on the container top while the adjoining container is being hoisted. (Fig. II.5)



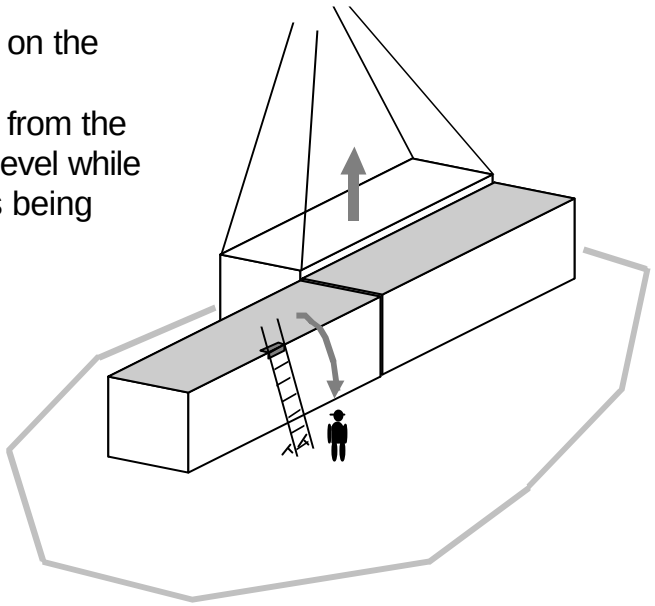
Adequate working area on the container top -
the slinger may remain on the container top while the lifting slings are approaching. (Fig. II.6)



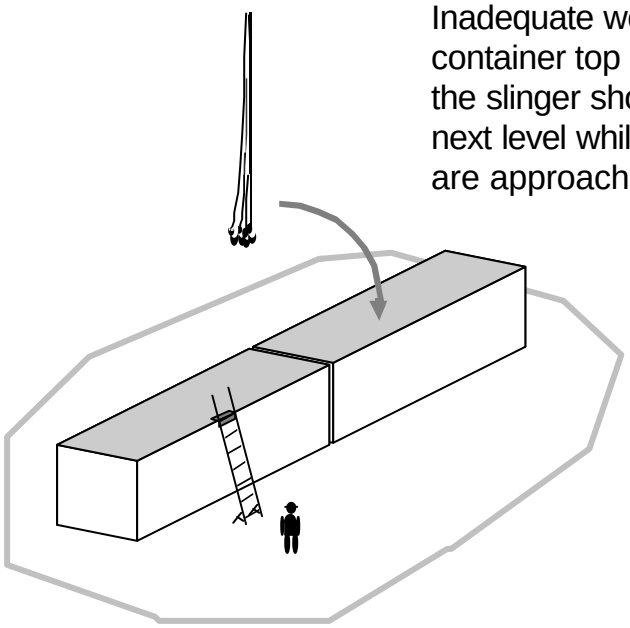
Unloading containers in multi-rows

Minimum working area on tops of containers

Inadequate working area on the container top -
the slinger should vacate from the container top to the next level while the adjoining container is being hoisted. (Fig. II.7)

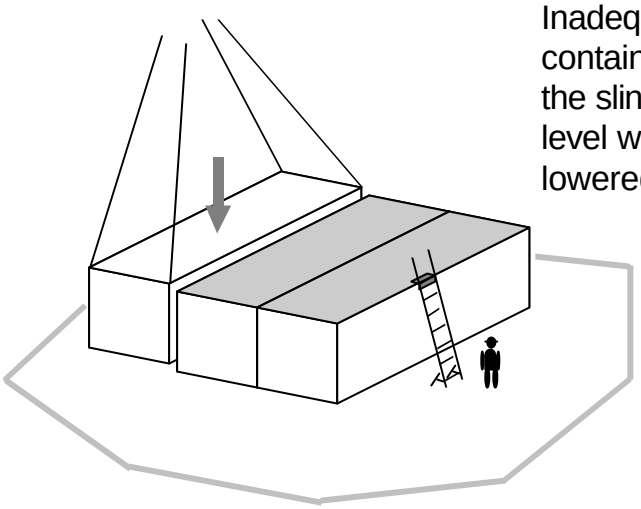


Inadequate working area on the container top -
the slinger should remain at the next level while the lifting slings are approaching. (Fig. II.8)

