DEPARTMENT OF TRANSPORT

NO. 863 **10 September 2021**

MERCHANT SHIPPING ACT, 1951 (ACT NO. 57 OF 1951)

MARITIME OCCUPATIONAL HEALTH AND SAFETY AMENDMENT REGULATIONS, 2021

WITHDRAWAL OF GOVERNMENT GAZETTE NOTICE NO. 44761

The Minister of Transport in terms of section 356 of the Merchant Shipping Act, 1951 (Act No. 57 of 1951) intends to replace the draft Maritime Occupational Health and Safety Amendment Regulations, 2021 published in Government Notice No. 388 of Government Gazette No. 44761 published on 25 June 2021 with the following schedule.

Interested persons are invited to submit comments on these draft Maritime Occupational Health and Safety Amendment Regulations to the Director-General, Department of Transport for the attention of Ms. Glory Semenya or Ms. Moloko Machaka within 30 days after publication of this notice:

The Department of Transport
Private Bag X193
PRETORIA
0001
E-mail: Semenyag@dot.gov.za or machakam@dot.gov.za Tel: 012 309 3499 or 012 309 3676

SCHEDULE

MERCHANT SHIPPING ACT, 1951 (ACT NO. 57 OF 1951)

MARITIME OCCUPATIONAL HEALTH AND SAFETY AMENDMENT REGULATIONS, 2021

GENERAL EXPLANATORY NOTE:

[ ] Words in bold typed in square brackets indicate omissions/deletions from existing regulations.

_____ Words underlined with a solid line indicate insertions in existing regulations.

Draft Maritime Occupational Health and Safety Amendment Regulations, 2021

Definition

1. In this Schedule "the Regulations" means the Maritime Occupational Health and Safety Regulations, 1994 published in Government Gazette No. 16068 by Government Notice No. R. 1904 dated 11 November 1994, as amended.

Amendment of Chapter I of the Regulations

2. Chapter I of the Regulations is hereby amended by the substitution for the table of contents (Arrangement of regulations) of the following table:

"Chapter I General

1 Definitions
2 General application
3 Duties of **[employers]** an employer and an employee
4 Health and Safety equipment and facilities to be provided by **[employers]** an employer
5 First-aid kit and first-aider
6 Reporting of accidents or serious injuries on board vessels".

Amendment of regulation 1 of the Regulations

3. Regulation 1 of the Regulations is hereby amended—

(a) by the insertion after the definition of "access equipment" of the following definitions:

"**"Authority"** means the South African Maritime Safety Authority established by section 2 of the South African Maritime Safety Authority Act, 1998 (Act No. 5 of 1998);"; and

"**"confined space"** means a space which has any of the following characteristics:
(a) has limited openings for entry and exit;
(b) has unfavourable natural ventilation;
(c) is not designed for continuous worker occupancy; and
(d) where it is foreseeable that the atmosphere may at some stage contain toxic or flammable gases or vapours, or be deficient in oxygen, to the extent that it may endanger the life or health of any person entering that space; and includes, but is not limited to, cargo spaces, double bottoms, fuel tanks, ballast tanks, pump-rooms, compressor rooms, cofferdams, void spaces, duct keels, inter-barrier spaces, engine crankcases and sewage tanks;";

(b) by the insertion after the definition of "contravene" of the following definition:

"**"employer"** for the purposes of this Chapter means the owner, master or person who employs and remunerates or undertakes to remunerate any stevedores, ship repair and maintenance worker or incidental person;"; and

(c) by the substitution for the definition of "tanker" of the following definition:

"**"tanker"** means a cargo ship constructed or adapted for the carriage in bulk of oil, chemicals or gas; and".

Substitution of regulation 2 of the Regulations

4. The following Regulation is hereby substituted for Regulation 2 of the Regulations:

"These regulations apply on board **[vessels]**a vessel and to the performance of all work on **[vessels]**a vessel, whether or not the **[vessels are]** vessel is afloat.".

Amendment of regulation 3 of the Regulations

5. Regulation 3 of the Regulations is hereby amended—

(a) by the substitution for the heading of regulation 3 of the following heading:

"**3 Duties of [employers and employees]an employer and an employee**"; and

(b) by the substitution for regulation 3 of the following regulation:

"(1) **[Every]**An employer shall—
(a) have a copy of these regulations readily available for perusal by his employees;
(b) ensure that **[all his employees are]**each employee is so far as is practicable familiar with these regulations where applicable;
(c) in so far as is practicable, ensure that employees observe the applicable provisions of these regulations **[applicable to employees are observed by them]**;
(d) in the interest of health and safety, ensure that discipline is enforced on board a vessel;
(e) ensure that on board a vessel work is performed or machinery is used under the general supervision of a person who is fully aware of the hazards connected therewith and who is conversant with the health and safety measures to be taken or observed to obviate such hazards;

(f) ensure that health and safety measures contained in the applicable Code and the SANS Standards prescribed by the South African Bureau of Standards are complied with;

(g) ensure that **[every]**each employee is **[aware of the hazards connected with any work to be performed, or machinery to be used by him and that he is conversant with the safety measures to be taken or observed to obviate such hazards]**—

(i) aware of the hazards connected with any work to be performed, or machinery to be used; and

(ii) conversant with the health and safety measures to be taken or observed to obviate hazards referred to in subparagraph (i);

(h) ensure that machinery and equipment which is brought on board a vessel and which does not form part of that vessel's machinery or equipment complies with the provisions of the Occupational Health and Safety Act, 1993 (Act No. 85 of 1993);

(i) ensure **[than]** that an employee who operates machinery or equipment on board a vessel is competent to do so**[.]**; and

(j) as far as is reasonably practicable establish that:

(i) the hazards to the health or safety of persons attached to any work which is performed, any cargo, equipment and any plant or machinery which is used in on board the vessel; and

(ii) the precautionary measures to be taken with respect to such work, cargo, equipment, plant or machinery in order to protect the health and safety of persons and provide the necessary means to apply such precautionary measures.

(2) **[No]** An employer shall not, other than in writing and subject to the conditions stipulated by **[him]**the applicable Code, allow the raising, lowering, transporting or supporting of a person by means of a lifting appliance, except in an emergency.

(3) **[Every]**An employee shall—

(a) take reasonable care for **[his]** own health and safety and that of any other **[persons]**person who may be affected by **[his]**the employee's acts or omissions;

(b) as regards any duty or requirement imposed on **[his]**the employee's, employer or any other person by the Act or regulations, co-operate with **[such]** the employer or person to enable that duty or requirement to be performed or complied with;
(c) carry out any lawful order given **[to him]**, and obey the rules and procedures laid down by **[his]**the employer or by anyone **[authorized]**authorised thereto by his employer, in the interest of health and safety;
(d) if any situation which is unsafe comes to **[his]**the employee's attention, as soon as practicable report such situation to **[his]**the employer or to the health and safety representative for **[his]**the workplace or section thereof, as the case may be, who shall report it to the employer;
(e) if **[he]**the employee is involved in any incident which may affect **[his]**the employee's health and safety, or which has caused an injury to **[himself]**the employee, report such incident to **[his]**the employer or to anyone **[authorized]**authorised thereto by the employer, or to **[his]**the health and safety representative, as soon as practicable but not later than the end of the particular shift during which the incident occurred, unless the circumstances were such that the reporting of the incident was not possible, in which case **[he]**the employee shall report the incident as soon as practicable thereafter; and
(f) not intentionally or recklessly interfere with or misuse anything which is provided in the interest of health and safety.".

Amendment of regulation 4 of the Regulations

6. Regulation 4 of the Regulations is hereby amended–

(a) by the substitution for the heading of regulation 4 of the following heading:

"**4 Health and Safety equipment and facilities to be provided by [employers]an employer**"; and

(b) by the substitution for regulation 4 of the following regulation:

"**[Taking into account the nature of the hazard that may be encountered, every employer shall, in order to render his employees safe, provide on a vessel adequate safety equipment and facilities, including—**

(1) suitable eye protection, welding shields, visors, hard hats, protective helmets, gloves, gauntlets, aprons, jackets, protective overalls or any similar equipment that will prevent bodily injury;
(2) waterproof clothing, low temperature clothing, fire retardant or flameproof clothing or any similar equipment, protective ointment, ear miffs, earplugs, respirators, breathing apparatus, masks, airlines, hoods, helmets or any similar equipment that will effectively protect against harm;
(3) belts, harnesses, nets, fall arresters, life lines, safety hooks, or any similar equipment that will provide protection in cases of falls; and
(4) mats, barriers, safety signs or any similar facility that will effectively prevent slipping or entry to unsafe areas.]

(1) An employer must, taking into account the nature of the hazard that may be encountered, and in order to render the employees safe, provide on a vessel adequate health and safety equipment, personal protective equipment and facilities, including—
(a) suitable eye protection, welding shields, visors, hard hats, protective helmets, gloves, gauntlets, aprons, jackets, protective overalls, safety footwear, reflective safety jackets or any similar equipment that will prevent bodily injury;
(b) waterproof clothing, low temperature clothing, fire retardant or flameproof clothing or any similar equipment, protective ointment, earmuffs, earplugs, respirators, breathing apparatus, masks, airlines, hoods, helmets or any similar equipment that will effectively protect against harm;
(c) belts, harnesses, nets, fall arresters, lifelines, safety hooks, or any similar equipment that will provide protection in cases of falls;
(d) mats, barriers, safety signs or any similar facility that will effectively prevent slipping and falling, multi-gas detectors for use before entry into confined spaces and other spaces with unsafe and harmful atmosphere; and
(e) other equipment and facilities as determined by the hazard identification process.

(2) An employer must immediately replace personal protective equipment that has become worn or defective.".

Substitution of regulation 5 of the Regulations

7. The following Regulation is hereby substituted for Regulation 5 of the Regulations:

"(1) **[Every]**Where more than five employees work on board a vessel an employer shall ensure that **[-]** there is readily available at that workplace a person holding a certificate of competency in first aid and thereafter one first aider must be appointed and available for every group of up to 50 employees.

(2) The certificate of competency referred to in subregulation (1) shall-

(a) in the case of a vessel crew be in compliance with the Merchant Shipping (Safe Manning, Training and Certification) Regulations, 2013; and

(b) for stevedores, ship repair and maintenance workers and incidental persons be **[a certificate of competency]** issued with a certificate of competency by an organization or person accredited by the relevant Sector Education and Training Authority and approved by the Chief Inspector of the Department of Employment and Labour for that purpose.

[(1) where more than five employees work on board a vessel where the vessel's medicine and medical appliances are not readily accessible, a portable first-aid kit is made available at or near the workplace where the employees are engaged and there is readily available at that workplace a person qualified in practical first aid; and

(2) the minimum contents of the portable first-aid kit is as follows:

Contents	**Quantity**
Wound cleanser (Cetrimide 1% solution)	**1 x 200 ml**
Pain relief tablets (e.g. paracetamol-codeine combination)	**25**
Anticeptic burn/wood cream (e.g. Proviodine)	**25g**
Paraffin gauze dressings 400mm x 100 mm	**1 tin**
Paraffin gauze dressings 100 mm x 100 mm	**1 tin**
Eyedrops (Naphazoline)	**10 ml**
Crepe bandage 75 mm x 6 mm	**1**
Roller bandages 75 mm x 6 mm	**2**

Triangular bandages	**2 large**
Cotton wool	**1 x 50 g**
Wound dressings 150 mm x 100 mm	**2**
Wound dressings 200 mm x 150 mm	**1**
Elastic adhesive wound dressing 25 mm x 1 m	**1 roll**
Self-adhesive wound dressings, assorted	**50**
Gauze 90 mm x 5 mm	**1**
Eyeshield	**1**
Tweezers	**1 pair**
Scissors, stainless steel, 100 mm blunt/sharp	**1 pair**
Assorted safety pins, brass, large	**1 packet**
Splints, in net for neck, arms and leg	**1 set**
Surgical gloves	**2 pairs**

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(3) Where more than five employees work on board a vessel an employer must ensure that a portable first-aid kit is made available at or near the workplace unless there is an agreement between the vessel Master and the employer over the use of the vessel's medicine and medical appliances.

(4) The portable first-aid kit referred to in subregulation (3) shall contain a minimum of the following contents:

Item	**Contents**	**Quantity**
1	Wound cleaner / antiseptic	(100ml)
2	Swabs for cleaning wounds	1 packet
3	Cotton wool for padding	(100g)
4	Sterile gauze	10
5	Forceps (for splinters)	1 pair
6	Scissors (minimum size 100mm)	1 pair
7	Safety pins	1 set
8	Triangular bandages	4
9	Roller bandages (75mm x 5m)	4
10	Roller bandages (100mm x 5m)	4
11	Roll of elastic adhesive (25mm x 3m)	1
12	Non-allergenic adhesive strip (25mm x 3m)	1
13	Adhesive dressing strips (minimum quantity 10 assorted sizes)	1 packet
14	First aid dressings (75mm x 100mm)	4
15	First aid dressings (150mm x 200mm)	4
16	Straight splints	2
17	Large and Medium size disposable latex gloves	2 pairs of each size

18	CPR mouth pieces or similar devices	2
19	An adequate supply of absorbent material **[for the absorption of blood and other body fluids spilled]**	
20	Disinfectant **[to disinfect the area after cleaning up blood and other body fluids spilled]**	
21	Large and medium size disposable rubber household gloves	2 Pairs of each size
22	A suitable sized impervious bag **[for the safe disposal of blood and other body fluid contaminated biohazard materials]**	

".

Substitution of regulation 6 of the Regulations

8. The following Regulation is hereby substituted for Regulation 6 of the Regulations:

"**[Any]**An employer or an employee must report any accident or serious injury, contemplated in section 259 of the Act, **[shall be reported]** on the prescribed casualty report, obtainable from the proper officer concerned.".

Amendment of Chapter II of the Regulations

9. Chapter II of the Regulations is amended—

(a) by the substitution for the table of contents (Arrangement of regulations) of the following table:

"**Chapter II** **Health and Safety provisions for staff on board ship, appliances and equipment**

7 Definitions
8 Application
9 Duties of an employer
10 Appointment, termination of appointment, and functions of a health and safety **[officers]**officer
11 Appointment, termination of appointment, and functions of a health and safety **[committees]**committee
12 Election, termination of office, and functions of a health and safety **[representatives]**representative

13 Requirements and duties of **[employers]**an employer regarding health and safety officers, health and safety committees and health and safety representatives to enable them to perform their functions
14 Access equipment
15 Use of access equipment
16 Hatch coverings
17 Lifting plants
18 Safeguarding of machinery
19 Electrical equipment
20 Safety measures when working under hazardous conditions
21 Safe access of persons on board
22 Transit areas
23 Lighting
24 Safety signs
25 Guardrails and Guarding of Openings
26 Fixed ladders
27 Enclosed or confined spaces"; and

(b) by the substitution for the heading of Chapter II of the following heading:

"**Chapter II** **Health and Safety provisions for staff on board ship, appliances and equipment**".

Amendment of regulation 7 of the Regulations

10. Regulation 7 of the Regulations is hereby amended—

(a) by the insertion after the definition of "Code" of the following definition:

"**"competent person"** means a person possessing the knowledge and experience required for the performance of a specific duty or duties and acceptable as such to a competent authority, as prescribed in the Code;";

(b) by the substitution for the definition of "employer" of the following definition:

"**"employer"** for the purposes of this Chapter means master or owner of a vessel;"; and

(c) by the substitution for the definition of "new vessel" of the following definition:

"**"new vessel"** means a vessel built on or after 1 January 1994 and includes a vessel whose construction and assembly commenced on or after 1 January 1994; and".

Substitution of regulation 8 of the Regulations

11. The following Regulation is hereby substituted for Regulation 8 of the Regulations:

"This Chapter shall not apply to—

[(1)](a) fishing vessels, except for regulations 17, 21 and 27(1), (2), (3)(b) and (c), and (4), read with the applicable Code;

[(2)](b) vessels used solely for sport and recreation;

[(3)](c) offshore installations while they are on or within 500 **[metres]**meters of their working stations; and

[(4)](d) a vessel in which there is, for the time being, no workplace.".

Substitution of regulation 9 of the Regulations

12. The following Regulation is hereby substituted for Regulation 9 of the Regulations:

"**[Every]**An employer of a crew **[shall]** in addition to the general duties prescribed in Chapter I **[comply with the following:]** shall—

[(1)](a) **[Ensure]**ensure that no safety equipment or other facility on a vessel **[be]**is removed therefrom, except for cleaning, repairing, maintenance, modification or replacement thereof;

[(2)(b) train all **[his]** employees or cause **[them]**employees to be trained in the proper use and maintenance of health and safety equipment or other facilities on board a vessel; and

[(3)](c) ensure that all health and safety hazards or potential health and safety hazards that [**caused**] may cause a safety officer to instruct that work **[to]** be stopped on a vessel, are removed before such work is resumed.".

Amendment of regulation 10 of the Regulations

13. Regulation 10 of the Regulations is hereby amended–

(a) by the substitution for the heading of regulation 10 of the following heading:

"**10 Appointment, termination of appointment, and functions of a health and safety [officers]officer**"; and

(b) by the substitution for regulation 10 of the following regulation:

"(1) An employer shall in writing appoint an officer other than the master of a vessel as the health and safety officer for that vessel.

(2) The appointment of a health and safety officer shall terminate on —
(a) **[on]** the date that health and safety officer ceases to be employed on board that vessel; or
(b) **[on]** the date that the employer terminates **[his]**the appointment.

(3) **[The]**A health and safety officer shall—
(a) ensure that the crew of the vessel comply with the provisions of the Code;
(b) ensure that the crew comply with any occupational health and safety policy determined by the employer concerned;
(c) ensure that the crew maintain a high standard of occupational health and safety;
(d) investigate the cause of an accident contemplated in section 259(1)(c) of the Act, all hazards or potential hazards to health and safety, including fatigue, that affect or may affect the crew of a vessel in the execution of their work, and all complaints by the crew of the vessel concerning occupational health and safety;
(e) make recommendations to the health and safety committee concerned about any investigation or inspection or the prevention of any accident or the removal of any hazard or potential hazard, and about any deficiency in occupational health and safety regarding—
(i) the requirements of the Act and these regulations that affect the crew;
(ii) any relevant Marine Notice; and
(iii) any provision of the Code;
(f) carry out inspections of each accessible part of the vessel in respect of the occupational health and safety of the crew, at least once during

this term of appointment or more frequently if there have been substantial changes in the conditions of work: provided that the interval between successive inspections shall not exceed three months;

(g) keep a record book **[in]** which **[he]** shall **[enter]** contain the full details—

(i) of any accident or hazardous occurrence **[(including the date, the names of persons involved and the nature of any injury)]**, including the name of any person involved or the nature of any injury; and

(ii) of any investigation, complaint or inspection referred to in this regulation;

(h) on written request as soon as practicable make the record book referred to in paragraph (g) available to the Authority or the health and safety committee concerned, as the case may be;

(i) immediately stop or cause to be stopped the performance of any work which **[in his opinion]** may cause an accident or **[serious]**an accident that may result in an injury, and inform the master thereof forthwith; and

(j) carry out any other investigation relating to occupational health and safety which an employer or a health and safety committee may deem necessary, if so requested to in writing by the employer or the health and safety committee, as the case may be, and thereafter submit a report in respect of such investigation.".

Amendment of regulation 11 of the Regulations

14. Regulation 11 of the Regulations is hereby amended–

(a) by the substitution for the heading of regulation 11 of the following heading:

"**11 Appointment, termination of appointment, and functions of a health and safety [committees]committee**"; and

(b) by the substitution for regulation 11 of the following regulation

"(1) An employer shall in writing establish a health and safety committee on board a vessel, designating the master to be chairperson and appointing

the health and safety officer and every health and safety representative as members.

(2) An employer may in writing dissolve a health and safety committee.

(3) A health and safety committee shall—
(a) upon receipt of any recommendation referred to in regulation 10(3)(e), submit to the employer such recommendation together with their own recommendations; and
(b) inquire into any occupational health and safety matter that affects a vessel and her crew and take the steps it may deem necessary to remove any hazard or potential hazard.".

Amendment of regulation 12 of the Regulations

15. Regulation 12 of the Regulations is hereby amended –

(a) by the substitution for the heading of regulation 12 of the following heading:

"**12 Election, termination of office, and functions of a health and safety [representatives]representative**"; and

(b) by the substitution for regulation 12 of the following regulation:

"(1) The crew may, if they so choose, elect—
(a) in a ship carrying fewer than 16 crew members, one health and safety representative; or
(b) in a ship carrying more than 15 crew members, one health and safety representative, to be elected by the officers, and one health and safety representative to be elected by the ratings, or in a ship carrying more than 30 ratings, one health and safety representative, to be elected by the ratings in each of the deck, engine and catering departments; and general purpose ratings shall for this purpose be included in the deck apartment.

(2) If a group of employees chooses to elect a health and safety representative, the manner in which the election is to be conducted shall be as follows:
(a) **[At]**at a meeting convened for the purpose of this election and presided over by the chairman of the health and safety committee or

his nominee, a group of employees shall from within their group nominate a candidate**[.]**;

(b) **[Each]**each nominated candidate shall, in writing, confirm to the chairman of the health and safety committee his acceptance of such nomination**[.]**;

(c) **[The]**the election of a health and safety representative shall be decided by ballot**[.]**;

(d) **[Each]**each member of the group of employees holding an election shall have only one vote**[.]**;

(e) **[The]**the candidate obtaining the majority of votes shall be the health and safety representative for the specific group of employees for a period not exceeding six months**[.]**; and

(f) **[In]**in the event of an equality of votes, the chairman of the health and safety committee shall have the decisive vote.

(3) The office of the health and safety representative shall terminate—

(a) on the date that the health and safety representative ceases to be employed on board that vessel;

(b) on the date of **[his]**the health and safety representative's resignation from office; or

(c) after **[he]**the health and safety representative has completed **[his]**the term of appointment.

(4) **[When he makes]** A health and safety representative must submit any representations and **[submits]** requests in writing to the employer or health and safety officer or health and safety committee on behalf of the crew **[he represents, the safety representative shall make such representations and submissions in writing]**being represented.".

Amendment of regulation 13 of the Regulations

16. Regulation 13 of the Regulations is hereby amended by—

(a) the substitution for the heading of regulation 13 of the following heading:

"**13 Requirements and duties of [employers]an employer regarding health and safety officers, health and safety committees and health and safety representatives to enable them to perform their functions**"; and

(b) the substitution for regulation 13 of the following regulation:

"**[Every]**An employer of a crew shall—

[(1)](a) inform the health and safety officer and health and safety committee concerned of any hazardous cargo on board a vessel and the hazards which may arise therefrom, and of any other hazards on board the vessel that are known to **[him]**the employer and that may endanger the vessel or her crew;

[(2)](b) allow a health and safety officer **[and]**or health and safety representative such reasonable absence from ship's duties without loss of pay as may be necessary **[to enable them]** to perform their duties or functions as health and safety officer or health and safety representative, as the case may be;

[(3)](c) at any reasonable time, receive representations about occupational health and safety from the health and safety officer, the health and safety representatives or the health and safety committee, including recommendations by a health and safety representative that certain work should be suspended, and discuss their representations with them and implement any agreed measures as soon as may be reasonable and practicable;

[(4)](d) provide the health and safety officer, and health and safety committee concerned on request with any information relating to accidents and potential hazards to health and safety on board a vessel;

[(5)](e) provide the health and safety officer concerned on request with any information or plans necessary to enable **[him]**the health and safety officer to undertake an inspection referred to in regulation 10(3)(d);

[(6)](f) set the election date of a health and safety representative to be within three working days of being requested to do so by any two persons entitled to vote in such an election and give publicity to any such election;

[(7)](g) subject to the provision of section 355A(5) of the Act, provide the health and safety officer and health and safety committee access to any necessary information, document and similar material, including any applicable legislation and Marine Notices;

[(8)](h) provide the health and safety officer and health and safety committee with the necessary accommodation, office equipment and similar materials;

[(9)](i) permit the health and safety officer and health and safety committee to inspect the whole or part of the vessel for the purpose of occupational health and safety; and

[(10)](j) display in a conspicuous place on board a notice containing the names of the health and safety officer and health and safety representative on board the vessel.".

Amendment of regulation 14 of the Regulations

17. Regulation 14 of the Regulations is hereby amended —

(a) by the substitution for subregulation (1) of the following subregulation:

"(1) **[The]** An employer shall provide—"; and

(b) by the substitution in subregulation (1) for paragraph (c) of the following paragraph:

"(c) on board a vessel of 120 **[metres]**meters or more in length, in addition to the gangway, an accommodation ladder **[(including a rope or portable ladder)]**, including a rope or portable ladder which is appropriate to the deck layout, size, shape and maximum free board of the vessel and which complies with the applicable requirements prescribed in the Code.".

Substitution of regulation 15 of the Regulations

18. The following Regulation is hereby substituted for Regulation 15 of the Regulations:

"**[The]**An employer shall ensure that, except in an emergency, access equipment referred to in regulation 14 is always used between a secured vessel and any quay, pontoon or similar structure or another vessel alongside to which that vessel is secured, and that—

[(1)](a) the access equipment is placed in position promptly after the vessel has been so secured and remains in position while the vessel is so secured;

[(2)](b) the access equipment which is used—

(i) is properly constructed, of adequate strength, properly

rigged, secured, deployed, and safe to use; and

(ii) is so adjusted from time to time as to maintain safety of access;

[(3)](c) the access equipment and immediate approaches thereto are adequately illuminated;

[(4)](d) when access is necessary between a vessel and the shore and that vessel is not secured alongside, access equipment is provided to ensure safe access;

[(5)](e) a portable ladder is used as access equipment only where no other safe means of access is practicable;

[(6)](f) a rope ladder is used as access equipment only between a vessel with high freeboard and a vessel with low freeboard or between a vessel and a boat where no other safe means of access is practicable;

[(7)](g) a life-buoy with a self-activating light and a separate safety line attached to a quoit or a similar device is provided ready for use at the point of access to a vessel; and

[(8)](h) an adequate number of safety nets are rigged to safeguard the full length of a gangway or accommodation ladder in use.".

Amendment of regulation 16 of the Regulations

19. Regulation 16 of the Regulations is hereby amended —

(a) by the substitution for subregulation (1) of the following subregulation:

"(1) **[The]**An employer shall ensure—";

(b) by the substitution in subregulation (1) paragraph (b) for subparagraph (ii) of the following subparagraph:

"(ii) is clearly marked, showing the correct replacement position, except in so far as hatch coverings are interchangeable or incapable of being incorrectly replaced; and"; and

(c) by the substitution for subregulation (2) of the following subregulation:

"(2) Except in the event of an emergency, **[no]**a person shall not operate a hatch covering which is power-operated or a vessel's ramp or a retractable car-deck unless authorised to do so by the officer of the watch.".

Amendment of regulation 17 of the Regulations

20. Regulation 17 of the Regulations is hereby amended –

(a) by the substitution for regulation 17 of the following regulation:

"(1) **[Every]**An employer shall ensure that any vessel's lifting plant is—";

(b) by the substitution in regulation 17 subregulation (1) for paragraph (c) of the following paragraph:

"(c) operated only by a competent person properly trained in the operation thereof and duly authorised by the officer of the watch to do so;";

(c) by the substitution in regulation 17 subregulation (1) for paragraphs (e) and (f) of the following paragraphs:

"(e) examined by a competent person after any **[of the tests]**test referred to in paragraph (d) **[have]**has been carried out, but at least once every 12 months, and that no lifting plant is used unless so examined and declared safe in writing;

(f) supplied with a test certificate stating that the lifting plant was tested by a competent person after any **[of the tests]**test prescribed in paragraph (d);";

(d) by the substitution in regulation 17 subregulation (1) for paragraphs (h) and (i) of the following paragraphs:

"(h) where practicable, fitted with—

(i) a limiting device which automatically arrests any driving effort when the load reaches its highest or lowest safe position;

(ii) a brake or other device suitable to holding a load and preventing the uncontrolled downward movement thereof when the raising effort of the lifting plant is interrupted; and

(iii) a hook or load-attaching device so designed or proportioned that the accidental disconnection of a load under working conditions is prevented; and

(i) fitted with—

(i) a device indicating the operating radius of the lifting plant at all times while it is in operation; and

(ii) a diagram or indicator indicating to the operator the safe working load of the lifting plant corresponding to its operating radius, if it has a safe working load which varies according to its operating radius."; and

(e) by the addition after subregulation (1) of the following subregulations:

"(2) An employer must obtain from the vessel's crew, prior to commencement of each crane operation, documentary proof of—

(a) the register of on-board lifting appliances and items of loose gear;

(b) crane wire certificates; and

(c) maintenance schedule for crane wires.

(3) The vessel's crew must-

(a) at all times monitor cargo operations; and

(b) ensure that routine inspection and maintenance of wire-ropes is conducted as per the manufacturer's requirements for inspection.".

Substitution of regulation 18 of the Regulations

21. The following Regulation is hereby substituted for Regulation 18 of the Regulations:

"**[Every]**An employer shall—".

[(1)](a) specifically cause every exposed and hazardous part of machinery on board a vessel which is within the normal reach of a person to be effectively safeguarded by means of insulation, fencing, screening or guarding so that it does not constitute a further hazard or potential hazard;

[(2)](b) ensure that the quality of material used for such insulation, fencing, screening or guarding is suitable for the purpose for which it is being utilised;

[(3)](c) ensure that all insulation, fencing, screening or guarding is properly maintained and kept in position while the guarded part is in operation; and

[(4)](d) supply suitable apparatus to stop immediately any machine on board a vessel in an emergency.".

Substitution of regulation 19 of the Regulations

22. The following Regulation is hereby substituted for Regulation 19 of the Regulations:

"**[Every]**An employer shall ensure that all the electrical equipment and installations on a vessel are operated and maintained in such a manner that any hazard or potential hazard is removed.".

Amendment of regulation 20 of the Regulations

23. The following Regulation is hereby substituted for Regulation 20 of the Regulations:

"**[Every]**An employer shall take all reasonable precautionary measures in order to ensure that **[employees]**an employee who **[have]**has to work on or near machinery which is in motion, under pressure, at high temperature or electrically alive **[(including the operation of such machinery for the purposes of the examination, adjustment, repair, lubrication or testing thereof)]**,including the operation of such machinery for the purpose[] of the examination, adjustment, repair, lubrication or testing thereof, are not injured, and shall in particular ensure that—

[(1)](a) the exposure of employees to dangerous parts of such machinery is limited to the minimum;

[(2)](b) the said exposure is authorised by the officer of the watch or other competent person;

[(3)](c) such machinery is examined only by a competent person;

[(4)](d) any employee who is required to be close to such machinery has, so far as is practicable, a working area which is of adequate size, properly illuminated, and clear of obstructions and loose material; and

[(5)](e) a notice specifying the hazards relating to such machinery is affixed in a legible form in a conspicuous place on, or in the vicinity of, that machinery or that the area around such machinery is demarcated with hazard tape.".

Substitution of regulation 21 of the Regulations

24. The following Regulation is hereby substituted for Regulation 21 of the Regulations:

"**[Every]**An employer shall ensure that a safe means of access is provided and maintained to any place on a vessel to which a person may be required to go.".

Substitution of regulation 22 of the Regulations

25. The following Regulation is hereby substituted for Regulation 22 of the Regulations:

"**[Every]**An employer shall ensure that all deck surfaces used for transit and all passageways, walkways and stairs on a vessel are properly maintained and, in so far as it is practicable, are kept free from all materials for substances likely to cause a person to slip or fall.".

Substitution of regulation 23 of the Regulations

26. The following Regulation is hereby substituted for Regulation 23 of the Regulations:

"**[Every]**An employer shall ensure that those areas of a vessel being used for the loading or unloading of cargo or for any other work or transit are adequately and appropriately illuminated.".

Substitution of regulation 24 of the Regulations

27. The following Regulation is hereby substituted for Regulation 24 of the Regulations:

"**[Every]**An employer shall ensure that all permanent health and safety signs used on board a vessel for the purpose of giving health and safety information or instruction comply with the standards prescribed by the International Maritime Organisation, the South African Bureau of Standards or the International Standards Organisation.".

Amendment of regulation 25 of the Regulations

28. Regulation 25 of the Regulations is hereby amended —

(a) by the substitution for the heading of regulation 25 of the following heading:

"**25 Guardrails and Guarding of Openings**"; and

(b) by the substitution for regulation 25 of the following regulation:

"**[(1) Every employer shall ensure that any opening, open hatchway or dangerous edge into, through, or over which a person may fall is fitted with secure guardrails or fencing of adequate design and construction to prevent such occurrence, except where the installation of such guardrails of fencing will interfere with the proper performance of work.**

(2) Where a temporary opening is made in a ship for carrying out repair work, the opening may, in lieu of the guarding required by subregulation (1), be guarded by means of hazard tape displayed at a height of not less than 800 mm and not higher than 1 200 mm and at a distance of not less than 2 000 mm from the edge of the opening]

(1) An employer must ensure that—

(a) any opening, open hatchway or dangerous edge into, through, or over which a person may fall is fitted with secure guardrails or fencing of adequate design and construction to prevent such occurrence, except where the installation of such guardrails of fencing will interfere with the proper performance of work;

(b) where a temporary opening is made in a ship for carrying out repair work, the opening may, in lieu of the guarding required by subregulation (1), be guarded by means of a hazard tape displayed at

a height of not less than 800 mm and not higher than 1 200 mm and at a distance of not less than 2 000 mm from the edge of the opening;

(c) hatchways open for handling cargo or stores, through which persons may fall or on which they may trip, should be closed as soon as work stops, except during short interruptions or where they cannot be closed without prejudice to safety or mechanical efficiency because of the heel or trim of the ship: Provided in such a case, an employer must ensure the opening is guarded by means of a fencing of adequate design and construction to prevent such occurrence;

(d) guard rails or fencing should not have sharp edges and should be properly maintained;

(e) where necessary, locking devices and suitable stops or toe-boards should be provided;

(f) each course of rails should be kept substantially horizontal and taut throughout their length;

(g) guard rails or fencing should consist of an upper rail at a height of 1 meter and an intermediate rail at a height of 0.5 meters which may consist of taut wire or taut chain;

(h) work is not conducted on walkways that are not properly fenced;

(i) for a ship undergoing repair and maintenance work, positive guarding or barricading is utilised for openings made in railings, decks, or tank tops; and

(j) walkways are safely and securely fenced by the ship's crew and that foremen or supervisors ensure that fencing has been erected and complies with the specifications prescribed in paragraphs (a) to (i).".

Amendment of regulation 26 of the Regulations

29. Regulation 26 of the Regulations is hereby amended —

(a) by the substitution for the heading of regulation 26 of the following heading:

"**26 Fixed ladders**";

(b) by the substitution for regulation 26 of the following regulation:

"(1) **[Every]**An employer shall ensure that every ladder used on a vessel—

(a) **[all ladders used on a vessel are]**is constructed of **[good construction and]** sound material, adequate strength and is suitable for the purpose for which **[they are]**it is used;
(b) **[Such ladders are]**is properly maintained and free from defects; and
(c) **[all the ladders on a new vessel comply]** complies with the requirements prescribed in the relevant sections of the Code.".

Amendment of regulation 27 of the Regulations

30. Regulation 27 of the Regulations is hereby amended —

(a) by the substitution for subregulation (1) of the following subregulation:

"(1) **[Every]**An employer shall ensure that all entrances to unattended, enclosed or confined spaces on a vessel are kept either closed or otherwise secured against entry, except when work is to be done therein.";

(b) by the substitution for subregulation (2) of the following subregulation:

"(2) **[Every]**An employer shall ensure that the provisions of the applicable Code pertaining to the hazards for safe entry to and work in an enclosed or confined space on board a vessel are complied with.";

(c) by the substitution for subregulation (3) of the following subregulation:

"(3) **[Every]**An employer of crew on board—
(a) any tanker or gas carrier of 500 gross registered tons or more; **[and]**
(b) any other vessel of 1 000 gross registered tons or more**[,]**; and
(c) or any other vessel with confined spaces on board,
shall ensure that drills simulating the rescue of a crew member from an enclosed or confined space are held at intervals not exceeding two months, and that such drills are recorded in the official log book."; and

(d) by the substitution for subregulation (4) of the following subregulation:

"**[(4) (a) Where entry into an enclosed or confined space may be necessary, every employer shall ensure that an oxygen meter and such other testing device as is appropriate to the hazard likely to be encountered in any such space is carried on board the vessel.**

(b) Every employer shall ensure that such meter any such other testing device is maintained in good working order and, where applicable, is regularly serviced and calibrated according to the manufacturers' requirements.]

(4) An employer shall ensure that—

(a) where entry into an enclosed or confined space may be necessary, an oxygen meter, a multi-gas detector and such other testing device as is appropriate to the hazard likely to be encountered in any such space is carried on board the vessel;

(b) the confined space is certified by a competent person on board using a multi-gas detector as safe for human entry; and

(c) the oxygen meter, multi-gas detector or any such other testing device referred to in paragraph (a) is maintained in good working order and, where applicable, is regularly serviced and calibrated according to the manufacturer's requirements.".

Amendment of Chapter III of the Regulations

31. Chapter III of the Regulations is amended —

(a) by the substitution for the table of contents (Arrangement of regulations) of the following table:

"**Chapter III Stevedores, [shore]ship repair and maintenance contractors and incidental person on board vessels in the course and scope of their duty**

28 Definitions
29 Application
30 Duties of **[owners, masters and employers]**an employer
31 Appointment, termination of appointment, and functions of a health and safety officer
31A Appointment, termination of appointment, and functions of a health and safety appointee
31B Appointment, termination of appointment, and functions of a health and safety committee
31C Incidental persons

31D Certification of stevedores, ship repair and maintenance contractor and incidental person as fit for duty by an Occupational Medicine Practitioner
31E Certification of an employee as fit for duty by an Occupational Medicine Practitioner
31F Portable Ladders
31G Safety measures when working with steel pipes and on container tops
32 Record books
32A Stevedore Health and Safety Induction Training"; and

(b) the substitution for the heading of Chapter III of the following heading:

"**Chapter III Stevedores, [shore]ship repair and maintenance contractors and incidental person on board vessels in the course and scope of their duty**".

Amendment of regulation 28 of the Regulations

32. Regulation 28 of the Regulations is hereby amended —

(a) by the substitution for the definition of "Code" of the following definition:

"**[''Code'' means the South African Ports Cargo Handling Code of Practice published by the National Ports Authority of South Africa, a division of Transnet Limited, as may be amended from time to time;]**
''Code'' means the Code of Safe Working Practice for Ships Working Cargo in South African Ports;";

(b) by the insertion after the definition of "Code" of the following definition:

"**''competent person''** means a person possessing the knowledge and experience required for the performance of a specific duty or duties and acceptable as such to a competent Authority, as prescribed in the Codes;";

(c) by the substitution for the definition of "employee" of the following definition:

"**"employee"** means any person other than a crew member who is employed by or working for any employer and receives or is entitled to receive any remuneration or who works under the direction or supervision of an employer or any other person who in any manner assists in the carrying on or the conducting of the business of an employer in so far as this person is performing stevedoring, or **[shore]**ship repair and maintenance contracting or any other work whatsoever in the course and scope of **[his]** employment on board a vessel;";

(d) by the substitution for the definition of "employer" of the following definition:

"**"employer"** means any person other than an employer of the master or crew who employs any person and remunerates that person or expressly or tacitly undertakes to remunerate **[him]** any person, or who permits any person in any manner to assist him in performing stevedoring or **[shore contracting]** ship repair and maintenance or any other work on board a vessel;";

(e) by the substitution for the definition of "incidental persons" of the following definitions:

"**"incidental [persons]person**" means any person other than the master and crew, and **[stevedores]**stevedore and **[shore contractors]** ship repair and maintenance contractor on board a vessel in the course and scope of their duty;";

(f) by the insertion after the definition of "incidental persons" of the following definitions:

"**"Occupational Medicine Practitioner"** for the purposes of this Chapter means a registered medical practitioner who meets the prescribed requirements of and has registered the applicable additional qualification with the Medical and Dental Professions Board of the Health Professions Council of South Africa;"; and

"**"safety officer"** means a person who holds an NQF level 5 training qualification in Health and Safety management accredited by a relevant Education and Training Authority or an equivalent NQF level 6 qualification from a recognised higher education institution and is appointed as such in terms of regulation 31(1);";

(g) by the substitution for the definition of "shore contractor" of the following definition:

"**"[shore]ship repair and maintenance contractor"** means a person temporarily employed on board a vessel to effect general or specific repairs, alterations, renovations, improvements, painting, maintenance of vessel or machinery, tank or hatch cleaning and related tasks;";

(h) by the insertion after the definition of "ship repair and maintenance contractor" of the following definitions:

"**"shipyard competent person"** means a person with a minimum NQF level 5 certificate in Safety management which includes hazard identification modules and has;

(a) completed a training in proper care and use of a multi-gas detector provided by the manufacturer;

(b) **[has]** a minimum of two years working in the ship repair and maintenance industry or oil and gas industry; and;

(c) **[has]** basic knowledge of vessel structure;"; and

"**"Ship repair Code"** means the Code of Safe Working Practice for Ships undergoing repair and maintenance in South Africa;"; and

(i) by the addition after the definition of "stevedore" of the following definition:

"**"stevedore"** means a person employed in the loading or unloading of a vessel or activities related thereto**[.]**; and

"workplace" means an area on board a vessel where work is performed.".

Amendment of regulation 30 of the Regulations

33. Regulation 30 of the Regulations is hereby amended—

(a) by the substitution for the heading of regulation 30 of the following heading:

"**30 Duties of [owners, masters and employers]an employer**";

(b) by the substitution for subregulation (1) of the following subregulation:

"(1) **[Every]**An employer **[of stevedores, shore contractors or incidental persons]** shall—

(a) in addition to the general duties prescribed by regulation 3, complies with the requirements of regulations 4, 5, 17(b) and (c), 20, 21, 25 and **[27(2)]**27(1), (2) and (4);

(b) ensure that **[each accessible part of the vessel is]** the workplace, including transit and access facilities are inspected in respect of occupational health and safety affecting employees at **[least once a day during the period the employees are employed]** the commencement of each shift and maintain a record of such inspection;

(c) immediately stop or cause to be stopped, the performance of any work which **[in his opinion]** may cause an accident or **[serious]**accident that may result in an injury and inform the employer, owner or master forthwith thereof**[.]**;

(d) ensure that at the commencement of each shift, a health and safety information session is conducted with employees to inform employees of hazards, risks and mitigating measures associated with the task to be performed during the shift and maintain a record of such information sessions; and

(e) ensure that for any work taking place in confined spaces, each confined space is certified gas-free, safe for human entry or safe for hot work by a competent person whilst the vessel is in port within South Africa and maintained as such by a shipyard competent person where applicable.";

(c) by the substitution for subregulation (2) of the following subregulation:

"(2) **[Every]**An employer **[of stevedores, shore contractors or incidental persons]** shall ensure that all deck surfaces, all passageways, walkways and stairs on a vessel used for transit by employees are kept, as far as it is practicable, free from all materials or substances likely to cause a person to slip or fall."; and

(d) by the substitution for subregulation (4) of the following subregulation:

"(4) **[Every]**An employer **[of a stevedore]** shall ensure **[compliance with the provisions of the Code**]—

(a) compliance with the provisions of the Code;
(b) that each employee—
(i) holds a valid medical certificate of fitness;
(ii) holds documentary evidence of having successfully completed a health and safety induction training in accordance with Annex 1 of the Code and Appendix 1 of the Ship Repair Code; and
(iii) has the appropriate personal protective equipment.".

Amendment of regulation 31 of the Regulations

34. Regulation 31 of the Regulations is hereby amended —

(a) by the substitution for the heading of regulation 31 of the following heading:

"**31 Appointment, termination of appointment, and functions of a health and safety officer**";

(b) by the substitution for subregulation (1) of the following subregulation:

"(1) **[The]**An employer **[of a stevedore or shore contractor]** shall in writing appoint an employee as a health and safety officer for a group of **[his]**employees.";

(c) by the substitution for subregulation (2) of the following subregulation:

"(2) The appointment of the health and safety officer shall cease on the date—
(a) the employee ceases to be employed by the employer; or
(b) **[that]**the employer terminates the appointment.";

(d) by the substitution for subregulation (3) of the following subregulation:

"(3) **[The]** A health and safety officer shall whilst the employees are working on a vessel—";

(e) by the substitution in subregulation (3) for paragraph (a) of the following paragraph:

"(a) ensure that the employees comply with the provisions of the regulations and the related provisions of the applicable Codes;";

(f) by the substitution in subregulation (3) for paragraph (b) of the following paragraph:

"(b) ensure that any occupational health and safety policy determined by the employer concerned is complied with by the employees;";

(g) by the substitution in subregulation (3) for paragraph (c) of the following paragraph:

"(c) ensure that the employees maintain a high standard of occupational health and safety;";

(h) by the substitution in subregulation (3) for paragraph (d) of the following paragraph:

"(d) investigate the cause of an accident **[mentioned]**referred to in section 259(1)(c) of the Act, all hazards or potential hazards to health and safety, including fatigue, affecting or which may affect the employees in the execution of their work and all complaints about occupational health and safety by the employees onboard the vessel;";

(i) by the substitution in subregulation (3) for paragraph (e) of the following paragraph:

"(e) make recommendations to the employer **[regarding]**or the health and safety committee concerned about any investigation or inspection or the prevention of **[an]**any accident, or the removal of **[a]**any hazard, or potential hazard, and about any deficiency in occupational health and safety regarding **[the requirements of the Act and these regulations]**—

(i) the requirements of the Act and these regulations that affect the employees; and

(ii) the related provisions of the Code;";

(j) by the substitution in subregulation (3) for paragraph (f) of the following paragraph:

"(f) monitor the effectiveness of the applicable health and safety measures, conduct inspections contemplated regulation 30(1)(b) and the investigation referred to in paragraph (j) and immediately stop or cause to be stopped, the performance of any work which **[in his opinion]** may cause an accident or **[serious]**an accident that may result in an injury and inform the employer, owner or master forthwith thereof;";

(k) by the substitution in subregulation (3) for paragraph (h) of the following paragraph:

"(h) carry out any other investigation relating to occupational health and safety which an employer or a health and safety committee may deem necessary if requested thereto in writing by the employer or the health and safety committee, as the case may be, and thereafter submit a report in respect of such investigation;";

(l) by the substitution in subregulation (3) for paragraph (i) of the following paragraph:

"(i) for the purposes of regulation 32, submit to the employer a brief report of **[the]**each investigation, complaint or inspection contemplated in this regulation **[to the employer for the purposes of record keeping]**; and"; and

(m) by the addition in subregulation (3) after paragraph (i) of the following paragraph:

"(j) ensure that the workplace is inspected periodically in respect of unsafe acts and unsafe conditions during the time the employees are employed on board a vessel and evidence retained as prescribed in regulation 32.".

Insertion of regulations 31A to 31E of the Regulations

35. The following regulations are hereby inserted in Chapter III of the Regulations after regulation 31:

"**31A Appointment, termination of appointment, and functions of a health and safety appointee**

(1) An employer shall in writing appoint in respect of any work on board a vessel at least one employee as a health and safety appointee for every shift worked on the vessel.

(2) The appointment of the health and safety appointee shall terminate on the date—
(a) the person ceases to be employed by the employer; or
(b) the employer terminates the appointment.

(3) A health and safety appointee shall ensure that—
(a) before each shift—
(i) every part of the vessel including access facilities, transit areas where cargo is to be worked is inspected in respect of occupational health and safety affecting employees;
(ii) employees are made aware of any hazards associated with the work being undertaken;
(iii) employees use the appropriate personal protective equipment; and
(iv) documentary evidence of compliance with subparagraphs (i) and (ii) are kept on the vessel;
(b) any unsafe equipment or workplace is reported to the health and safety officer and that appropriate corrective action is taken;
(c) workplaces are well-lit and well-ventilated;
(d) any person not involved in work is kept clear of areas where cargo handling and ship repair and maintenance is taking place;
(e) safety equipment is used only for its intended purpose and is not misused or interfered with;
(f) ensure that the inspection contemplated in regulation 30(1)(b) is conducted; and
(f) report any other unsafe acts or unsafe conditions to the Health and Safety Officer.

31B Appointment, termination of appointment, and functions of a health and safety committee

(1) An employer shall in writing establish a health and safety committee consisting of a chairperson appointed by the employer, a health and safety officer and every health and safety appointee.

(2) The chairperson may co-opt as a member of the health and safety committee any other person whose knowledge or experience can contribute to the business of the committee.

(3) An employer may in writing dissolve, or reconstitute, the health and safety committee at any time.

(4) The health and safety committee shall meet at least once every three months: provided that the Authority may by notice in writing direct that a meeting be held at any place and time determined by the Authority and specified in the notice.

(5) Subject to any directions by an employer, the health and safety committee shall determine its own procedures.

(6) The health and safety committee shall—
- (a) consider every recommendation of the health and safety officer made in terms of regulation 31(3)(e) and any recommendation of a health and safety appointee;
- (b) submit such recommendations referred to in paragraph (a) to the employer together with its own recommendations;
- (c) inquire into any occupational health and safety matter that affects the employer or its employees and take the steps it may deem necessary to remove any hazard or potential hazard; and
- (d) monitor the employer's procedures and arrangements for ensuring that—
  - (i) an accident involving an employee is reported in terms of the Act and investigated by the health and safety officer and that appropriate corrective action is taken;
  - (ii) every workplace is safe so far as reasonably practicable; and
  - (iii) any equipment used by employees to work meets the applicable statutory requirements.

(7) An employer shall keep proper minutes of every meeting of the health and safety committee for a period of at least three years and shall make the minutes available to the Authority upon demand.

31C Incidental persons

(1) An employer of an incidental person shall upon employment of a new employee ensure that—
   (a) the employee attends internal health and safety induction training covering hazards associated with access to the vessel as well as hazards and risks associated with working on board the vessel;
   (b) the employee uses the appropriate personal protective equipment; and
   (c) any incidental person reports to the health and safety appointee referred to in regulation 31(1) before proceeding to work on any working area where cargo operations or ship repair and maintenance work is taking place.

31D Certification of a stevedore, ship repair and maintenance contractor or incidental person as fit for duty by an Occupational Medicine Practitioner

(1) A stevedore, ship repair and maintenance contractor or incidental person shall be examined and certified fit for duty only by a certified Occupational Medicine Practitioner, in accordance with the Medical Surveillance Protocols prescribed in Table 1 of Annex 5 of the Code, with due regard to the portability of the position.

(2) An Occupational Medicine Practitioner shall consider the multitasking and exposure to additional hazards related to the position and conduct an assessment of whether stevedore, ship repair and maintenance contractor or incidental person is fit for duty in accordance with the criteria prescribed in Table 2 of Annex 5 of the Code.

(3) An Occupational Medicine Practitioner shall, when conducting an assessment of whether a bulk cargo stevedore, ship repair and maintenance contractor or incidental person is fit for duty, comply with the guidelines prescribed in Table 3 of Annex 5 of the Code: provided where the bulk cargo is not listed in Table 3, the Material Safety Data Sheet

(MSDS) or the International Maritime Solid Bulk Cargoes Code (IMSBC Code) shall be consulted for guidance.

31E Certification of an employee as fit for duty by an Occupational Medicine Practitioner

(1) An employee shall be examined and certified fit for duty only by a certified Occupational Medicine Practitioner, in accordance with the Medical Surveillance Protocols prescribed in Table 1 of Annex 4 of the Code, with due regard to the portability of the position.

(2) An Occupational Medicine Practitioner shall consider the multitasking and exposure to additional hazards related to the position and conduct an assessment of whether an employee is fit for duty in accordance with the criteria prescribed in Table 2 of Annex 4 of the Code.

31F Portable Ladders

(1) An employer shall ensure that every ladder used on a vessel—
- (a) is constructed of sound material of adequate strength and is suitable for the purpose for which it is used;
- (b) is properly maintained and free from defects;
- (c) complies with the requirements prescribed in the relevant sections of the Code;
- (d) is fitted with non-skid devices at the bottom ends and hooks or similar devices at the upper ends of the stiles which shall ensure the stability of the ladder during normal use; and
- (e) is so lashed, held or secured whilst being used as to ensure the stability of the ladder under all conditions and at all times.

(2) An employer shall not use a ladder, or permit it to be used, if it —
- (a) (i) has rungs fastened to the stiles only by means of nails, screws, spikes or in like manner;
  - (ii) has rungs which have not been properly let into the stiles: provided that in the case of welded ladder or ladders of which the rungs are bolted or riveted to the stiles, the rungs need not be let into the sides; or
  - (iii) has damaged stiles, or damaged or missing rungs.

(3) An employer may not permit the use of a ladder longer than 9 metres which is required to be leaned against an object for support.

(4) In the case of a wooden ladder, an employer shall ensure that—
  (a) each ladder is constructed of straight grained wood, free from defects, and with the grain running in the length of the stiles and rungs; and
  (b) each ladder is not painted or covered in any manner, unless it has been established that there are no cracks or other inherent weaknesses: provided that the ladder may be treated with oil or covered with clear varnish or wood preservative.

(5) When work is done from a ladder, an employer shall—
  (a) take special precautionary measures to prevent articles from falling off; and
  (b) provide suitable sheaths or receptacles in which hand tools shall be kept when not being used.

(6) An employer shall ensure that a fixed ladder which exceeds 5 metres in length and is attached to a vertical structure with an inclination to the horizontal level of 75 degrees or more—
  (a) has its rungs at least 150 millimetres away from the structure to which the ladder is attached; and
  (b) is provided with a cage which—
    (i) extends from a point not exceeding 2,5 metres from the lower level to a height of at least 900 millimetres above the top level served by the ladder; and
    (iii) shall afford firm support along its whole length for the back of the person climbing the ladder, and for which purpose no part of the cage shall be more than 700 millimetres away from the level of the rungs: provided that the provisions of paragraph (b) shall not apply if platforms, which are spaced not more than 8 metres apart and suitable for persons to rest on, are provided.

(7) An employer shall ensure that employees—
  (a) have both hands free for climbing up and down;
  (b) face the ladder when climbing up and down;
  (c) do not wear footwear that is slippery; and

(d) use a belt or other suitable means to carry any object they may need whilst using a ladder.

31G Safety measures when working with steel pipes and on container tops

(1) An employer shall take all reasonable precautionary measures in order to ensure that employees who have to work **[with,]** near or with the discharge of steel pipes **[are]** follow precautions prescribed in the Code.

(2) An employer shall take all reasonable precautionary measures in order to ensure that employees who have to work on top of containers are not injured and comply with the safety measures prescribed in the Code.".

Amendment of regulation 32 of the Regulations

36. Regulation 32 of the Regulations is hereby amended —

(a) by the substitution for subregulation (1) of the following subregulation:

"(1) **[Every]**An employer **[of a stevedore or shore contractor]** shall maintain a record book**[, in which he shall enter]**containing the full details of—

(a) any accident or dangerous occurrence **[mentioned]**referred to in section 259(1)(c) of the Act **[(including the date of, names of persons concerned and the nature, if any, of any injuries suffered)]** including the date of, names of persons concerned and the nature, if any, of any injuries suffered; and

(b) any investigation, complaint or inspection in terms of regulation 31 and evidence of compliance with regulation 31A."; and

(b) by the substitution for subregulation (2) of the following subregulation:

"(2) **[The]** An employer shall keep the records specified in subregulation (1) for a period of **[not less than]**at least three years, and shall make these records available to the Authority upon demand.".

Amendment of Chapter IV of the Regulations

37. Chapter IV of the Regulations is amended by the substitution for the table of contents (Arrangement of regulations) of the following table:

"**Chapter IV Fishing Vessels**

33 Definitions
34 Application
35 Duties of employer
36 Appointment, termination of appointment, and functions of a health and safety **[officers]**officer
37 Appointment, termination of appointment, and functions of a health and safety **[appointees]**appointee
38 Appointment, termination of appointment, and functions of a health and safety **[committees]**committee
39 Record books
39A Compliance audit
39B Access equipment".

Amendment of regulation 35 of the Regulations

38. Regulation 35 of the Regulations is hereby amended by the substitution for subregulation (2) of the following subregulation:

"(2) **[Every employer of a crew shall in]**In addition to the general duties prescribed in Chapter I **[comply with the following:]**an employer of a crew shall—

(a) **[Ensure]**ensure that **[no]**health and safety equipment or other facility on a vessel **[be]**is not removed therefrom, except for cleaning, repairing, maintenance, modification or replacement thereof;

(b) train all **[his]** employees or []**[them]**the employees to be trained in the proper use and maintenance of health and safety equipment or other facilities on board a vessel;

(c) ensure that all hazards or potential hazards to health and safety that may cause[] a health and safety officer or health and safety appointee to stop work on a vessel, are removed before resumption of such work;

(d) ensure compliance with regulations 17, 21 and **[27(1)]**27(1), (2), (3)(b) and (c), and (4), read with the applicable Code.".

Amendment of regulation 36 of the Regulations

39. Regulation 36 of the Regulations is hereby amended—

(a) by the substitution for the heading of regulation 36 of the following heading:

"**36 Appointment, termination of appointment, and functions of a health and safety [officers] officer**";

(b) by the substitution for subregulation (1) of the following subregulation:

"(1) (a) For the **[purpose]**purposes of a fishing vessel in service, **[the]**an employer of the crew of **[the]**a vessel shall in writing appoint a suitably qualified crew member as **[the]**a health and safety officer for the vessel.

(b) A person is not suitably qualified for the purposes of paragraph (a) unless **[he or she]that** such person holds documentary evidence of having successfully completed health and safety officer training approved by the Authority: provided that this provision does not require a person to hold such documentary evidence during the period expiring 12 months after the commencement of Part 1 of the Merchant Shipping (Miscellaneous Amendments) Regulations, 2004.";

(c) by the substitution for subregulation (2) of the following subregulation:

"(2) The appointment of a health and safety officer shall terminate—

(a) on **[a]**the date that **[he]**the health and safety officer ceases to be employed on board the fishing vessel; or

(b) on the date that **[his]**the employer, in writing, terminates **[his]**the health and safety officer's appointment."; and

(d) by the substitution for subregulation (3) of the following subregulation:

"(3) A health and safety officer shall, whilst a fishing vessel is in service—

(a) ensure that the crew **[comply]**complies with the provisions of the Code;

(b) ensure that the crew **[comply]**complies with any occupational health and safety policy determined by the employer concerned;

(c) ensure that the crew **[maintain]**maintains a high standard of occupational health and safety;

(d) investigate **[the cause of an accident contemplated in section 259(1)(c) of the Act; all hazards or potential hazards to safety including fatigue, that affect or may affect the crew of a vessel in the execution of their work, and all complaints concerning occupational safety]**—

(i) the cause of an accident contemplated in section 259(1)(c) of the Act;

(ii) all hazards or potential hazards to health and safety including fatigue, that affect or may affect the crew of a vessel in the execution of their work; and

(iii) all complaints concerning occupational health and safety;

(dA) ensure that the members of the vessel's health and safety committee are made aware of—

(i) the relevant requirements of these regulations and **[of]**the Act;

(ii) any relevant Marine Notice; and

(iii) the provisions of the Code**[.]**;

(e) make recommendations to the health and safety committee concerned about any investigation or inspection or the prevention of any accident or the removal of any hazard or potential hazard, and about any deficiency in occupational health and safety regarding—

(i) the requirements of the Act and these regulations that affect the crew;

(ii) any relevant Marine Notice; and

(iii) any provisions of the Code;

(f) carry out inspections of each accessible part of the vessel in respect of the occupational health and safety affecting the crew, at least once during a voyage;

(g) immediately stop or cause to be stopped, the performance of any work which **[in his opinion]** may cause an accident or **[serious]**an accident that may result in an injury, and inform the master thereof forthwith;

(h) carry out any other investigation or inspection relating to occupational health and safety which an employer or health and safety committee may deem necessary, if so requested in writing by the employer or health and safety committee, as the case may be, and thereafter submit a report in respect of such investigation or inspection; and

(i) submit to the employer for the purposes of the record book a brief report of the investigation or inspection referred to in this regulation.".

Amendment of regulation 37 of the Regulations

40. Regulation 37 of the Regulations is hereby amended —

(e) by the substitution for the heading of regulation 37 of the following heading:

"**37 Appointment, termination of appointment, and functions of a health and safety [appointees]appointee**";

(f) by the substitution for subregulation (1) of the following subregulation:

"(1) **[The]**An owner of a fishing vessel shall in writing appoint an employee as a health and safety appointee for that fishing vessel whilst it is not in service.";

(g) by the substitution for subregulation (2) of the following subregulation:

"(2) The appointment of the health and safety appointee shall terminate—
(a) on the date that the employee ceases to be employed by the owner; or
(b) on the date that the employer terminates **[his]**the employee's appointment."; and

(h) by the substitution for subregulation (3) of the following subregulation:

"(3) The health and safety appointee shall whilst a vessel is not in service—
(a) ensure that **[the]**employees comply with the provisions of the Code;
(b) ensure that **[the]**employees comply with any occupational health and safety policy determined by the employer concerned;
(c) ensure that **[the]**employees maintain a high standard of occupational health and safety;

(d) investigate **[the cause of an accident contemplated in section 259(1)(c) of the Act; all hazards or potential hazards to safety including fatigue, that affect or may affect the employees in the execution of their work, and all complaints by the employees of the vessel concerning occupational safety]**—

(i) the cause of an accident contemplated in section 259(1)(c) of the Act;

(ii) all hazards or potential hazards to health and safety including fatigue, that affect or may affect the employees in the execution of their work; and

(iii) all complaints concerning occupational health and safety;

(e) make recommendations to the health and safety committee concerned, about any investigation or inspection or the prevention of any accident or the removal of any hazard or potential hazard, and about any deficiency in occupational health and safety regarding—

(i) the requirements of the Act and these regulations that affect **[the]**employees;

(ii) any relevant Marine Notice; and

(iii) any provision of the Code;

(f) carry out inspections of each accessible part of the vessel in respect of the occupational health and safety of **[the]**employees, at least once during the vessel's not-in-service period and should such period extend beyond one month, at least once a month;

(g) immediately stop or cause to be stopped, the performance of any work which **[in his opinion]**may cause an accident or **[serious]**injury and inform the owner thereof forthwith;

(h) carry out any other investigation relating to occupational health and safety which an employer or health and safety committee may deem necessary, if so requested in writing by the employer or the health and safety committee, as the case may be, and thereafter submit a report in respect of such investigation; and

(i) submit to the employer for the purposes of the record book a brief report of the investigation or inspection referred to in this regulation.".

Amendment of regulation 38 of the Regulations

41. Regulation 38 of the Regulations is hereby amended —

(a) by the substitution for the heading of regulation 38 of the following heading:

"**38 Appointment, termination of appointment, and functions of a health and safety [committees]committee**"; and

(b) by the substitution for regulation 38 of the following regulation:

"(1) **[The]**An owner of every fishing vessel shall in writing establish a health and safety committee for the vessel, which committee is to consist of such number of members as the owner may determine from time to time taking into account the other provisions of this regulation.

(2) The**[]**chairperson, in the person of the owner or the owner's representative, shall co-opt the vessel's health and safety officer and not less than one crew member from each of the deck, engine, factory **[(if applicable) and]**or catering departments on board, and may co-opt such other crew members or employees as are necessary to conduct the business of the committee.

(3) The **[chairman]**chairperson may also co-opt any other person who by the virtue of **[his]**such person's special knowledge can contribute to the business of the health and safety committee.

(4) An owner may, **[in his discretion,]**in writing, dissolve a health and safety committee.

(5) A health and safety committee **[is to]** shall meet as often as may be necessary for the effective and efficient performance of its functions: provided that the Authority may by notice in writing direct that a meeting be held at any place and time determined by it and specified in the notice.

(6) The procedure at meetings of a health and safety committee shall be determined by the committee.

(7) The committee shall consider all recommendations of the health and safety officer or health and safety appointee.

(8) After consideration of such recommendations a health and safety committee may recommend any appropriate action in respect of any

incident on board a vessel and the recommendation shall be made available to the Authority upon demand.

(9) **[The]**An owner shall keep the minutes of every meeting of a health and safety committee for a period of at least three years and shall make the minutes available to the Authority upon demand.".

Amendment of regulation 39 of the Regulations

42. Regulation 39 of the Regulations is hereby amended —

(i) by the substitution for subregulation (1) of the following subregulation:

"(1) **[Every]**An employer shall maintain a record book, **[in which he shall enter]** containing the full details of—

(a) any accident or dangerous occurrence referred to in section 259(1)(c) of the Act **[(including the date, names of persons concerned and the nature, if any, of any injuries suffered)]** including the date, names of persons concerned and the nature, if any, of any injuries suffered; and

(b) any investigation, complaint or inspection referred to in **[terms of]** regulations 36 and 37."; and

(j) by the substitution for subregulation (2) of the following subregulation:

"(2) **[The]**An employer shall keep the records specified in subregulation (1) for a period of at least three years, and shall make these records available to the health and safety committee, and to the Authority upon demand.".

Amendment of regulation 39A of the Regulations

43. Regulation 39A of the Regulations is hereby amended —

(a) by the substitution for subregulation (1) of the following subregulation:

"(1) **[The]**An owner shall, at intervals not exceeding three months, audit the arrangements for ensuring compliance with these regulations in respect of its vessels to ensure that they are implemented effectively—.";

(b) by the substitution in subregulation (1) for paragraphs (a) and (b) of the following paragraphs:

"(a) a health and safety officer or health and safety appointee, as the case may be, has been duly appointed in respect of each of the owner's vessels and is functioning effectively;
(b) a health and safety committee has been duly appointed in respect of each of the owner's vessels and is functioning effectively;"; and

(c) by the substitution for subregulation (3) of the following subregulation:

"(3) **[The]**An owner shall maintain a written record of each audit for a period of at least three years and shall make the record available to the Authority upon demand.".

Substitution of regulation 39B of the Regulations

44. The following Regulation is hereby substituted for Regulation 39B of the Regulations:

"**[The]**An employer shall provide—".

Amendment of regulation 40 of the Regulations

45. Regulation 40 of the Regulations is hereby amended by the substitution for subregulations (1) to (5) of the following subregulations:

"(1) **[Every]**An employer commits an offence when an employer contravenes regulation 3(1) or (2), 4, 5, 9, 10(1), 11(1), 13, 14, 15, 16(1), 17, 18, 19, 20, 21, 22, 23, 24, 25(1), 26, 27, 30(1), (2) or (4), 31(1), 31A(1), 31B(1) or (7), 32, 35(2), 36(1), 39 or 39B.

(2) **[Every]**An employee who contravenes regulation 3(3)(f) commits an offence.

(3) **[Every]**A person who contravenes regulation 16(2) commits an offence.

(4) **[Every]**An owner commits an offence when an owner contravenes regulation 35(1), 37(1), 38(1), 38(9) or 39A(1) or (3).

(5) **[Every]**A master who contravenes regulation 35(1)(b) commits an offence.".

Short title and commencement

46. These regulations are called the Maritime Occupational Health and Safety Amendment Regulations, 2021 and are published for public comments.

Part 2 Draft Code of Safe Working Practice for Ships Working Cargo in South African Ports 2021

1. Introduction

1.1 The Code of Safe Working Practice for Ships Working Cargo in South African Ports (hereinafter referred to as the "Code") is a compilation of safety standards applicable to all persons involved in cargo handling operations aboard ships in South African ports. The Code has been compiled in association with stevedoring companies, labour unions, Transnet National Ports Authority, Transnet Port Terminals, Department of Employment and Labour, Department of Transport, and the Transport Education Training Authority, the medical profession and the South African Maritime Safety Authority.
The Code is based on standards embodied in the Code of Practice on Safety and Health in Ports (ILO Geneva), as amended, and on lessons learnt after investigating casualties to stevedores in South African ports.

The Code aims at promoting a safe working environment on board ships and to introduce a safety culture in management and labour involved in cargo handling operations.

For the purposes of this Code, and the requirements to comply with the provisions contained in it, the Code must be read with the Maritime Occupational Safety Regulations, 1994, the Merchant Shipping Act, 1951 (Act No. 57 of 1951) and some provisions of the Occupational Health and Safety Act, 1993 (Act No. 85 of 1993).

The Code must be used by management to audit their work processes and ensure that they are providing a safe working environment and have the necessary mechanisms in place to confirm this. When preparing safety courses for stevedores, in-house and external trainers must use the Code in addition to any in-house requirements. Stevedore labour should be made aware of the Code to heighten their level of safety awareness.

1.2 The Code supersedes the South African Ports Cargo Handling Code of Practice, 1994 only for operations on board ships.

2. Definitions

2.1 **"authorised person"** means a person authorized by the employer, the master of the ship or a responsible person to undertake a specific task or tasks and possessing the necessary technical knowledge and experience.

2.2 **"Authority"** means the South African Maritime Safety Authority.

2.3 **"Casual worker"** for the purpose of the code means a stevedore that is not in full time employment with the stevedore company and whose service is not sourced via a labour broker.

2.4 **"competent person"** means a person possessing the knowledge and experience required for the performance of a specific duty or duties and acceptable as such to the competent authority.

2.5 **"container"** means a container, as defined by the IMO in the International Convention for Safe Containers (CSC). Containers are rigid, rectangular, reusable cargo units intended for the intermodal road, rail or sea transport of packaged or bulk cargo by one or more means of transport without intermediate reloading. Containers can be general cargo containers, such as general-purpose containers, open top, platform or platform-based containers, specific purpose containers such as tank containers, thermal containers or dry bulk containers, or named cargo-type containers. Most containers now in use are **IS0** series 1 freight containers. Requirements for their specification and testing are contained in the **IS0** 1496 Series 1 freight containers, specification and testing family of standards.

2.6 **"employer of stevedores"** means a stevedore company.

2.7 **"explosion-protected"** refers to electrical equipment that is constructed and installed in such a way that it is not liable to ignite in a flammable or explosive atmosphere, should it occur. Such equipment should be certificated as complying with an appropriate standard acceptable to the competent authority.

2.8 **"fatigue"** means the result of physical effort and also of working times that are contrary to the body's natural inclinations, e,g. at night or due to shift systems. Fatigue can be insidious; it can develop slowly and can at times not be apparent to the stevedore or supervisor. Fatigue leads to a loss of concentration, where stevedores fail to ensure their own safety and that of others, through errors of judgment.

2.9 **"factor of safety"** means the numerical value obtained by dividing the minimum breaking load or tension of an item of equipment by its certificated safe working load.

2.10 **"hatch cover"** means any part of a ship's equipment designed to close an opening in any part of a ship, through which cargo is worked.

2.11 **"heavy lift derrick"** means a ship's derrick that is specially rigged for use from time to time in order to lift loads greater than those that can be lifted by the ship's light or general-purpose lifting appliances.

2.12 **"in-service"** means a lifting appliance when handling loads up to its safe working loads in permissible wind speeds and other conditions specified by the manufacturer.

2.13 **"inspection"** refers to a visual inspection by a responsible person carried out in order to determine whether, inasmuch as can be ascertained in such manner, the equipment is safe for continued use.

2.14 **"labour provider"** means a person or entity who provides labour to a stevedore company;

2.15 **"lifting appliance"** means any fixed or mobile appliance on a vessel which is used for suspending, raising or lowering a load or moving it from one position to another while suspended, but does not include-

2.15.1 any screw, belt, bucket or other conveyor used for transport of cargo or people;

2.15.2 any survival craft or rescue boat launching and recovery appliance or arrangement; or

2.15.3 any pilot hoist.

2.16 **"lifting gear"** means any gear by means of which a load can be attached to a lifting appliance and which does not form an integral part of the load or the appliance, and includes a lifting beam or spreader, lifting frame or forks, bulk bag, grab or any similar article.

2.17 **"limiting device"** means a device that automatically stops a lifting appliance motion or function when it reaches a prescribed limit (including limit or micro switches).

2.18 **"lift truck"** means a mobile, mechanically driven, cargo handling vehicle.

2.19 **"loose gear"** means any equipment not being part of lifting gear used to attach cargo to a lifting appliance, and includes **a** hook or ring, shackle, link, sling, strop, snotter, swivel, or any similar equipment.

2.20 **"man- cage"** means a platform enclosed on all sides, whether closed or open at the top, designed for the purpose of raising and lowering persons by means of a

lifting machine, but does not include mobile elevated work platforms and suspended access platforms.

2.21 **"out of service"** means that the lifting appliance is without load on the load and **is** either not required for use or is out of use under conditions specified by the manufacturer.

2.22 **"Personal Protective Equipment (PPE)"** means the minimum equipment that must be provided and worn by a stevedore whilst on board a vessel for the protection of personal safety, including-

(a) Boiler suit/overall with reflective properties covering for front, back, side and aerial view;
(b) Appropriate hard hat for the task, lashing hand might require hard hat with strap;
(c) safety shoes;
(d) hand gloves;
(e) colourful reflective vest or jacket with reflective properties covering front, back, side and aerial view; and
(f) based on a risk assessment the stevedore company might be required to provide additional PPE which caters for temperature variations, environmental and health conditions.

2.23 **"Port"** for the purpose of this Code means a port as defined in the National Ports Act, 2005 (Act No. 12 of 2005) and any proclaimed small harbour.

2.24 **"radius indicator"** means a device that automatically shows the current operating radius of a lifting appliance and indicates the safe working load corresponding to that radius.

2.25 **"regulations"** means the Maritime Occupational Health and Safety Regulations, 1994, issued under the Merchant Shipping Act, 1951 (Act No. 57 of 1951);

2.26 **"responsible person"** means a person appointed by the employer, the master of the ship or the owner of the gear, as the case can be, to be responsible for the performance of a specific duty or duties and who has sufficient knowledge and experience and the requisite authority for the proper performance of such duty or duties.

2.27 **"safe working load indicator"** means a device that automatically provides acoustic and/or visual warnings when the load on **a** lifting appliance approaches or exceeds the safe working load by a specified amount.

2.28 **"safe working load"** means the maximum gross load that can be safely lifted by a lifting appliance or gear or item of loose gear in any given condition.

2.29 **"safe working load limiter"** means a device that automatically prevents a lifting appliance from exceeding the designed safe working load.

2.30 **"Safety Officer"** means a person who is appointed in terms of Regulation 31 (1) and holds an NQF level 5 certificate in Health and Safety Management accredited by the relevant Education and Training Authority.

2.31 **"Safety Appointee"** means a person who is appointed as such in terms of the regulations and trained internally in identification of hazards and risk assessment and who reports to the Safety Officer.

2.32 **"ship"** means a ship as defined in the Merchant Shipping Act, 1951.

2.33 **"ship's derrick"** refers to a derrick having a boom which can be raised, lowered and slewed transversely while supporting a load by means of winches which either form an integral part of the arrangement or are used primarily with it.

2.34 **"stevedore"** means any person engaged in work handling cargo on board a ship.

2.35 **"stevedore company"** means a company licenced by Transnet National Port Authority (TNPA) and is responsible for the occupational health and safety of stevedores from the time that a labour broker delivers labour to the place of business of the company, where such services are used.

2.36 **"stevedore health and safety induction training"** means annual induction training following the guidelines in ANNEX 1 of this Code.

2.37 **"the Act"** means the Merchant Shipping Act, 1951 (Act 57 of 1951).

2.38 **"thorough examination"** means a detailed visual examination by a competent person, if necessary supplemented by other suitable means or measures, in order to arrive at a reliable conclusion as to the safety of the item of equipment examined.

2. General provisions
Responsibilities

Safety onboard ships is the responsibility of everyone who is directly or indirectly concerned with work onboard and needs to cooperate to develop safe systems of work and ensure that they are put into practice.

The introduction of new ideas and concepts in cargo-handling demands special attention to safety requirements. The guidance given in this Code of practice relates to both new and existing working practices.

3. Authority

The South African Maritime Authority (hereinafter "Authority") is the Authority. The Merchant Shipping Act requires accidents and incidents to be reported to the Authority.

4. Employers of stevedores

The company that provides the cargo handling services to the master or agent of a ship is deemed to be the employer. This company might also be contracted by the terminal operator to provide cargo handling services from and onto a ship. The employer is to ensure that the provisions of the regulations and the Code are adhered to by all its employees including workers provided by the labour provider.

They are responsible for ensuring that labour that is provided by labour brokers is competent in that is has-

- Valid certificate of medical fitness;
- relevant proof of competency;
- has appropriate personal protective equipment; and
- has attended a stevedore health and safety induction training.

4.1 Labour providers

Labour providers, commonly known as brokers, are responsible to provide labour that is competent for the job and meets the training and medical standards specified in the Regulations and Code.

4.2 Management of stevedoring companies

Management of companies are required to ensure that-

- vessels are audited in terms of health and safety including checking of lifting appliances before the stevedores start working on the vessel;
- all labour procured from labour providers is competent and appropriately trained;
- all workers are aware of the hazards of the cargo being handled;
- all workers are aware of and comply with the provisions of the Code;
- all workers are properly supervised;
- all workers, including casual workers and those workers provided by labour brokers are provided with the personal protective equipment and are trained in the safe use, limitations and care of the equipment;
- all workers adhere to safety policies and instructions;
- all workers have suitable reporting facilities for unsafe working conditions;
- all workers are medically fit;
- all workers are not likely to suffer from fatigue due to excessive working hours;
- all workers are provided with special protective clothing required for hazardous cargoes.
- all equipment brought on board a ship-
    - is inspected before use;
    - has the SWL clearly marked;
    - is tested at regular intervals;
    - is suitable for the cargo being handled;
    - is operated by a trained person;
- safe working systems are in place;
- appropriate corrective action is taken when any faults in plant or equipment are reported, and that unsafe working conditions are noted;
- the workplace is inspected for occupational safety at the commencement of each shift;
- accidents requiring reporting to the competent authority are reported within the stipulated time; and
- plans to respond to accidents are in place.

4.3 Stevedore supervisors and Foremen

Supervisors and Foremen are the link on board between employees and management.

Supervisors and Foremen must-

- ensure that all stevedores have personal protective clothing before allowed on board the vessel;
- bring to the attention of stevedores the hazards of the cargo being handled;
- ensure that the correct protective clothing is being used continuously during cargo operation;
- ensure that any defective equipment is not used;
- ensure that stevedores to whom work is allocated are trained;
- ensure that adequate lighting and fencing are in place;
- Ensure that workers are following written safe work procedures and standard operating procedures as the case may be; and
- bring to the attention of the ship's personnel any of the ship's equipment deemed to be unsafe. If necessary, cargo work should be stopped.

4.4 Stevedores

Stevedore employees must-

- ensure that their own actions do not endanger themselves or other workers;
- comply strictly with all safety policies and instructions;
- make use of all safety guards, devices and personal protective clothing and care for them;
- notify their supervisor(s) of any defective equipment and hazardous conditions;
- not interfere with any safety devices;
- refrain from consuming alcohol or narcotics prior to a shift or during a shift; and
- when not working, leave the area where cargo is being worked;
- follow all lawful orders made in the interest of safety by the employer;
- raise concerns with the employer when given orders that places their health, safety and that of their fellow stevedores in danger.

4.5 Ship's personnel

Ship's personnel must ensure that-

- there are means of safe access to the ship and cargo working areas;
- the accommodation ladder, gangway and any other means of access to the ship is monitored throughout the cargo operation to ensure that it remains safe;
- personnel not directly involved in cargo handling are not allowed into that area;
- only authorised persons enters the vessel during cargo operations;

CONTINUES ON PAGE 130 OF BOOK 2

Printed by and obtainable from the Government Printer, Bosman Street, Private Bag X85, Pretoria, 0001
Contact Centre Tel: 012-748 6200. eMail: info.egazette@gpw.gov.za
Publications: Tel: (012) 748 6053, 748 6061, 748 6065

Government Gazette
Staatskoerant

REPUBLIC OF SOUTH AFRICA
REPUBLIEK VAN SUID AFRIKA

Vol. 675 10 September / September 2021 No. 45131

PART 2 OF 3

ISSN 1682-5845

9 771682 584003 45131

- ship's personnel requiring access to cargo working area are provided with personal protective equipment similar to that worn by stevedores;
- the ship's equipment is well maintained;
- railing is in place and in good state of repair;
- Cargo holds are fenced where there are no fixed railings;
- working areas are well lighted and ventilated;
- the ship's rigging plans are available;
- the ship's crew members are not allocated work where cargo is being handled unless absolutely unavoidable;
- the ship's personnel are always available to open and close hatch covers, which function mustn't be undertaken by stevedores; and
- the register of on-board lifting appliances and items of loose gear, and all documents related to crane wire maintenance are available for inspection.

4.6 Hazard identification and risk assessment

4.6.1 General provisions

The difference between hazard and risk must be clearly understood.

A hazard is a source of potential harm or damage and can be a physical item or situation. A risk is the combination of the likelihood and the consequence of a specific hazard.

4.6.2 The stevedore company must identify, evaluate systematically and record the hazards and risks to the safety and health of stevedores that may arise during the course of their work.

4.6.3 The identification of hazards in the workplace must take into account:

(a) the situation or events or combination of circumstances that have the potential or have been proven to give rise to injury or illness;
(b) the nature of potential injury or illness relevant to the activity, product or service;
(c) those likely to be harmed;
(d) past injuries, incidents and illness; and the hazards and risks of cargoes and equipment.

4.6.4 The identification process should also include consideration of:

(a) the way in which work is organized, managed, carried out and any changes that occur in this process;
(b) the design of workplaces, work processes, materials, plant and equipment;

(c) the purchasing of goods and services;
(d) the contracting of plant, equipment, services and
(e) labour including contract specification and responsibilities to and of contractors; and
(f) the inspection, maintenance, testing, repair and replacement of plant and equipment.

4.6.5 A risk assessment involves a careful examination of the working environment in order to identify hazards (physical, chemical, biological, ergonomic, and organizational) and to evaluate the potential harm that they could cause. Evaluation of risk takes into consideration both the likelihood of the hazard causing harm to persons and the severity of such harm if it were to occur.

4.6.6 A risk assessment involves five steps, namely:
(a) identification of hazards;
(b) identification of who might be harmed and how;
(c) evaluation of the risks and how to control them;
(d) recording the results of the assessment and setting priorities for improvement; and
(e) reviewing and updating the assessment, as necessary.

4.6.7 There are many established methods and techniques for carrying out risk assessments. Some use a numerical weighting system to determine priorities for action. For each hazard identified, a numerical value is assigned to the likelihood of the hazard causing harm, as well as to the severity of the consequences. This can be expressed on a rising scale from low to high as follows:
Likelihood:
(1) rare: has rarely if ever happened;
(2) unlikely: is possible, but is not expected to happen;
(3) possible: could be expected to happen once a year;
(4) likely: will probably occur, but is not persistent; and
(5) almost certain: occurs regularly.

Severity:
(1) insignificant: no injury or ill health;
(2) minor: short-term impact;
(3) moderate: semi-permanent injury or ill health;
(4) major: disabling injury or ill health; and
(5) catastrophic: potentially fatal.

4.6.8 The degree of risk can be represented in the following manner: Risk = Likelihood × Severity.

4.6.9 By determining the level of risk associated with each hazard identified in the working environment, employers and workers and their representatives can identify areas for priority action.