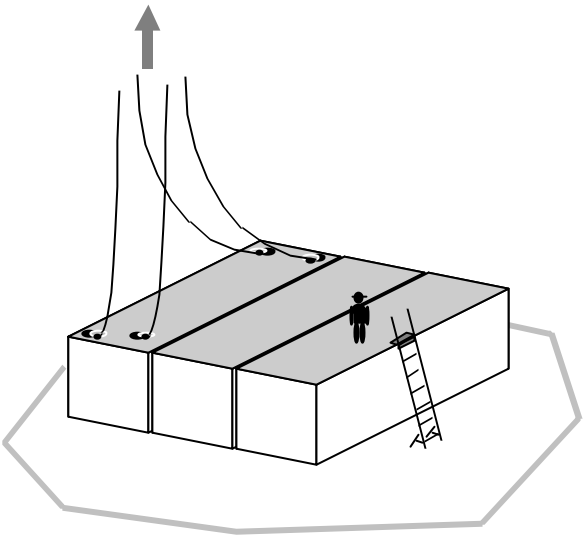


Unloading containers in multi-rows

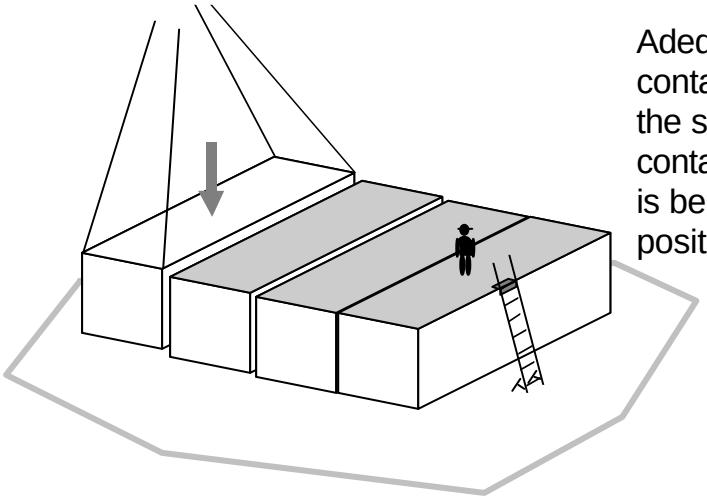
Minimum working area on tops of containers



Inadequate working area on the container top -
the slinger should remain at the next level while the container is being lowered into position. (Fig. II.9)



Adequate working area on the container top -
the slinger may remain on the container top after disengaging the lifting slings from the lowered container and while the lifting slings are being hoisted. (Fig. II.10)

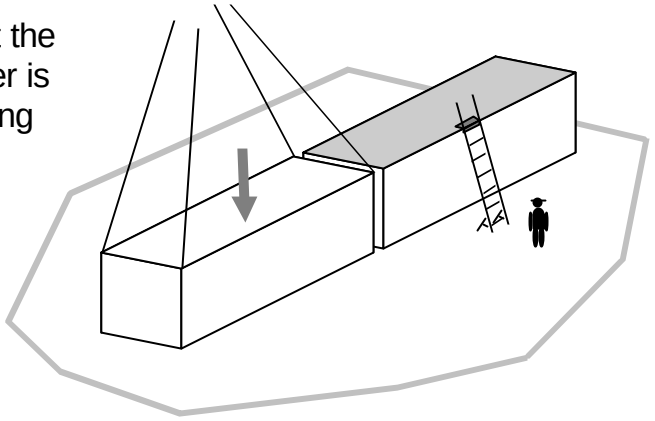


Adequate working area on the container top -
the slinger may remain on the container top while the container is being lowered to an adjacent position. (Fig. II.11)

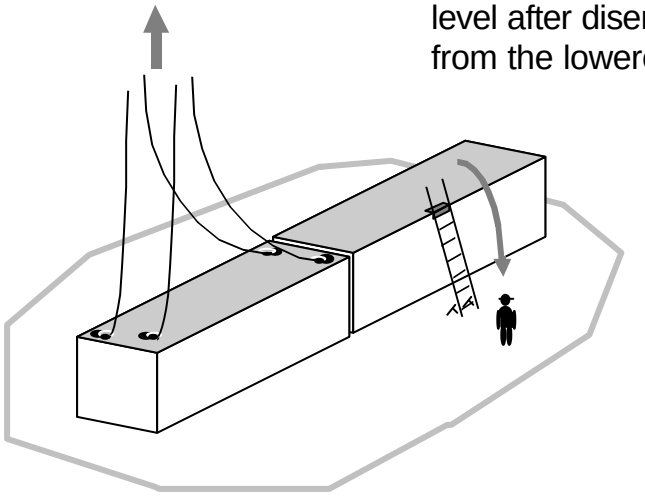
Loading containers in a single row

Minimum working area on tops of containers

Inadequate working area on the container top -
the slinger should remain at the next level while the container is being lowered to the adjoining position. (Fig. II.12)



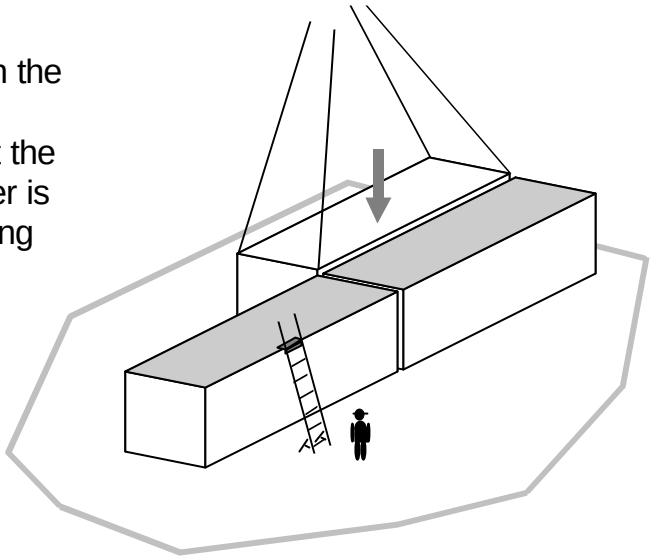
Inadequate working area on the container top -
the slinger should vacate to the next level after disengaging the lifting slings from the lowered container. (Fig. II.13)