For example, a risk that rarely arises (1) and has insignificant consequences (1) would have the lowest priority (1)
(i.e. 1 ×1 = 1), whereas a hazardous event that occurs regularly (5) and has potentially fatal consequences (5) would have the highest priority for action (25) (i.e. 5 × 5 = 25). The higher the level of risk, the more important it is to apply controls that eliminate, reduce or minimize exposure to the hazard.

In its simplest form the quantitative risk rating is the product of the likelihood of a hazard occurring and the potential consequences, including their severity:

Hazard likelihood		Hazard Severity	
Very likely	5	Very High	5
Likely	4	High	4
Quite possible	3	Moderate	3
Possible	2	Slight	2
Not likely	1	Nil	1

4.6.10 Priority areas of action can also be determined by evaluating particular hazards in the port. Two questions need to be considered for each hazard: “How often is a person exposed to the hazard?” and “What is the likely outcome?”. The likelihood of an event occurring is expressed as daily, weekly, monthly or rarely, whereas the severity of the consequences varies from the most severe (death or permanent disability) to the least severe (minor injury requiring only first aid). From these two factors, priority of action can be determined as high, moderate or low.

4.6.11 Results of the assessment must be recorded in a narrative form, specifying the workplace, type of ship or type of cargo being assessed, the main hazards and those at risk, the level of risk and the measures required to eliminate, reduce or minimize exposure.

4.6.12 The assessment should be reviewed whenever there has been a significant change in the work to which it relates or when there is reason to suspect that it is no longer valid. The review should be incorporated in to a system of management accountability which ensures that control action shown to be necessary by the initial assessment is in fact taken.

4.7 Planning and implementation of controls

4.7.1 Based on the results of the risk assessment and other available data, such as the results of monitoring of the workers' health and of the working environment, the port employer should:

(a) define occupational health and safety objectives for the reduction of such risks to as low a level as possible;

(b) devise and implement corresponding preventative measures, based on an appropriate order of prevention; and

(c) develop, approve and implement a "safe workplan" before any operation starts.

4.7.2 These activities should include the routine application of site inspection and planning, as well as of the principles of work organization.

4.8 Hierarchy of controls

4.8.1 Preventative and protective measures must be implemented in the following order of priority:

(a) eliminate or substitute the hazardous agent with a less hazardous one, such as a less hazardous or non-hazardous substance or low-voltage electrical hand tools;

(b) reduce the hazard/risk at source through the use of engineering controls, such as providing sound-proofed safety cabs for driven machinery or interlocking guards with machinery;

(c) minimize the hazard/risk by using safe working procedures;

(d) where unacceptable risks remain, provide suitable PPE, such as protective clothing, respiratory protective equipment, hearing protectors, and ensure that it is properly used and maintained.

4.8.2 Personal protective Equipment often provides the least effective means of protection and should be considered as a last resort.

4.9 Monitoring, evaluation and improvement

4.9.1 Control measures must be monitored and reviewed at regular intervals and, if necessary, revised, especially when circumstances change or if new information becomes available about the risks posed or the suitability of existing control measures. Control measures must also be reviewed

and, if necessary, revised following work-related injuries, ill health, diseases and incidents.

4.9.2 The monitoring and evaluation of Occupational Health and Safety performance must reinforce commitment to accident and disease prevention and promote a preventative Occupational Health and Safety culture within the organization.

5. Safe systems of work

(1) Accidents are unplanned events. Working in a structured manner that recognises and controls potential hazards can minimize such events. This is the basis of a safe system of work. Such systems result in safer and more efficient operations. Although they cannot have been developed with safety in mind, quality control systems similarly result in safer operations by ensuring that operations follow specified patterns, thereby minimising unplanned events.

(2) Development of safe systems of work must include consideration of-

- operations to be performed;
- workers who will carry it out;
- location of the work;
- working environment;
- nature of the cargo to be handled;
- plant, equipment and materials to be used; and
- precautions to be taken, including any necessary emergency arrangements.

(3) A safe system of work must specify-

- the task;
- necessary competencies of workers;
- equipment to be used, including protective equipment, where necessary;
- potential hazards;
- control of the relevant hazards;
- procedures to be followed; and
- control and supervision.

(4) To be effective, a safe system of work must be developed in consultation with all parties involved in putting it into practice. Once finalised, it must be promulgated by appropriate means and any necessary training carried out before it is put into

effect. Supervision personnel must in practice monitor the any problems that can occur.

(5) Safe systems of work must be approved by relevant management representative and reviewed periodically in the light of changes and operational experience as necessary.

6. Safety officers

Safety officers must be appointed in writing as required by, Chapter III, regulation 31(1) of the Regulations and must comply with the requirements contained in that regulation.

7. Safety appointee

Safety appointees must be appointed in writing as required by Chapter III, regulation 31A as well as Chapter IV, regulation 37 of the Regulations and must comply with requirements contained in those regulations.

8. Safety committees

The committee must be constituted and also perform its duties in accordance with regulation 31B of the Regulations.

9. Investigation of minor accidents

(1) Minor accidents are those not required to be reported in terms of section 259 of the Act, read with the definition of an accident. Minor accidents can also be termed as a near miss and must result in an internal investigation, the result can identify corrective action to be taken to avoid a re-occurrence.

(2) The analysis of all minor incidents and the compilation of trends will identify what areas of safety require attention.

10. Investigation and reporting of accidents and serious injuries

(1) An accident or serious injury, which requires reporting, is defined in section 259 of the Act. These accidents must be reported as prescribed in the Act in the shortest possible time, by telephone, immediately and at the first available opportunity.

(2) It should be noted that no person is allowed to disturb or remove any item involved in such an accident until given permission is given by the Authority to do so. A ship can be detained until the accident investigation is completed. When accidents are being investigated it is not only the direct cause of the accident,

but also the underlying cause or causes which are often the real cause of the accident, that need to be considered.

11. Training

(1) Regulation 30(4)(b)(ii) requires that prior to any stevedore being employed on a ship, he or she is to have undergone the minimum stevedore safety induction training as prescribed in Annex 1 of this Code.

(2) In addition to the prescribed training required, stevedores undertaking the following work must have received specialised training covering-

- Gangway (Signaller);
- Lifting appliances;
- Lashers;
- Dangerous goods; or
- Hazardous cargoes.

(3) The provision of training must be undertaken when new or revised methods of working cargo are introduced.

(4) Refresher training is to be undertaken annually and is to ensure that the training content of the minimum stevedore safety induction is reminded to stevedores, and any changes in the Code or relevant legislation, are brought to their attention.

12. Medical standards

(1) Regulation 30(4)(b)(i) requires that a person employed as a stevedore has undergone a medical examination. Medical examinations are required to be undertaken on an annual basis.

(2) The cost of the medical examination is for the account of the employer.

(3) Certain hazardous cargoes can require more frequent examination in order to monitor any effects of exposure to a particular cargo.

(4) Specific cargoes requiring additional health and safety precautions are governed by the introduction into the Code of the regulations contained in the Occupational Health and Safety Act, 1993 (Act No. 85 of 1993). The relevant applicable regulations are the Hazardous Chemical Substances Regulations, Asbestos Regulations, and the Lead Regulations.

13. Personal protective equipment

(1) In addition to the minimum personal protective equipment required to be supplied in terms of regulation 4 of the Regulations, certain cargoes, work conditions, environmental and health conditions may require additional specialised personal protective equipment to be used.

(2) The requirements for personal protective equipment of the Occupational Health and Safety Act, 1993 (Act No. 85 of 1993) and its regulations are to be used for the following cargoes:

- asbestos, with reference to the Asbestos Regulations;
- chemicals, all substances listed in the Hazard Chemical Substance Regulations;
- lead, with reference to the Lead Regulations; and
- cooled, chilled or frozen cargo, with reference to the Environmental Regulations for Workplaces.

14. Mobile mechanical equipment

All mobile mechanical equipment must be fitted with a manual audible warning device, and an automatic audible warning device operating during reversing movements.

15. Lifting appliances and lifting gear

15.1 General requirements

(1) Every lifting appliance and item of lifting gear and of loose gear must be-

- of good design and construction, of adequate strength for its intended use and free from any patent defect;
- made to a recognised international or national standard;
- tested, thoroughly examined, marked and inspected in accordance with section 4.12 of the Code;
- maintained in good working order; and
- must be conveyed from a store to a ship by means of a pallet. Loose gear must never be dragged in order to prevent damage and to avoid obscuring the markings indicating SWL.

(2) Occupational safety is affected not only by the design of lifting appliances but also by that of their accessories and other loose gear used with them. The proper design and maintenance of all are essential, since breakage of any of them can cause serious accidents. Deterioration can be visible, as when it starts from the

surface or is concealed internally. In either case, the mechanical strength of the material is reduced.

(3) Documentation (as appropriate) relating to lifting appliances must include-

- Driver's instruction manual;
- erection manual;
- maintenance manual;
- spare parts manual;
- manufacturer's certification of fitness for use;
- certificate of test and thorough examination after initial erection;
- manufacturer's certificates for wire ropes installed on cranes; and
- examination and maintenance records.

15.2 Brakes

(1) Every power-operated lifting appliance must be provided with an efficient brake or brakes capable of stopping a load while it is being lowered. The brakes must normally be applied automatically when-

- the motion control lever is returned to its neutral position;
- any emergency stop is operated;
- there is any power supply failure; and
- in the case of electrically operated brakes, there is a failure of one phase or a significant drop in voltage or frequency of the power supply.

(2) Band brakes generally act in a preferential direction and are sometimes jerky. They should only be used for emergency braking. Brakes with symmetrical jaws and two pairs of pivots have a gradual action.

(3) A slewing brake must be capable of holding the crane stationary with the maximum safe working load suspended at its maximum radius when the maximum in-service wind acts in the most adverse direction. Sudden application of the brake must not damage the crane slewing gear.

(4) The brake-lining or pads must remain adequately secured during their working life. Unless the brake is self-adjusting, appropriate means must be provided to permit brake adjustment to be readily carried out in safety.

(5) The design of electrically operated brakes must ensure that the operating solenoid cannot be accidentally energized by the back electromotive force of any motor driven by the crane, by a stray or rogue current, or by breakdown of any insulation.

15.3 Electrical supply

Self-reeling flexible cables must not allow long lengths of cable to drag on the ground where they can be exposed to damage.

15.4 Safe working load (SWL)

(1) Every lifting appliance and item of loose gear must be marked with its safe working load. The markings must be in kilograms (kg) if the safe working load is 1 tonne or less, or in tonnes if it is more than 1 tonne.

(2) Lifting appliances where the safe working load varies with the radius of operation, must display a chart, showing the radius and the corresponding safe working load, in the cab in a position where the operator at the controls can clearly see it. The chart must also state the maximum and minimum operating radius for the appliance and from where the radius is measured. Such appliances must also be fitted with a radius indicator that can be clearly seen by the operator at the controls and, where practicable, a safe working load indicator.

(3) The maximum load that can be lifted when items of loose gear with a significant weight are attached to lifting appliances must be unambiguous. There must be no confusion between the safe working load-

- below the header block/hook of the lifting appliance;
- of the loose gear; and
- below the loose gear.

15.5 Controls

(1) Controls must be-

- so positioned that the operator has an unrestricted view of the operation or any person authorized to give the operator signals; and
- marked with their purpose and method of operation.

(2) The operating pedals for travel motions of mobile lifting appliances must follow road traffic practice with the clutch (when fitted) on the left of the operator's feet accelerator or other power control on their right and a brake between the other two pedals.

(3) Whenever driving considerations permit, controls must return to the neutral position when released.

(4) Consideration must be given to fitting dead man's controls to prevent inadvertent movement.

(5) The control system must be such that no motion can start when the power supply is connected or the engine started. Movements must only be possible after a positive action.

15.6 Limiting devices

(1) Wherever possible, every limiter must be positively actuated and designed for safe failing. Where one motion of an appliance can cause a second motion to approach a limiter (e.g. a derricking-out motion that can cause a hoist motion to reach its limit), the limiter must stop both motions.

(2) Every power-operated lifting appliance other than a ship's derrick must, where practicable, be fitted with a safe working load limiter. This must operate when the load being raised or lowered exceeds the safe working load by a predetermined quantity, generally within the range of 3 to 10 per cent above the safe working load. The limiter must only prevent motions that would increase the overload.

(3) Cranes must also be fitted with the following limiters:

- hoisting limiter, preventing the load-lifting attachment being raised to the position where it strikes the structure of the crane;
- hoisting limiter, preventing the load-lifting attachment being raised to the position where it strikes the structure of the crane;
- lowering limiter, ensuring the minimum number of turns is always left on the winch drum:
- derricking-in limiter, ensuring that the crane jib cannot be derricked back beyond the minimum radius position;
- derricking-out limiter, ensuring that the jib cannot be derricked out beyond the maximum radius position;
- trolley or crab limiter, ensuring that the trolley or crab is stopped before it reaches the track end stops:
- slewing limiter on cranes with a limited arc of slew; and
- long travel limiter on rail-mounted cranes, preventing them from approaching the track end stops.

15.7 Lubrication

Before commencement of cargo work, lubrication points of lifting appliances must be inspected to indicate recent lubrication.

15.8 Operator's cab

(1) The operator's cab must provide the operator with a safe and comfortable working environment.

(2) In particular it must have-

- an unrestricted view of the area of operation;
- adequate protection from the elements;
- windows that can be readily and safely cleaned inside and out;
- a windscreen wiper on any window that normally affords the operator a view of the load;
- a comfortable seat that enables the operator to look in the required direction;
- a sliding or inward-opening door readily openable from inside and outside if the cabin is elevated;
- means of emergency escape; and
- suitable fire extinguishers.

15.9 Winch rope drums, leads and anchorages

(1) Ropes must be fastened to winch drums in the manner prescribed by their manufacturer.

(2) The derricking and hoisting drums of a ship's derrick or derrick crane must be capable of accommodating the maximum working length of rope and the number of complete turns to remain on the winch that is specified by the manufacturer.

(3) The angle of a wire rope leading to a winch drum must be sufficiently small to ensure that the rope is not damaged in service. The angle between the rope and the plane perpendicular to the axis of the drum must generally not exceed one (1) in 16 for hoisting ropes and one (1) in 12 for derricking ropes.

(4) Where it would otherwise not be possible to avoid an excessive lead angle, a suitable coiling or spooling device must be fitted.

(5) Lowering operations must normally be possible only with the winch connected to the power source. Free-fall lowering must be possible only in exceptional circumstances and if the winch is equipped with an automatic speed-limiting device.

15.10 Access

Safe means of access must be provided to all working positions on lifting appliances.

15.11 Inspection of shore supplied lifting gear

Lifting appliances and loose gear must be safe when first provided and remain safe throughout their operational life. The procedures for achieving this are well established, based on testing, thorough examination, marking and inspection. It is widely accepted that the testing of certain types of loose gear must be treated differently.

15.12 Testing of lifting appliances and gear

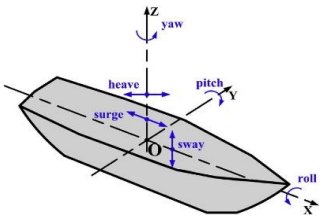
(1) As all vessels are dynamic platforms and thus are exposed to external forces in all three planes.

ALL AT THE SAME TIME, RESULTING IN A GREATER LOAD ON LIFTING PLANT ON BOARD

Vertical Plane: Heaving **UP** ⇧ **DOWN** ⇩

Horizontal Plane: Swaying **LEFT** ⇦ **RIGHT** ⇨

Foreword and Aft Plane: Surging **FORWARDS** and **BACKWARDS**



(2) As a result of these external forces above, lifting plant on board vessels are test to a **HIGHER SAFETY FACTOR** than lifting plant used ashore on a stable platform.

(3) As most modern Lifting Plant is purchased as a finished unit from a manufacturer who equipment is type approved for use in the marine environment, the maintenance manual for the lifting plant should be consulted and any testing guidance therein followed.

(4) Lifting appliances should be retested at least once in every five years, if part of a ship's equipment or at least every 4 years in the case of a South African vessel; and lifting gear tested annually.

(5) The tests must cover all parts and must be supplemented with a detailed examination of the appliance as a whole. The tests are matters for specialists and must be carried out by organizations whose competence has been recognised by the competent Authority.

(6) All assembled parts of a lifting appliance must be tested under a proof load. The test conditions for the various parts must be those imposing the severest stresses on each part when in service.

(7) A record of all tests of lifting appliances and related certificates must be kept and be available.

15.13 Examination of lifting appliances, lifting gear and Maintenance

(1) Lifting devices must be inspected at the commencement of each shift. The inspection is of a visual nature and must be sufficient to identify damage or excessive wear.

(2) Lifting appliances should be thoroughly examined in line with the designer's and manufacturer's recommendations but at least once every 12 months or after any repair or modification.

(3) Appliances used to lift persons should be thoroughly examined at least every six months, or at shorter intervals determined by a competent person.

(4) Particular attention should be given to equipment that may be maintained on a less regular basis, including slewing rings in the case of shipboard cranes.

(5) Items of lose gear to be thoroughly examined every three months

(6) Maintenance

a) All lifting appliances and loose gear should be maintained in good working order, and in efficient condition and good repair.
b) Maintenance, including lubrication, should be carried out on a regular scheduled basis, in accordance with the manufacturer's recommendations and operational experience.

(7) Replacement components should conform to the manufacturer's manual or be of an equivalent standard.

15.14 Tests examination reports, registers and certificates

(1) The results of tests and examinations must be recorded.

(2) After completion of the thorough examination, the competent person must prepare a report that-

- clearly identifies the item examined, the date of the thorough examination, its safe working load(s) and any defects found;
- specifies any parts to be repaired or replaced;
- includes a statement that the item is, or is not, safe for continued use;
- gives the date by which the next test and thorough examination of a ship's appliance must be carried out;
- gives the date by which the next thorough examination of all other lifting appliances and loose gear must be carried out; and
- gives the name and qualifications of the competent person.

(3) Such records only provide evidence of the safe condition of lifting appliances and loose gear at the time of the examination.

(4) Registers of on-board lifting appliances and items of loose gear must be kept for at least five years after the date of the last entry.

15.15 Marking

(1) All lifting appliances and gear must be legibly and durably marked with their safe working load.

(2) On derricks, the lifting capacity should be shown near the seating (gudgeon pin) in painted letters and figures within a frame of indentations or welding spots incised on a brass plate or inscribed on other material sufficiently resistant to defacement.

(3) On cranes, the capacity should be painted on metal plates that are then enamelled or covered with varnish.

(4) Every item of loose gear must, in a conspicuous place, be legibly and durably marked with its safe working load, with an alphanumeric identification mark to relate it to records of test examinations and, where appropriate, with a mark to Indicate the quality grade of the steel from which it is made. Where appropriate, the inscriptions must be incised, stamped or outline-welded.

(5) The marking must be made in a place where it will not give rise to stress.

(6) On long chains, the markings must be in a number of places.

(7) The stamp must give a concave indentation without sharp corners and must not be struck with a blow greater than is necessary for a clear indentation.

(8) If the material is too hard or if direct marking would affect or be liable to affect the subsequent safe use of the gear, the marking must be made on some other suitable item of durable material permanently attached to the gear, such as a tablet, disc or ferrule.

(9) Larger items, such as lifting beams, container spreaders or similar gear, that have a significant weight must also be conspicuously marked with their own weight. The markings must be so positioned and of such size as to be immediately legible to those using the gear from the quay or ship's deck.

(10) Wire ropes used in long lengths without terminations are not usually marked. To enable identification, the manufacturer's certificate for the wire is endorsed with its place of use. A wire or wire sling with a thimble or loop splice ferrule must have the safe working load stamped on the ferrule.

(11) Markings on wire slings must be made in a permanent manner, on-

- the terminal ring or link;
- a tablet, disc or ferrule attached to the sling, provided that the attachment will not cause damage to the rope;
- a ferrule of a wire rope having ferrule-secured eyes;
- the sling itself; and
- a label; or
- by an approved electronic capture system.

(12) Markings on slings must include the number of legs and the safe working load in straight lift and when the angle between the legs and the vertical is 45^0.

(13) Non-metallic slings should be marked with a label. The label should show, or have electronically captured, the sling's:

- safe working load in straight lift;
- material;
- nominal length;
- individual identification mark and traceability reference; and
- manufacturer's or supplier's name.

15.16 Ship's lifting gear

(1) Prior to operating a ship's cargo gear, stevedores must inspect the gear to ensure that it is in a safe condition.

(2) Every ship must carry adequate rigging plans at least showing-

- correct position of guys;
- resultant force on blocks and guys;
- position of blocks;
- identification markings of blocks; and
- arrangements for union purchase (where relevant).

(3) Safe operation of derricks depends largely on the proper maintenance of the running rigging. Wear and tear must be reduced as far as practicable. It is essential to ensure that running ropes do not rub against a fixed or mobile part.

(4) Heel blocks must be restrained by a tensioning device to prevent them from swinging down during lowering when there is no load on the rope.

(5) A derrick must neither be rigged nor used at an angle less than the minimum angle marked on it.

(6) Derricks must be rigged in such a way that their components cannot whip against the winch man.

(7) It must be ensured that light derrick booms do not lift out of their seating.

(8) Each derrick must be legibly marked with its safe working load, as follows:
- used only in single purchase SWL xt.
- used additionally with a lower cargo block SWL x/xt.
- used in union purchase SWL (U) xt. (where x = safe working load).

(9) The lowest angle to the horizontal at which the derrick can be used must also be marked on the derrick.

(10) The derrick luffing winch must have an effective blocking arrangement. This normally consists of the traditional pawl engaging in the wheel. Whatever device is used, it must eliminate all risk of loss of control during the raising or lowering of a load.

(11) A ship's cargo lift must have controls-
- of the dead man's type that is fail safe;
- arranged so that only one set of controls can be operated at a time;
- placed so that the operator is not in danger from the lift or moving vehicles; and
- from which the whole of the lift platform can be seen at all times.

(12) An independent emergency stop control must be fitted in a prominent position among or near the other controls.

(13) Each opening in a deck for a cargo lift must be protected by barriers that are-
- substantial and at least 1 m high on each side that is not in use for vehicle access;
- hinged or retractable on the sides used for access;
- interlocked so that the platform cannot be moved unless all the barriers are closed;
- arranged so that they cannot be opened unless the platform is at that level;
- as close to and above the edge of the opening as is practical, so that they cannot be closed if any part of a vehicle or its cargo overlaps the deck opening; and
- painted in alternate yellow and black warning stripes.

(14) A flashing warning light, preferably yellow, must be fitted on the deck side of each cargo lift opening, at a place where it can be readily seen from any vehicle on the deck.
(15) The light must operate continuously when the platform is away from the opening in that deck.
(16) Some ships carry mobile lifting appliances such as lift trucks and mobile cranes that can be used for cargo handling. These must comply fully with the requirements for similar equipment ashore.

15.17 Forklift trucks

(1) When lift trucks are selected, it must be clearly understood that trucks powered by internal combustion engines carry flammable fuel, produce exhaust gases with toxic components and can create noise nuisance, Trucks to be used in ship's holds or other confined spaces must preferably be electrically driven.
(2) Every truck driven by an internal combustion engine must-
- have an efficient exhaust system fitted with a silencer and a gas cleaner, where appropriate; and
- carry an appropriate fire extinguisher.

(3) The forks of lift trucks must be designed to prevent their accidental unhooking or lateral displacement when in use.
(4) The forks of a truck are items of loose gear and must be tested and certified before being taken into use.
(5) Trucks must be fitted with devices to automatically limit the upward movement of the forks, and, unless it is non-powered, the downward movement.
(6) Any trapping, crushing or shearing points within reach of the operator in the normal operating position on the truck must be suitably guarded.
(7) All trucks and battery containers on electric trucks intended to be hoisted aboard ship must have suitable stinging points.
(8) All trucks must be fitted with a manual audible warning device, and an automatic audible warning device operating during reversing movements.
(9) It is recommended that forklifts have spotlights fitted to illuminate the area where cargo is being worked.
(10) Forklift trucks must be fitted with a substantial overhead guard sufficiently strong to protect the operator as far as possible against the impact of objects falling from above. In some cases, an additional guard to protect against small falling objects can be necessary. This can be a solid or perforated metal sheet.
(11) All trucks must be marked with their safe working load or loads (where there is more than one load owing to the use of devices such as stabilizers or extension forks) and related load centre.
(12) The load plate must show the safe working load of the truck at various load centres and lift heights.

(13) No further weight must be added to a counterweight for the purpose of increasing the lifting capacity.

(14) The operating platforms of end-controlled powered trucks and tractors must be provided with substantial guards to prevent the operators from being crushed in the event of collision with obstacles or other vehicles.

(15) All lift trucks must be painted in a bright colour highly visible against the backgrounds where they operate. The back ends of rear-wheeled steered trucks must be painted in yellow and black stripes to warn of the dangers of the swinging back when manoeuvring.

(16) Under no circumstances must passengers be carried on forklifts.

(17) Under no circumstances must workers be lifted while standing on forklift's forks

(18) All forklift operators must be trained and have their competence checked at regular intervals.

15.18 Chain slings

(1) Chains and chain slings must generally be constructed from steel bars of at least 10 mm diameter for Grade M chain (*ISO 1835)* and 7 mm for Grade T chain *(ISO 3076)*.
Chains to be used at temperatures below about -5°C must be made of special steels. Grade T chains can be used, with no reduction of their safe working load, at temperatures between -30^0 and $+200^0$C.

(2) All wire ropes on lifting appliances must be regularly treated with a wire rope dressing free from acid or alkali. Whenever possible, this must be of a type recommended by the manufacturer.

(3) Where it is practical and safe to do so, the dressing must be applied where the rope passes over a drum or pulley, as the bending of the rope facilitates the penetration of the dressing.

(4) It may be necessary to clean wire ropes used in dusty abrasive environments thoroughly before applying the dressing.

(5) Clear evidence of deterioration will often be presenting the form of barbs or fins formed by broken wires. Such barbs are dangerous when ropes are handled. However, deterioration may also be due to rotting of the textile (fibre) core. This deprives the steel wire strands of all their support, and the rope then undergoes deformation, which becomes progressively more apparent.

(6) If a wire rope has deteriorated, the defective parts should not be joined together.

(7) Wire ropes should be replaced when:
- they show significant signs of corrosion, particularly
- internal corrosion;
- there is any tendency towards “bird caging” (separation
- of the strands or wires);
- they show signs of excessive wear indicated by flats on
- individual wires;
- the number of broken wires or needles in any length of
- six diameters exceeds 5 per cent of the total number of
- wires in the rope;
- broken wires:
  – appear in one strand only;
  – are concentrated in a shorter length of rope than ten diameters; or
  – appear in the tucks of a splice; and
  – there is more than one broken wire immediately adjacent to a compressed metal ferrule or any compressed termination.

(8) Further guidance on the examination of wire ropes and discard criteria is given in the international standard ISO4309 Cranes – Wire ropes – Care and maintenance, inspection and discard.

(9) The reason for any defects found should be investigate and remedial action taken.

(10) Any protection on a splice in a wire rope to a lifting appliance must only be provided at its tail. This allows any deterioration of the splice (i.e. broken wires) to be seen. The generally accepted standard to indicate that deterioration is unacceptable is 10% of the strands damaged in 8 diameter lengths.

(11) Compressed metal ferrules must be made to a manufacturer’s standard, and-
- the material used must be suitable, in particular, to withstand deformation without any sign of cracking;
- the correct diameter and length of ferrule must be used for the diameter of the rope;
- the end of the rope looped back must pass completely through the ferrule;
- correct dies must be used for the size of the ferrule;
- correct closing or compression pressure must be applied to the dies; and
- tapered ferrules, where the end of the rope is not visible for inspection after closing, must not be used.

(12) A Langs lay rope must only be used if it is not free to twist about its axis (i.e. both ends of the rope are secured).

(13) Bolted clamps (such as Crosby, plate or bulldog grips) must not be used to form a terminal join in any hoist rope, derricking rope, guy of a ship's derrick or derrick crane, or in the construction of a sling.

(14) Crane wire snapping during cargo operation pose a great risk to life, property and the environment. Wires must be inspected at regular intervals as per manufacturer's instructions and also based on frequency of use. The Table below serves as a guide for a maintenance programme.

List of Wire Rope Faults and their Possible Causes		
Fault	**Possible Cause**	
Accelerated Wear	Severe abrasion from being dragged over the ground or obstruction Rope not suitable for application Large Fleet angle. Worn sheave with improper grooves, size or shape. Sheaves and followers have rough ear surface. Stiff or seized sheave bearings. High bearing and contact pressure. Sheave drum too small.	
Rapid appearance of broken wires	Rope not suitable for application. Reverse bends. Sheave drum too small. Overload or shock loads. Excessive rope vibration. Kinks have formed and have been straightened out. Crushing and flattening of the rope. Sheave wobble.	
Corrosion	Inadequate Lubrication. Improper storage. Exposure to acids and alkalis.	
Kinks	Improper instillation. Improper hardening. Stack rope pulled tight.	
Excessive localised	Drum crushing. Equalizer sheave.	

	Vibration.	
Stretch	Overload. Passed normal stretch and approaching failure.	
Broken wires near fitting	Rope vibration. Fittings get pulled too close to sheave or drum.	
Sheaves and drums wear out	Material too soft.	
Pinching, crushing oval shape	Sheave grooves too small. Not following proper instillation maintenance procedures on multiple layer drums.	
Rope unlays (open up)	Wrong rope construction. Rope end attached to swivel.	
Reduction in Diameter	Broken core. Overload. Internal wear. Corrosion.	
Bird Cage	Tight sheaves. Rope is forced to rotate around its own axis. Shock loads. Improper wedge socket instillation.	
Core protrusion	Shock loading. Disturbed rope lay Rope unlays. Load spins and rotates around its own axis.	
For greater guidance see; ISO 4309:2004 – Cranes – Wire ropes – Care, maintenance, instillation examination and discard. (any wire rope which is found to have the above faults should be withdrawn from service and replace with an equivalate certified replacement wire as per OEM manual / guide)		

15.19 Fibre ropes

(1) Natural fibre rope for use on a riffing appliance or for slings must be of good grade manila (abaca), sisal (aloe) or other fibre of equal quality.

(2) Natural fibre slings are usually manufactured from three-strand rope. The splice must be dogged off or a tail allowed. Natural fibre slings are usually made with soft eyes or endless.

(3) As natural fibre ropes are affected by damp, it can be advantageous to use ropes that have been treated with a suitable rot-proofing and/or a water-repellent agent.

(4) A thimble or loop spliced in a natural fibre rope must have not less than three full tucks, with all the yarns in the strand tucked against the lay. The splice must then be dogged.

(5) A synthetic fibre rope should not be used as a sling or as part of a lifting appliance unless:

- it is made to a recognized national or international standard, or in accordance with the requirements of a classification society;
- the manufacturer has certified its guaranteed minimum breaking load; or
- its diameter is more than 12 mm.

(6) A synthetic fibre rope should not be-

- reeved through a pulley block on which-
  - the groove of a sheave is less than the diameter of the rope; or
  - the sheave has any defect likely to cause damage to the rope.

(7) A synthetic fibre rope intended to be used for lifting must not be spliced to a natural fibre rope.

(8) When a synthetic fibre rope is joined to a wire rope, the two ropes must have the same direction of lay.

(9) A thimble must be fitted to the eye of the fibre rope and the ropes shackled together.

(10) Synthetic fibre rope slings are usually manufactured from three-strand rope and spliced in the same way as natural fibre slings. The fibre can be indicated by the colour of the identification label as follows:

- green polyamide (nylon);
- blue polyester (terylene);
- brown polypropylene.

(11) A thimble or loop splice-

- in a polyamide and polyester fibre rope must have at least three tucks with all the yarns in the strands, followed by one tuck with approximately half the yarns of each strand, and a final tuck with at least one-quarter of the yarns;
- in a polypropylene fibre rope must have at least three full tucks, with all the yarns in the strands.

(12) All tucks must be against the lay of the rope.

(13) Tails protruding from the rope must be at least three rope diameters long or be dogged.

(14) Polypropylene webbing or rope slings likely to be exposed to prolonged bright sunshine must be manufactured of material stabilised against degradation by ultraviolet light, otherwise severe loss of strength can occur in a relatively short period.

(15) Synthetic fibre webbing slings for general use should be at least 35 mm and not more than 300 mm wide. Specially designed slings may be wider. Slings can be manufactured endless or with soft eyes. The eyes of slings over 50 mm wide are reduced by folding at the time of manufacture to allow them to be accommodated in hooks and shackles of the correct safe working load. The eyes may be fitted with reinforcing at point of-hook contact. Wear sleeves may also be fitted to reduce damage to the main body of the slings.

(16) The minimum length of a soft eye measured internally when the webbing is laid flat should be-

- two-and-a-half times the width of webbing, for widths greater than 150 mm; and
- three times the width of webbing up to 150 mm wide.

(17) Any substance used to increase the resistance of a webbing sling to abrasion should be compatible with the synthetic fibre.

(18) Polypropylene webbing or rope slings likely to be exposed to prolonged bright sunshine should be manufactured of material stabilized against degradation by ultraviolet light, as otherwise severe loss of strength may occur in a relatively short period.

(19) The stitching material should be of the same synthetic yarn as the sling, and the join should be such that, so far as is practicable, the load is distributed equally across the width of the belt.

(20) Webbing slings should be manufactured to an internationally or nationally recognized standard, supported by an internationally recognized quality management system.

(21) Disposable or one-trip slings should-

- be not less than 25 mm wide; and

- have a breaking load at least five times their safe working load if up to 50 mm wide and at least four times their safe working load for wider slings.

(22) Disposable or one-trip webbing slings should be clearly and durably marked in a suitable place with the following:
- the safe working load at angles from 0º to 45º from the vertical;
- either the mark "U", indicating a disposable sling, or the word "disposable" or "one way" in English;
- the maker's identification mark;
- the batch number relating to the test certificate or certificate of conformity of the sling; and
- the year of manufacture.

(23) Round slings should not be used for regular cargo handling but may be used for special or project cargo under the direct supervision of a competent person.

15.20 Loose gear and lifting gear

(1) Hooks must be constructed so as to cause as little distortion and damage to the eye of a sling as possible. The larger the hook that can be used, the less distortion to the sling is caused.

(2) Every hook must be provided with an efficient device to prevent the displacement of the load from the hook or be of such construction or shape as to prevent displacement. These can be safety catches, C hooks, ring assemblies for union purchase or rams horn hooks for use with heavy lifts. In cases, when a displacement prevention device is missing or not available and a bridle is used for continuous operation, a short wire sling with eyes at both ends may be passed through the bridle's straps sitting on the hook and shackled together around the shank of the hook.

(3) Other loose gear includes lifting beams, spreaders, lifting frames and other attachments for lift trucks, tongs, claws and cradles for handling round bars or logs. All must have adequate strength for their intended purpose with an appropriate factor of safety. The effectiveness of tongs and claws depend on the roughness of their surface or the condition of their teeth.

(4) When pairs of shackles are selected for a job, both must have the same safe working load.

(5) Dee shackles must be used for straight pull applications and "Bow" shackles where a number of slings pull at different angles. Where shackles are

permanently rigged, the pins should be locked by mousing a screw collar pin or by a split cotter pin on a nut and bolt pin.

(6) The safe working load of a shackle in a sling must always be equal to the sling, the increased stress due to an angle in the arrangement being duly taken into account.

(7) When used in normal slinging applications, the screw pins of shackles must only be done up hand tight. However, the pins must be secured with seizing wire to keep them from coming undone.

(8) Hooks must be selected to cause as little distortion and damage to the eye of a sling as possible. The larger the hook used, the less distortion to the sling.

(9) Hooks must always have a means of preventing a sling from becoming accidentally detached.

(10) Hooks are designed to take loads vertically through the saddle. Bow shackles must be used where there are too many slings in a hook or the spread is too wide. Shackles must always be used with their pin in the hook.

(11) Specialized cargo-handling hooks must be used, where appropriate. These include hooks designed to lift by specially designed bands around cargo or to stick into goods such as logs and bales.

(12) Where hooks are hooked into the eyes of lugs or container corner fittings, they must always be hooked from the inside out to prevent them from becoming unhooked accidentally.

(13) The correct type of loose gear must be used to lift IS0 containers without spreaders. Those for lifting from bottom corner fittings fit in from the side and can be used vertically or at an angle. As they are right- and left-handed, it is important to check carefully that they are at the correct corner.

(14) When grabs are used to handle bulk cargo-

- there must be ample room at loading and unloading points for workers to avoid the swinging grab;
- grabs must be secured against accidental opening and be so constructed that they can be locked in the open position to prevent persons from being trapped by accidental closing;
- if heavy goods such as ore are being handled, special supervision must be provided for trimmers; and

- the attachment and changing of grabs on the lifting appliance must be left to a competent and responsible person.

(15) Automatic container spreaders must be used, whenever practicable. If manually operated spreaders are used, stevedores usually have to go on top of containers to hook on and off.

(16) Manual spreaders must always be fitted or removed on the ship's deck or quayside where the hook of the appliance can be lowered. Tags or restraining lines must be used to control the container when necessary.

(17) Vehicles carried on non-purpose car carriers are slung either by means of special gear equipped with metal frames on which the chassis rests, or by fixing a net, usually a metal one, under the wheels, and attaching the net to ropes slung from a lifting beam. It is essential to calculate the loads carried by each sling. The slings used must each be able to withstand the heaviest stresses that can be set up by a load.

(18) The safest way of lifting pallets is with pallet forks having a sliding centre of gravity. The tines of the forks must extend at least 75 per cent of the way under the pallet. These forks can be fitted with nets to prevent items falling from the pallet while in the air.

(19) Pallets can be lifted by slings passed under the boards and rove around the outside of the centre bearer block. Where no centre blocks are part of the pallet, a spreader must be used.

(20) Inspections of wooden pallets must include checks to ensure that-

- all deck boards are of equal thickness;
- all members are secured by at least two nails that are adequately spaced;
- deck boards, bearers or blocks are not split or otherwise damaged or distorted;
- nails are not pulled through and do not project from deck boards;
- deck boards are not loose, permitting the pallet to distort or rack;
- members do not have extensive bark or knot inclusions; and
- members are not contaminated by corrosive or flammable substances.

(21) Pallets that are found to be defective must be destroyed or repaired before being returned to service.

15.21 Man-cages

(1) Man-cage was known as a cradle or suspended basket. The aim of this section is to ensure that stevedores are lifted safely and work is done safely. The Man-cage checklist is contained in Annex 4 of this Code.

(2) The intention is to limit the use of a man-cage as far as possible. The employer must firstly consider lifting stevedores with machine/equipment specially designed to lift persons (i.e. cherry picker).

(3) In the event that a lifting machine other than the one designed to lift persons, a crane can be used to lift stevedores inside the Man-cages/cradles or suspended basket.

(4) In the exceptional circumstances stated in section 4.22.3 of the Code, the use of an associated forklift or a crane with a man-cage must meet the following criteria:
- The man-cage must be designed and constructed in line with the relevant Regulations and applicable standard under the Occupational Health and Safety Act, 1993;
- Dedicated lifting gear for man-cage must be set aside and meet the testing, examination, and maintenance requirements;
- The method of attachment must be such that accidental disconnection cannot take place;
- A risk assessment for the operation must be developed;
- A safe working procedure must be developed;
- All stevedores involved in the operation must be medically fit for duty and trained in the risk assessment and the safe working procedure;
- Signallers must be competent; and
- Only competent crane operators to be used

(5) Evidence that the man-cage and the operation comply with the requirements of this Code will be inspected by the authority during ad hoc inspections.

16. Safe use of lifting appliances and lifting gear

16.1 Planning and controlling operations

(1) It is essential that all who work on board ships are aware of the basic potential hazards of lifting operations. To control these hazards it is necessary to ensure that-
- all lifting equipment is suitable for the proposed operation and environment;
- initial and continuing integrity of the equipment can be verified;
- all personnel are appropriately trained and supervised;

- lifting operations are properly planned and managed;
- safe systems of work are followed; and
- the equipment is regularly maintained.

(2) All lifting operations must be planned and carried out under the control of a responsible person. Operators of lifting appliances must be competent in controlling routine operations under the general control of management, but more complex and specialist operations must be carried out under the direct control of a person with the necessary knowledge and experience.

(3) Matters to be considered when planning lifting operations must include the following:

- type and size of ship and cargo;
- type of loads to be lifted;
- particular lifting hazards associated with those loads (e.g. position of centre of gravity, placing of lifting lugs stability, rigidity, etc.);
- attachment of the load to the lifting appliance (availability of appropriate loose gear);
- frequency of the lifting operation;
- where the loads are to be lifted from to;
- selection of appropriate lifting appliances;
- position of the lifting appliance (sufficient space and level ground);
- provision of competent personnel (lifting appliance operators, slingers, signallers, supervisors, etc.);
- safe systems of work for taking the lifting appliance out of service during maintenance, thorough examination, testing and repairs;
- emergency procedures, including rescue of an operator from an elevated position; and
- systems for reporting breakdowns, accidents and dangerous occurrences.
- systems to prevent any unauthorized movement of lifting appliances; and
- provision and maintenance of appropriate safety equipment.

(4) The planning must be constantly reviewed to ensure that any changes are adequately considered.

16.2 Training

All lifting appliance operators and users of loose gear must be carefully selected, trained and tested to ensure that they are competent. Operators must produce proof of competency to operate each make and model of lifting machinery which they operate.

16.3 Inspection

(1) All lifting appliances and loose gear must regularly be visually inspected before and during use with a view to checking for obvious deterioration and determining whether they are safe for continued use.

(2) Inspection is a completely separate process from maintenance. Inspections must be carried out by conscientious, responsible personnel. Lifting machine operators and slingers are often competent to carry out daily and weekly inspections, but checks are needed to ensure that they have the necessary competence.

(3) Prior to the initial commencement of cargo work, all certificates relevant to the vessel's cargo working gear must be checked to confirm the period of validity.

(4) All lifting appliances must visually be inspected at the beginning of each shift or working day during which they are to be used. The use of a checklist is recommended.

(5) The checks must include, as appropriate for the type of appliance, all daily checks specified in the manufacturer's handbook, and checks to ensure that-

- all ropes are correctly positioned on their sheaves, and drums are not displaced;
- electrical equipment is not exposed to contamination by oil, grease, water, or dirt;
- relevant levels and/or components show no loss of fluids (e.g. lubricating oil, coolant);
- all limit switches, cut-outs and dead man's handles or levers operate correctly, with caution to be taken during checking in case of malfunction;
- the safe working load limiter is correctly set and the manufacturer's daily test carried out;
- items such as lights, windscreen wipers, washers and other attachments are properly secured and operate efficiently;
- wheels are secure and the condition and pressure of tyres is appropriate on wheel-mounted lifting appliances;
- all controls function correctly without load;
- the appliance is in tidy condition and free from tins of oil, rags, tools, or materials other than those for which stowage provision is made; and that audible warning devices operate correctly;
- safe access is provided;
- appropriate fire-fighting equipment is available;

- visual inspection is done of all ropes for broken wires, flattening, basket distortion, excessive wear or surface corrosion or other signs of damage;
- checks are made of all rope terminations, swivels, pins, retaining devices and sheaves for damage, worn bushes or seizure;
- checks are made of the structure for damage (including missing and bent bracings on bridges and strut jibs, as well as bulges, indentations and unusual rubbing marks, cracked welds and loose bolts or other fasteners);
- inspection is done of hooks and other load-lifting attachments wear, and checks are made ensuring that hook shank threads and securing nuts do not show signs of excessive wear or corrosion;
- checks are made ensuring correct operation and adjustment of controllers;
- inspections are done to identify any creep of hydraulic rams and hoses, any fitting deterioration on hydraulic machines, and any oil leaks;
- checks are made ensuring the effectiveness of brakes and clutches; and
- inspections are done of steering, brakes (foot and parking), lights, indicators, warning devices, windscreen wipers, and washers.

(6) Inspections of blocks must check that-

- sheaves are not cracked at the rim, and that no part of the rim is missing;
- grooves are not excessively worn;
- sheaves turn freely and smoothly;
- head-fitting swivels are secured and free from visible defects;
- shanks are not distorted, turn freely by hand and are not slack in their holes;
- clearance between sheaves and partitions of side plates is not excessive;
- side straps are sound and free from any cracks;
- greasing arrangements are satisfactory and grease nipples have not been painted over: and
- data plates are intact and legible.

(7) Appropriate records must be kept. As a minimum, these must record any defects found that could not be immediately rectified and that the inspection has been carried out. Such defects must be reported for rectification.

17. Weather

(1) Adverse weather conditions in which cargo operations can need to stop include-

(a) high winds;
(b) lightning;
(c) dangerous impairment of visibility by rain, snow, fog, etc.; and
(d) adverse sea-conditions.

(e) Significant vessel movement from wash

(2) The parameters for weather related conditions in which cargo work will be allowed need to be clearly stipulated by the relevant Port Authority and communicated to all people involved in cargo operations.

(3) Weather forecasts must be obtained so that appropriate steps can be taken before the arrival of the high winds or other adverse weather conditions.

(4) Even at lower wind speeds, it can be dangerous to continue lifting operations, particularly when the load on a crane has a large surface area (e.g. a container). Lifting operations must stop if it is likely to become difficult to control the movement of the load.

(5) Lifting operations must be stopped and all persons withdrawn from the vicinity of cranes, or derricks if there is a possibility of the crane being struck by lightning.

(6) Ropes attached to the load (tag lines) can be used to help to control loads in light winds, but it is essential to ensure that workers holding tag lines are fully aware of the motions to be performed by the crane. Workers holding such lines must never attach them to, or wrap them around, their bodies. The lines must be held so that they can be instantly released if necessary.

18. Ship's Lifting appliance

18.1 Safe use

(1) Lifting appliances and gear must only be used in accordance with the manufacturer's instructions.

(2) Operating rules incorporating safe systems of work must be drawn up for all lifting operations.

(3) All movements of deck cranes controlled by limit switches must be tested before use.

(4) Cranes must lift loads vertically only

(5) A lifting appliance operator must not be permitted to use-

- a limiter as the normal means of stopping a motion; or
- a working load limiter as the normal means of determining that a load can be lifted or lowered.

(6) Loads must never be dragged or moved in any manner that exerts a side load on a crane or lift truck. If it is necessary to drag a load a short distance, for example on the 'tween decks area of a ship, a snatch block must be used.

(7) There must be a safe clearance of at least 1m between any part of a crane and any fixed object. Persons must be prevented from entering any area where the clearance could lead them to being crushed.

(8) All personnel not directly involved in the lifting operation must be kept clear of the area.

(9) No person must stand under a suspended load.

(10) No person must be lifted by a lifting appliance other than in a man-cage.

(11) No persons must be permitted to board or leave a lifting appliance without first obtaining the operator's permission. If the access point is out of sight of the operator, means must be provided to ensure that the operator is aware of the whereabouts of the other person. A notice specifying the boarding procedure must be posted at the boarding point, where appropriate.

(12) Lifting appliance operators must-

- only perform lifting operations when specifically instructed to do so by the designated signaller; however, every emergency stop signal must be obeyed;
- always conduct a test lift up to 1m before doing a full lift onto or off a vessel.
- perform the operations smoothly, avoiding sudden jerks; and
- ensure that the power supply is turned off before leaving the appliance.

(13) Lifting appliance operators must never-

- lift loads over persons;
- leave loads suspended longer than is necessary to move them;
- leave appliances unattended with a load suspended; or
- allow workers to travel with loads other than in man-cages.

19. Ship's derricks

(1) When a derrick is rigged-

- a person must be stationed at each span winch and/or cargo winch in use;

- only persons engaged in the rigging work must be allowed in the vicinity, whereas other persons must only pass along the working side of the deck with the permission of the person in charge of the operation;
- wire ropes must be checked to ensure that they are free from corrosion, kinks, needling or other patent defects;
- all shackles and securing blocks must be fitted correctly, with their pins properly tightened and secured by seizing with wire or other effective means;
- block sheaves must be checked to ensure that they are free to turn and properly lubricated;
- guys, including preventer guys where appropriate, must be properly attached to the derrick head and the correct deck eye-plates in order to prevent possible jack-knifing;
- it is essential to ensure that the gooseneck is free to swivel when the derrick is at a low angle, from 30° to 50°, with one or more persons gently swinging on the guy(s);
- a heavy lift derrick must be checked to ensure that any temporary mast or Samson post stays are properly fitted and that any special slewing guys directly attached to the lower cargo block are properly rigged; and
- rigging items must not be able to whip against the winch man.

(2) When deck cargo stowed on a ship makes the deck eye-plates inaccessible, the guys must be secured to wire rope or chain pendants designed specially for the purpose. The pendants must be sufficiently long to enable the guys to be coupled to the pendants at the top level of the deck cargo. Extreme care must be taken to ensure that the relative positions of the guys remain as shown on the rigging plans.

(3) The winch operators must-

- be protected against the weather, preferably by a sheet metal cab with large windows; and
- have a clear unobstructed view of the hatch.

20. Union purchase

(1) The angle between the two cargo falls must not exceed 90^0 at any time. As the angle increases above 90^0, the stresses on the ropes and booms increase rapidly.

(2) The load in union purchase must generally be limited to half the safe working load of the weaker of the two booms used.

(3) Where the length of a guy is adjusted by a claw device in conjunction with a series of metal ferrules compressed to a wire rope secured to a deck eye-plate, the claw must be of suitable design and of adequate strength and arranged so that it will not accidentally be released in the event of temporary partial slackness in the guy. If a fibre rope block and tackle is used, the rope must be of man-made fibre, as this has better elasticity and does not need adjustment when it becomes wet or dry.

(4) When derricks are in use in union purchase-

- the load must be raised just enough to clear the coaming, bulwark or railings, whichever is the highest; and
- slings on loads must be of minimum length to enable the height of lift to be kept as low as possible.

(5) A preventer guy should be fitted in addition to the main guy, care being taken not to confuse a guy intended only for trimming a boom with a working guy-

- the preventer and the main guy should be attached to deck eye plates that are separate but placed as close together as practicable;
- the preventer and the main guy should be adjusted when the derrick boom is under a slight dynamic loading, such as a suspended heavy hatch beam; and
- the main (working) guy should be under slightly more tension than the preventer guy.

(6) Where the length of a guy is adjusted by a claw device in conjunction with a series of metal ferrules compressed to a wire rope secured to a deck eye plate, the claw should be of suitable design and of adequate strength, and arranged so that it will not be accidentally released in the event of temporary partial slackness in the guy. If a fibre rope block and tackle is used, the rope should be of synthetic fibre, as this has better elasticity and does not need adjustment when it becomes wet or dry.

(7) The hoist ropes of the two derricks should be secured by the use of an equalizing pulley or by suitable swivels to a common ring carrying the cargo hook. The hook should be fitted as close to the junction of the falls as possible.

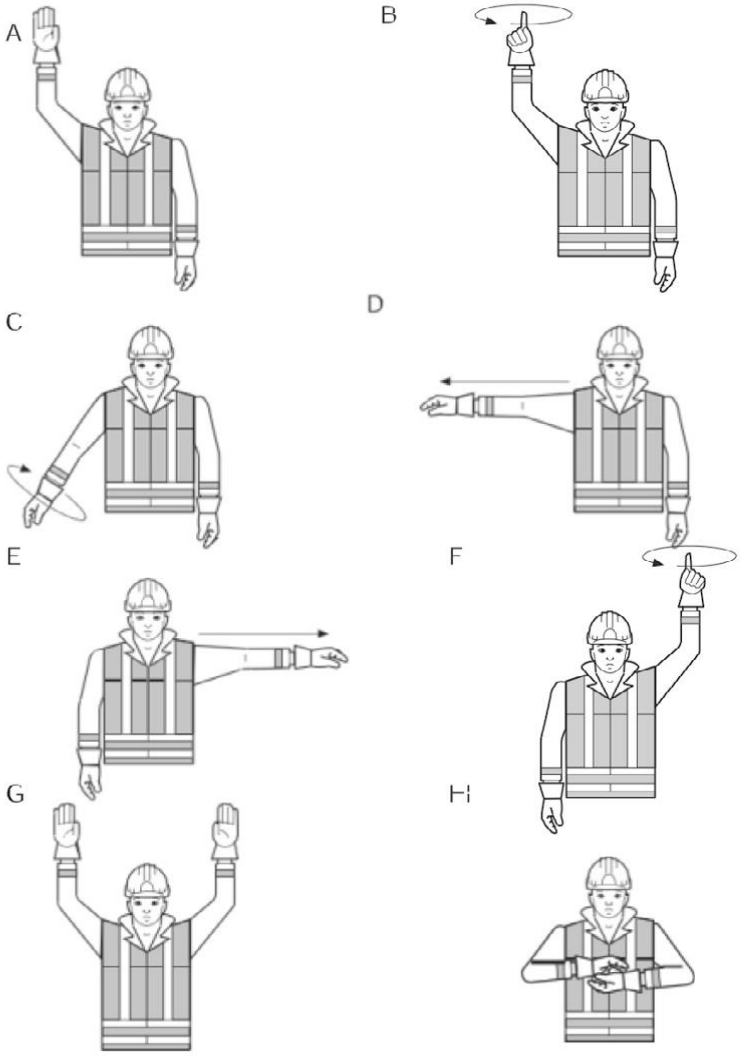
(8) When derricks are in use in union purchase-

- the load should be raised just enough to clear the coaming, bulwark or railings, whichever is the highest; and equalizing pulley for two coupled cranes; and

- slings on loads should be of minimum length to enable the height of lift to be kept as low as possible.

21. Signallers (Gangways)

(1) Signallers can be slingers or other persons responsible for giving directions to lifting appliance operators. They must be trained and certified in the art of signalling and directing crane movements in accordance with the provisions of the Code and signalling signs below.



A. Stop (end of movement).
B. Raise.
C. Lower.
D. Move in direction indicated.
E. Move in direction indicated.
F. Twistlocks on/off; rotate wrist of left hand.
G. Emergency stop.
H. End operations.

(2) Only one person must act as the signaller for each lifting, appliance. The signaller must be clearly identifiable to the operator and, unless responding to an emergency stop signal, the operator must only act on the signaller's instruction. Identification can be ensured by a distinctively coloured hat or clothing or by radio call sign. Wearing light-coloured sleeves and gloves will enable signals to be more easily seen

(3) More than one signaller can be required for a lifting operation if-

- one signaller will not have a clear view of the load throughout its path of travel; and
- hand signals are used and the first signaller has to move out of view of the appliance operator.

(4) If signalling requires verbal communication, the signaller must be able to give clear and precise instructions in the language understood by the appliance operator.

(5) Hand signals must be clear and precise and given by wide movements that are unambiguous.

(6) The system of hand signals must be agreed upon and clearly understood by all parties. This is particularly important if the signaller and the operator of a lifting appliance are of different language groups.

(7) The signalling system must fail safe, If radios are used, each crane must have its own separate call sign and frequency, which must be kept free from communications for other purposes in order to prevent operators reacting to signals intended for another crane. The signaller must constantly repeat the required motion throughout the intended movement, such as "hoist, hoist...hoist", and the motion must be stopped if the operator ceases to hear the instruction.

(8) The signalling system must include a means for a signaller to inform the crane driver that he or she will no longer be giving the directions. A further signal must indicate to the crane operator that a second signaller is taking over responsibility for directing the crane movements.

(9) Signallers must not give an order before satisfying themselves that all measures have been taken to ensure that the operation can be carried out safely. The essential characteristics of signallers must be ceaseless vigilance and awareness that appliance operators are totally dependent on them during operations outside the operator's line of sight.

(10) Before work is started for the day, a signaller must ensure that the workplace on the ship's deck or on the deck cargo is clear.

(11) Signallers on ships must place themselves where they can be seen both by the workers in the hold and by the operator of the appliance.

(12) Signallers must do their utmost to protect persons against accidents. When necessary, they must warn persons in cargo holds, on lighters and ashore.

(13) When cargo is being loaded or unloaded-

- by a runner at a hatchway, it must be possible for the signaller to pass safely between the hatchway and the ship's side; and
- when more than one runner is being worked, a separate signaller must be used for each runner, except in the case of union purchase.

(14) Before giving a signal to hoist, a signaller must ensure that the load is properly slung and that hoisting can commence without risk to persons working in the hold or elsewhere.

(15) No signal to lower a load must be given by a signaller unless all persons are clear in the hold and elsewhere.

(16) Before giving the signal to land, signallers must satisfy themselves that the load can be safely landed.

(17) Signallers must never-

- give an order to move a load if any person is under its path, which person must be instructed to move;
- agree to order operations that would violate safety rules, such as operations with defective slinging, dragging loads horizontally other than by bull-roping, or with persons travelling on the load; or
- give an instruction for operations if the light is insufficient or if there is thick fog, unless special precautions have been taken.

(18) Signallers must ensure that no persons are carried by lifting appliances except in a man-cage built for that purpose in terms of the Code.

(19) If it is necessary to stop a load while it is being raised or lowered, the signal must be precise but not abrupt, so that the operator of the lifting appliance does not jolt the load.

(20) Equipment used for giving sound, colour or light signals for hoisting, lowering or transporting loads must be efficient, properly maintained and protected from accidental interference.

(21) An audible emergency stop alarm be available, it must be-
- known to everybody working cargo on board and ashore; and
- be able to be heard by stevedores in the hold, and crane drivers on board and ashore.

22. Forklifts

(1) Operators must be trained and certified to operate each make and model of lifting appliance which they operate.

(2) Pre-use checks must be made at the commencement of each shift and must ensure that-
- electrical equipment is not exposed to contamination by oil, grease, water, or dirt;
- relevant levels and/or components show no loss of fluids (e-g. lubricating oil, coolant);
- all limit switches, cut-outs and dead man's handles or levers operate correctly, caution must be taken during checking in case of malfunction;
- items such as lights, windscreen wipers, washers and other attachments are properly secured and operate efficiently;
- wheels are secure and that the condition and pressure of tyres are appropriate on wheel-mounted lifting appliances;
- all controls function correctly without load;
- audible warning devices operate correctly; and
- all checks recommended by the manufacturer are undertaken.

(3) All forklifts should be conspicuously and clearly marked with the safe working load:

23. Operations on board

(1) All stevedores, including supervisors and foremen, on board ships must be fully trained and competent for tasks they are performing and fully aware of risks and safety measures involved. This is essential, given that more accidents involve stevedores working on board ships than at any other location in ports.

(2) All port operations on board ships must be carried out in accordance with safe systems of work. These must be drawn up following identification of the hazards, assessment of the risks and development of measures to control them.

(3) Experience has also shown that regular inspections and reports on the condition of ships help to reduce the number of shipboard accidents involving stevedores.

(4) It is the responsibility of the ship's personnel to provide conditions on board in which cargo work can safely be carried out. However, before starting to load or unload a ship, the company responsible for the stevedoring work must itself take steps to ensure that-

- there are safe means of access onto and about the ship;
- a ship's lifting appliances and lifting gear (if they are to be used for cargo operations) are correctly certificated and are in good order and safe to use;
- crane wires are in good working conditions and maintenance records are available;
- suitable deck and under-deck lighting is provided, taking into account any specific need that can require additional lighting;
- slings around pre-slung cargo on a ship have been certificated and are in all respects safe to discharge the cargo; and
- any lashing gear to be used is suitable, in a safe condition and compatible with the cargo to be lashed.

(5) This exercise that occurs before loading and unloading operations must be documented and signed off by both the ship's master or his representative and a stevedore representative.

(6) If it is found that the provisions made, are not safe or do not comply with the regulations and Code, the deficiencies must be reported to the ship's master or his or her representative, the ship owners and the shore-side management. The stevedore must not allow work to start until the deficiency has been corrected. Alternatively, a shore-side provision can be made to remedy the situation.

(7) A stevedore handling cargo with ship's gear must verify that the gear is safe by checking certificates and carrying out visual inspections before it is used.

(8) Any damage to the ship or its equipment occurring during cargo handling or other activities must be immediately reported to a responsible ship's officer.

24. Access to ship

(1) Sufficient, safe and suitable means of access to the ship must be available for the use of stevedores passing to and from the ship.

(2) The means of access must be of sound material and construction and adequate strength, be securely installed and be maintained in a good state of repair.

(3) The means of access from the quay to the ship's deck must be the ship's accommodation ladder.

(4) **Accommodation ladders** - should be safe to use and must as a minimum conform to the following:

- Ship's accommodation ladders should be set in a safe position and safety nets deployed. Nets should be fastened top rail to top rail.
- The construction of the ladder should be sufficiently robust to reduce any sway or bounce to a minimum. It should be fenced on both sides along its entire length with both upper and intermediate guard rails.
- The ladder should be properly rigged and be kept adjusted in such a way that:
  - whatever the state of the tide or the draught of the ship, the ladder's angle to the horizontal does not exceed approximately 40˚ as far as this is practicable; and
  - it is safe to pass from the lowest tread or platform of the ladder onto the dock and also up to and onto the deck.
- As far as is practicable, the ladder should be kept free of any grease or other substance likely to make a handhold or foothold insecure.
- Precautions should be taken to prevent the suspension ropes of accommodation ladders from becoming slack; this can result in the ladder falling violently along the ship's side if the ship lurches away from the quay as a result of wind or the wash of a passing ship.

(5) If the use of an accommodation ladder is not reasonably practicable-

- A gangway can be used;
- when normal access equipment cannot be used owing to the ship's high freeboard, purpose-built shore side access equipment must be provided and used;
- where the freeboard is too low for the normal means of access to be used, the ship or barge must be moored alongside a quayside ladder;
- portable ladders must only be used where no safer access is reasonably practicable; and

- where the access is to or from a ship and a barge or other ship of low freeboard moored alongside it, a rope ladder, with man ropes, can be used when it is impracticable to comply with any of the above requirements.

(6) The means of access must-
- be so placed as to ensure that no loads pass over it and, if this is not practicable, it must be supervised at all times during cargo handling;
- be placed where access to it will not be obstructed;
- not be placed on or near a crane track, railway track or other route in the port where it could be struck by moving traffic on that track or route; and
- have a lifebuoy with a line very nearby.

(7) A safety net must be rigged wherever a person can fall between the ship and the quay from a means of access to a ship. As far as is reasonably practicable the net must protect the entire length of the means of access.

(8) The relationship between the quay and the ship is not always static. When necessary, the means of access must be regularly checked to ensure that it is correctly adjusted.

(9) A portable ladder must only be used as means of access to ships in exceptional circumstances, such as in the event of damage to an accommodation ladder or a gangway.

(10) A rope ladder must only be used to provide access from a ship to a barge or similar ship of lower freeboard.

(11) **Access to ro–ro ships** - Whenever possible, safe pedestrian access, separate from vehicle access ramps, must be provided to ro-ro ships. Pedestrian access via the main loading ramp can present hazards from moving vehicles.

(12) When pedestrian access via a vehicle ramp is necessary, a separate walkway or walkways must be provided, and used, on the outer edge or edges of the ramp. Walkways must be fenced on both sides, to prevent falls into water and provide protection from moving vehicles.

(13) If the provision of a fenced walkway is not practicable, a clearly marked and signed walkway must be provided on one side of the ramp.

(14) If none of these options is practical, access via the ramp must be controlled at all times while vehicles are using it. The degree of control necessary can vary with the size of the ramp and the number of vehicle movements. The control

arrangements adopted must ensure that all pedestrians, including seafarers and other persons visiting the ship, are subject to the same control system.

(15) The ramp controller must ensure that when vehicles are using the ramp, pedestrians are prevented from doing so. The traffic movements must be stopped to enable them to transit the ramp.

(16) Safe means of access about the ship must be provided for stevedores between the gangway or other main access and the holds, deck cargoes, winches and cranes that are to be worked.

(17) Access routes must not pass under cargo being worked.

(18) All such access routes must be kept tidy and clear of obstructions.

(19) Access routes must as far as possible avoid lashings, ropes and other obstructions that might otherwise impede access. If deck cargo is stowed up to the bulwarks, access must be provided on the other side of the ship or, if that is not possible, a safe route must be constructed through or over the cargo.

(20) If access is required during the hours of darkness, the routes must be lit.

(21) Stevedores must always be alert to moving vehicles when moving around cargo holds and decks of ro-ro ships. Safety helmets and high-visibility garments must always be worn.

25. Access to working areas

(1) Safe means of access about the ship must be provided for stevedores between the gangway or other main access and the holds, deck cargoes, winches and cranes that are to be worked.
(2) Access routes must not pass under cargo being worked.
(3) All such access routes must be kept tidy and clear of obstructions. If specially constructed, they can consist of wooden grating or steel plates at least 60 cm wide. They must be raised some 10 cm above the deck.
(4) Access routes must, as far as possible, avoid lashings, ropes and other obstructions that might otherwise impede access. If deck cargo is stowed up to the bulwarks, access must be provided on the other side of the ship or, if that is not possible, a safe route must be constructed through or over the cargo.
(5) If access is required during the hours of darkness, the routes must be lit.

26. Access to holds

(1) Access to cargo holds must be by way of the ship's permanent access. Access must be by way of portable ladders only if all permanent access ways are obstructed or otherwise cannot be used. Prior to the commencement of cargo work, ladders must be checked by a responsible person.

(2) Man-hatches and other openings giving access to holds must be protected by coamings. There must be a clear space of at least 40 cm around the coamings to allow easy access.

(3) The approaches to a hold and man-hatch must be kept without obstruction to reduce the risk of falls and to enable holds to be evacuated quickly in an emergency.

(4) Stevedores must be alert to the possibility of openings into holds having been left open or unfenced or being hidden or obstructed by cargo.

(5) Where such openings have lids, these must be secured to prevent them from accidentally closing during access.

(6) Access areas must be adequately lit.

27. Access to deck cargo

(1) When it is necessary for stevedores to gain access to the tops of general break bulk deck cargoes and safe means of access are not provided, suitable safe access must be constructed. This must include suitable hand holds.

(2) Access routes onto and about stows of timber on deck must be constructed, where necessary, in accordance with Chapter 2 of the IMO 2011 Code of Practice for Ships Carrying Timber Deck Cargoes, as amended.

(3) When access involves walking across the cargo itself, care must be taken not to step into gaps in the timber stows and to avoid tripping hazards such as banding or pre-slung cargo slings lying on the surface of the timber. When uneven length timber units have been wrapped, the wrapping on top must be removed.

(4) Particular care must be taken when timber deck cargo is discharged, as rough weather can have dislodged stacks or made them unstable.

(5) When possible, container top working and the need for access must be avoided. However, when container top work is necessary on board ships, safe means of access must be provided.

(6) When there are no safer means available, portable ladders can be used to access containers up to two-high. Stevedores must never be permitted to climb up the ends of containers. A co-worker must always be holding the ladder unless it is otherwise adequately secured.

28. Hatches

(1) Stevedores must not open or close main deck hatch or 'tween deck hatch covers. This is the responsibility of the ship's personnel.

(2) After the ship's personnel have opened hatch covers, stevedores must enquire whether the locking mechanisms are in place and verify visually that this is correct.

(3) Stevedores must discuss work plans with the ship's personnel to ensure that hatch covers are not operated without stevedores working in that area having been informed.

29. Handling hatch covers

(1) Hatch covers, beams and pontoons must not be removed or replaced while work is going on in the hold under the hatchway.

(2) All hatch covers must be operated by designated members of the ship's crew only.

(3) It is essential to ensure that there are no loose objects on folding or lift-away hatch covers before they are operated.

(4) No person must be permitted to be on any hatch cover, whether closed or retracted, when it is about to be opened or closed.

(5) Persons must be warned when hatch covers are about to be opened or closed.

(6) Stevedores must keep well clear of hatch covers and their machinery while they are being operated. They must never stand on covers during such operations.

(7) No person must be allowed onto the top of a retracted backfolding hatch cover unless the preventer chains or other securing devices are in position.

(8) Loading or unloading must not take place at a hatch unless-

- all parts of a hatch covering that can be displaced by a load have been removed or secured; or
- powered hatch covers are secured in the open position or are of such a design as to make inadvertent abrupt closing impossible.

30. Stacking of hatch covers

(1) Hatch covers, beams, tarpaulins and pontoons that have been removed must be placed, stacked or secured in such a way that they cannot fall into the hold, present a tripping hazard or otherwise cause danger.

(2) Hatch covers and pontoons must either be arranged in neat stacks not higher than the coaming and away from it or spread one high between coaming and rail

with no space between them. It is recommended that, on the working side of the hatch, the top level of the stacks must be at least 15 cm below the top of the coaming.

(3) The height of stacks must be limited so that workers below or over side will not be endangered if the stack is accidentally struck by a load.

(4) Safe walkways must be left between the hatch coaming and the rail and from fore to aft.

31. Protection of hatch covers and openings

(1) Hatches at deck level must be protected by coamings of sufficient height to prevent accidental falls into the hold.

(2) Stevedores must not work on cargoes on deck or between decks that are over an opened hatch.

(3) Work in the 'tween decks area must not normally take place if the hatch is open to the lower hold. If this cannot be avoided, the hatch must be fenced to prevent stevedores from falling.

(4) The fencing must be one (1) m high and can be of suitable wire rope or chain, provided that-

- there are means to keep the ropes or chains as taught as possible;
- wire ropes have sufficient wires per strand to be flexible, are free from broken wires, and any loose ends are fitted with ferrules or other means of protection to prevent injury; and
- sufficient stanchions are provided.

(5) Deck sockets into which stanchions fit must be equipped with locking devices and must be sufficiently deep and designed in such a way so as to prevent the stanchions from moving unduly out of the vertical or being accidentally displaced.

(6) The fencing must form a permanent part of the ship's equipment and be kept in place at all times, except-

- when the hatch is being opened or closed;
- when goods are being loaded onto that particular deck and the work in the hold prevents the hatch from being closed; and
- during meal breaks or similar short interruptions of work.

(7) Where necessary, barriers must be installed to prevent-

- lift trucks working in the 'tween decks area from falling into the hatch; and
- lift trucks operating to and from side doors from falling onto the quay.

(8) The ship's officers must ensure that any opening, open hatchway or dangerous edge into, through, or over which a person can fall is fitted with secure guardrails or fencing of adequate design and construction preventing such occurrence, except where the installation of such guardrails of fencing will interfere with the proper performance of work.

32. Work In holds

(1) The possibility that the atmosphere in a hold or access way to a hold can be hazardous must always be considered before entry is made.

(2) The main hazards that stevedores handling cargo in holds must be aware of, include-

- falling through openings in holds or from cargo;
- falls of unstable cargo;
- congested working areas;
- uneven working surfaces on cargo;
- tripping hazards;
- manual handling hazards;
- unclear or inadequate communication with lifting appliance operators;
- swinging loads;
- falling objects;
- collapse of stow;
- mechanized plant and vehicles and their fumes;
- inadequate lighting; and
- loose electrical wiring.

(3) All persons working in holds must wear personal protective equipment including safety helmets and high-visibility clothing.

(4) Cargo must be stowed, handled, stacked or unstacked under competent supervision.

(5) There must be a separate signaller for each fall worked, except in the case of union purchase.

(6) When a clear view of the area where loads are being slung in the hold is impossible for lifting appliance operators, a signaller must be employed to direct the operator of the lifting appliance. The signaller must be able to see and be

seen both by the stevedores in the hold and by the lifting appliance operator. The signaller must use an agreed set of hand signals. Alternatively, the signaller must be in direct radio communication with the lifting appliance operator.

(7) Safe access to a safe position on the deck or the deck cargo must be provided for the signaller.

(8) As far as is practicable, loads in holds must be made up in such a way that they can be lifted vertically. Lifting appliance operators must ensure that there is a smooth taking up of the load and also when the load is lifted out of a hold. Where practicable, tag lines can be used to control any swing or twist motion.

(9) Stevedores must stand away from the load once it has been made up and while it is lifted out of a hold. They must be alert to possible swinging of the load once the appliance has taken the strain.

(10) When cargo is built up in sections in the hold, each section must allow for a safe landing place for the cargo.

(11) Suitable protection must be provided where stevedores have to work close to edges from which they can fall more than 2 m. This can take the form of netting or other suitable means.

(12) No loose gear or other objects must be thrown into or out of the holds.

(13) Dunnage must be used when necessary to make cargo stowage safe and stable. When dunnage is used for this or any other reason, consideration must be given as to how it can be removed at the port of discharge and at any intermediate ports where access can be required.

(14) Where cargo for discharge is situated under the 'tween decks area, it needs to be brought out to the square of the hatch, where it can be plumbed by the lifting appliance, in order to be discharged safely. Light goods can be moved into the square on rollers. With heavier goods, a suitable lift truck or other mechanical device must be used whenever possible. Where there is no alternative and the weight of the cargo is within the safe working load of the lifting appliance, a bull wire can be attached to the goods and reeved through a snatch block at the opposite end of the hatch.

(15) The bull wire must preferably be attached to a ship's winch. If a crane has to be used, the cargo hook must be attached to a bull wire to prevent wear on the hoist rope. The crane jib head must be positioned vertically above the sheave. One

signaller must be on deck and another signaller in the hold to ensure that the goods do not snag. With careful movements the crane must be able to bring the goods to the square.

(16) Mechanical plant that needs to be lifted in and out of holds must have-
- four lifting lugs built onto the body of the plant as near to the four corners as possible;
- each of the pair of lugs at the front and rear of the plant at the same height but not necessarily at the same height front and rear; and
- the lugs positioned so that, when a sling is attached, its legs will not come into contact with the overhead guard or any other part of the plant.

(17) A dedicated four-legged lifting sling assembly must be made up and used to lift each item of plant or similar items having the same layout, weight and configuration of lifting points. The assembly must-
- have legs constructed from an appropriate size of steel wire rope;
- have legs of sufficient length to ensure that the plant remains level when lifted;
- preferably include a small chandelier spreader;
- be attached to the plant by shackles that form part of the assembly;
- be clearly marked with the identity of the item of plant or model of plant for which it is intended to be used; and
- only be used for its intended purpose.

(18) When mechanical plant is used in a hold, adequate ventilation must be maintained at all times.

(19) The operator must at all times pay careful attention to the stability of the plant.

(20) Working space in holds is often congested. Rear-wheeled steered plant has a tight turning circle. Great care must be taken by plant operators and other workers in the hold to avoid collisions with people, cargo stacks, which could be dislodged, or damage to the ship's structure.

(21) Smoking is not permitted in any area where cargo is being worked. Smoking is permitted in designated areas of the ship only.

(22) Stevedores must at all times ensure that the weight of the cargo being handled does not exceed the Safe Working Load of the appliance being used. If no weight is displayed, the weight should be established by consulting the manifest before cargo work commences.

33. Work on deck

(1) All upper decks to which stevedores have access to carry out cargo work must be provided on the outer edge with a bulwark or guard rails that are so designed, constructed and placed, and of such a height above the deck, as to prevent any worker from accidentally falling overboard.

(2) The bulwark or guard rails must be secured in position. Removable sections must be secured when in position.

(3) Work surfaces must be safe, with ropes, beams and covers, hatch lids and other gear and equipment stowed safely and tidily. Any spillages of oil, cargo or other substances likely to affect the safety of stevedores must be cleaned up. Stevedores must be alert to possible obstructions built into the deck, such as eye bolts, and those on the deck, such as lashings.

(4) Deck cargoes must be stowed in such a way that-

- safe access is provided to the deck cargo, winches or deck cranes, hold ladders and signaller's stand; where necessary, properly secured ladders or other means must be used; and
- winches and deck cranes to be used during loading or unloading can be safely operated.

(5) When a signaller has to move from the square of the hatch to the ship's side, a space of at least one (1) m wide must be kept clear.

(6) If the surface of the deck cargo is uneven, safe walkways running both fore and aft and athwart ships must be provided, where this is practicable.

(7) When deck cargo that is not being worked, is stowed against the ship's rails or hatch coamings, and at such a height that the rails or coamings would not prevent stevedores from falling overboard or into the open hold, temporary fencing must be provided.

34. Lashing and securing cargo of cargo

(1) All ships of 500 gross tonnes or more that are designed to carry cargo that requires lashing and securing for sea voyages are required to carry a cargo securing manual. This must detail how the cargo must be secured, what lashings or other equipment can be used and how tight the lashings must be.

(2) The stevedore must ensure that the requirements of the manual are followed, unless otherwise instructed by the master of the ship. General guidance on securing cargo is contained in the IMO Code of Safe Practice for Cargo Stowage and Securing (CSS Code) and the Nautical Institute's book Lashing and securing of deck cargoes. In the case of timber deck cargoes, the employer of stevedores must also refer to the IMO's Code of Safe Practice for Ships Carrying Timber Deck Cargoes, 2011.

(3) Safe places of work must be provided to enable stevedores to carry out such securing work.

35. Shifted cargo

(1) Ships at sea can often encounter bad weather and rough seas. This can cause cargo to move, despite all the securing arrangements made beforehand. Deck cargoes can be moved out of stowage and even lost overside. Hold stowages can move and, in severe cases, be completely mixed up and out of place. In such circumstances, damage may be done to cargo and spillage may occur, including spillage that continues after the adverse conditions have passed.

(2) Great care needs to be taken to ensure the safety of stevedores during such operations, which must normally be carried out under the direct control of experienced supervisors, A high level of alertness is required, particular attention being paid to the stability of the cargo, safe access, footholds and hand holds, the application of lifting gear and the need to stand well clear.

36. Hot Work

(1) No hot work may be carried out without a written permit issued by the Port Authority's or and the Master.

(2) It is important that proper planning to tasks takes place to ensure that all required permits are applied for in advance. Poor planning often results in temptation to cut corners and conduct work such as hot work without a permit and little precautionary measures.

(3) Hot work permit must be valid for no more than 24 hours for all hot work in Hazardous and dangerous spaces.

(4) Hot work permit may be extended in exceptional instances at the discretion of the Port Authority and based on a risk assessment provided by the contractor to no more than 72 hours only for areas other than hazardous or dangerous area.

(5) The Port Authority can recommend that the hot work permit be withdrawn where in the opinion of the Port Authority the conditions of the Hot Work Permit are not met.

37. Specific ship types

37.1 Container ships

(1) General

1.1 All lashing gear is provided by the ship and is ship's equipment. Fully manually operated twist locks are now tending to be replaced by semi-automatic twist locks (SATLs). On loading, SATLs can be placed in position on the underside of the container on the quay. When the crane lowers the container into position, the SATLs automatically lock into position. On discharge, the SATLs have to be unlocked with the aid of a long pole. Because of their length and weight, such poles can only be used from deck level to unlock containers up to four high.

1.2 The need for working on top of containers must be eliminated or reduced by the use of-

- SATLs that reduce but do not completely eliminate the need;
- a combination of lashing platforms and SATLs restricting it further; and
- fully automatic twist locks.

1.3 When a jib crane or derrick is used for discharging or loading, there can be a need to steady the load when a container is being lifted or lowered or a spreader is lowered onto a container.

1.4 When it is necessary to use over-height frames to lift open-topped containers-

- all lifting brackets, shackles and other loose gear on both the main frame and the subframe used in the lift must be of a suitable design and SWL;
- a physical check that twist locks have turned and are must be made before lifting; and
- where necessary, care must be taken to ensure that the twist lock operating ropes do not catch on fixed objects while the frame is in use.

(2) Working on deck

2.1 Shore-side management must 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.

2.2 The placing and removal of lashing equipment on the ends of containers must be carried out in a gap between container stows athwartship.

2.3 The space provided between the container stows for stevedores to carry out such work must provide-

- a firm and level working surface;
- a working area, excluding lashings in place, preferably of one (1) m and not less than 75 cm wide to allow clear sight of twist lock handles and the manipulation of lashing gear; and
- sufficient space to permit the lashing gear and other equipment to be stowed without causing a tripping hazard.

(3) Working on top of containers

3.1 When work on top of container cannot be avoided, safe means of access must be provided.

3.2 Access to the tops of containers must be from part of the ship's permanent superstructure, whenever possible. This can be from lashing platforms.

3.3 When such access is not possible, safe access must be provided by the use of a purpose-built man-cage on quayside crane headblock.

3.4 When it is not practicable to use a personnel cage, a platform may be provided on the headblock or spreader of a crane to lift stevedores onto container tops.

3.5 Portable Ladders must only be used for access to container tops aboard ships when there is no other means of access available and must only be used to access container tops up to two high. Ladders must comply with the provisions of the Regulations.

3.6 When a man-cage or platform is used for access-

- at least two persons must travel in the man-cage, one of whom must have a radio in direct contact with the crane operator;
- the crane operator must only take directions from that person;

- the secondary means of attachment to the spreader must be connected;
- all parts of the body, particularly the hands and head, must be kept inside the man-cage at all times; and
- the man-cage must have an anchor point for stevedores to attach their fall arrest equipment.
- Stevedores must remain attached to the anchor point whilst on the man-cage and when unlashing.

3.7 the operation must comply with the requirements prescribed in Annex 2 of this Code.

3.8 Stevedores must never climb up the ends of containers including climbing the doors of containers is to be avoided.

3.9 Non-purpose-built container-carrying ships can also carry containers on deck or in the hold in circumstances where stevedores can be required to access container tops. When this involves loading or discharging by jib crane, an additional reason for being on the top layer of the containers can be to steady the load as it is positioned or removed. In these circumstances, a safe system of work must be developed to ensure stevedores have safe access.

3.10 When work has to be undertaken on top of containers, precautions must be taken to ensure the safety of stevedores. Suitable fall prevention or fall arrest systems of work must be devised and used in order to eliminate or control the risk of falling from the container stow. Fall prevention systems include working from inside a cage used for access, or secured to a short lanyard that prevents falls from open sides of containers.

3.11 The choice of system actually used will be influenced by the equipment used to secure the containers. If this equipment consists of manually placed twist locks and bridging pieces, it can be possible to carry out the work from inside an access cage, or it can be undertaken actually on the tops of containers. If the securing equipment consists of SATLs, there must be no need to go onto container tops during loading operations. On discharge, SATLs of more than four containers high have to be unlocked by pole either from the topmost tier or from a gondola at the side of the stow.

3.12 When a purpose-built man-cage is used, it can be moved slowly across the top of each tier of containers while workers in it place or remove twist locks. Great care must be taken to ensure that stevedores hands are not trapped.

A second person in the cage must be in direct radio contact with the crane operator and control the operation at all times.

3.13 Stevedores in the man-cage must wear a full body harness and be connected to a secure anchorage point by lanyards, safety lines or inertia reel fall arrest equipment. The harness must have D. rings at the front and back for attachment to the reel and to aid recovery.

3.14 Other systems or methods can be used in connection with container top working, provided that they ensure the safety of stevedores at all times.

3.15 Work on top of containers must cease in high-wind conditions, where working conditions are unsafe.

3.16 Similar precautions must be taken to ensure the safety of stevedores who have to go onto the tops of containers on the deck or in the hold of combi ships, where freight containers are stowed and lashed. Further guidance on safe working on tops of containers is in the ICHCA International Ltd. International Safety Panel Briefing Pamphlet No. 8.

37.2 Ro-ro ships

(1) General

1.1 Ro-ro ships are equipped with a variety of cargo access equipment, e.g. ship or shore ramps, bow, stern or side doors, internal ramps and cargo lifts. This equipment must be operated by the ship's crew.