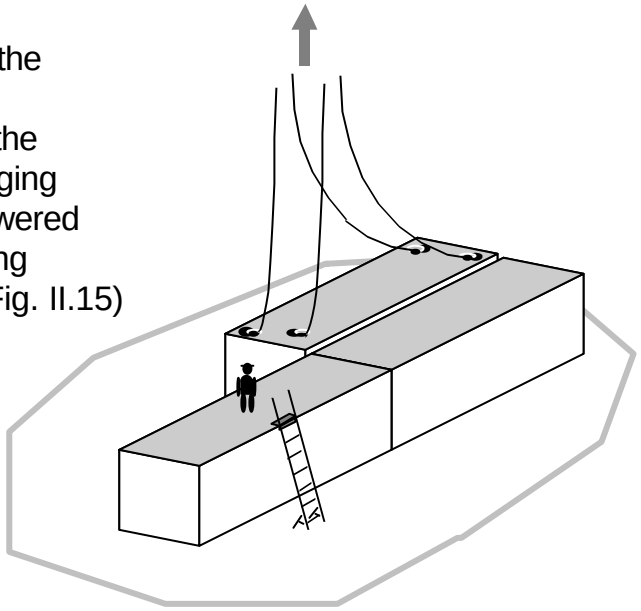
Loading containers in multi-rows

Minimum working area on tops of containers

Inadequate working area on the container top -
the slinger should remain at the next level while the container is being lowered to the adjoining position. (Fig. II.14)



Adequate working area on the container top -
the slinger may remain on the container top after disengaging the lifting slings from the lowered container and while the lifting slings are being hoisted. (Fig. II.15)



Loading containers in multi-rows

APPENDIX III

Standards

A3.1 British Standard BS 4654: 1970
Specification for hooks for lifting freight containers of up to 30 tonnes

A3.2 British Standard, BS 6166: Part 1: 1986
Lifting slings, Part 1. Methods of rating

A3.3 British Standard, BS 6166: Part 2: 1986
Lifting slings, Part 2. Specification for marking

A3.4 British Standard, BS 6166: Part 3: 1988
Lifting slings, Part 3. Guides to selection and safe use of lifting slings for multi-purposes

A3.5 ISO Standards, ISO 3874:1997
Series 1 freight containers - Handling and securing

APPENDIX IV

References

A4.1 Code of practice, Safe and Health at Work (Land-based Construction over Water - Prevention of Fall), Labour Department, HKSAR

A4.2 Code of safe working practices for merchant seamen, Maritime and Coastguard Agency, UK

A4.3 Container Top Safety, Lashing and Other Related Matters, International Cargo Handling Co-ordination Association, UK

A4.4 A Guide To Safety Management, Labour Department, HKSAR

A4.5 Safety and Health in Dock Work, International Labour Office, Geneva

A4.6 Safety in Docks, Docks Regulations 1988, Approved Code of Practice and Guidance, Health & Safety Commission, UK

A4.7 《貨櫃裝卸及運輸安全指南》(Container Loading, Unloading and Transportation Safety Guide), Occupational Safety and Health Council, HKSAR

A4.8 《船上貨物裝卸安全指南》(Stevedoring Safety Guide), Marine Department, HKSAR

APPENDIX V

Marine Department contacts

A5.1 For enquiries on occupational safety and health matters relating to shipboard industrial operations including cargo handling, ship-repairing and marine construction; and for reporting of shipboard industrial accidents during office hours-

Marine Industrial Safety Section
Room 2315 Harbour Building, 38 Pier Road, Central, Hong Kong

Tel.: 2852 4472, 2852 4477 Fax.: 2543 7209

A5.2 For reporting of marine accidents during office hours-

Marine Accident Investigation Section
Room 2103 Harbour Building, 38 Pier Road, Central, Hong Kong

Tel.: 2852 4511, 2852 4943 Fax.: 2543 0805

A5.3 For enquiries on matters relating to dangerous goods carried by vessels during office hours-

Dangerous Goods and Project Section
Room 307 Harbour Building, 38 Pier Road, Central, Hong Kong

Tel.: 2852 3085, 2815 8596 Fax.: 2805 2584

A5.4 For reporting of marine and shipboard industrial accidents during and outside office hours-

Vessel Traffic Centre

Tel.: 2858 2107, 2858 2163 Fax.: 2858 6646

A5.5 For alerting the search and rescue authority (24 hours manned)-

Hong Kong Maritime Rescue Co-ordination Centre (HK MRCC)

Tel.: 2545 0181 Fax.: 2541 7714