1.2 The main operations in a ro-ro hold are the marshalling of vehicles and lashing them to the deck for the voyage. In a ro-ro ship, cargo such as paper reels is brought into the hold on roll trailers. They are then taken off the trailer by lift truck and placed into a stow in the hold.

1.3 In each of these operations, mechanical appliances are widely used and, apart from driver-accompanied freight vehicles and passenger cars, are usually driven and operated by stevedores, who can also marshal vehicles and lash or unlash vehicles to the deck.

1.4 The principal hazards for stevedores working in ro-ro holds are associated with vehicle movements. Vehicles moving in a confined space represent a risk of man to machine contact, and vehicle exhaust fumes can affect health. Lashing operations can also present a risk. Stevedores must also

be aware of any cargo-access equipment in the area where they are working and know how it operates.

1.5 Audible and visual warnings must be given before any cargo-access equipment is operated. Stevedores must be alert to such indications.

1.6 The slope of an internal ramp must not exceed one (1) in 10.

1.7 Every stanchion or other fixed structure on an enclosed deck liable to be a danger to vehicles or to give rise to a risk of trapping between itself and a vehicle must be clearly marked with alternating black and yellow stripes.

1.8 All stevedores on ro-ro ships must wear personal protective clothing which includes high-visibility clothing and safety shoes.

(2) Vehicle movements

2.1 All movement of vehicles on board ro-ro ships must be effectively and continuously controlled.

2.2 Only authorised persons must be allowed on any vehicle deck while vehicle movements are taking place.

2.3 Only licenced drivers and operators are allowed to drive and operate vehicles and machinery on and off a ro-ro ship. Drivers must comply with the relevant speed limits on ramps and vehicle decks at all times. These can be lower than those on the quay. Signs indicating the speed limit must be clearly displayed in prominent positions both on the quay and on the ship.

2.4 All large vehicles and trailers being reversed or manoeuvred into stowage positions on deck must do so under the direction of a signaller.

2.5 Signallers must satisfy themselves that no person is in a position of danger, particularly in any trapping area behind a reversing vehicle.

2.6 Drivers must not move their load or vehicle unless a signaller so directs.

2.7 Drivers must immediately stop their vehicles at any time the signaller is not within their field of vision.

2.8 While loading and unloading is taking place, the area must be kept clear, as far as is practicable, of dunnage, loose wires, unused vehicles, securing gear and other extraneous equipment or material.

(3) Vehicle lashing

3.1 The wearing of safety bump caps by stevedores lashing vehicles can be more appropriate than safety helmets owing to the restricted working positions.

3.2 Stevedores carrying out lashing operations must work in pairs, each worker always remaining in sight of the other.

3.3 Great care must be taken when vehicles are moving, especially when the system requires vehicles to reverse into place. In particular, it is essential to ensure that-

- large vehicles are always controlled by a signaller when reversing; and
- stevedores do not position themselves at the back of a vehicle when vehicle loading operations are taking place in that row.

3.4 Stevedores must release lashings warily, as ship and vehicle movement during the voyage could have made them excessively taut.

(4) Lifts

Stevedores working on or near cargo lifts must-

- not ride on a cargo lift when it is in operation, except the driver of a vehicle who is in the cab; and
- exercise caution when working with or close to a cargo lift.

(5) Mechanical work

5.1 During discharging of motor vehicles, trucks and large machinery especially, the services of mechanics is often required to refuel or jump-start vehicles that would not start and fixing of minor mechanical issues.

5.2 Only competent employees must be used for mechanical work.

5.3 The safe working procedure for jump-starting of non-starters must be developed and must include competency requirements for the mechanic and positioning during jumpstarting.

37.3 Bulk carriers and bulk cargoes

(1) General

1.1 Loading and unloading must be undertaken in accordance with the plan required by the IMO BLU Code and agreed upon between the terminal representative and the ship's master.

1.2 When stevedores are required to use mechanical plant in a hold to trim loaded dry bulk cargo and to move or break down cargo residues for discharge, care must be taken not to cause damage to the structure of the ship.

1.3 When work has to be carried out in the holds of bulk carriers-

- signallers must control grabs' movement or other equipment;
- in holds loaded by grabs, one worker must act as lookout if there is a danger of workers being buried under a load from a grab;
- all stevedores must be checked in and out of the hold;
- workers must be secured by a full safety harness and lifeline when necessary during trimming or discharge;
- appropriate precautions must be taken to prevent dust inhalation;
- the equipment and methods used to bring down bulk cargo residues adhering to the sides and ends of holds should ensure the safety of workers; and
- equipment such as grabs should only be used for the purpose for which they are designed.

1.4 During loading and discharge using shore side gantries, without the use of a signalman, payloader operators and trimming labour must at all times be aware of the position of the grab or skip.

1.5 When equipment is being used in a bulk cargo hatch, no person should work unobserved.

38. Heavy lifts

(1) Abnormal and unusual loads must only be worked by stevedores after careful planning with the ship's officers, shipper or manufacturer, and the cargo agent.

(2) It is the responsibility of the shipper or manufacturer to provide an accurate description of the cargo. These loads should preferably be worked during daylight hours.

(3) Only experienced stevedores must be used during this operation.
(4) During the safety information session, it must be clearly stipulated to stevedores the risk involved and precautions to be taken during the operation.

39. Steel pipes

(1) Due to irregular shape of the steel pipes it is often easy for stevedore to lose footing and fall. Stevedore companies to take the following dangers into consideration when planning the discharge of steel pipes and ensure that appropriate precautions are in place.

(2) Unbundled pipes make the attachment or securing of lifting gear difficult.

(3) Lashing or securing wires which may have slackened during the voyage making stows unstable.

(4) Dunnage that may have become compressed during the voyage or insufficient dunnage which may have been utilised at the port of loading, making the attachment or securing of lifting gear difficult.

(5) Pipes that may be oiled, creating a slippery surface on which to stand and making the pipes difficult to handle.

(6) Pipes that may create an uneven surface to work on.

(7) Removal and discharge of loose pipes that may result in remaining pipes in stow rolling into voids.

40. Scrap metal

(1) Stevedores must be alert to the possible hazards of scrap metal received. These hazards include the following:

- Flammable residues inside closed ships;
- lack of oxygen in closed receptacles or containers due to rusting or other atmospheric oxidation;
- the presence of radioactive sources or radioactive contamination in scrap from demolition or dismantling of plant at factories and mines;
- heating of consignments of aluminium smelting by-products or turnings that have become damp.

(2) Magnetic lifting gear must-

- only be used in holds if stevedores are able to take shelter from any falling objects; and
- never be used to transport persons.

(3) When magnetic lifting gear is used-

- the power to the magnet must not be switched on until the magnet has been lowered onto the load to be lifted;
- after the power has been switched on, the lifting motion must be delayed for a few seconds (up to ten seconds in the case of scrap metal);
- it must be carefully lowered on the load, not dropped; and
- it must not be allowed to strike a solid obstacle.

41. Health

41.1 General

(1) Stevedores must be fit to carry out the work for which they are employed, as indicated on the medical certificate of fitness. They must be protected from health hazards that can arise from the activity itself, the means to carry out that activity, the work environment or the organization of the work. This part of the Code gives examples to assist in identifying the risks and detailing the action that must be taken to avoid them.

(2) The health and fitness for work of stevedores who regularly work in areas or on operations known to include health hazards must be regularly monitored by competent person. Those carrying out the monitoring process must regularly liaise with those responsible for areas or operations to ensure that the precautions and arrangements for eradicating, reducing or controlling the hazards are effective.

(3) Health hazards must be identified, the risks known and evaluated, the dangers to health understood and effective preventative measures put in place to ensure the health of the stevedores concerned, There must be a management system for identifying such risks and a strategy for responding to them. Arrangements for the participation of workers must include health matters, e.g. health and safety committees.

(4) The principal health hazards arising from port operations are noise, fatigue, fumes, vibration and exposure to hazardous substances, and cargoes. These hazards must be controlled.

(5) Exposure of stevedores to particular hazardous substances must be kept below the relevant time-weighted occupational exposure levels of a maximum of 15 of minutes and eight hours for the substances concerned in accordance with the parameters set out in the Occupational Health and Safety Act, 1993..

(6) Stevedores exposed to hazardous materials must be trained and provided with material safety data sheets. The materials must be adequately labelled with the contents. Workers must be advised as to the precautions to be taken when exposed to these materials.

(7) Where containers are noted to be damaged or leaking the Material Data Sheet must be consulted prior to handling.

41.2 Dangerous goods and fumigation

(1) Health hazards can arise from specialized activities associated with dangerous goods.

(2) Great care must be taken when it is necessary to inspect or sample such goods. Particular attention must be paid to the hazards of the cargo as indicated by the labels or placards and documentation.

(3) Cargo transport units that have been transported under fumigation must be declared and bear the fumigation sign. They must be ventilated before entry is permitted. In order to ensure that the atmosphere is safe for entry, it must be tested it first.

(4) If the cargo, packaging or dunnage in a cargo transport unit is of a category that might need to be fumigated, fumigant residues can still be present in the unit. Precautions must be taken before entry, even though the cargo is not dangerous goods and have not been declared as being transported under fumigation.

(5) Bulk cargoes such as grain fumigated before entry into the port area from shore or from sea must be declared and the agent must advise stevedores accordingly. In addition-

- adequate and suitable measures must be taken to safeguard the health of stevedores engaged in handling such cargoes; and
- such measures must take account of the possibility that fumigant is still present in the cargo.

41.3 Dusty cargoes

(1) Exposure of stevedores to dust must be prevented as far as is practicable. This must include nuisance dusts for which no specific occupational exposure level has been assigned.

(2) Loading or unloading of dusty cargoes must be adequately ventilated. Where this is not practicable, dust emissions must be prevented as far as possible and controlled.

(3) Measures to control dust emissions include-

- appropriate design of grabs, hoppers, conveyors and other material-handling equipment;
- enclosure of transfer and discharge points;
- enclosure of operator's cabs;
- local exhaust ventilation; and
- suppression by covering or damping.

(4) Other measures to limit exposure to dusts must include-

- avoiding the need for stevedores to enter or work in dusty areas;
- restricting the time spent in such areas;
- provision of appropriate respiratory protective equipment, such as helmets providing a continuous supply of clean filtered air and masks; and
- ensuring that respiratory protective equipment is worn when necessary.

(5) Some dusts, such as grain, can have a sensitising effect inducing changes in the respiratory system, such as asthma or other medical conditions. Stevedores who are medically assessed a being sensitive to such conditions must not work in areas where they can be exposed to such dusts.

(6) Other cargoes can also give off dust that can be harmful in enclosed spaces. These can include some forest products and scrap metal.

41.4 Other cargoes

(1) Some cargoes, including mouldy cargoes, can present risks of infection of stevedores. Stevedores handling such cargoes must be under appropriate medical supervision and be provided with, and use, relevant personal protective equipment.

(2) Exposure to hides, skins, fleeces, wool, hair, bones or other parts of animals can give rise to anthrax or other animal-related diseases which can be transmitted to

and be harmful to humans. Such cargoes must be disinfected and certificated by a competent authority before shipping in accordance with national legal requirements. When the risk of anthrax is suspected, special precautions, including the use of personal protective equipment and medical supervision, must be taken.

(3) Some cargoes can bring with them insects, snakes and other creatures, and stevedores must be alert to the dangers of being bitten. In the event of such a bite, they must receive medical treatment immediately.

41.5 Noise

(1) Noise can be emitted from engines and transmission equipment fitted to lifting appliances and vehicles and can be heightened when the equipment is being used in a ship's hold. Noise levels can affect the equipment operator and/or stevedores that work with or in the vicinity of such equipment when it is being used.

(2) In coordination with the workplace safety committees, noise levels must periodically be monitored and sources of excessive noise identified.

(3) Noise levels must be controlled at source whenever practicable.

(4) The need to work in noisy areas must be avoided or minimised as far as possible. Appropriate hearing protection must be supplied and worn, when necessary.

(5) When appropriate, consideration must be given to the periodic monitoring for loss of hearing of stevedores.

41.6 Fatigue

(1) Fatigue can affect health, safety and work performance. Regular breaks must be incorporated into work periods. Excessively long shifts or work periods must be avoided.

(2) If it is necessary to work an abnormally long shift, it is essential that an adequate period of rest be provided before the start of the next period of work, particularly overnight.

(3) Everyone is different and will be affected differently by fatigue.

(4) In addition to physical fatigue, there is also mental fatigue. This is the most dangerous type of fatigue as it can result in errors of judgement. The causes of mental fatigue include the need for concentration for long periods, excessive working hours and sleep deprivation.

(5) Some jobs need higher levels of concentration than others. An obvious example is the operation of a crane. In many cases the operator will be a member of a team. It can therefore be possible to rotate the jobs within the team to maintain the necessary level of concentration for the most demanding job throughout the working day.

(6) Everyone from time to time needs breaks in their working day. The frequency will depend on many factors, including the physical demands of the work. In some cases, job rotation will help to reduce excessive fatigue. In determining the duration of working periods, employers must consider not only the normal or usual working day, but also whether shorter periods between intervals would be appropriate on occasions when it is necessary to work beyond normal hours.

(7) A number of factors over which stevedores have no control affecting the shipping industry can lead to the need to work beyond normal hours. Such matters can include the late arrival of ships due to bad weather and the resulting need to work a ship to finish. Matters to consider in such circumstances include not only the additional hours to be worked, i.e. the overall length of the working day and the working week, but also the frequency of the need to work additional hours and the intervals between the end of a working day and the start of the next.

(8) It is essential that there is an adequate interval between the end of one working day and the start of the following working day. This interval must be long enough to allow adequate time for sleep, meals, travel to and from home and, where appropriate, exercise. In considering the time necessary for travel, it must be appreciated that owing to changes in industry in recent years it is less likely that employees will live close to their work. In many cases they may have to travel for lengthy periods each day.

(9) The matters referred to above are equally relevant to a shift system of work. In addition, particular consideration must be given to the need to cover for absences such as those due to illness or holidays. If the shift systems involve altering normal patterns of sleep the matters discussed below must also be considered. Particular attention must be given to arrangements for changing or rotating shifts, especially if a rest day is not incorporated at the time of change. In such circumstances it is preferable for the new shift to be retarded.

(10) People are not naturally nocturnal animals. A person's normal body rhythm involves sleeping at night. If this rhythm is ignored, health, safety and efficiency can fall at some or other times of the day and particularly between about midnight and 6 am. The ability of people to cope with changed sleep patterns varies considerably and must be considered when selecting people to work at night. Difficulty with sleeping during normal day time can be experienced resulting in less than normal periods of sleep and consequential reduction in alertness and in increased probability of falling asleep during working hours. These problems can be highlighted by the social needs and activities of workers. The problems can however be reduced by training and information on the effects of shift work and lifestyle on fatigue. Such matters need to be understood not only by the workers themselves but also by their families. It is important therefore that such information is suitable for and available to their families as well as to the workers.

(11) One effect of shift work in general and night work in particular, can be taking sedatives to aid sleep at unusual times. The effect of such sedatives can interact and lengthen reaction times thereby increasing the risk of accidents either at work or on the way to or from work. Similar effects can be produced by medication being taken for other purposes.

(12) Prolonged periods of work will increasingly lead to a build-up of fatigue. When considering arrangements to cover for illness, leave or other absences, it is essential that the need for rest days at appropriate intervals is considered.

(13) It is recommended that a shift is of eight (8) hours duration and, where heavy manual labour is undertaken, does not exceed 12 hours. The extension to longer shifts of 9 to12 hours must only be contemplated in the following situations:

- the nature of work or workload is suitable for extended hours;
- the shift system is designed to minimise fatigue;
- sufficient cover for absenteeism;
- overtime is not added;
- there is strict control of the employee;
- toxic exposures are limited;
- complete rest recovery is possible.

41.7 Fumes

(1) Exhaust fumes emitted by terminal machinery, trade cars, passenger vehicles, ro-ro vehicles and trade wheeled cargo vehicle exhausts can present health risks to stevedores from-

- carbon monoxide (the main component of fumes from petrol engines);

- carbon dioxide (the main component of fumes from diesel engines);
- polycyclic aromatic hydrocarbons (PAH);
- oxides of nitrogen;
- sulphur oxides;
- aldehydes; and
- particulate matter, e.g. soot.

(2) The composition of exhaust fumes and the risks from them vary with the type of engine, the fuel being used and the age and level of maintenance of the engine. The volume of exhaust emissions in the atmosphere will depend on the number of engines running at any one time and the level and efficiency of ventilation.

(3) Hazardous levels of fumes can affect those in the immediate vicinity, especially if the area is enclosed or if the fumes are concentrated at one particular point.

(4) Prevention measures include-

- regular scheduled maintenance of all terminal vehicles, including engine tuning and exhaust systems;
- ventilating places where vehicles operate by natural or mechanical ventilation to ensure safe levels;
- switching engines off when vehicles are standing for long periods;
- making initial fume assessments of individual vehicles;
- preparing fume profiles of each hold of a ship in which vehicles are operated on a regular basis;
- preparing a plan to ensure that fumes from such vehicles on premises and in holds do not exceed safe levels, and specifying the maximum number of engines allowed to run at any one time; and
- using electric, LPG- or LNG-driven vehicles or vehicles using other form of clean fuel where appropriate.

(5) Profiling of holds can typically consist of taking readings of fume levels in each hold at hourly intervals throughout the loading or unloading process. Normally it is not necessary to take readings for each component of the vehicle exhaust fumes; only for carbon monoxide and carbon dioxide readings. If it can be shown that the levels of those components are safe, it can normally be assumed that the other components are equally safe. If there is any doubt, an industrial hygienist or other expert must be consulted.

(6) Profiling of holds must be carried out with all available ship's ventilation in operation and with the maximum number of vehicle engines consistent with operational procedures running at any one time.

(7) During operations in holds, it is essential to ensure that-

- all available ship ventilation is in operation;
- the ventilation functions correctly, with exhaust fans not reversed, and air ducts not covered or obstructed at either end;
- doors, ramps and other openings in the hull are open to permit natural ventilation; and
- only the stipulated number of engines are being run at any one time.

41.8 Other health aspects

(1) Where stevedores are engaged in abnormal environments, such as extremes of temperature, or where the wearing of respiratory equipment is essential, they must be relieved at suitable intervals for rest in fresh air.

(2) Where stevedores are accidentally exposed to health hazards, their health must be checked by persons competent to do so.

(3) Where stevedores handle harmful substances, they must change their outer clothes and thoroughly wash their hands and face with soap or some other suitable cleaning agent before taking any food or drink.

(4) Health protection surveillance must be considered for special groups, e.g. older stevedores, female stevedores, disabled persons and insulin-dependent workers.

(5) Special attention must be paid to risks from manual handling, especially heavy loads. Stevedores must not be engaged on such activities without suitable medical assessment and training in the skills necessary to carry out manual handling safely.

41.9 Ergonomics

(1) Workplaces, work systems and work equipment must be designed, constructed and maintained in accordance good ergonomic principles. When necessary, specialist advice must be obtained.

(2) Poor design of the equipment and poor posture can affect the health of stevedores, especially if they are spending most of their working time in the same position.

(3) When appropriate, the time spent on a task continuously must be limited, possibly by job rotation or other suitable relief.

(4) Stevedore companies have no influence over ship design and thus they work with what is available. However employers have a responsibility to ensure that good ergonomic principles are adhered when stevedores are performing different tasks.

(5) Bad design of the operator's cab and poor posture can affect the health of stevedores, especially if they are spending most of their working time in the same position. This includes:

- the layout and positioning of the cab;
- the climate inside the cab;
- daylight and illumination;
- possible obstruction of view from within the cab;
- noise;
- positioning of displays and other communication means; and
- positioning of the hand and foot controls, and the design and positioning of the operator's seat.

(6) These should all be taken into account when designing and arranging operators' cabs.

(7) When appropriate, the continuous time spent on a task should be limited, possibly by job rotation or other suitable relief.

41.10 First-aid

Where more than five employees work on board a vessel an employer shall ensure that there is readily available at that workplace a person holding a certificate of competency in first aid. All requirements of Regulation 5 must be be taken into account.

41.11 Vibration

(1) Hand/arm and whole-body vibration generated by powered hand tools and machinery can affect human health.

(2) Vibration levels should be measured and kept below nationally recognized maximum and eight-hour exposure levels. Operators of machinery are most likely to be adversely affected by whole-body vibration levels.

(3) An assessment of the risks from vibration should be based on readings of each piece of operating equipment and should lead to the preparation of a plan that will ensure that such equipment remains safe for its operators.

41.12 Substance abuse

(1) Substance abuse in the workplace is a serious problem not only affecting the user but also the safety of fellow-workers. All drugs, including, alcohol have side effects that increase the risks of accidents in the workplace. Substance abuse can result in family problems, disciplinary action, job loss and therefore poverty and social deprivation.

(2) For the employers, substance abuse leads to safety problems affecting the business, and gives rise to increased costs and lower productivity. In order to reduce this problem, the employers need to have alcohol and drug policies and programmes that will promote prevention, reduction and management of substance abuse related problems in the workplace whilst observing all the constitutional rights of the employees.

(3) The contents of an alcohol and drug policy must include the following information:
- measures to prohibit the availability of alcohol and drugs in the workplace;
- prevention of alcohol and drug related problems through information, education, training of workers and other relevant programmes; and
- identification and referral of those who have alcohol and drug related problems.

(4) The benefits of a drug policy:
- It reduces the risk and cost of accidents caused by impaired judgment;
- It reduces the cost of absenteeism or poor work performance of the substance user;
- It saves the cost and inconvenience of recruiting and training replacement crew when users become unreliable; and
- It improves personnel morale.

41.13 Temperature fatigue

(1) In this industry extremes of temperature are often found. Extreme temperatures are well documented in the Occupational Health and Safety Act, 1993 and regulations relating thereto must be strictly adhered to.

(2) In port cities, however, high temperatures and heavy manual labour are a greater issue. The standard measure of environmental temperature is the WBGT (wet bulb globe temperature), which takes into account the ambient temperature and humidity.

(3) Each company must develop protocols -
- to measure the temperatures in the cargo working area; and
- regarding working time, maximum period between breaks and fluid intakes.

(4) Communicable diseases

(a) Due to the nature of their work, stevedores may be exposed to contact with persons, animals and materials originating from communicable disease endemic zones. The employer must ensure that the ships that the stevedores are going to work on have been granted Free Pratique and cleared by Port Health and other relevant authorities.

(b) An employer must ensure that stevedores are notified, educated in mitigating measures and protected from any existing epidemic and pandemic that might be carried by vessels or cargo.

(c) An employer must consider all relevant advise issued by WHO, the IMO, the ILO, the Authority, the National Port Authority and other appropriate bodies in this regard and act appropriately by providing the necessary information to stevedores.

(d) The employer must provide al personal protective equipment and facilities to protect stevedores from communicable diseases.

42 Emergency arrangements

42.1 General

(1) Many types of emergencies are possible on board ships, and emergency plan must be reviewed regularly.

(2) Appropriate training or instruction of stevedores on the action they must take in an emergency is essential.

(3) Each type of potential emergency that could occur in port areas must be considered when preparing appropriate emergency arrangements.

(4) Emergency arrangements and emergency plans must cover all foreseeable emergencies, from minor mishaps to major incidents. They must be capable of increasing appropriate responses as an incident develops.

42.2 Injuries

(1) First aid provisions must meet the requirements of the regulations. There must be readily available means to take injured employees to hospital and to call for emergency personnel for more serious cases. The stevedore foreman on board must establish which ship's officer is to be contacted in the event of an accident and establish the response availability on board. The emergency telephone number of medical response facilities must be displayed in a prominent position on-board.

(2) First-aid helpers and ambulance personnel must be capable of safely reaching people who are injured, wherever they are.

(3) Contacting emergency personnel must always take first preference of reporting the incident to the Authority and other role players.

42.3 Rescue

(1) If workers become ill or are injured in places to which access is difficult and who cannot get themselves back to where they can receive help, it will be necessary to rescue them. Such places include-

- holds of bulk carriers with access only available by hold ladder;
- jibs of general cargo cranes; and
- outboard gangways of large container ships beyond the reach of the crane.

(2) This task must only be conducted by competent rescue personnel with specialised equipment.

42.4 Fire

(1) Emergency arrangements in the event of fire must be in addition to normal fire precautions and the various steps to be taken to prevent the outbreak of fire, control of flammables and sources of ignition, including smoking, and regular of the operations.

(2) If a fire is discovered, the alarm must be raised immediately since trivial fires frequently develop into serious fires.

(3) The emergency plan must set out the action to be taken when the alarm is raised. This must include alerting relevant emergency services.

(4) When the evacuation of an area is necessary, all workers must leave the area immediately along the nearest, safe route and go to the appropriate fire assembly point. At the fire assembly point a check must be carried out to ensure that nobody is missing.

(5) Fire extinguishers must only be used by persons who have had appropriate training and experience in the use thereof and when it is safe to use it. Persons using fire extinguishers must be aware of circumstances where the use of inappropriate extinguishers or equipment is dangerous. This includes the use of water on electrical equipment and on materials that react with water.

(6) Appropriate emergency access for trained fire-fighters and their equipment, and means of escape in case of fire must be kept clear at all times.

42.5 Cargo spillage

(1) Spillage of cargo containing dangerous goods poses a threat to stevedores in the immediate area. Emergency arrangements must include safe means of identifying the cargo. The IMDG Code must be consulted.

(2) Hazardous spillages must only be dealt with by trained personnel. Such personnel can be from local emergency services, or other specialists or stevedores appropriately trained to deal with low-level emergencies. In each case the immediate action must be-

- the evacuation of the area;
- the safe removal of any casualties;
- the identification of the material spilled; and
- the notification of the ship's crew and emergency services.

(3) Arrangements to deal with cargo spillages must take into account the fact that it can be necessary to deal with cargo spillages or leakage that occur on board a ship during a voyage when the ship enters port.

(4) Any arrangement for the disposal of spillages must take into account potential environmental hazards. Sweeping or washing residues over the side of the ship must be prohibited.

42.6 Falls into water

(1) By the nature of ports, falls into water are a commonplace hazard, and not all stevedores who fall into water can swim. Means by which such persons can rapidly escape from the water or be rescued must be provided.

(2) Speed is essential when rescuing persons in the water, as it can prevent tragic results. Means of rescuing must, therefore, be capable of being deployed very quickly. Delay can result in workers, clinging to a fixed floating object after a simple fall, being affected by fright, cold water, currents and tide and can soon make them lose consciousness and let go.

(3) When victims have been taken out of the water, they must be warmed, their wet clothes must be taken off, if possible, and they must be wrapped in blankets or other suitable wrapping.

(4) If a victim no longer seems to be breathing, artificial respiration must be applied by the mouth-to-mouth method or, if not possible, by the Holger-Nielsen method.

(5) Ship's personnel are experienced and better trained in this kind of emergency. Stevedores must ensure that the emergency procedure includes contacting the crew for assistance during this emergency.

42.7 Emergency planning

(1) Emergencies must be anticipated and arrangements for them prepared.

(2) The overall objectives of an emergency plan are to-

- contain and control emergency incidents;
- safeguard people on board the ship and in the neighbouring area; and
- reduce the effects of an incident and minimise damage to property and the environment.

(3) The plan must be concerned with four factors, namely-

- the hazard and nature of an event and its possible extent;
- the risk and probability of its occurrence;
- the consequences and possible effect on people and the environment; and
- the means and actions to be taken to minimise the consequences of the event.

43 General

43.1 Flexible intermediate bulk containers (FIBCs)

(1) Some FIBCs (for carrying powdered homogeneous cargo) are reusable but single trip FIBCs must never be reused. The lifting straps at the corners of FIBCs must always be lifted vertically.

(2) Before an FIBC is lifted, the certificate of conformity and a thorough examination certification (issued in the preceding 12 months) must be checked, and the bags must be inspected.

43.2 Pallets

Pallets must be free from visible defects liable to affect their safe use. The decks of wooden shipping pallets must be at least 35 mm thick. The space between the decks must be sufficient to allow easy access by the forks of lift trucks or the arms of other pallet-lifting devices.

43.3 Personal protective equipment

(1) Personal protective equipment must never be used as a substitute for eliminating or controlling a hazard at source. However, if this is not possible, appropriate personal protective equipment must be provided and used.

(2) Personal protective equipment must be provided by the employer at no cost to the stevedore.

(3) Personal protective equipment must generally be available in a range of sizes, as one size or type seldom fits all. Comfort and acceptability to the wearer are important, as the equipment might have to be worn for long periods.

(4) In addition to stevedore personal protective equipment, it is necessary that particular personal protective equipment necessary must be determined by an assessment of the hazards involved.

(5) Stevedores must be instructed in the correct use and care of the personal protective equipment provided to them. They must use the equipment when required and take good care of it.

(6) Managers and supervisors must ensure that appropriate personal protective equipment is used by all stevedores in accordance with instructions. Managers must give a clear lead by using the equipment when required.

(7) Based on a risk assessment the stevedore company might be required to provide additional PPE which caters for temperature variations, environmental and health conditions, all stevedores must be provided with the following personal protective equipment as a minimum:

- Boiler suit/overall with reflective properties covering for front, back, side and aerial view;
- Appropriate helmet/ hard with chin strap;
- safety shoes;
- hand gloves;
- colourful reflective vest or jacket with reflective properties covering front, back, side and aerial view.

(8) All persons in cargo-handling areas must wear high-visibility overalls or other high-visibility outer clothing.

(9) Loose clothing must never be worn by workers when working near open conveyors or other moving machinery. One-piece overalls are suitable.

(10) Stevedores handling substances that are corrosive or can be absorbed through the skin must wear appropriate impervious personal protective clothing.

(11) Stevedores handling substances that are corrosive or can be absorbed through the skin must wear appropriate impervious personal protective clothing.

(12) Personal protective equipment that is not in use must be kept in suitable facilities. If the equipment or clothing can be contaminated by toxic or otherwise dangerous substances, it must be kept separate from the mess rooms for workers.

(13) All personal protective equipment must be regularly cleaned and maintained in an efficient and hygienic condition and replaced when necessary.

(14) Filters in respiratory protective equipment and other components with a limited capacity or shelf life must be regularly replaced in accordance with the manufacturer's recommendations.

(15) Reusable personal protective equipment must be washed and disinfected, as appropriate, before being reissued.

43.4 Conveyors

Stevedores working with conveyors must be aware of the dangers of loose equipment, e.g. spades, or brooms getting caught in the conveyor and causing injury.

Annex 1: Minimum Stevedore Safety Induction Training

Stevedore safety induction training

Knowledge, understanding and proficiency	**Methods for demonstrating competence**	**Criteria for evaluating competence**
General understanding of the Maritime Occupational Safety Regulations and the Code	Identifies and explains various Regulations and sections of the Code	Correctly identifies safety criteria from a multi-choice list, describing each
Knows the correct PPE to war for the operation being performed	Identifies and explains the correct use of PPE for any particular operation including hazardous cargo	Indicates the correct application of PPE in relation to a given situation (as listed)
Knowledge of how to safely access a ship, holds, cargo stows	Demonstrates how to use a variety of access methods	Correctly demonstrates how to safely use access equipment
Understands the dangers associated with the consumption of alcohol and drugs	Understands the effects of alcohol and drugs on the body and the dangers to own person and fellow workers	Conveys that is dangerous to use alcohol and drugs before going on shift
General knowledge of various types of ships and cargoes	Explains the difference of various ships and cargoes	Demonstrates the ability to identify various ships and cargo types using diagrams and photographs
Knowledge of common lifting equipment used on a shop and the dangers of swinging and falling cargo	Explains the difference between the types of lifting equipment	Demonstrates the ability to identify various types of lifting equipment using diagrams and photographs and able to explain the dangers of standing near moving loads
Understands the danger of standing in the square of a hatch while cargo is being lifted	Explains that cargo can fall out of a lift and that another person can throw shackles or dunnage down the hold	States that a person must stand in the wings when cargo is being lifted and

		that items must be lowered into a hold not thrown
Understands symbolic safety signs displayed on a vessel	Identifies and explains the application of a variety of shipboard safety signs	Explains a person's actions relevant to a safety sign
Knows who to and how to report an unsafe act and conditions	Identifies who to contact and explains how to report an unsafe act, condition or incident	Knows the role of the safety appointee, officer and committee
Knows what to do in the event of various emergency situations	Explains the correct procedure for emergency situations	Details the procedure for emergency situations
Understands the importance of good housekeeping	Identifies poor housekeeping and explains the necessity of maintaining a safe working area	Correctly identifies poor housekeeping and how to maintain a clean and safe working area

Annex 2 Safe Systems of work for container operations

The following should be considered for inclusion in the safe system of work for accessing and working on containers tops aboard ships:

1. Supervision
   Container top work should only be conducted under the supervision of a competent person who is aware of the hazards and precautions.

2. Training
   (a) Stevedores and or terminal operator personnel must be trained on the safe system of work with respect to stevedores accessing and working on container tops.
   (b) Crane Operators responsible for transporting stevedores in man-cages to container tops must be competent.

3. Medical Fitness
   (a) Stevedores should be medically fit to work at heights.
   (b) Crane Operators responsible for transporting stevedores in safety cages to containers tops must also be medically fit.

4. Personal Protective Equipment (PPE)
   (a) personal protective equipment is to be worn
   (b) Fall prevention and fall arrest equipment must be regularly inspected for defects.

5. Equipment
   (a) The construction of man-cages must comply with section 4.22 of the Code.
   (b) Man-cages cages, platforms on the cranes headblocks and must be inspected for defects at least every quarter and same recorded.
   (c) Ships lifting appliances and shore cranes must be tested and inspected according to the provisions of the Code.

6. Transportation of Stevedores in man-cages
   (a) When the crane is being used to transport stevedores the maximum speed of hoist and trolley drives should be limited to 0.76 m per second. The movement should be smooth.
   (b) All parts of the body, particularly the hands and head must be kept inside the safety cage, platform or gondola at all times.

7. Lighting
Adequate illumination should be provided if work on container tops is necessary during the hours of darkness.

8. Adverse Weather Conditions
The safe system of work for container top work should clearly identify the weather conditions under which all container handling operations should discontinue e.g. high winds.

9. Communication
(a) When stevedores are working on container tops, in conjunction with a crane, it is important that a clear communication system is established with the Crane Operator. There should be one person in charge of each operation on container tops and the Crane Operator is to follow instructions from that person only.
(b) Communication with the Crane Operator can be by radio, hand signals or by a third party such as a supervisor.
(c) If handheld radios are used, caution is to be exercised in allocating channels and the parties are to identify who they are and who they are talking to (call signs), to ensure that an instruction by one Crane Operator is not acted upon by another.

10. Flat Racks
(a) Difficulties may also occur when access is necessary to block stows or flat racks, open top, over height, soft top or tank containers which do not have rigid roofs. Ship planners must arrange for such containers to be stowed in alternate rows with conventional closed containers so that there is safe access to both sides of these types of containers.
(b) The use of over height lifting frames can eliminate the need to manually connect lifting gear to containers with over height cargo.

11. Jammed Twistlocks
The freeing of jammed container securing devices are operations that need to be undertaken by experienced persons who are aware of the potential dangers of such operations.

12. Ships Gear
When ship's gear is used to handle containers, where practicable, automatic spreaders should be used. This will eliminate the necessity for stevedores to work on container tops to hook or unhook lifting gear.

13. Means of Accessing Container Tops

Methods of accessing container tops are listed in section 7.16.10 The preferred means of accessing container tops and the risks and precautions attached to this should be included in the safe system of work.

14. Work on Top of Containers
Methods of working safely on container tops are listed in the Annex 2. The preferred means of safe container top work and the risks and precautions attached to this should be included in the safe system of work.

15. Emergencies
Should a stevedore fall whilst using a fall arrest system, an effective means of rescuing him / her should be in place to prevent suspension trauma.

Annex 3 Certification of a stevedore, welders, fire watch and incidental person as fit for duty by an Occupational Medicine Practitioner

(1) A stevedore, welder, fire watch and incidental persons shall be examined and certified fit for duty by an Occupational Medicine Practitioner in accordance with the Medical Surveillance Protocols prescribed in the following Table:

Table 1.
Medical Surveillance protocols: Stevedore, Ship repair and maintenance contractor or incidental person

Medical Surveillance Protocols	Medical History	Physical Assessment	Psychological questionnaire	Audiometry	Spirometry	Colour Vision screen	Chest X-ray	Biological effect monitoring	Immunology screening	Biological monitoring
Administrative Staff	v	v	-	-	-	-	-	-	-	-
Supervisors / foreman / project managers	c	c	-	c	c	-	-	-	-	-
Welders/ Fire Watch	c	c	c	c	c	-	-	c	c	
Mobile Machinery operators	c	c	-	c	c	-	?*	-	-	-
Lashing Hands	c	c	c	c	c	-	-	-	-	-
Signallers- gangways/man-cages	c	c	c	c	c	-	c	-	-	-
Hatchmen	c	c	c	c	c	-	c	-	-	-
Drivers	c	c	-	c	c	-	-	-	-	-
General Workers	c	c	c	c	c	-	c	-	-	-

?*=dependent on cargo
V= compulsory
V= voluntary

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(2) An Occupational Medicine Practitioner shall, when conducting an assessment of whether a bulk cargo stevedore, or incidental person is fit

for duty, comply with the guidelines prescribed in the following Table: Provided where the bulk cargo is not listed hereunder, the Material Safety Data Sheet (MSDS) or the International Maritime Solid Bulk Cargoes Code (IMSBC Code) shall be consulted for guidance:

Table 2.
Specific guidelines for various bulk cargo handled in the stevedore industry

Medical Surveillance Protocols	Medical History	Phsyical Assessment	Spirometry	Chest X-ray	Biological effect monitoring	Immunology screening	Biological monitoring	Comments
1.Wheat	x	x	x			x*		Immunology testing if atopic symptoms present
2. Mineral dust	x	x	x	x				High risk exposure to bulk product
3. Fruit	x	x						
4. Rice (bagged)	x	x						
5. Sugar (bagged)	x	x						
6. Cement (bagged)	x	x	x	x*				If cement dust exposure from unbagged/bulk product, spirometry, CXR indicated.
7. Anthracite (bagged)	x	x	x*	x*				If notable exposure from bulk product, spirometry and CXR indicated.
8. Manganese ore (bulk)	x	x	x	x	x*		x*	If exposure exceeding 50% OEL, Biological monitoring will be required.
9. Urea (bulk)	x	x	x					
10. Coal (bulk)	x	x	x	x				
11. Soya (bulk)	x	x	x					
12. Free-flow agriproducts (bulk)	x	x	x					
13. Chrome ore (bulk)	x	x	x				x*	If exposure exceeding 50% OEL, Biological monitoring indicated.

140

Annex 4: Man-cage use inspection checklist

	Requirement	Documentation	Available		Comments
1.	**Design and Manufacturing**		**Y**	**N**	
a.	Copy of applicable standard	EN 14502-1			
b.	Design and construction certified by a professional engineer registered with (ECSA)	Proof of registration & drawings			
c.	User instructions	Manual			
2.	**Risk Assessment**				
a.	Risk Assessment for the operation	Task Risk Assessment			
b.	Design safe operating/working procedures	SOP/SWP			
c.	Provide training on safe operating procedures to the workers using man- cages, signallers and crane operators	Training Cert / Attendance Register			
d.	Job observations	Completed job observation			
e.	Planning for potential emergencies	Emergency plans			
3.	**Lifting Gear (by shore contractor)**				
a.	Dedicated lifting gear for man-cage	Company to confirm			
b.	Inspection of lifting gear assembly by a Competent lifting Machinery Inspector (LMI)	Quarterly Inspection Proof load certificate Proof of competence			
c.	The method of attachment must be such that accidental disconnection cannot take place.	-			

4.	**Ships Lifting Appliance**				
a.	Copy of the Ships Gear Register	Gear Register			
b.	Crane Operators crane inspection	Crane Inspection checklist (visual)			
c.	Competent Crane Operator with valid medical certificate of fitness (shore contractor)	COC & medical certificate of fitness			
d.	Ships crane approved for lifting of persons	Certificate			
5.	**Signaller**				
a.	Medical certificate of fitness	Certificate of Medical fitness			
b.	Signalling training	Training certificate (training can be inhouse)			

Part 3 Draft Code of Safe Working Practice for Ships Working Cargo in South African Ports, 2021

Section 1

Introduction

This Code of Practice sets out the procedures to be followed by employers and their staff to foster good safety attitudes and practices and a healthy working environment so far as is reasonable and practicable.

All activities performed on, or in, a ship either afloat, in floating dock, graving dock, or slipway or any other platform used for ship repair and maintenance are subject to the South African Merchant Shipping Act, 1951 (Act No. 57 of 1951) and the Maritime Occupational Health and Safety Regulations of 1994.

The ship repair industry in South Africa is faced by the following factors including:

(1) Nearly all repair work is carried out, in or on, vessels owned by a Shipowner. The repairer has little or no control over the working conditions on board, the facilities or the equipment provided by the Shipowner. The Ship repairer must rely on the statutory authorities control to ensure that internationally acceptable standards are maintained. If the ship is providing sub-standard working conditions, the Ship repairer must either decline to work on the ship or require the Shipowner to render the working area safe.

(2) In the event of a dispute, the Ship Repairer shall refer the matter to the Principal Officer of the South African Maritime Safety Authority.

(3) It is assumed that there will be a Master, Chief Engineer Officer and Crew on board

the ship and that they are competent to act in their various capacities.

(4) The ship may, on occasion, be unmanned, possibly at a remote berth and the repairer must, in those circumstances, take all necessary precautions and provide adequate supervision to ensure the health and safety of the staff.

(5) Few ship repairers have repair berths close to their administration offices and the chain of responsibility for safety becomes extended. It is therefore necessary to ensure that Supervisors are correctly trained and are given the authority to ensure that the regulations are observed.

(6) Repair teams vary in number from a major steelwork renewal in drydock, which may involve 30 or more staff, to a mechanical job afloat involving one artisan and a helper.

Policy Statement

This Code of Practice must be observed by the ship repair and maintenance industry to ensure the implementation of safe practices in their activities.

The protection of the health and safety of all staff and the preservation of the environment is paramount.

This Code must be read with the Merchant Shipping Act, 1951 (Act No. 57 of 1951), the Maritime Occupational Health and Safety Regulations, 1994 and the Occupational Health and Safety Act, 1993 (Act No. 85 of 1993).

Definitions

"accident", as defined by the Act, in relation to a vessel, includes-

a) the collapse or overturning of any lift, crane, davit, derrick, mobile powered access platform, access equipment, staging or bosun's chair or the failure of any load bearing part thereof;

b) the explosion, collapse or bursting of any closed container, including a boiler or boiler tube, in which there is any gas (including air), liquid or any vapour at a pressure greater than the atmospheric pressure;

c) any electrical short circuit or overload resulting in fire or explosion;

d) the sudden, uncontrolled release of flammable liquid or gas from any system, plant or pipeline;

e) the uncontrolled release or escape of any harmful substance;

f) (either of the following occurrences in respect of any pipeline, valve or any piping system in a vessel-

(i) the bursting, explosion or collapse of a pipeline;

(ii) the accidental ignition of anything in a pipeline or of anything which, immediately before it ignited, was in a pipeline;

g) any contact of the human body with loose asbestos fibre;

h) the failure of any lashing-wire, chain or appliance;

i) any collapse or significant movement of cargo;

j) the malfunction of any hatch cover, hatch cover control wire or any other mechanism;

k) any person falling overboard;

l) the parting of a tow rope;

m) the failure of bilge pumping arrangements or life-saving or fire-fighting equipment to operate;

"Act" means the South African Merchant Shipping Act, 1951 (Act No. 57 of 1951);

"air monitoring" means the monitoring of the concentrations of airborne hazardous chemical substances;

"asphyxiation" means to be deprived of oxygen;

"Authority" means the South African Maritime Safety Authority;

"authorized person" means a person authorized by the employer, the master of the

ship or a responsible person to undertake a specific task or tasks and possessing the necessary technical knowledge and experience;

"biological monitoring" means a planned programme of periodic collection and analysis of body fluid, tissues, excreta or exhaled air in order to detect and quantify the exposure to or absorption of any substance or organism by persons;

"Chief Executive Officer", in relation to a body corporate or an enterprise, means the person who is responsible for the overall management and control of the business of such body corporate or enterprise;

"confined space" means a space which has any of the following characteristics:

(a) limited openings for entry and exit;

(b) unfavourable natural ventilation; and

(c) is not designed for continuous worker occupancy, and includes, but is not limited to, cargo spaces, double bottoms, fuel tanks, ballast tanks, pump-rooms, compressor rooms, cofferdams, void spaces, duct keels, inter-barrier spaces, engine crankcases and sewage tanks;

"competent person" means a person possessing the knowledge and experience required for the performance of a specific duty or duties and acceptable as such to the competent authority;

"competent person in terms of working in confined spaces" means a person who holds a minimum of National Diploma (NQF level 6) with-

a) a major in chemistry or

b) hold an equivalent qualification or

c) a person registered as an Occupational Hygiene Technologist or higher with the Southern African Institute for Occupational Hygiene,

d) a person who has attended training in the proper use and care of a multi-gas dictator provided by the manufacturer;

e) a person who has basic understanding of vessel structure and tankers and has three years working experience in the chemical analysis field, environmental health and occupational hygiene atmospheric sampling field;

"contractor" means an employer, as defined in the Act, who performs ship repair and

maintenance work and includes principal contractors;

"dangerous goods" means goods which by reason of their nature, quantity or mode of stowage, are either singly or collectively liable to endanger the lives or health of persons on or near the ship or to imperil the ship and includes all substances within the mean or the expression "explosives", as used in the Explosives Act, 1956 (Act No. 26 of 1956) and any other goods specified in the regulations as dangerous goods;

"earthed" means connected to the general mass of earth in such a manner as will ensure at all times an immediate safe discharge of electrical energy;

"employee" means, any person other than a crew member who is employed by or working for an employer and receives, or is entitled to receive any remuneration or who works under the direction or supervision of an employer or any other person who in any manner assists in the carrying on or the conducting of business of an employer in so far as this person is performing stevedoring, or shore contracting or any other work whatsoever in the course and scope of his employment on or in a vessel;

"employer" means any person other the an employer of the master or crew who employs any person or expressly or tacitly undertakes to remunerate the person, or who permits any person in any manner to assist him in performing stevedoring or shore contracting or any other work on board a vessel;

"explosion-protected" refers to electrical equipment that is constructed and installed in such a way that it is not liable to ignite a flammable or explosive atmosphere, should it occur. Such equipment should be certificated as complying with an appropriate standard acceptable to the competent authority;

"fire watch" means a person holding a basic Marine Fire Prevention and Fire Fighting certificate from an institution accredited for such training by the Authority;

"flammable" means, capable of being ignited and burning in air;

"flammable" means any liquid which produces a vapour that forms and explosive mixture with air and includes any liquid with a closed-cup-flash-point of less than 55º Celsius;

"flash point" the lowest temperature at which a flammable liquid can form an ignitable mixture in air;

"gantline" the hauling rope on a stage of bosun's chair;

"gas-free" means that the tank, compartment or container has sufficient fresh air introduced into it in order to lower the level of any flammable, toxic or inert gas to that required for any purpose;

"harbour", for purposes of this Code has a corresponding meaning to "port";

"hot work" means work involving sources of ignition or temperatures sufficiently high to cause the ignition of a flammable gas mixture or combustibles. This includes any work requiring the use of welding, burning or soldering equipment, blow torches, some power-driven tools, portable electrical equipment, which is not intrinsically safe or contained within an approved explosion proof housing or internal combustion engines;

"hot work permit" means a document issued by the Port Authority permitting specific hot work to be conducted during a specific time interval in a defined area;

"Inspection" refers to a visual inspection by a responsible person carried out in order to determine whether, inasmuch as can be ascertained in such manner, the equipment is safe for continued use;

"lifting appliance" means any fixed or mobile appliance which is used for suspending, raising or lowering a load or moving it from one position to another whilst suspended and includes a block and tackle, chain block, hoist, crane. jib crane, lift truck but does not include;

a) any screw, belt, bucket or any other conveyors used for the transport of cargo or people;

b) any survival craft or rescue boat launching or recovery appliances or arrangements; or

c) any pilot hoist;

"lifting gear" means any gear by means of which a load can be attached to a lifting appliance and which does not form an integral part of the load or the appliance, and includes a lifting beam or spreader, lifting frame or forks, bulk bag, grab or any similar article;

"lizard" means a short rope with a thimble in the eye at one end. The thimble can be used a guide or fairlead for another rope and can sometimes be used in place of a single

sheave block;

"LNG" means liquid natural gas;

"LPG" means liquid petroleum gas;

"Marine Chemist" has corresponding meaning to the competent person in terms of working in confined spaces;

"noise rating limit" means the value of the 8-hour rating level, 85dBA at and above with hearing impairment is likely to result;

"occupational hygiene assessments" includes air monitoring, biological monitoring, medical surveillance and noise monitoring assessments;

"Personal Protective Equipment (PPE)" means minimum PPE that must be provided, based in risk assessment of the task, and worn by ship repair and maintenance workers whilst working on board a vessel and includes-

- boiler suit/overall with reflective properties covering for front, back, side and aerial visibility;
- appropriate helmet/hard hat for the task in some instances it must have a chin strap;
- safety shoes with anti-slip properties;
- hand gloves appropriate for the task based on the risk assessment;
- reflective vest or jacket with reflective properties covering for front, back, side and aerial visibility, based on a risk assessment this might not be appropriate for some tasks;
- eye protection; and

ear protection appropriate for the task;

"Police" means the South African Police Services (SAPS);

"port" for the purpose of this Code means a port as defined in the National Ports Act, 2005 (Act No. 12 of 2005) and includes any proclaimed small harbour in South Africa;

"portable electrical tool" means any electrically operated implement, with the exception of ordinary household electrical appliances, which is designed for use with–

(a) A flexible cord at the supply end and which is intended for use by hand and to be carried by hand at the place of work;

(b) A flexible cable at the supply end and which is intended for use by hand and to be moved by hand at the place of work;

"principle contractor" means an employer, as defined in the Act, who performs ship repair and maintenance work and is appointed by the client to be in overall control and management of a part or the whole of a ship;

"Regulations" means the Maritime Occupational Health and Safety Regulations, 1994 as amended and issued under the Act;

"responsible person" A person appointed by the employer, the master of the ship or the owner of the gear, as the case can be, to be responsible for the performance of a specific duty or duties and who has sufficient knowledge and experience and the requisite authority for the proper performance of such duty or duties;

"safety appointee" means a person trained in basic health and safety management which includes hazard identification and risk assessment and is appointed as such in terms of regulation 31A(1) of the Regulations and who reports to the Safety Officer. ;

"safety officer" means a person who holds an NQF level 5 training qualification in Health and Safety management accredited by a relevant Education and Training Authority or an equivalent NQF level 6 qualification from a recognised higher education institution and is appointed as such in terms of regulation 31(1) of the Regulations;

"safe working load" is the maximum gross load that can be safely lifted by a lifting appliance or gear or item of loose gear in any given condition;

"scaffolding" means any temporary elevated platform and supporting structure used for providing access to and supporting workmen or materials or both;

"shipyard competent person" in the case of confined spaces means a person with a minimum NQF level 5 certificate in Health and Safety management which includes hazard identification modules and has;

(a) completed a training in proper care and use of a multi-gas detector provided by the manufacturer;

(b) has a minimum of two years working in the ship repair and maintenance industry or oil and gas industry and;

(c) has basic knowledge of vessel structure;

"ship repair and maintenance contractor" means a person temporarily employed on or in a vessel, to affect general or specific repairs, alterations, renovations, improvements, painting, maintenance of a vessel or machinery, tank or hatch cleaning and related tasks, and

"Ship repairer" has a corresponding meaning;

"staging" has the same meaning as **"scaffolding"**;

"supervisor" means a person with at least 1-year experience in the cleaning, painting and associated trades, or 3 years' experience in all other ship repair trades who is fully conversant with the requirements of this Code and the Regulations, and capable of identifying unsafe working conditions and acts and have the authority to correct any such unsafe conditions and acts;

"thorough examination" means a detailed visual examination by a competent person, if necessary supplemented by other suitable means or measures, in order to arrive at a reliable conclusion as to the safety of the item of equipment examined; and

"workplace" means any place on a vessel where an employee performs work in the course of their employment.

General Provisions

1. Responsibilities

Safety onboard ships is the responsibility of everyone who is directly or indirectly concerned with work in or alongside and needs to cooperate to develop safe systems of work and ensure that they are put into practice. The introduction of new ideas and concepts demands special attention to safety requirements. The guidance given in this Code of practice relates to both new and existing working practices.

1.1 Authority

The South African Maritime Authority (hereinafter "Authority") is the competent authority. The Merchant Shipping Act, 1951, requires accidents and incidents to be reported to the Authority

1.2 Client

A client shall be responsible for-

1) Preparing a documented health and safety specification for ship repair and maintenance work, and provide any principal contractor who is making a bid or appointed to perform ship repair and maintenance work for the client with the same;

2) Providing the principal contractor with any information which might affect the health and safety of any person at work carrying out ship repair and maintenance work;

3) Appointing each principal contractor in writing for the project or part thereof on a ship;

4) Ensuring that where changes are brought about, sufficient health and safety information and appropriate resources are made available to the principal contractor to execute the work safely;

5) Ensuring that every principal contractor is registered and in good standing with the Compensation Fund or with a licensed compensation insurer prior to work commencing on a ship;

6) Ensuring that potential principal contractors responding to request for quotation (RFQ), have made provision for the cost of health and safety measures for the duration of the project;

7) Discussing and negotiating with the principal contractor the contents of the health and safety plan and thereafter finally approve the health and safety plan for implementation;

8) Ensuring that a copy of the principal contractor's health and safety plan is available on request to an employee, contractor or the Authority; and

10) Ensuring that prior to appointment of a principal contractor to perform ship repair and maintenance work, the client is reasonably satisfied that the principal contractor that they intend to appoint has the necessary competencies and resources to carry out the work safely.

1.3 Principal Contractor

1) A principal contractor shall provide and demonstrate to the client a suitable and

sufficiently documented health and safety plan, based on the client's documented health and safety specification, which shall be applied from the date of commencement of and for the duration of the ship repair and maintenance work.

2) A principal contractor shall take reasonable steps as far as is necessary to ensure co-operation between all contractors to enable each of those contractors to comply with the provisions of this Code.

3) A principal contractor shall be responsible for:

a.) Providing any contractor who is making a bid or appointed to perform ship repair and maintenance work for the principal contractor, with the relevant sections of the documented health and safety specification pertaining to the ship repair and maintenance work which has to be performed;

b.) Appointing each contractor in writing for the part thereof of the project on a ship repair work site;

c.) Taking reasonable steps to ensure that each contractor's health and safety plan is approved, implemented and maintained on the ship repair work site: Provided that the steps taken shall include periodic audits at intervals mutually agreed upon between the principal contractor and contractor(s);

d.) Stopping any contractor from executing ship repair and maintenance work which is not in accordance with the principal contractor's and/or contractor's health and safety plan for the ship or which poses a threat to the health and safety of persons;

e.) Ensuring that where changes are brought about, sufficient health and safety information and appropriate resources are made available to the contractor to execute the work safely;

f.) Ensuring that every contractor is registered and in good standing with the compensation fund or with a licensed compensation insurer prior to work commencing on site; and

g.) Ensuring that potential contractors submitting tenders have made provision for the cost of health and safety measures during the ship repair and maintenance process.

4) A principal contractor shall hand over a consolidated health and safety file to the client upon completion of the construction work and shall, in addition include a record

of all drawings, designs, materials used and other similar information concerning the completed structure and a comprehensive and updated list of all the contractors on the ship accountable to the principal contractor, the agreements between the parties and the type of work being done is included and available.

5) No principal contractor shall appoint a contractor to perform ship repair and maintenance work unless the principal contractor is reasonably satisfied that the contractor they intend to appoint, has the necessary competencies and resources to perform the construction work safely.

1.4 Contractors

1) A contractor shall provide and demonstrate to the principal contractor a suitable and sufficiently documented health and safety plan, based on the relevant sections of the principal contactor's health and safety specification provided by the principal contractor, which plan shall be applied from the date of commencement of and for the duration of the ship repair and maintenance work.

2) Where a contractor appoints another contractor to perform ship repair and maintenance work, the responsibilities as determined in section 1.3(3) that apply to the principal contractor shall apply to the contractor as if such contractor were the principal contractor.

3) No contractor shall appoint another contractor to perform ship repair and maintenance work unless they are reasonably satisfied that the contractor they intend to appoint, has the necessary competencies and resources to perform the construction work safely.

4) Contractors shall co-operate with the principal contractor as far as is necessary to enable each of them to comply with the provisions of the Code.

5) Every contractor shall as far as is reasonably practicable, promptly provide the principal contractor with any information which might affect the health and safety of any person at work carrying out ship repair and maintenance work or any person who might be affected by the work of such a person at work or which might justify a review of the health and safety plan.

1.5 Labour providers

Labour providers, commonly known as brokers and sub-contractors are responsible to provide labour that meets the training requirements of their duty and medical standards specified in the regulations and the Code.

1.6 Management of ship repair and maintenance companies (Employer)

Occupational Health and Safety Policy

(1) The employer, in consultation with workers and their representatives must set out in writing an Occupational Health and Safety policy in line with all applicable legislation, which should be:

a) specific to the organisation and appropriate to its size and the nature of its activities;

b) concise, clearly written, dated and made effective by the signature and endorsement of the employer or the most senior accountable person in the company;

c) communicated and readily accessible to all persons at their place of work;

d) reviewed for continuing suitability; and

e) made available to relevant external interested parties, as appropriate.

(2) The Occupational Health and Safety policy must include, as a minimum, the following key principles and objectives to which the organisation is committed:

a) protecting the safety and health of all workers of the organisation by preventing work-related injuries, ill health, diseases and incidents;

b) complying with relevant provisions of the Occupational Health and Safety Act, 1983 and the regulations thereunder, voluntary programmes and collective agreements on good practices;

c) ensuring that workers and their representatives are consulted and encouraged to participate actively in all elements of the Occupational Health and Safety management system; and

d) continually improving the performance of the Occupational Health and Safety management system

(3) Management of companies are required to ensure that (for both fulltime, casual and labour providers' workers)—

a) all workers are appropriately trained;

b) all workers are aware of the hazards of the work being undertaken;

c) all workers are aware of and comply with the provisions of the Code;

d) all workers are properly supervised;

e) all workers are provided with the minimumship repair and maintenance personal protective equipment;

f) all workers adhere to safety policies and instructions;

g) all workers have suitable reporting facilities for unsafe working conditions;

h) all workers are medically fit;

i) all workers are not likely to suffer from fatigue due to excessive working hours;

j) all workers are provided with special protective clothing required for hazardous activities;

k) all equipment brought on board a ship adheres to legislative requirements;

l) safe working systems are in place;

m) appropriate corrective action is taken when any faults in plant or equipment are reported or unsafe working conditions are noted;

n) the workplace is inspected for occupational health and safety at the commencement of each shift;

o) accidents requiring reporting to the competent authority are reported within the stipulated time; and

p) plans to respond to accidents are in place.

1.7 Supervisors/Foremen

Supervisors are the link on board between labour and management. Supervisors must—

1) bring to the attention of employees the hazards of the work being conducted;

2) ensure that the correct protective clothing is being used;

3) ensure that any defective equipment is not used;

4) ensure that employees to whom work is allocated are trained;

5) ensure that adequate lighting and barricading are in place;

6) bring to the attention of the ship's personnel any of the ship's equipment deemed to be unsafe. If necessary, work should be stopped;

7) ensure that area of work has been inspected in respect of occupational health and safety;

8) ensure that gas free certificate or hot work permit is issued as the case may be; and

9) ensure that permit to work is issued and signed by the master before work commences.

1.8 Employees

Ship repair and maintenance employees must—

1) ensure that their own actions do not endanger themselves or other workers;

2) comply strictly with all health and safety policies and instructions;

3) make use of all health and safety guards, devices and protective clothing;

4) notify their supervisor(s) immediately of any defective equipment and hazardous conditions or accidents;

5) not interfere with any safety devices;

6) refrain from consuming alcohol or narcotics prior to a shift or during a shift; and

7) when not working, leave the work area.

1.9 Ship's personnel

Ship's personnel must ensure—

1) means of safe access to the ship and working areas;

2) that personnel not directly involved in the specific activity being performed are not allowed into that area;

3) that the ship's equipment is well maintained;

4) that working areas are well lighted and ventilated;

5) that the ship's rigging plans are available

7) that the ship's crew members are not allocated work where ship repair and maintenance is being conducted unless absolutely unavoidable;

8) that the ship's personnel are always available to open and close hatch covers and these are secured open;

9) are available to operate ships equipment;

10) that the on-board lifting appliances and items of loose gear register is available for inspection; and

11) that railing or fencing as the case may be is available and of sound material.

1.10 Hazard identification, risk assessment and preventive and protective measures

1) For work which by its very nature exposes workers to hazardous chemical, physical or biological factors, psychosocial factors and climatic conditions, arrangements must be made for the identification and periodic assessment of these hazards and risks to health and safety at each workplace in both the facility and every new ship, generated by the use of different operations, tools, machines, equipment and substances. This review, together with other available data, must be used for the development of safe workplans/procedures.

2) Employers must plan and implement appropriate preventive and protective measures required to prevent the identified hazards and assessed risks, or reduce them to the lowest reasonable and practicable level, in conformity with the Act.

3) Employers must have a system in place, in consultation with all workers and their representatives, to identify hazards, assess risks to safety and health and apply control measures in the following order of priority:

a) eliminate the hazard;

b) control the risk at source, through measures such as substitution (for example, replacing hazardous equipment or substances with less hazardous equipment or substances) or engineering controls where possible;

c) minimise the risk through the design of safe work procedures; and

d) in so far as the risk remains, provide for the use of PPE, including protective

clothing, in various sizes, adaptable to Safety and health in ship repair at no cost to workers, and implement measures to ensure its use and maintenance.

4) In giving effect to the above, the employer must establish, implement and maintain documented procedures to ensure that the following activities take place:

a) hazard identification;

b) risk assessment;

c) control of risks; and

d) a process to monitor and evaluate the effectiveness of these activities.

1.10.1 Hazard identification

The identification of hazards in the workplace must take into account:

a) the situation or events or combination of circumstances that have the potential to give rise to injury, illness or fatality;

b) the nature of potential injury or illness relevant to the activity, product or service;

c) past injuries, dangerous occurrences and illness due to similar activity;

d) the ship design, work processes, materials, plant and equipment;

e) the fabrication, installation, commissioning, handling and disposal of materials, plant and equipment;

f) the purchasing of goods and services;

g) the contracting of plant, equipment, services and labour, including contract specification and responsibilities in relation to and of contractors and their subcontractors; and

h) the inspection, maintenance, testing, repair and replacement of plant and equipment.

1.10.2 Risk assessment

1. Risk assessment is a process used to determine the level of risk of injury or illness associated with each identified hazard, for the purpose of control. All risks must be assessed in consultation with workers and their representatives, and have control

priorities assigned, based on the assessed level of risk. The priority for control increases as the assessed level of risk rises.

2. The risk assessment process must take account of the likelihood and severity of injury or illness from the identified hazard. There are many established and recognized methods and techniques that can be implemented for the purpose of risk assessment.

1.10.3 Risk control

1. Unless a particular hazard or exposure to the hazard is removed, the risk associated with such a hazard can never be completely eliminated. In such cases such a risk must be controlled following the order of priority described in section 1.10, paragraphs 3 and 4.

2. The employer must plan the management and control of those activities that can or may pose a significant risk to safety and health.

3. Control measures must be monitored and reviewed at regular determined intervals and, if necessary, revised, especially when circumstances change or if new information becomes available about the risks identified or the suitability of existing control measures. Control measures must also be reviewed and, if necessary, revised following an accident.

1.10.4 Evaluation

1. The processes of hazard identification, risk assessment and control must be subject to a documented evaluation of effectiveness and modified as necessary, to establish an ongoing process for continual improvement.
2. Evaluations must take into consideration advances in technology, knowledge and experiences globally.

1.10.5 Initial review of work

Before work commences on a ship, the employer should guarantee that an initial review is carried out by competent persons and a Safety Officer to-

1) identify the necessary work procedures and the associated hazards based

on the scope of work;

2) assess the risks to safety and health expected to arise from the proposed work environment or tasks;
3) determine whether planned or existing controls are adequate to eliminate hazards or control risks;
4) ensure that only competent workers are allocated to tasks;
5) ensure where applicable that ship's lifting plant is in good working order.

1.11 Safe systems of work

1) Accidents are unplanned events. Working in a structured manner that recognizes and controls potential hazards can minimize such events. This is the basis of a safe system of work. Such systems result in safer and more efficient operations. Although they cannot have been developed with safety in mind, quality control systems similarly result in safer operations by ensuring that operations follow specified patterns, hereby minimizing unplanned events.
2) Development of safe systems of work must include consideration of-

- operations to be performed;
- workers who will carry it out;
- location of the work;
- working environment;
- nature of the work;
- plant, equipment and materials to be used; and
- precautions to be taken, including any necessary emergency arrangements.

3) A safe system of work must specify—
   - ✓ the task;
   - ✓ necessary competencies of workers;
   - ✓ equipment to be used, including protective equipment, where necessary;
   - ✓ potential hazards;

- ✓ control of the relevant hazards;
- ✓ procedures to be followed; and
- ✓ control and supervision.

4) To be effective, a safe system of work must be developed in consultation with all parties involved in putting it into practice. Once finalized, it must be promulgated by appropriate means and any necessary training carried out before it is put into effect. Supervision personnel must in practice monitor the implementation and effectiveness of the system and be alert to any problems that can occur.

5) Safe systems of work must be dated, signed off by management and reviewed periodically in the light of changes and operational experience and must be revised, as necessary.

6) Permit-to-work system Application

1. This section applies to the following types of high-risk work:

a) work which involves the use of any hazardous, volatile, corrosive or flammable chemical, material or solvent in significant quantities;

b) work involving entry into any confined space;

c) work at heights;

d) spray painting work;

e) abrasive blasting work carried out in a confined space;

f) testing or dismantling of any pipe or equipment that contains steam or contains, or had contained, oil or substances that are flammable, toxic or corrosive;

g) ballasting and de-ballasting of a ship;

h) repair or maintenance work carried out on the hydraulic system of a ship;

i) bunkering and transferring of fuel oil;

j) radiography work;

k) pressure testing;

l) electrical work;

m) such other work as the competent authority may specify; and
n) such other work identified as high-risk by the employer.

Implementation of permit-to-work system
2. Where any high-risk work is or is to be carried out, it should be the duty of the employer to:
a) develop and implement a permit-to-work system; and
b) appoint a health and safety officer or a competent person to issue a permit to work.

3. The permit-to-work system should provide that:
a) the high-risk work is carried out with due regard to the safety and health of persons carrying out the work; and
b) such persons are informed of the hazards associated with the high-risk work and the precautions they have to take.

4. Where any high-risk work is or is to be carried out, it should be the duty of the employer under whose direction any person carries out the high-risk work, to ensure that no such high-risk work is carried out without a permit to work in respect of that high-risk work.

5. All permits to work must be signed prepared by the foreman or supervisor for the activity with the help of the Health and Safety Officer and for the vessel with the crew on board, must be signed off by the Master or his representative.

1.12 Housekeeping

1) A housekeeping programme must be established and continuously implemented on each ship repair and maintenance project. It should include provisions for:

a) the proper storage of materials and equipment; and
b) the removal, at appropriate intervals, of scrap, waste and debris; and

c) cable management.

2) Loose materials which are not required for immediate use should not be placed or allowed to accumulate on the work area including deck so as to dangerously obstruct means of access to and from work areas.

3) Work areas and passageways that are slippery owing to oil or other causes must be cordoned off and cleaned up as soon as it is practicable.

4) Tools, bolts, nuts and other objects must not be left lying about where they could create a tripping hazard.

5) Scrap, waste, rubbish and dirt must not be allowed to accumulate at workplaces or in passageways.

6) Rubbish, dirt and refuse should not be thrown overboard and should be removed in an environmentally sustainable manner in accordance with applicable legislation.

1.13 Safety officers

Safety officers must be appointed in writing as required by regulation 31 of the Regulations and must comply with the requirements contained in that regulation.

1.14 Safety appointee

1) Safety appointees must be appointed in writing as required by the regulation 31A of the Regulations, 2021, and must comply with the requirements contained in that regulation.

2) safety appointee must instructs employees involved with ship repair and maintenance work to ensure that they adhere to observe the items noted in the Regulation 31A.

1.15 Safety committees

The committee must function as per requirements of Regulation 31b and must consider but is not be limited to the following:

1) consider every recommendation of the health and safety officer made in

terms of regulation 31(3)(e) and any recommendation of a health and safety appointee;

2) submit such recommendations referred to, to the employer together with its own recommendations;

3) inquire into any occupational health and safety matter that affects the employer or its employees and take the steps it may deem necessary to remove any hazard or potential hazard; and

4) monitor the employer's procedures and arrangements for ensuring that—

   a) an accident involving an employee is reported in terms of the Act and investigated by the health and safety officer and that appropriate corrective action is taken;

   b) every workplace is safe so far as reasonably practicable; and

   c) any equipment used by employees to work meets the applicable statutory requirements.

5) An employer shall keep proper minutes of every meeting of the health and safety committee for a period of at least three years and shall make the minutes available to the Authority upon demand.

1.16 First Aider

1) Where more than five employees work on board a vessel an employer shall ensure that there is readily available at that workplace a person holding a certificate of competency in first aid issued by an organisation accredited by the relevant Sector Education and Training Authority and approved by the Chief Inspector of the Department of Employment and Labour for that purpose.

2) Where there are more than 50 persons employed a first aider must be appointed for each group of 50 persons or part thereof.

1.17 Investigation of minor accidents, investigation and reporting of accidents and serious injuries

Minor accidents are those not required to be reported in terms of section 259 of the Act, read with the definition of an accident. Minor accidents can also be termed as a near miss and must result in an internal investigation, the result can identify corrective action to be taken to avoid a re-occurrence.

The analysis of all minor incidents and the compilation of trends will identify what areas of safety require attention.
Investigation and reporting of accidents and serious injuries

An accident or serious injury, which requires reporting to the competent authority, is defined in section 259 of the Act. These accidents must be reported to the authority in the shortest possible time, by telephone, immediately and at the first available opportunity the Casualty/Accident Report must be completed in conjunction with the Addendum to Casualty / Accident Report and submitted to the Authority.

The Master and the shore contractor are both separately obligated to report serious injuries occurring on board.
It should be noted that no person is allowed to disturb or remove any item involved in such an accident until given permission is given by the Authority to do so. A ship can be detained until the accident investigation is completed. When accidents are being investigated it is not only the direct cause of the accident, but also the underlying cause or causes which are often the real cause of the accident, that need to be considered.
Safety officers or persons undertaking incident investigations should be suitably qualified and appointed by their employer in writing.

1.18 Training

Regulation 30(4)(b) of Regulations requires that prior to any shore contractor being employed on a ship, they must have undergone a ship repair and maintenance health and safety induction training. The training content is contained in Annex 1.
All operators of machinery and equipment must provide evidence of competency for the

machinery or equipment employed to operate.

1.19 Medical Standards

1) Regulation 30(4)(b) of the Regulations requires that a person employed as a shore contractor must undergone a medical examination. Medical examinations are required to be undertaken on an annual basis.
2) The standard of medical fitness required is contained in Appendix 2 of this Code.
3) The cost of the medical examination is for the account of the employer.
4) Certain hazardous work can require more frequent examination in order to monitor any effects of exposure to a particular hazardous substance.
5) Specific activities requiring additional health and safety precautions are governed by the introduction into the Code of the regulations contained in the Occupational Health and Safety Act, 1993. The relevant regulations are the Environmental Regulations, Noise Induced Hearing Lost, Regulations, Diving Regulations (TBC), Hazardous Chemical Substances Regulations and Asbestos Regulations.

1.20 Personal Protective Equipment

In addition to the minimum personal protective equipment required to be supplied in terms of this Code and provisions of regulation 4 of the Maritime Occupational Safety Regulations, 1994, certain activities require additional personal protective equipment to be used.

The requirements for personal protective equipment of the Occupational Health and Safety Act, 1993, and its regulations are to be used for the following work involving asbestos, with reference to the Asbestos Regulations; chemicals, all substances listed in the Hazard Chemical Substance Regulations; lead, with reference to the Lead Regulations; noise, with reference to Noise Induced Hearing Loss biological agents, with reference to Hazardous Biological Agents; hot temperatures, with reference to the Environmental Regulations for Workplaces.

1.21 Self-propelled mechanical equipment

All self-propelled mechanical equipment must be fitted with a manual audible and visual warning device, and an automatic audible warning device operating during reversing movements.

1.22 Access Control

Stringent systems of access control to be implemented for workers accessing the ship to ensure that only the following people enters the ship:

- only authorised people;
- only workers instructed in the risk assessment for the project;
- only workers with evidence of having attended a ship repair safety induction training in the last 12 months; and
- only workers who had tested negative for blood alcohol or any other intoxicating substance and have no obvious signs of intoxication.

Entry to confined spaces to be strictly control and a guard to be in place to control entry and exit using a register. A guard must have training in face aid and understand what to do in the event of an emergency.

Section 2

2 Fire Prevention

Fire is a major hazard encountered o board ships it is important that safety measures put in place reflect that. Fire is not only a threat to life but also to property.

2.1 Smoking and Naked Lights

(1) Smoking on board is prohibited unless otherwise approved by the ship's Master in designated areas.

(2) In approving spaces for smoking areas, the vessel's Master must ensure that the areas will, remain free of flammable vapours and due account must be taken of the

prevailing wind conditions.

(3) In places where smoking is authorised, suitable containers should be made available for extinguishing cigarettes and disposing of matches.

(4) "**NO SMOKING**" notices throughout the ship must be strictly observed at all times.

(5) Fires are often caused by the indiscriminate discarding of burning cigarettes thrown overboard which may be blown back on board.

(6) The risk involved in carrying matches and, more particularly lighters when working on the ship should be impressed on all personnel. No one having on his person matches or lighters should be permitted to enter a prohibited space.

2.2 Spontaneous Combustion

Spontaneous combustion can occur in damp or oil-soaked rags or cotton waste. Plastic bags must be provided for the storage of oil-soaked rags or cotton waste, prior to removal from the ship for disposal ashore. Cleaning materials should not be stored adjacent to hot surfaces.

2.3 Compartmentation

The compartmentation of working areas aboard a vessel should be maintained at all times so that should fire starts it gets confined to a limited space or compartment. This will usually conform to the designed compartmentation of the vessel. No obstructions which would prevent the operation of fire doors, etc. between compartments or spaces should be tolerated.

2.4 Doors

As far as is possible, doors must be kept shut even if they are constructed of combustible material. If a fire starts the boundary sealing, thus provided, will keep the fire in check. Any malfunction of fire doors etc. should be immediately attended to and wherever practicable doors, skylights etc. should be closed when work is finished for the day.

2.5 Hot Soot

Incandescent carbon from the main or galley funnel or from the funnels or other craft alongside may ignite-flammable vapours or other combustibles. Once started, such sparking is not easy to stop. When it occurs, tank cleaning or other hazardous operations should cease immediately.

2.6 Portable oil engines

Unless a vessel is wholly gas free and frequent gas tests are made, the use of portable oil engines should be prohibited in the vicinity of spaces likely to contain flammable gas.

2.7 Hot work

1) Hot work permit is required for any hot work taking place on board. It is important that proper planning of tasks takes place to ensure that all required permits are applied for in advance. Poor planning often results in temptation to cut corners and conduct work such as hot work without a permit and little precautionary measures. Hot Work Permit is issued by the Port Authority or an Authority in charge of a harbour and then only a Master can issue own hot work permit.
2) Hot work permit must be valid for no more than 24 hours for all hot work in-
   - Tankers;
   - Hazardous or dangerous spaces which includes fuel tanks, cargo tanks, engine rooms, machinery spaces;
   - Spaces adjacent to hazardous and dangerous spaces; and
   - Areas where risk assessment indicate high risk of explosion or of fire.
3) Hot work permit can be extended at the discretion of the Port Authority and based on a risk assessment provided by the contractor to no more than 72 hours only for areas other than hazardous or dangerous.
4) No Hot work Permit shall be issued for more than 72 hours. The Authority can recommend that the hot work permit be withdrawn where in the opinion of the Authority the conditions of the Hot Work Permit are not met. The following conditions and precautions apply:

a) No hot work may be carried out without a written permit issued by the Port Authority, and the Master;
b) Do not commence hot work without first sighting the hot work permit, observing any special conditions thereon, and then being authorised to proceed by the Supervisor;
c) Before starting any hot work, thoroughly check the vicinity of the job to ensure that there is no flammable material beneath, behind or within the object under repair. All combustibles in way of the working area must be stripped clear;
d) Before commencing any hot work, ensure that a Fire Watch is in place. The Fire Watch can be from ship/shore. Fire watch to ensure that proper firefighting equipment is in place;
e) Fire Watch to check spots where sparks can reach and guard against sparks falling onto combustible material. Fire watch to ensure that there is no incompatible activity taking place nearby, such as painting. Fire watch to be equipped with combustible gas detector;
f) Where hot work is to be performed in confined spaces or tanks that could contain flammable or explosive liquids or gasses it is essential to obtain a Gas Free Certificate declaring space safe for hot work before applying for a Hot Work Permit from a Port Authority;
g) The conditions set out in the certificate must be strictly observed. These may include: continuous clean air ventilation, the blanking of all connections through which hazardous gasses or liquids may enter the space and provisions for rescue. If the space is unoccupied for a lengthy period the permit must be re-issued; and
h) A gas-free tank may become hazardous:
    - If there occurs a change in temperature causing vapour to be given off;
    - Upon dismantling or testing of fittings including heating coils which may contain volatile oil or vapour;

- Upon disturbing scale or sludge; and
- Upon opening valves or accidental removal of blanks leading to the tank permitting ingress of volatile oil, vapours, inert gas etc. from scale, sludge or residue.

2.8 Weather Precautions

In the event of thunderstorms, gas freeing should be stopped where flammable fumes may be present.

2.9 Painting

(1) The solvents used in paints give rise to flammable vapours which may also be toxic.

(2) Interiors of enclosed spaces should be well ventilated both while painting is in progress and until the paint is dried.

(3) Smoking in or near these spaces is prohibited and only explosion proof lighting may be used. “NO SMOKING” signs must be prominently displayed.

(4) The air in the space must be regularly checked with a multi-gas detector to ensure that the vapour level in the atmosphere does not exceed 0,1% of the LOWER EXPLOSIVE LIMIT (LEL) of the particular solvent. The value of the LEL can be obtained from the PRODUCT SAFETY DATA SHEET obtained from the solvent supplier. At least one portable multi-gas detector must be in place within the confined space at all times.

(5) All personnel in an enclosed space being painted must wear air fed hoods or pressure fed masks with additional eye protection.

(6) Normal protective clothing must be worn e.g. overalls, gloves and suitable footwear of the non-sparking type.

2.10 Compatible Activities

(1) Incompatible activities must not be allowed to take place simultaneously e.g. painting or working with combustible materials in the same area where hot work

is being carried out.

(2) In pursuing their various occupations workmen should not obstruct means of escape with materials and/or tools.

(3) Flammable liquids and other combustible materials or dangerous goods should not be stored on board the vessel in excess of their daily or immediate requirements. Dangerous goods not in immediate use should be kept in suitable non-combustible receptacles or safe storage areas.

(4) Planning meetings must be held every morning to ensure that incompatible activities are not conducted. At the same work area.

2.11 Removal of Waste and Other Combustibles

(1) Arrange for the regular removal of empty gas cylinders, empty containers, which have held paint thinners, accumulated waste, rubbish and scrap. Remove all combustible materials to safe storage areas when not in use, especially when work has finished for the day.

(2) Rags and other waste contaminated with flammable liquids should be placed in plastic bags and removed at the end of each day.

(3) Waste liquid should be collected, kept in a closed container and removed from the ship daily or more frequently where necessary.

(4) Flammable liquid and other material must be removed from a work area before hot work commences.

2.12 Working Areas

Ensure working areas are safe prior to and during work. After completion of work all naked flames and smouldering rope ends should be extinguished and the area rendered safe.

2.13 Fire Protection Equipment

The fixed and portable fire protection installed on a vessel should be fully operative at all times. If any part of the equipment is removed or rendered inoperative, the particular

item should be replaced. Failing this, alternative firefighting provision should be made. Whenever necessary, to cover a particular risk, additional firefighting equipment should be supplied.

2.14 Fire Hazards in Machinery Spaces

The seriousness of fire in machinery spaces cannot be over stressed. All personnel should be fully aware of the precautions necessary for its prevention and of the immediate action to be taken should fire break out.

(1) It should be ensured that fire-fighting appliances are kept free of obstruction and ready for use at all times.

(2) Smoking should be prohibited if there is any possibility of flammable vapour being present.

(3) Cleanliness is the best precaution against fire. Plastic bags should be provided for the disposal of used cotton waste, cleaning rags and similar materials. The closed plastic bags should be safely disposed of at the end of every day.

(4) If a hot bearing has been observed in a closed crankcase, the crankcase must not be opened until the bearing has cooled down, otherwise the entry of air could create an explosion.

(5) All oil spills should be wiped up as soon as possible.

(6) Oil should not be allowed to accumulate in boiler registers, tank tops, bilges and near hot pipes or other heated surfaces.

(7) Save-alls and drip trays should be kept free from oil and any leakage should be given immediate attention.

(8) Engine room bilges should at all times be kept clean of rubbish and other substances so that strums are not blocked and bilges may be readily and easily pumped.

(9) When handling oil or gas-freeing, vapour should be prevented from entering machinery spaces, as much of the equipment there is neither explosion proof nor intrinsically safe. Burners in the boilers are potential sources of ignition.

(10) Extreme caution is required when filling any settling or other oil tank to prevent it

overflowing, especially in engine rooms where the exhaust pipe or other hot surfaces are directly below. Particular care should be taken when filling tanks which have their sounding pipes in the machinery spaces. In no case should a weighted cock on a sounding pipe of a fuel or lubricating oil tank be secured in the open position.

(11) Paint or solvent may not be stored in machinery spaces and must be removed immediately after use.

2.15 Packed Flammable Products

(1) The handling of flammable liquids and gases in cylinders or containers should be carefully supervised, ensuring that-

a) Each package is inspected for leakage or damage;

b) Empty containers unless gas-free, are treated as filled containers; and

c) Temporary protection is provided to prevent hoists, slings, etc. striking against bulwarks or coamings and so risking sparks.

(2) Any hold which has been used for packed cargo should be thoroughly ventilated and the atmosphere tested before entry.

(3) Any oil drums employed for emptying tank contents should be removed from the ship with the least practicable delay.

(4) Should oil reception facilities be available, these should be used in preference to emptying contents into drums. Alternatively, consideration may be given to pumping directly into a barge suitable for the purpose.

2.16 Use of Tools

(1) Care should be taken to avoid smears or flakes of aluminium adhering to surfaces. To avoid the risk of ignition of flammable mixtures, tools which have been used on aluminium structures or fittings should be cleaned after use. Portable equipment made of aluminium or light alloy should be used with great care in oil tanks or adjacent confined spaces.

(2) Tools should not be carried by personnel into oil tanks, but lowered in a canvas bag or plastic bucket to avoid their being dropped.

(3) In tanks which have previously held flammable liquids all steel tools should be used with the minimum impact force necessary.

(4) Before any hammering or chipping is undertaken or any power tools used, it should be ensured that there is no flammable gas in the vicinity.

2.17 Static Electricity

Static electricity can cause sparks that can ignite flammable gas. Broadly all petroleum distillates are prone to electrostatic generation and should be handled accordingly if a gassy atmosphere is suspected.

2.18 Precautions to Prevent Ignition

(1) Metallic or metal reinforced hoses should be thoroughly bonded.

(2) Water in suspension in petroleum is a potent static producing medium. Before any clean or white oil is pumped, it should be checked that oil lines and tank bottoms are as free as possible of water. A low loading rate (1 metre/sec) will reduce the possibility of static electricity. After the bottom oil inlet and floors have been covered, the filling rate may be somewhat increased.

(3) During filling or transfer of clean oils no conducting material of any description must be allowed inside the tank being filled. Conducting materials include, manual steel ullage tapes, sampling cans and metal sounding rods. Non-conducting materials may however be used.

(4) Cell phones are not safe unless certified suitable for the classification of flammable gas present. This applies even if the phone is switched off. Cell phones must be regarded as unsafe to be taken into hazardous zones unless the flammable vapours and the cell phone classification have been proven safe. **As a general rule, cell phones should not be taken into a hazardous zone.**

2.19 Fire Extinguishers

In the event of fire on board the ship repair staff must immediately inform the crew, the

Port Authority and other relevant firefighting Authority. Ship repair staff must obey ship's crew instructions as well as any other fire team's deployed by the Port Authority or any other Authority during firefighting. There may be occasions when the full ship's crew are not available and the repair contractor's staff should endeavour to contain the fire.

Water is suitable for fire involving solid materials, but it is dangerous to use water on deep seated burning oils and fat.

Water fog, however, can be used against small oil fires or for making a screen between the fire fighters and the fire. The hose-reel is the most effective first-aid hand appliance available. Unless a ship fire occurs in a drydock, fullest use should be made of water in its extinction, provide adequate drainage and bilge pumping facilities are fitted and are in an efficient working condition, so that stability is maintained.

It is important to start pumping out the water as soon as hoses are brought into play.

Water must not be used on electrical fires.

Fires involving low flash point fuels cannot be effectively extinguished by water. If the flash point is lower than the water temperature it is quite useless to even attempt cooling.

Foam is suitable for petroleum fires, but must not be used for electrical fires.

CO^2 is suitable for most fires. CO^2 is asphyxiating and ineffective against liquefied gas fires.

Dry powder is suitable for all small fires, particularly liquefied gas fires. The use of dry powder is not recommended for delicate electrical equipment such as telephone switchboards or other equipment containing relays because the dry chemical is likely to

coat the contacts and make them inoperative.

Note: On tanks or vats of flammable liquids dry powder is likely to have inadequate lasting blanketing effect, making it necessary to take steps to overcome re-ignition hazards from heated surfaces of the tanks or vats. Dry powder has no cooling or wetting effect and will not extinguish deep-seated fires in ordinary combustibles and should be followed up with foam or water, as the case requires, in order to ensure that the fuel is completely cooled. However, avoid the use of powder with foam, unless both substances are compatible.

2.20 Use of fire extinguishers

All personnel should be made familiar with the right type of extinguisher for dealing with a particular fire and the correct method of operating the particular extinguisher provided. An extinguisher will not operate unless the correct method is used.

2.21 Attacking a fire

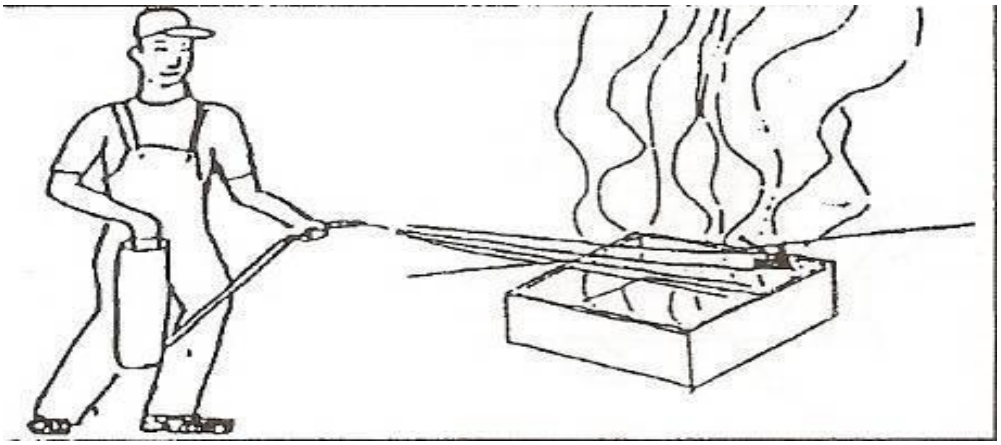
Take up a position where access to the fire is unrestricted but where a quick and safe retreat is possible, e.g. on the side of the fire nearest a door or, when outside on deck, windward of the fire.

2.22 Foam Extinguishers

Where the liquid on fire is in a container, direct the foam jet at the inside edge of the container or at an adjoining vertical surface above the level of the burning liquid, as shown above. This breaks the jet and allows foam to build up and flow across the surface of the liquid.

Where this is not possible, stand well back, direct as illustrated and with a gentle sweeping movement allow the foam to drop down and lie on the surface of the liquid.

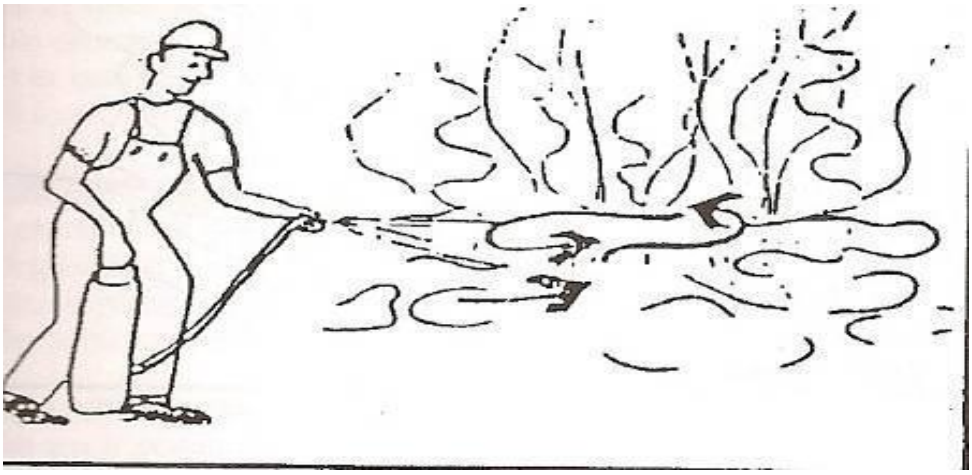
Do not direct the foam jet straight into the burning liquid. This may drive the foam under the surface of the burning liquid and render it ineffective. In addition, it may splash the burning liquid onto the surroundings.



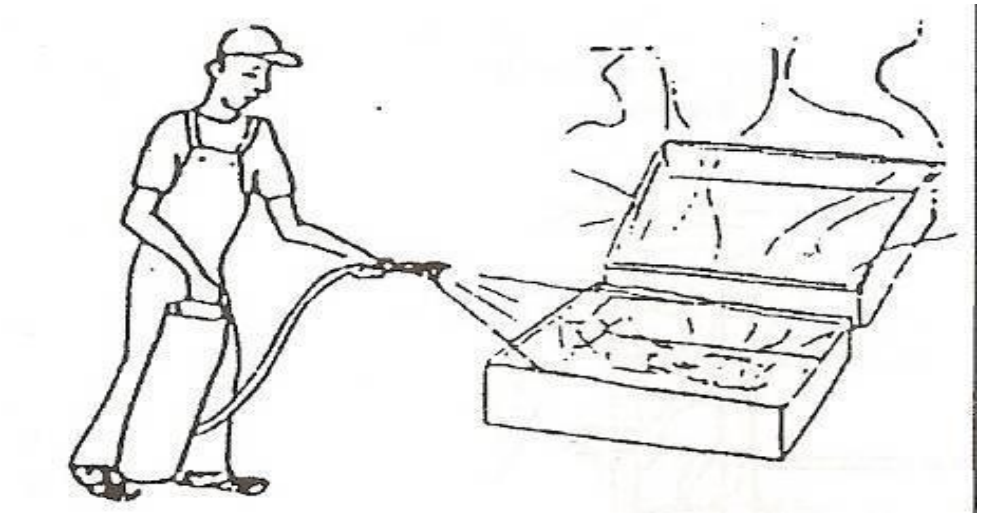
2.23 Dry Powder, Carbon Dioxide and Vaporising liquid Extinguishers

On fires involving flammable liquids in containers or spilled liquids, direct the jet or discharge horn at the edge of the fire and with a rapid sweeping motion drive the fire towards the far edge until the flame is extinguished.

On fires in falling liquids, direct the jet or horn at the base of the flames and sweep upwards.



On fires in electrical equipment, direct the jet or horn straight at the fire. Where the equipment is enclosed, direct the jet or horn into any opening with the object of penetrating the interior.



Note: When using any extinguisher of the controlled discharge type, shut off the discharge when the fire appears to be extinguished. Wait until the atmosphere clears and if the flame re ignites, attack the fire again.

2.24 Action in the event of Fire

On discovery of a fire, immediately raise the alarm by shouting at the top of your voice. If people are in the vicinity tell them to sound the nearest alarm and summon help. If the outbreak is in its early stages and is controllable, fight it with the equipment that is at hand. If this does not extinguish the fire evacuate immediately, closing doors behind you to restrict the spread of smoke, fumes and flames. Ensure no one is left behind when closing the door.

2.25 Evacuation

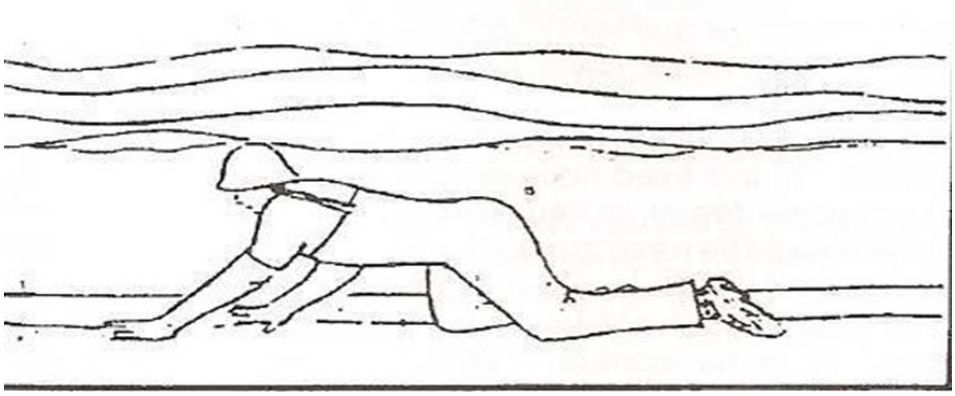
A person may be overcome in two ways by the change of atmosphere caused by a fire, irrespective of the heat:

(a) by toxic fumes, principally carbon monoxide; and

(b) by asphyxiation when the fire has reduced the normal oxygen content of the air.

If escape necessitates passing through a smoke-filled room, keep low. It may make progress easier because as a general rule, smoke will rise and the atmosphere nearer the door may be relatively clear.

If you must pass close to the flames or radiant heat of the fire, clothing will help to protect your body but will present extra danger if it catches fire, wet clothing, towels or handkerchiefs will provide a temporary extra measure of protection.



2.26 Methods of Dealing with Different Types of Fire

Oil Spillage on Deck

Use a dry chemical extinguisher and follow up with foam (if compatible) or water fog spray. Cool surrounding areas with water spray.

Electrical Fires

Switch off and electrically isolate; use $CO^{2,}$ vaporizing liquid or dry chemical extinguisher.

Ship's Galley

Use CO^2 dry chemical or vaporizing liquid for a small fire or use foam if oil fire.

Accommodation Involving Combustible Materials

Use water spray; close all doors and ports of affected and adjacent accommodation. Continue water spray to prevent re-ignition. Breathing apparatus may be required.

Oil Cargo Tanks

Use foam or steam smothering if fitted and in the case of heavy oils use water fog or spray.

Major Fire in Engine room or Pump room

Sound the alarm and ensure that the engine room has been evacuated and all personnel accounted for. Close down engine-room or pump room. Stop and blank ventilation. Shut off all oil suction's and oil pumps, using the remote controls. Ship's fixed equipment is to be used, that is, foam, steam, water fog or stored inert gas under pressure. Water sprays should be used to cool decks and structures in vicinity.

LPG and LNG fires

Such fires should not be extinguished until the source of vapour is under control. When such a fire is ready for extinguishing, dry chemical is the most effective medium. Cover affected area with large quantities of water spray to cool and control the effect of radiant heat. Water jets should not be used directly into an LPG. or LNG fire.

Always Remember That Fire Prevention Is Easier Than Fire Fighting!

2.27 Gas Freeing

Tank cleaning is a safe operation but if due precautions are not observed, the consequences can be disastrous.

Precautions

Before gas freeing, ensure that:

(1) Ships personnel have been notified and permission granted;
(2) Warning signals and notices are displayed as required;
(3) All fire appliances are ready for use and correctly positioned;
(4) Adequate safe lighting as required is available;
(5) No naked lights are being used;
(6) No hot or unauthorized work is being carried out;
(7) There will be no smoking on board, except in authorized places;
(8) There is no cooking on board, except in areas considered safe;
(9) All doors and openings leading from the main deck to accommodation or machinery spaces are, as far as is practicable, closed (particularly important on tankers);
(10) All tank openings, except those required to be used, are closed;
(11) All pipes containing oil or any combustible fluid are drained and isolated and control valves closed;
(12) All oil lines, valves, etc. required for use are properly set;
(13) The valves in the venting system are open (tankers);
(14) No unauthorized craft is alongside; and
(15) There are no naked lights in use and no smoking in the vicinity of the ship.

Procedure

The following procedure is recommended to be observed by Ship repairers and owners. The repair contractor must be satisfied that these minimum procedures have been adhered to:

(1) After stripping, wash through the whole pipeline system;
(2) Wash through all oil pumps with water;

CONTINUES ON PAGE 258 OF BOOK 3

Printed by and obtainable from the Government Printer, Bosman Street, Private Bag X85, Pretoria, 0001
Contact Centre Tel: 012-748 6200. eMail: info.egazette@gpw.gov.za
Publications: Tel: (012) 748 6053, 748 6061, 748 6065

Government Gazette
Staatskoerant

REPUBLIC OF SOUTH AFRICA
REPUBLIEK VAN SUID AFRIKA

Vol. 675 10 September / September 2021 No. 45131

PART 3 OF 3

ISSN 1682-5845

9 771682 584003 45131

(3) Close gas valves, if any, of tanks whose vent systems are common to those being cleaned (tankers);
(4) Blow through heating coils, if fitted;
(5) Open tank covers as necessary;
(6) Operate mechanical fans, gas ejectors or other safe means (e.g. windsails), as long as necessary; (Note: Do not use ordinary electric fans);
(7) Test for gas with a combustible gas indicator;
(8) If atmosphere still contains flammable gas, give additional ventilation;
(9) Again test for gas. If clear, call a competent person to confirm and issue “Safe Entry Permit”;
(10) When gas-free mop up tank bottoms, keeping ventilating devices operating;
(11) Remove all sludge, sediment and scale;
(12) Clear all gas lines;
(13) The covers of all tank openings should be kept closed unless required for gas-freeing;
(14) Do not employ oxygen for ventilating;
(15) In tankers, gas from tanks under the centre castle should be vented outside the centre castle;
(16) If tank washing is required, the tank atmosphere should be in non-flammable condition, preferably below 15% of the Lower Explosive Limit; and
(17) If steaming a tank containing white oil is essential, precautions stated under “Static Electricity” should be observed.

Note: If in the course of work in any oil-tank or in any compartment or space adjacent thereto, any pipe or tank joint is opened or broken or any other event occurs so that there is a risk of oil vapour contaminating the space, work should be suspended forthwith and thereafter any certificate for ‘entry’ or ‘hot work’ previously issued in respect of the tank space, or compartment should no longer be regarded as valid.

Pump Rooms and Cofferdams

The precautions recommended for gas freeing tanks apply to pump rooms and cofferdams.

Section 3

3 Safe Access (to ship and places of work)

3.1 General

(1) Access to ships must be provided by an accommodation ladder or gangway and only when it is impossible to rig either should portable ladders be used.

(2) Where appropriate, at the point of access on board the vessel a lifebuoy with an attached line should be kept ready for immediate use.

(3) During the hours of darkness all means of access should be adequately illuminated.

(4) Every bridle, chain, wire, shackle, block, tackle, rope or any other means of attachment used should be subject to frequent inspections.

(5) The general means of access to the ship should be placed in such a position that cargo is not worked over it. Where this is not practicable, a man should be situated near to the gangway to warn persons coming on board or leaving the vessel that cargo is being worked.

(6) In the event of a means of access being unsafe for any reason physical barriers should be erected and warning notices prohibiting its use posted at every approach.

(7) The means of access should be kept in position as long as required, and where practicable be of permanent construction.

(8) Any oil or other slippery substance falling on the floor should be removed as quickly as possible.

(9) All places of work and means of access should be kept free of rubbish, obstructions, projecting stacked material, nails, bit of wood, etc.

(10) Dependent on the number of persons on board, a suitable number of means of general access to the ship should be provided.

(11) Every avenue of escape should be kept clear at all times. At least two satisfactory means of escape must always be available for use in an emergency.

(12) If a ship is lying alongside another ship and workers are required to pass from one to the other, a safe means of access should be provided.

(13) Where it is necessary to erect outside staging for a ship in a graving dock or floating dock, there should be provided sufficient ladders giving direct access to the stages. The number of ladders will depend on the extent of the staging and the work to be done.

(14) Every means of access should be of sound construction, of adequate strength for the purpose for which it is intended and properly maintained.

3.2 Guard Rails and Fencing

1) The contractor must ensure that—

a) any opening, open hatchway or dangerous edge into, through, or over which a person may fall is fitted with secure guardrails or fencing of adequate design and construction to prevent such occurrence, except where the installation of such guardrails of fencing will interfere with the proper performance of work;

b) where a temporary opening is made in a ship for carrying out repair work, the opening may be guarded by means of a hazard tape displayed at a height of not less than 800 mm and not higher than 1 200 mm and at a distance of not less than 2 000 mm from the edge of the opening;

c) hatchways open for handling machinery, equipment or stores, through which persons may fall or on which they may trip, must be closed as soon as work stops, except during short interruptions or where they cannot be closed without prejudice to safety or mechanical efficiency because of the heel or trim of the ship: Provided in such a case, an employer must ensure the opening is guarded by means of a fencing of adequate design and construction to prevent such occurrence;

d) guard rails or fencing must not have sharp edges and should be properly

maintained;

e) where necessary, locking devices and suitable stops or toe-boards must be provided;

f) each course of rails should be kept substantially horizontal and taut throughout their length;

g) guard rails or fencing should consist of an upper rail at a height of 1 metre and an intermediate rail at a height of 0.5 metres which may consist of taut wire or taut chain;

h) work is not conducted on walkways that are not properly fenced;

i) for a ship undergoing repair and maintenance work, positive guarding or barricading must be utilised for openings made in railings, decks, or tank tops; and

j) walkways must be safely and securely fenced by the ship's crew and that foremen or supervisors ensure that fencing has been erected and complies with the specifications prescribed in paragraphs (a) to (i).

3.3 Accommodation ladder

1) Accommodation ladders must be safe to use and must as a minimum conform to the following:

a) Ship's accommodation ladders must be set in a safe position and safety nets deployed. Nets must be fastened top rail to top rail.

b) The construction of the ladder must be sufficiently robust to reduce any sway or bounce to a minimum. It must be fenced on both sides along its entire length with both upper and intermediate guard rails.

c) The ladder must be properly rigged and be kept adjusted in such a way that:

- whatever the state of the tide or the draught of the ship, the ladder's angle to the horizontal does not exceed approximately 40˚ as far as this is practicable; and
- it is safe to pass from the lowest tread or platform of the ladder onto

the dock and also up to and onto the deck.

d) As far as is practicable, the ladder must be kept free of any grease or other substance likely to make a handhold or foothold insecure.

e) Precautions must be taken to prevent the suspension ropes of accommodation ladders from becoming slack; this can result in the ladder falling violently along the ship's side if the ship lurches away from the quay as a result of wind or the wash of a passing ship.

3.4 Gangways

(1) If the use of an accommodation ladder is not reasonably practicable a gangway can be used;

a) when normal access equipment cannot be used owing to the ship's high freeboard, purpose-built shore side access equipment must be provided and used;

b) where the freeboard is too low for the normal means of access to be used, the ship or barge must be moored alongside a quayside ladder;

c) portable ladders must only be used where no safer access is reasonably practicable; and

d) where the access is to or from a ship and a barge or other ship of low freeboard moored alongside it, a rope ladder, with man ropes, can be used when it is impracticable to comply with any of the above requirements.

(2) The means of access must-

a) be so placed as to ensure that no loads pass over it and, if this is not practicable, it must be supervised at all times during cargo handling;

b) be placed where access to it will not be obstructed;

c) not be placed on or near a crane track, railway track or other route in the port where it could be struck by moving traffic on that track or route; and

d) have a lifebuoy with a line very nearby.

(3) A safety net must be rigged wherever a person can fall between the ship and the quay from a means of access to a ship. As far as is reasonably practicable the

net must protect the entire length of the means of access.

(4) The relationship between the quay and the ship is not always static. When necessary, the means of access must be regularly checked to ensure that it is correctly adjusted.

(5) A portable ladder must only be used as means of access to ships in exceptional circumstances, such as in the event of damage to an accommodation ladder or a gangway.

(6) A rope ladder must only be used to provide access from a ship to a barge or similar ship of lower freeboard.

3.5 Staging

Where any of the above means of access to the vessel are possible a purpose made staging or scaffolding platform can be erected to provide access to and from the vessel.

3.6 Means of Escape

(1) Adequate and safe means of escape from any part of the vessel e.g. ship's holds and enclosed spaces must be maintained at all times. Rope and vertical ladders are not satisfactory where emergency evacuation is required.

(2) Exits should provide unobstructed and safe means of escape and be clearly marked and suitably lighted. Where work is done at night an emergency lighting system is suggested.

(3) Employers must ensure that employees are trained in the basic requirements of evacuation in an emergency.

(4) Ship repair employees must, in an emergency, comply with the instructions and directions of the ship's crew.

(5) Where there are no crew on board, employees must be instructed to evacuate in an orderly manner and assemble at a safe position near the shore end of the gangway.

Section 4

4 Welding and Flame Cutting

4.1 Electric and Arc Welding

(1) Arc welding and cutting equipment may be divided into two groups:
   (a) Equipment connected to electrical supply; and
   (b) engine driven equipment.

(2) In the case of stationary transformers or motor generator sets, a suitable switch and fuse should be provided adjacent to the equipment, in order that it may be isolated from the main supply, if necessary.

(3) It should be ensured that all equipment is properly earthed and that the cables are of the correct type and capacity and fitted with appropriate connectors on the output side. Particular care should be taken to ensure that the work piece is connected to the “work” terminal of the transformer. In addition, the work piece should be earthed independently.

(4) A periodic inspection will be required to ensure that:
   (a) all connections are clean and tight;
   (b) they are correctly made;
   (c) the correct types and sizes of cables, earthing clamps, electrode holders, cable connectors, etc, are used; and
   (d) the earthing arrangements are satisfactory in all respects.

(5) Before engine driven equipment is put into use, a check should be made to ensure that the exhaust outlet is sufficiently removed so that there is no danger of exhaust gasses being inhaled.

(6) Care should be taken to ensure that the plant is level and the wheels chocked to prevent accidental movement.

(7) Careful watch should be kept for fuel leaks and avoidance of spillage when filling fuel tanks.

4.2 Electric Shock

(1) The open-circuit voltage of arc welding equipment will not usually exceed 100

volts which is generally safe under normal working conditions, but the risk of shock is present.

(2) In cramped spaces such as boilers and small tanks, which may also be warm and damp, or in an insecure position where an electric shock may lead to a serious fall, special care should be exercised.

(3) In the event of a worker sustaining an electric shock, first ensure that the injured person is no longer connected to the electrical supply and that the supply is isolated. Artificial respiration should be started at once and continued until a doctor or paramedics arrive.

(4) Electric welding equipment must be maintained in a safe condition with particular attention to electrical leads and the insulation of electrode holders. Welding operators must visually inspect their equipment daily and report any defects to their supervisor immediately.

(5) All welding equipment must be checked visually for defects by the supervisor daily.

(6) Welding gloves, helmets visors aprons, gaiters and boots etc shall be provided as necessary free of charge.

(7) Insulating mats shall be provided in damp situations and welding screens should be erected where welding flashes interfere with other workers.

4.3 Welding In Confined Spaces

Where an operator is required to weld in a confined space, such as inside a boiler drum, air receiver, tank, etc. the following must be observed:

(1) The space must be certified gas free safe for human entry and gas free safe for hot work by a competent person;

(2) The adjacent spaces must be gas free safe for hot work and free of any flammable products;

(3) The space must be free of any flammable residue and material;

(4) A fully insulated electrode holder should be used;

(5) Adequate ventilation should be provided;

(6) An assistant should keep the operator under constant observation;

(7) Suitable means should be provided to enable the assistant to cut off the power immediately, if required;

(8) Provision should be made for the withdrawal of the operator in the case of shock or other injury; and

(9) It is recommended that mats, dry boards or other non-conducting materials and rubber boots be used to assist in the prevention of electric shock.

The flux coating of an electrode should not be regarded as sufficient protection against electric shock. Consequently, the insertion of an electrode into a holder should be done only when wearing insulated gloves. Electrodes should be removed from the holders when not in use.

4.4 Care and Storage of Cylinders

(1) Oxygen cylinders may be stacked horizontally and secured to prevent their displacement. Acetylene cylinders should always be stored and used in an upright position, and properly secured against falling. Cylinders should never be carried in chain slings; proper rope slings or cradles should be used.

(2) Cylinders should not be dropped from one level to another, nor used as work supports or rollers.

(3) Cylinders should not be allowed to come into contact with electrical apparatus or live wires.

4.5 Care in the Use of Cylinders

(1) Cylinders should not be transported with regulators and hoses attached unless a proper trolley or carrier is used. Before transporting a cylinder, its valves should be properly shut.

(2) When a cylinder is empty of gas, its valve should be shut. No attempt should be made to fill one cylinder from another.

(3) In the case of an acetylene cylinder becoming hot or catching fire, the cylinder

and its fittings should be handled as little as possible. Either opening or closing the valve could cause an explosion. Cooling the cylinder body from a safe position is recommended. Alternatively, the cylinder may be thrown overboard into the sea. In the event of such an occurrence, the Fire Services Department and the suppliers should be advised immediately.

(4) Only standard keys should be used for operating cylinder valves. Long leverage spanners or regulation keys fitted with extension pieces should not be allowed. If a cylinder valve spindle is found damaged the supplier should be informed. When closing cylinder valves excessive force should not be used.

4.6 Care in the Use of Oxy-Acetylene Equipment

(1) Before attaching a regulator to the cylinder it is advisable to “snift” the valve in order to rid the connection of dirt, oil or foreign particles, the regulator chosen should be correct for the gas contained in the cylinder.

(2) Gauges for oxygen must be marked "oxygen" and never tested with oil.

(3) Welding or cutting apparatus must not be used unless automatic pressure regulators are fitted to the oxygen and acetylene gas cylinders.

(4) Before fitting a regulator to a full cylinder, the adjusting screw for regulating the output pressure must be released. Otherwise there is a risk of damage to the regulator.

(5) It should be ensured that the threads on the regulators and other fittings correspond with those on cylinder valve outlets.

(6) All equipment must be kept clean and in good condition so that it is safe to use.

(7) Frequent accidents occur due to leakages or to the supply hoses becoming loose or being blown off. Hoses must be firmly attached to torches and regulators by suitable means. Hose and other connections must be frequently examined and leakage tests using soapy water carried out. Faulty or leaky equipment should be changed without delay.

(8) Rubber hoses must be inspected periodically to see that they are free from cuts, cracks, burns and wear. the hoses should be run clear of sharp edges or corners,

falling objects, sparks or blowpipe flame.

(9) Gas welding and burning equipment, especially oxygen and acetylene must be provided with sound hoses, in good condition and firmly attached to the apparatus with suitable clips.

(10) Efficient regulating valves, gauges and two flash back arrestors shall be fitted where possible, but a minimum of one flash back arrestor to be installed and a portable fire extinguisher shall be provided in a bracket on each welding and burning set.

(11) Under no circumstances must oil or grease be introduced to the spindles of valves or regulators of oxygen bottles.

(12) Care must be taken to protect hoses conveying the gasses from the cylinders against damage or crimping.

(13) Naked flames must not be introduced to the vicinity of oxygen or acetylene cylinders.

(14) Cylinders which contain or, have contained oxygen or any fuel gas under pressure must not be installed or placed within five metres of any substantial source of heat other than the torch in use.

(15) No oxygen or acetylene cylinder must be taken below the uppermost deck unless it is installed or placed in a part of the vessel which is adequately ventilated to prevent any dangerous concentration of gas or fumes.

(16) When the use of the equipment ceases and at the end of each day, the supply valves should be securely closed and the movable pipes or hoses disconnected from the cylinders.

(17) When it is necessary to undertake hot work in confined spaces, adequate ventilation should be provided and maintained as a precaution against asphyxiation, injurious fumes or explosions.

(18) Additional precautions will be necessary where there is a risk of toxic fumes being produced by cutting, welding or heating of certain metals.

(19) The storage of oxygen cylinders and fuel gas cylinders on board a vessel should be separated from each other and their quantities kept to a minimum.

(20) Smouldering ropes should not be used to light torches. Spark lighters, such as ones employing flint on steel, are suitable.

(21) Cylinders should not be taken into tanks.

(22) Torches should be removed from tanks during breaks or end of shift.

4.7 Training

(1) Welding and flame cutting equipment must be operated by suitably competent personnel.

Section 5

5 Machinery

5.1 Working on Machinery

1) Before working on any machinery the employer must ensure that is correctly immobilised and cannot be started inadvertently. The Engineer Officer in charge must issue a Permit to Work in writing confirming that the machinery is correctly and safely immobilised and isolated. He must ensure that all immobilising devices, such as notices, padlocks, fuses etc cannot be interfered with, without the agreement and knowledge of the persons working on the machinery.

2) Diesel driven machinery must have the valves in the air starting system securely closed and the vent or drain valve open.

3) Before any personnel are allowed to enter the main engine crankcase, or gear casing, the turning gear must be engaged and a warning notice posted at the starting position.

4) Lubricating oil must be wiped up in the immediate working area and suitable staging, adequately secured, should be used to provide a safe working place.

5) Before turning gear is used for turning the main engine, it should be ascertained that all personnel are clear of the crankcase and any moving parts of the main engine, gear box line shafting and propeller, and that the engine will not foul any disconnected parts or tools.

6) A warning notice indicating whether the position of the turning gear is in or out should be attached to the controls.
7) Where machinery guards have been removed and the machinery is to be run on trial, temporary guards or hazard tape must be used to protect the operators and other persons in the area.
8) On completion of the overhaul, all guards must be replaced before the machinery is tested.
9) When working on upper platforms or staging, it should be ensured that no heavy objects such as tools or parts of machinery can drop on a person working below. A bucket or box should be used for tools or smaller parts of machinery. Larger parts must be lashed up.
10) When working on the steering gear whilst the vessel is afloat, steps must be taken to immobilize the rudder.
11) No machinery must be run without the permission of the ships Engineering Officer in charge.

5.2 Turning the Propeller

Under no circumstances may the propeller be turned without the permission of the ships engineering officer in charge and by ensuring that no persons are endangered by the turning propeller.

5.3 Floor Plates

(1) Whenever floor plates, gratings, handrails or ladders are removed, the openings should be effectively fenced or guarded.
(2) Any oil spillage on the floor plates should be removed as quickly as possible.

5.4 Working in Boilers

(1) Before entering a boiler which is one of a range of two or more boilers, all inlets through which steam, water, fuel or exhaust gas might enter must be positively made safe by disconnecting, blanking, or securely locking the valves in the safe

position. In the case of locking the supervisor shall hold the key and warning notices shall be securely attached to the valves. These precautions must remain in place for whole time that persons remain in the boiler.

(2) Both gas and water spaces must be well ventilated before entry and the boiler must be allowed to cool sufficiently to make work in the boiler safe.

(3) Before closing up a boiler the supervisor must ensure that no persons, equipment or materials are left inside the boiler.

(4) No boiler shall be fired without the permission of the engineer officer in charge.

(5) Setting of safety valves must be entrusted only to skilled and experienced personnel under the close supervision of the ships Chief Engineer.

5.5 Steam Pipes

(1) Before joints in steam lines or fittings are broken, it is important that the valves on the steam lines and exhaust lines are closed, that the lines are completely drained and any drain valves left open.

(2) It should be remembered that steam valves often leak slightly when closed and can thus build up a pressure in the pipeline and suddenly eject steam and water which may have collected in a dip in the line.

5.6 Electrical Equipment

(To be read in conjunction with applicable national regulations and standards.

Shore Power / Temporary Power Supply

Connection and distribution connections are to be carried out by a Registered Installation Electrician. Cables are to be ranged clear of hazardous areas and to avoid obstructing walkways, fire doors, watertight doors and sharp corners.

Cables are to be of correct size, fitted with crimped lugs and firmly secured aboard ship and shore to keep them out of the water where possible. A separate earth cable is to be fitted between ship and shore.

Portable Multiple Socket Outlets 380 Volt 3 Phase

Multiple socket outlets for welding machines etc should be designed, installed and tested in accordance with the applicable national standard.

Portable Multiple Socket Outlets 220 Volt Single Phase

Multiple multi socket outlets for temporary 220 volt systems used for temporary lighting, portable power tools and low voltage (50 volt) transformer supplies shall be designed, installed and tested in accordance with the applicable national standard.

Temporary Lighting

All 110/220 Volt temporary lighting leads to be supplied from a an earth leakage protection device approved in terms of an applicable national standard. Alternative low voltage lighting (32 Volt) supplied from a double wound transformer with the centre tap earthed, may be used. Cables are to avoid water and sharp corners and should not obstruct access ways. Preferably they should be led overhead. Temporary lighting and small power distribution board breakers must be tested for correct operation, prior to being put into service. Earth leakage units must be tested with an earth leakage tester.

5.7 Lock out System

No work to be carried out on electrical equipment without an electrical isolation permit.

(1) All electrical supervisors and artisans are to be in possession of one padlock with one key and a danger board. Each lock and danger board is to be clearly marked with the person's name.

(2) Receipt of these items is to be acknowledged in writing. Spare padlocks, danger boards and gang locks are to be kept in the maintenance workshop. Only registered padlocks are to be used. If more than one person is to work on a unit, a gang lock is to be used in conjunction with each personal padlock.

(3) When the supervisor is satisfied that adequate precaution have been complied

with the supervisor may complete and issue an electrical isolation work permit.

(4) After locking out the unit to be worked upon, a danger board is to be hung on the isolator and an attempt made to start the unit before commencing work. It must also be verified that there is no alternative power supply to the unit.

(5) On completion of the work the persons who worked on the unit are each to remove his lock and danger board and to sign off the isolation work permit before switching on the isolator. No person is allowed to remove another person's lock.

(6) In exceptional cases where it is established that it is impossible to safely isolate a unit, a danger board shall be attached to the isolator and the cables to the unit shall be disconnected from the isolator. If this is impractical, the fuses and all spare fuses may be drawn and kept by the electrician. Merely opening the circuit breaker and hanging a safety board will not suffice.

(7) Only when the supervisor is satisfied that it is safe to do so may the isolation work permit be completed and issued.

Workmen should be prohibited from tampering with electrical fittings on board ship.
Electrical apparatus should not be connected to the supply without approval and supervision of the ship's Engineer Officer in Charge.
No portable electrical lamps, torches or equipment may be used in potential y explosive areas unless they are of the approved category of safety for that area, i.e. explosion proof, flame proof, spark free or intrinsically safe. Wandering leads must not pass through such areas.

5.8 Portable Power Tools:

(1) Power operated portable hand tools must be regularly inspected for the integrity of the insulation and plugs.

(2) Unless properly used, handled and maintained, they can be dangerous. Electric tools must be adequately earthed, unless double insulated. The supply cables and plugs should be of adequate capacity.

(3) It is important that the operator is competent in the use of the portable tool. No

power tool which is wet, faulty, or has a guard or safety device missing should be used.

(4) Care must be taken to prevent "kick back" from impact wrenches and portable drills. It should be ensured that any release or stop safety device is effective.

(5) Leads and hoses must be protected from wear, sharp bends and damage.

(6) Air powered tools must not be connected to an air supply where the pressure is in excess of the maker's specification.

(7) Grinding wheels must be equipped with a guard enclosing the entire wheel that the work permits.

(8) Abrasive wheels must be fitted, using flanges of the correct size and soft washers.

(9) Oversize abrasive wheels must not be fitted to any grinding machine.

(10) Abrasive wheels must not be used above their maximum recommended speed.

(11) If an abrasive wheel has been dropped it must be carefully inspected before further use.

5.9 Hand Tools

(1) Hand tools must be maintained in good condition, inspected periodically and defective tools taken out of use.

(2) It must be ensured that the handles are secure, jaws of spanners and wrenches are not worn, and that hammers, cold chisels and other percussive tools do not have barbs or jagged edges.

(3) It must be ensured that the tools used for the job are correct.

Section 6

6 Personal Protective Equipment

6.1 Protective Equipment

Employers shall make every reasonable effort to remove environmental hazards such as noise, dust and extremes of temperature etc. Where this is not reasonable minimum

protective equipment must be provided free of charge. Employees are obliged to wear and maintain (wear and tear excepted), the appropriate equipment and must subjected to a disciplinary process should they fail to do so.

6.2 Clothing

(1) Minimum Personal Protective Equipment (PPE)" means minimum PPE that must be provided and worn by ship repair and maintenance workers whilst working on board a vessel includes-

- Boiler suit/overall with reflective properties covering for front, back, side and aerial visibility;
- Appropriate helmet/hard hat for the task with a chin strap;
- safety shoes with anti-slip properties;
- hand gloves appropriate for the task based on the risk assessment;
- reflective vest or jacket with reflective properties covering for front, back, side and aerial visibility. Based on a risk assessment this might not be appropriate for some tasks;
- Eye protection; and
- Ear protection appropriate for the task.

(2) Based on a risk assessment additional PPE which caters for particular task, specific environmental and health conditions must be provided to the workers.

(3) Loose or torn clothing and long hair are a hazard when working near moving machinery. Wearing of neck ties, sweat rags around the neck and finger rings while working in the machinery spaces should be discouraged. Hair nets shall be worn where necessary.

(4) Overalls and boiler suits shall have long sleeves and capable of being buttoned or zipped at the neck.

(5) Safety shoes or boots shall have toe protection and be of a non-slip and be of heat resistant type.

(6) Hearing protection shall be provided where necessary by earmuffs or plugs, when the sound level exceeds 85dBA.

(7) Suitable eye protection and dust masks should be used by workers hand cleaning tubes, scaling boilers and cleaning back ends.

(8) Eye protection meeting the national standard for the task must be worn when operating a power tool such as a grinding or scaling machine. If there is a risk of eye injury, people nearby should also wear eye protection.

(9) Face shields should be worn, together with plastic aprons, and gloves when handling hazardous substances that could splash onto the face or body.

(10) Gloves shall be provided when dirty or rough conditions could be injurious to the hands.

6.3 Safety Head Gear

Hard hats must be worn unless it can be shown to the satisfaction of the Supervisor that the wearing of hard hats is impracticable or unsafe.

6.4 Safety Harness

(1) The type of harness must be correct for the task to be performed and conform to the applicable national standard or similar internationally recognised standard.

(2) Safety harnesses must be secured to a safe anchorage.

6.5 Skin Effect Precautions

(1) As far as practicable contact with petroleum's, corrosives and other harmful chemicals should be avoided. Protective clothing, goggles, and gloves must be used, as required.

(2) In case of contact, the substance must be removed as soon as possible using clean cloth, soft soap and water.

(3) Personnel must avoid wearing oil-soaked clothes by using disposable overalls.

(4) In case of any skin disease prompt medical advice should be sought.

6.6 Inspection and Maintenance of Protective Equipment

Safety Head Gear

(1) Monthly inspections of the shell must be carried out after removing the head band and internal fittings.
(2) Should any significant defects to the headband or shell be found, that part must be replaced.
(3) The headband and internal fittings must be disinfected before being re-fitted.

Goggles and Face Shields

(1) Full face shields must be used for all grinding operations.
(2) This type of equipment is best issued on a permanent loan basis.
(3) It must be ensured that the user knows how to clean and maintain the equipment.
(4) Only substances which can have no adverse effect should be used for cleaning lenses and head bands.
(5) Where goggles or face shields are issued on a temporary loan basis, they should be taken apart and thoroughly washed and disinfected before being re-issued.
(6) If a lens becomes chipped, pitted or partially opaque it should be scrapped.
(7) After cleaning, all eye protective devices must be placed in individual polythene bags and stored in a dry and dust proof cupboard.

Hand and Foot Protection

A regular inspection should be made to ensure that gloves and foot protection are in good condition and can afford the protection for which they are intended.

6.7 Respiratory Protective Equipment Selection

(1) In the selection of the correct equipment, amongst the factors to be taken into account are the location, the nature of the substance or substances against which protection is required, their likely concentrations in air, the possible duration of exposure and the kind of work to be performed.
(2) Self-contained breathing apparatus, air line respirators and cartridge respirators require special operator training as recommended by the equipment suppliers.
(3) Self-contained breathing apparatus and canister and cartridge type respirators

provide protection to different degrees for relatively short periods of time, whereas air hose type breathing apparatus provides protection for as long as the face piece is supplied with breathable air.

(4) Dust respirators provide protection for long periods at low airborne dust concentrations. Canister, cartridge and dust respirators interfere little with the wearer's mobility. But at high work rates the inhalation and exhalation resistance results in discomfort which can limit the period of time for which these may be worn, as also will adverse environmental conditions of temperature and humidity.

6.8 Inspection and Maintenance of Respirators:

(1) Before cleaning, the respirator must be taken apart and the rubber, plastic or PVC components carefully examined for signs of deterioration.

(2) Stretching and lightly folding rubber or PVC will reveal any fine cracks. Damaged or worn parts should be discarded.

(3) For respirators used by painters, the parts should first be soaked in a solution of suitable alkaline cleaner to get rid of foreign matter, and then removed and dried.

(4) Head harnesses should be washed in warm soapy water, thoroughly dried and inspected again.

(5) It is recommended that head harnesses be disinfected before re-issue.

(6) The respirator should be placed in a clean polythene bag until required for use.

Cartridge, Canister and Full Face Respirators

(1) These respirators must be taken apart, cleaned, inspected and tested as in the case of dust respirators.

(2) Lenses must be examined for any signs of damage and replaced if necessary.

(3) It must be ensured that the head harness straps are properly fitted.

(4) Leakage tests must be carried out paying special attention to the corrugated tubes and the areas around the eye pieces or frames around wide vision masks, if the latter type is used.

(5) The valves must be checked and the respirator disinfected. If necessary, the

cartridge or canister should be changed making sure the storage life has not been reached or exceeded.

(6) The respirator must be repacked and it is ensured that the proper card to record the periods of use is furnished.

(7) The respirator must be stored until required for use in a place which is dry and free of contamination.

Air Line Respirators

(1) Air line respirators must have their face masks inspected, tested, cleaned and disinfected as for canister face masks.

(2) Filters must be taken apart, cleaned, disinfected, dried and re-assembled.

(3) Filter agents must be renewed as necessary.

(4) Any unusual accumulation of oil, dirt or foreign matter within the filter or airline should be investigated and rectified.

(5) The pressure regulator must be checked.

(6) The entire length of the air hose must be examined to ensure that it is in good condition.

(7) Ensure airline connections are colour coded and independent of any other connections.

(8) The harness provided with this equipment should be checked.

Self-Contained Breathing Apparatus

(1) Personnel required to use this equipment must be carefully trained and instructed in its use, inspection and maintenance.

(2) All parts of the apparatus must be inspected, cleaned, tested and disinfected at regular intervals.

(3) The cylinders must always be kept fully charged.

(4) Record cards must be provided for each set of equipment.

(5) The equipment must be maintained in accordance with the manufacturer's recommendations.

Section 7

7 Confined Space Entry

7.1 Entry into Confined and Potentially Hazardous Spaces

The atmosphere in any enclosed space may be oxygen-deficient or oxygen-enriched and/or contain flammable and/or toxic gases or vapours. Such unsafe atmospheres could also subsequently occur in a space previously found to be safe. Unsafe atmospheres may also be present in spaces adjacent to those spaces where a hazard is known to be present.

(1) A confined space entry procedure must be developed in conformity with the provisions of the Code and IMO's revised recommendations for entering enclosed spaces aboard ships, Resolution A.1050(27).

(2) The following guidelines are to be followed for all confined spaces:

a) Confined spaces must never be assumed to be safe for entry;

b) Confined spaces should have signs to prevent inadvertent entry;

c) No person shall enter a confined space on board a ship within any Port or harbour in South Africa unless the atmosphere has been certified safe for human entry by a Marine Chemist or a Shipyard Competent person where applicable and a permit to work issued by the Master;

d) Inside a confined space or area, no naked light or flame or hot work should be permitted unless the level of flammable or explosive gas has been tested and found safe by a Marine Chemist; and

e) Only explosion-proof lights, and tools should be used inside such confined space or area for initial inspection, cleaning or other work required to be done for making the area safe.

(3) While a worker is in a confined space-

a) adequate facilities and equipment, including breathing apparatus, first-aid kit, resuscitation apparatus and oxygen, should be readily available for rescue purposes;

b) an attendant/tank guard with First Aid and training in resuscitation must be stationed at or near the opening and should have no other assignments and must keep an entry and exit register;
c) suitable means of communication should be maintained between the worker and the attendant(s); and
d) means should be available for the attendant(s) to effect rescue from the confined space without the necessity of they themselves entering it.

(4) The space should be thoroughly ventilated, so that an ample supply of oxygen in the atmosphere is assured; (not less than21% by volume).
(5) The atmosphere in the compartment must be tested by a competent person for confined space entry and certified “SAFE FOR ENTRY”.
(6) Ventilation
a) Effective ventilation must be maintained whilst workers are inside the space.
b) If the ventilation is interrupted for any reason all work is to be suspended, all workers should be evacuated from the space without delay and brought to the open atmosphere.
(7) Testing

For entry purposes, steady readings of the following should be obtained:

a) 21% oxygen by volume by oxygen content meter;
b) not more than 1% of lower explosive limit (LFL) of a particular product on a suitably sensitive multi-gas detector; and
c) where the preliminary assessment has determined that there is potential for flammable gases or vapours.

If these conditions cannot be met, additional ventilation must be applied to the space and re-testing must be conducted after a suitable interval. Any gas testing must be carried out with ventilation to the enclosed space stopped, in order to obtain accurate readings.

(8) All confined space entry work must be conducted in accordance with the Code and the IMO's Revised Recommendations for entering enclosed spaces Resolution A.1050(27).

(9) Gas free certificates shall not be valid for longer than 24 hours for the following:

a) tankers;
b) hazardous areas which includes fuel tanks;
c) sewage tanks;
d) spaces that previously contained dangerous or hazardous products;
e) ballast and void spaces that are suspected of harbouring toxic gases; and
f) spaces adjacent to dangerous or hazardous spaces.

(10) For all other spaces not described as hazardous gas free certificates can be valid for a maximum of 72 hours pending confirmation by the shipyard competent person every 24 hours.

(11) There must be at least 1 personal oxygen meter or multi-gas detector for every 10 ship repair workers inside the tank.

7.2 Rescue

The person positioned outside the enclosed compartment must remain alert and constant watch on the workers inside. If showing signs of being affected, they should raise the alarm, but must NOT enter the space to give help. The Master must be notified immediately to effect initial rescue. The Emergency Rescue services must be contacted for rescue. The Emergency rescue services will take over from the Master. Only when the atmosphere in the compartment has been retested by a competent person and proven —SAFE FOR ENTRY- and the Master has reissued a "PERMIT FOR SAFE ENTRY" can work resume in the enclosed space.

7.3 General Precautions

(1) Breathing apparatus should be kept in good working order and adjusted to fit the user. They must be kept at entrance to the confined space.

(2) Any resuscitation equipment (e.g. Minuteman, Epac, etc) should be maintained in good working order and be readily available to revive any person overcome by fumes.

(3) A sufficient number of employees trained in methods of artificial respiration and in the use of resuscitation apparatus should be readily available.

(4) Filter canisters are intended for specific gases and are effective only in atmospheres containing sufficient oxygen. Such apparatus must not therefore be used for rescue work. It will however be helpful for specific purposes, e.g. painting in a confined space.

(5) Any worker in a confined space should be allowed to leave the space for rest spells in the open air appropriate to the duration and type of work on which he is engaged.

(6) In a confined space in which work is proceeding, constant ventilation must be maintained to dispel vapour or fumes evolved and to keep the atmosphere fresh.

(7) The assistant outside the compartment should have to hand a suitable fire extinguisher and a supply of water.

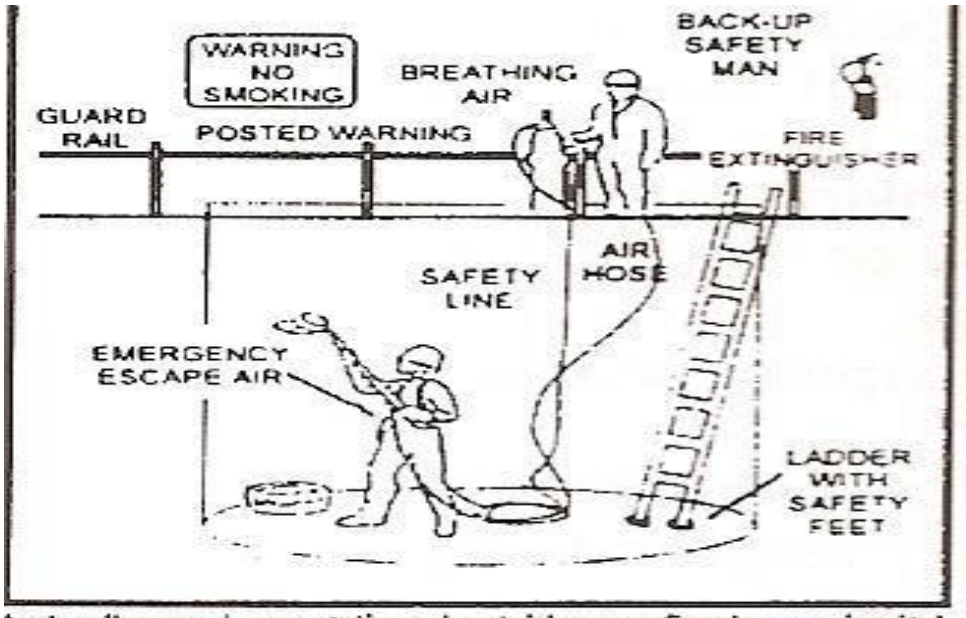
(8) When painting is in progress, warning notices should be posted at the entrances of confined spaces.

(9) Enclosed spaces should be well ventilated both while painting is in progress and until the paint as dried, particularly as the evaporating paint solvents may be toxic.

(10) Paints containing lead or mercury should not be used in confined spaces.

(11) Toxic and explosive gases may be generated in compartments such as bilge wells by the decomposition of organic matter in water.

(12) A multigas detector might not indicate oxygen deficiency or reliably indicate the presence of hydrogen. Even when a reading of zero is obtained, it does not follow that the tank is safe to enter therefore due caution should still be exercised.



A standby employee stationed outside a confined space is vital

Section 8

8 Lifting Appliances and Lifting Gear

8.1 Lifting Appliances

(1) The lifting appliances must be conspicuously marked with the safe working load and this load shall not be exceeded.

(2) All such lifting appliances shall be of sound construction, correctly maintained in a safe condition and shall be regularly inspected and tested.

(3) Loads in excess of 5 tons shall only be lifted under the direction of a rigger or suitably qualified artisan.

(4) No person may be lifted using a man-cage except in an operation meeting the requirements of section 8.3 of the Code

(5) No person working in or on a ship may operate a mobile crane, fork lift truck or similar mobile device without being authorised by his supervisor.

(6) No person may operator a ships crane, without being authorised by the Officer

of the Watch.

(7) Persons operating mobile cranes, forklift truck or similar mobile devices must be trained and competent according to the requirements of the Occupational Health and Safety Act, 1993.

8.2 Chain Blocks

(1) Chain blocks must be examined before use and the brakes tested.

(2) Chain blocks must be examined every six months and the results of the examination documented.

(3) Chain blocks must be thoroughly examined by a competent person annual y and the results of the examination documented.

8.3 Lifting Tackle

Wire Ropes

(1) Wire ropes should be of adequate strength for the frequency and type of intended use and selected in accordance with ISO 16625:2013 Cranes and hoists – Selection of wire ropes, drums and sheaves.

(2) The guaranteed minimum breaking load should not be less than the product of the safe working load and a factor of safety.

(3) Hoisting ropes should be in one length without any joins. If the lengthening of a cable is unavoidable, it should be done by an approved method, such as fitting a thimble and shackle. In such cases, the safe working load should be reduced by an appropriate amount. It may also be necessary to fit larger sheaves if the connection needs to pass over them.

(4) Wire rope slings may be endless, that is, formed by jointing the two ends of the rope, or have a variety of terminations and splices.

(5) The safe working load should be marked on every wire rope.

(6) Wire ropes should be inspected for:

a) severe corrosion;

b) local wear or shiny spots on the outer surface;

c) reduction of diameter; a one third reduction of diameter is not safe;
d) distortion or other damage of end fittings;
e) distortion of wire rope structure; and
f) an excessive number of broken wires.

Synthetic fibre ropes

(1) Fibre rope and synthetic web slings are used primarily for lifting machinery units and piping equipment. They are also the best choice for use for valuable loads, highly finished parts, fragile components and delicate equipment.

(2) Fibre rope deteriorates upon contact with acids and caustics. Fibre rope slings should not therefore be used with such substances, unless the manufacturer recommends them for that use.

(3) Inspection of fibre rope slings is carried out by examining the surface for cuts, gouges or worn surface areas, dry, brittle, scorched or discoloured fibres, or melted fibres. Where defects are observed, the rope must be discarded. Fibre rope slings cannot be repaired. The interior of fibre ropes should be inspected. It should be clean. A build-up of powder on the inside of a fibre rope indicates excessive internal wear.

Chains and chain slings

(1) A load must not be lifted with a chain that has a kink or knot in it. A chain must not be shortened by bolting, wiring or knotting.

(2) A thorough inspection of all chains in use must be made at least every three months. Each chain must bear an indication of the month in which it was thoroughly inspected. The thorough inspection must include inspection for wear, defective welds, deformation and increase in length or stretch.

(3) All repairs to chains must be made under qualified supervision. Links or portions of the chain found to be defective must be replaced by links having proper dimensions and made of material similar to that of the chain. Before repaired chains are returned to service, they must be proof tested to the proof test load

recommended by the manufacturer.

(4) Chain slings must be removed from service when, due to stretch, the increase in length of a measured section exceeds 5 per cent.

Hooks

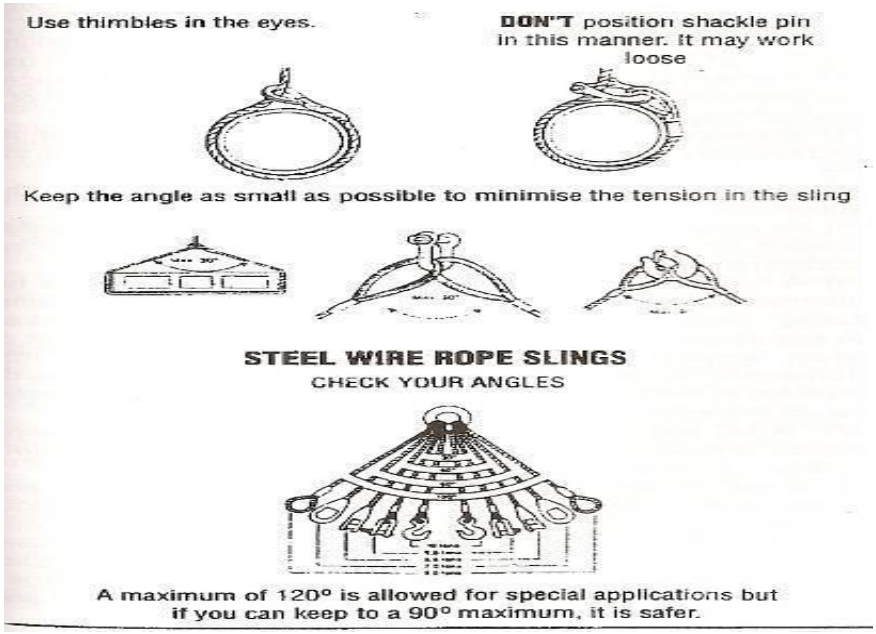
(1) The manufacturer's recommendations must be followed in determining the safe working loads of the various sizes and types of specific and identifiable hooks. All hooks for which no applicable manufacturer's recommendations are available should be tested to twice the intended safe working load before they are initially put into use.

(2) Loads must be applied to the throat of the hook, since loading the point may overstress and bend or spring the hook.

(3) When the hook of a multi-legged sling is attached to an eye fitting on a pallet, tray or load, it must be inserted into the eye from the inside of the load, so that in the event of a leg of the sling becoming momentarily slack, the hook will remain engaged in the eye.

(4) Every hook must be provided with an efficient safety device to prevent the displacement of the load from the hook.

(5) Hooks must be inspected periodically to ensure that they have not been bent by overloading. Bent or sprung hooks must not be re-used.



Man-cages

(1) Man-cage was known as a cradle or suspended basket. The aim of this section is to ensure that stevedores are lifted safely and work is done safely.

(2) The intention is to limit the use of a man-cage as far as possible. The employer must firstly consider lifting stevedores with machine/equipment specially designed to lift persons (i.e. cherry picker).

(3) In the event that a lifting machine other than the one designed to lift persons, a crane can be used to lift stevedores inside the Man-cages/cradles or suspended basket.

(4) In the exceptional circumstances stated in section 8.3 (3) of the Code, the use of an associated forklift or a crane with a man-cage must meet the following criteria:

- The man-cage must be designed and constructed in line with the relevant Regulations and applicable standard under the Occupational Health and Safety Act, 1993;
- Dedicated lifting gear for man-cage must be set aside and meet the testing, examination, and maintenance requirements;
- The method of attachment must be such that accidental disconnection cannot take place;
- A risk assessment for the operation must be developed;
- A safe working procedure must be developed;
- All stevedores involved in the operation must be medically fit for duty and trained in the risk assessment and the safe working procedure;
- Signallers must be competent; and
- Only competent crane operators to be used.

(5) Evidence that the man-cage and the operation comply with the requirements of this Code will be inspected by the authority during ad hoc inspections.

8.4 Inspection of Lifting Tackle

(1) Lifting tackle must be inspected prior to and after use.

(2) Lifting tackle must be examined by a competent person on a quarterly basis and

the results of the inspection documented.

8.5 Rigging and Lifting

(1) The supervisor or other competent person must supervise gear selection process to ensure that correct lifting appliances and gear is used.

(2) The supervisor or other competent person must ensure that gear selected is inspected, maintained and examined according to the requirements of the Code.

(3) The supervisor or other competent person, appointed in charge, must be present when raising and lowering operations are in progress.

(4) Before commencing operations, it must be ensured that the gear selected is suitable for the job and that it is in good condition.

(5) The weights of the load to be lifted and the lifting gear must be ascertained so that the lifting appliances will not be overloaded.

(6) Loads must be raised and lowered smoothly, avoiding any sudden jerks, dragging, snatching or tipping. Steps should be taken to prevent chains or ropes coming into contact with sharp edges during the operations.

(7) If the load is large or of awkward proportions, or is to be manoeuvred in a confined space, special care must be taken. Any contact with the surrounding structure may cause excessive strain on a part or whole of the lifting arrangement. In such a situation the gear selected must have a higher SWL than that required for normal working.

(8) A load should not be left suspended where practical, unless there is a suitable person in charge of the lifting appliance while the load is so left. Loads being raised or lowered should not pass or remain suspended over any person.

(9) Where necessary guide ropes should be attached to the load so that it may be safely manoeuvred.

(10) Loads should be securely suspended or supported whilst being raised or lowered and all reasonable precautions should be taken to prevent their slipping or displacement.

(11) Every lifting appliance or gear should be adequately and suitably supported or

suspended having regard to the purpose for which it is used.

(12) Only persons who have been adequately trained and certified competent should be permitted to work as riggers, slinger's and operators.

8.6 Slinging

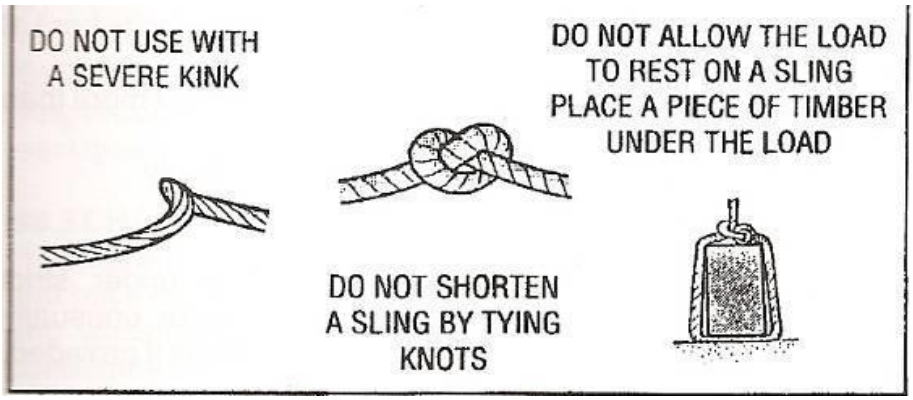
(1) The slinging of a load should be done under strict supervision. Where the load is cumbersome or unusually heavy, slings should be attached to a lifting lug or suitable fitting if provided, rather than passing around the load.

(2) Where slings pass around the load they should be suitably protected from sharp corners or protrusions by adequate packing. Packing should be provided to prevent slings slipping on the load. In all cases the slings should be pulled tight and secured before lifting.

(3) Chain or rope slings should never be dragged along a hard floor. In order to avoid pulling slings from beneath a load in contact with the floor, battens should always be available and positioned before the load is landed.

(4) When reeving a sling around a load, it is very important to ensure that loops do not form in the rope, since tension applied in these circumstances will tend to produce a kink.

(5) The minimum radius round which a sling may be bent is three times the diameter of the rope.



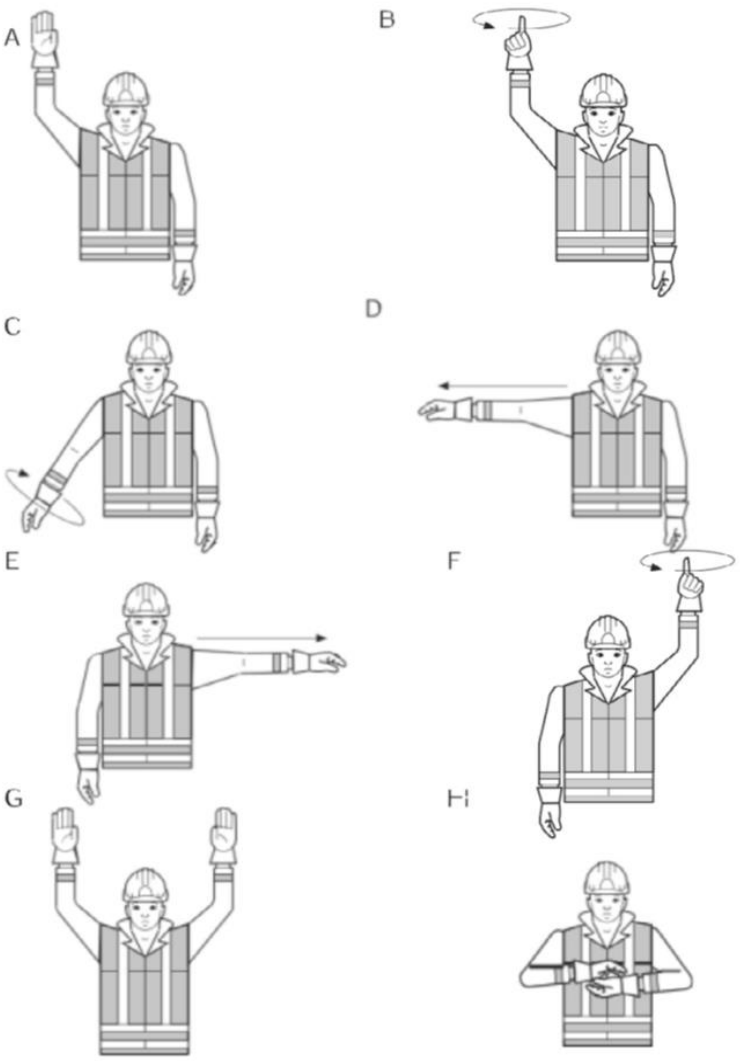
8.7 Signalling

(1) Signalling must be conducted by persons trained and certified in the art of signalling and directing crane movements in accordance with the provisions of the Code and signalling signs below.

(2) Only one person must act as the signaller for each lifting, appliance. The signaller must be clearly identifiable to the operator and, unless responding to an emergency stop signal, the operator must only act on the signaller's instruction. Identification can be ensured by a distinctively coloured hat or clothing or by radio call sign. Wearing light-coloured sleeves and gloves will enable signals to be more easily seen.

(3) More than one signaller can be required for a lifting operation if-

- one signaller will not have a clear view of the load throughout its path of travel; and
- hand signals are used and the first signaller has to move out of view of the appliance operator.



A. Stop (end of movement).

B. Raise.

C. Lower.

D. Move in direction indicated.

E. Move in direction indicated.

F. Twistlocks on/off; rotate wrist of left hand.

G. Emergency stop.

H. End operations.

(4) If signalling requires verbal communication, the signaller must be able to give clear and precise instructions in the language understood by the appliance operator.

(5) Hand signals must be clear and precise and given by wide movements that are unambiguous.

(6) The system of hand signals must be agreed upon and clearly understood by all parties. This is particularly important if the signaller and the operator of a lifting appliance are of different language groups.

(7) The signalling system must be fail safe, If radios are used, each crane must have its own separate call sign and frequency, which must be kept free from communications for other purposes in order to prevent operators reacting to signals intended for another crane. The signaller must constantly repeat the required motion throughout the intended movement, such as “hoist, hoist...hoist”, and the motion must be stopped if the operator ceases to hear the instruction.

(8) The signalling system must include a means for a signaller to inform the crane driver that he or she will no longer be giving the directions. A further signal must indicate to the crane operator that a second signaller is taking over responsibility for directing the crane movements.

(9) Signallers must not give an order before satisfying themselves that all measures have been taken to ensure that the operation can be carried out safely. The essential characteristics of signallers must be ceaseless vigilance and awareness that appliance operators are totally dependent on them during operations outside the operator's line of sight.

(10) Before work is started for the day, a signaller must ensure that the workplace on the ship’s deck or on the deck cargo is clear.

(11) Signallers on ships must place themselves where they can be seen both by

the workers on board and by the operator of the appliance.

(12) Signallers must do their utmost to protect persons against accidents. When necessary, they must warn persons on board and ashore.

(13) Before giving a signal to hoist, a signaller must ensure that the load is properly slung and that hoisting can commence without risk to persons working on board or elsewhere.

(14) No signal to lower a load must be given by a signaller unless all persons are clear.

(15) Before giving the signal to land, signallers must satisfy themselves that the load can be safely landed.

(16) Signallers must never-

- give an order to move a load if any person is under its path, which person must be instructed to move;
- agree to order operations that would violate safety rules, such as operations with defective slinging, dragging loads horizontally other than by bull-roping, or with persons travelling on the load; or
- give an instruction for operations if the light is insufficient or if there is thick fog, unless special precautions have been taken.

(17) Signallers must ensure that no persons are carried by lifting appliances except in a man-cage built for that purpose in terms of the Code.

(18) If it is necessary to stop a load while it is being raised or lowered, the signal must be precise but not abrupt, so that the operator of the lifting appliance does not jolt the load.

(19) Equipment used for giving sound, colour or light signals for hoisting, lowering or transporting loads must be efficient, properly maintained and protected from accidental interference.

(20) An audible emergency stop alarm be available, it must be-

- known to everybody working cargo on board and ashore; and
- be able to be heard by stevedores in the hold, and crane drivers on board and ashore.

Section 9

9 Working in Elevated Positions

9.1 Scaffolding

(1) Where work cannot safely be done on or from the ground, or from part of a ship or other permanent structure, a safe and suitable scaffold, or other equally safe and suitable provision, should be provided and maintained.

(2) No employer shall require or permit any person to work in an elevated position, and no person may work in an elevated position, unless such work is performed safely from a scaffolding, or from a position where such person has been made as safe as if he were working from a stage.

(3) The employer shall ensure that all scaffolding is properly designed, erected, maintained and inspected by a competent person.

(4) All scaffolding must meet the requirements of SANS 10085-1 as amended (The design, erection, use and inspection of access scaffolding).

(5) In positions more than 2 metres above ground or working platform all workers including those working from scaffolding must wear safety harness, unless the use of a harness could prove dangerous. In such circumstances the employer must give written exemption.

(6) Scaffolds should be provided with safe means of access, such as gangways, stairways or ladders. Ladders should be secured against inadvertent movement.

(7) Every scaffold and part thereof should be:

a) designed so as to prevent hazards for workers and collapse or accidental displacement when properly used;

b) designed so that guard rails and other protective devices, platforms, putlogs, rakers, transoms, ladders, stairs or ramps, as appropriate, can be easily put together; and

c) of adequate size and strength for the purpose for which it is to be used and maintained in a proper condition.

9.2 Mobile Elevating Work Platforms (MEWP)

MEWP are built for the primary purpose of lifting people. They are normally used in dry docks and not on board vessels. Driven machinery must comply with the provisions of the Occupational Health and Safety Act, 1993.

9.3 General guidelines for working in elevated position

(1) Tools or equipment may not be dropped from an elevated position and workers in the vicinity of an elevated working position shall wear approved hard hats.

(2) A worker working at a height may not be able to give his full attention to the job and at the same time guard himself against falling. Proper precautions must therefore always be taken to ensure personal safety when work has to be done aloft or when working outboard. It must be remembered that movement of the ship in a seaway will add to the hazards involved in this type of work. A stage or ladder must always be utilised when work is to be done beyond normal reach.

(3) A safety harness with lifeline or other arresting device must be continuously worn when working aloft, outboard or near open hatches.

(4) A safety net must be rigged where necessary and appropriate. Additionally, where work is done over the ships side, buoyancy garments must be worn and a lifebuoy with sufficient line attached should be kept ready for immediate use.

(5) When working in the vicinity of the whistle, radar or radio, permission must be obtained from the ship's Officer in Charge confirming that these items have been isolated and warning notices affixed to the controls to prevent accidental operation while work is in progress.

(6) Unless it is essential, work must not be done aloft on a stage or bosun's chair in the vicinity of cargo working.

(7) Care must also be taken while work is being done aloft or at a height to avoid risks to anyone working or moving below. Suitable warning notices must be displayed.

(8) Tools and stores must be sent up and lowered by line in suitable containers which must be secured in place for stowage of tools or materials not presently in use.

9.4 Bosun's Chair

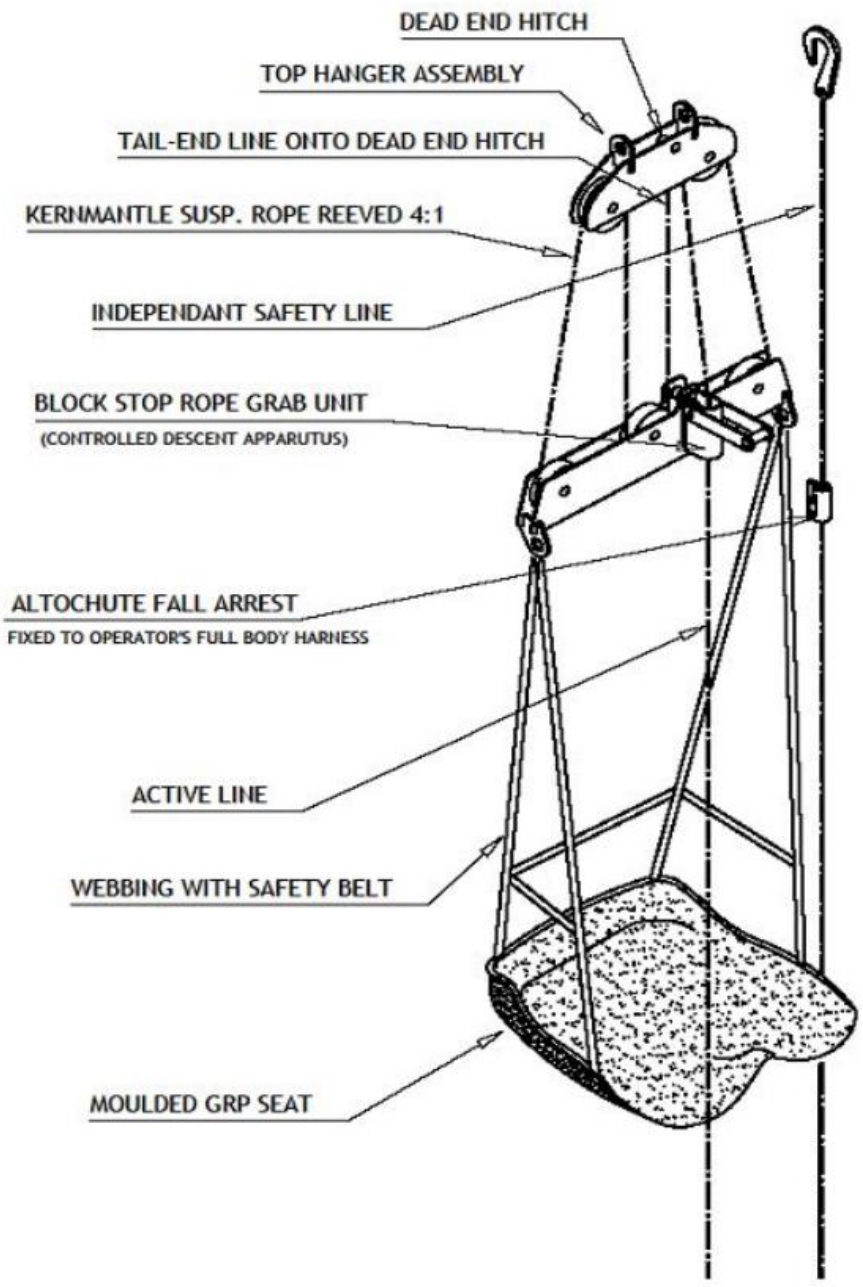
Requirements for Bosun's chairs

(1) A contractor must ensure that every Boatswain Chair is securely suspended and is constructed in such a manner so as to prevent any occupant from falling.

(2) The contractor must ensure that an inspection is carried out prior and a performance test immediately after the Boatswain Chair has been erected and thereafter a visual inspection should be carried out on a daily basis.

(3) The contractor must ensure that the occupant in the Boatswain Chair is wearing an appropriate safety helmet as well as a full body safety harness which is equipped with a fall arrest deceleration device. The device must be properly attached to the static safety line via a guided type of fall arrester.

(4) The user shall ensure every attaching device which forms an integral part of the Boatswain Chair, to be designed or proportioned that accidental disconnection of the load, under working conditions cannot take place.



(5) The user shall ensure the whole installation of the Boatswain Chair to be thoroughly examined and subjected to a performance test as prescribed by the manufacturer or by a person who has knowledge and experience of the erection and maintenance of the type of equipment involved. The person shall determine the serviceability of the structures, ropes, safety devices before they are put into use following every time they are dismantled and re-assembled and thereafter at intervals not exceeding 3 months. Provided that in the absence of such prescribed performance test, the whole installation of the Boatswain Chairs shall be tested with 110% of the rated load applied over the complete lifting of equipment and in such a manner that every part of the installation is stressed accordingly.

(6) Every user of the Bosun's Chair shall at all times keep on his premises a register in which he shall records or cause to be recorded full particulars of any performance test and examination and any modification or repair to the equipment and shall ensure that the register is available on request for inspection.

9.5 Ropes

(1) The safety of the worker aloft or over the ships side depends on the strength of the line holding him/her, whether it is a lifeline to the harness or gantline to a bosun's chair or stage.

(2) Many types of both synthetic and natural fibre ropes are available, each with different properties and different resistance to contamination by substances in use about the ship which may seriously weaken the rope.

(3) Generally synthetic ropes are better than natural fibre ropes, with Polypropylene having the best resistance to most chemicals found on board except for Chlorinated solvents such as Trichloroethylene which is sometimes used in paint and varnish removers. Polyester rate second best and Polyamide (nylon) next. All these ropes deteriorate in strong sunlight.

(4) Before use, lifelines and gantlines, lizards and chairs should be load tested to

four or five times the load they are required to carry.

9.6 Fall Protection Plan

Ship repair and maintenance employees are often required to work in dangerous environments that may include fall hazards. Accidents involving elevation equipment such as ladders, scaffolds, and aerial lifts are often serious, even fatal. Other potential hazards includes deck Openings where there are reported cases of employees falling into from deck.

1) The Employer must ensure that a fall protection plan is developed by a competent person where there is a fall risk.
2) A work area survey must be conducted by a competent person before a fall protection plan is developed taking into consideration the work area, type of vessel, type of access required.
3) The fall protection plan must be amended and reviewed as and when required.
4) Employers must ensure that the plan is adhered to through continuous monitoring.
5) A fall protection plan must include the following:
   (a) Scope of work;
   (b) Risk assessment covering all tasks posing a fall risk;
   (c) Safe work procedures and methods addressing risks identified for each work area;
   (d) List of workers who will be involved in a task with a fall risk including the competent person details;
   (e) Training and competence;
   (f) Medical fitness competency;
   (g) Equipment to be used including rescue equipment. Must cover maintenance, storage and testing;
   (h) Rescue technique to be used; and
   (i) Rescue plan that includes techniques and evacuation plans.

Section 10

10 Emergency Planning, Prevention, Preparedness and response arrangements.

1. Many types of emergencies are possible on board ships, and emergency plan must be reviewed regularly.
2. Appropriate training or instruction of stevedores on the action they must take in an emergency is essential.
3. Each type of potential emergency that could occur in port areas must be considered when preparing appropriate emergency arrangements.
4. Emergency arrangements and emergency plans must cover all foreseeable emergencies, from minor mishaps to major incidents. They must be capable of increasing appropriate responses as an incident develops.

Appendix 1

Ship Repair and Maintenance Safety Induction Training

Knowledge, understanding and proficiency	Methods for demonstrating competence	Criteria for evaluating competence
General understanding of the Maritime Occupational Safety Regulations and the Code	Identifies and explains various Regulations and sections of the Code	Correctly identifies safety criteria from a multi-choice list, describing each
Knows the correct PPE to war for the operation being performed	Identifies and explains the correct use of PPE for any particular operation including hazardous cargo	Indicates the correct application of PPE in relation to a given situation (as listed)
Knowledge of how to safely access a ship, holds, cargo stows	Demonstrates how to use a variety of access methods	Correctly demonstrates how to safely use access equipment
Understands the dangers associated with the consumption of alcohol and drugs	Understands the effects of alcohol and drugs on the body and the dangers to own person and fellow workers	Conveys that is dangerous to use alcohol and drugs before going on shift
General knowledge of various types of ships and cargoes	Explains the difference of various ships and cargoes	Demonstrates the ability to identify various ships and cargo types using diagrams and photographs
Knowledge of common lifting equipment used on a shop and the dangers of swinging and falling cargo	Explains the difference between the types of lifting equipment	Demonstrates the ability to identify various types of lifting equipment using diagrams and photographs and able to explain the

		dangers of standing near moving loads
Understands the danger of standing in the square of a hatch while cargo is being lifted	Explains that cargo can fall out of a lift and that another person can throw shackles or dunnage down the hold	States that a person must stand in the wings when cargo is being lifted and that items must be lowered into a hold not thrown
Understands symbolic safety signs displayed on a vessel	Identifies and explains the application of a variety of shipboard safety signs	Explains a person's actions relevant to a safety sign
Knows who to and how to report an unsafe act and conditions	Identifies who to contact and explains how to report an unsafe act, condition or incident	Knows the role of the safety appointee, officer and committee
Knows what to do in the event of various emergency situations	Explains the correct procedure for emergency situations	Details the procedure for emergency situations
Understands the importance of good housekeeping	Identifies poor housekeeping and explains the necessity of maintaining a safe working area	Correctly identifies poor housekeeping and how to maintain a clean and safe working area

Appendix 2: Medical Standards

Medical Surveillance Protocols	Medical	Physical	Psychologi	Audiometry	Spirometry	Colour	Chest X-ray	Biological	Immunolog	Biological
Administrative staff	v	v	-	-	-	-	-	-	-	-
Roving Staff: supervisors/foreman/project managers	c	c	-	c	c	-	-	-	-	-
Hot work: welders, cutters, burners, boilermakers, fire watchers, grinders, fire watch	c	c	c	c	c	-	-	-	-	-
Grit blasters	c	c	c	c	c	-	c	-	-	-
Tank Work	c	c	c	c	c	-	c	-	?	-
Electrical engineers	c	c	c	c	c	c	-	-	-	-
Mobile Machinery operators	c	c	-	c	c	-	c	-	-	-
Riggers	c	c	c	c	c	-	-	-	-	-
Fitters (mechanics)	c	c	c	c	c	-	-	-	-	-
Pipe fitters/plumbers	c	c	c	c	c	-	-	-	-	-
Scaffolding erectors	c	c	c	c	c	-	-	-	-	-
Painting	c	c	c	c	c	-	-	-	-	-
Chipping/scraping	c	c	c	c	c	-	-	-	-	-
Chemist	c	c	-	c	c	c	-	-	-	-
General worker	c	c	c	c	c	-	c	-	-	-