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Code of Safe Working Practices for Merchant Seafarers

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Filing instruction – Amendment 3

Amendment No 3 – Instructions for Updating the Code:

Remove	Insert
MSCP01 4 pages	MSCP01 5 pages
Contents pages 5-8	Contents pages 5-8
Chapter 9 pages 3-4	Chapter 9 pages 3-4
Chapter 17 pages 5-6	Chapter 17 pages 5-6
Chapter 18 pages 1-22	Chapter 18 pages 1-22
	Chapter 18 pages 26A-26B
Chapter 19 pages 1-20	Chapter 19 pages 1-20
	Chapter 19 pages 36A-36B
Chapter 25 pages 1-2	Chapter 25 pages 1-2
Chapter 28 pages 1-2	Chapter 28 pages 1-2
Chapter 28 pages 5-8	Chapter 28 pages 5-8
Appendix 1 pages 7-8	Appendix 1 pages 7-8
Appendix 2 pages 5-6	Appendix 2 pages 5-6
Appendix 3 pages 3-4	Appendix 3 pages 3-4
Appendix 4 pages 1-2	Appendix 4 pages 1-2
Index pages 1-44	Index pages 1-44

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Code of Safe Working Practices for Merchant Seafarers

MSCP01

2015 edition

Chapters	Pages	Revision status
Contents	1	1.02
Contents	2	1.01
Contents	3	1.02
Contents	4	1.03
Contents	5	1.01
Contents	6	1.02
Contents	7	1.03
Contents	8	1.02
Contents	9	1.03
Contents	10	1.01
Contents	11	1.03
Contents	12	1.02
0	ALL	1.01
1	1-18	1.01
1	19-20	1.02
1	21-24	1.01
1	25	1.02
1	26-28	1.01
2	ALL	1.01
3	1-2	1.01
3	3	1.02
3	4-9	1.01
3	10-10D	1.02
4	1	1.02
4	2-3	1.01
4	4-5	1.02
4	6-12	1.01
5	1-2	1.01
5	3	1.02
5	4	1.01
6	ALL	1.01
7	1-4	1.01
7	5	1.02
7	6	1.01
8	1-2	1.02
8	3-12	1.01
9	1	1.02
9	2	1.01
9	3	1.02

Chapters	Pages	Revision status
9	4-8	1.01
9	9	1.02
9	10	1.01
9	11	1.02
9	12-18	1.01
10	1-7	1.01
10	8	1.02
10	9	1.01
10	10	1.02
11	1	1.02
11	2	1.01
11	3	1.03
11	4-6B	1.02
11	7-12	1.01
11	13	1.02
11	14	1.01
12	1-2	1.01
12	3	1.02
12	4-9	1.01
12	10-11	1.02
12	12	1.01
12	13	1.02
12	14-16	1.01
12	17	1.02
12	18	1.01
13	1-2	1.01
13	3	1.02
13	4-6	1.01
13	7	1.02
13	8-13	1.01
13	14	1.02
13	15-22	1.01
14	ALL	1.01
15	1-6	1.01
15	7-10B	1.02
15	11-13	1.01
15	14	1.02
15	15-16	1.01
15	17-18	1.02
15	19-20	1.01
16	ALL	1.01
17	1	1.02
17	2	1.01

Chapters	Pages	Revision status
17	3-4	1.02
17	5	1.03
17	6-7	1.02
17	8	1.01
17	9	1.02
17	10-16	1.01
18	1	1.02
18	2	1.03
18	3-9	1.02
18	10	1.03
18	11-16	1.02
18	17	1.03
18	18	1.02
18	19-20	1.03
18	21-22	1.02
18	23-26B	1.01
19	1	1.03
19	2	1.02
19	3	1.03
19	4	1.02
19	5	1.03
19	6-7	1.02
19	8	1.03
19	9-16	1.02
19	17-19	1.03
19	20-36B	1.01
20	1	1.01
20	2-4B	1.02
20	5-15	1.01
20	16	1.02
20	17-26	1.01
21	1-7	1.01
21	8	1.02
21	9-10	1.01
22	1-2	1.01
22	3-4	1.02
22	5	1.01
22	6-8	1.02
22	9	1.01
22	10-12	1.02
22	13-14	1.01
23	1	1.02
23	2-4	1.01

Chapters	Pages	Revision status
23	5-6B	1.02
23	7-10	1.01
24	1	1.03
24	2-10	1.02
24	11-16	1.01
25	1	1.02
25	2-4	1.01
26	1-8	1.02
26	9-12	1.01
27	1-8	1.01
27	9	1.02
27	10	1.01
28	1	1.02
28	2-3	1.01
28	4-5	1.02
28	6	1.01
28	7	1.03
28	8	1.01
28	9-11	1.02
28	12	1.01
29	ALL	1.01
30	1	1.01
30	2-3	1.02
30	4	1.01
31	1	1.01
31	2	1.03
31	3	1.02
31	4	1.01
31	5	1.02
31	6-12	1.01
32	ALL	1.01
33	ALL	1.01
Appendix 1	1-2	2.01
Appendix 1	3	2.02
Appendix 1	4	2.01
Appendix 1	5	2.02
Appendix 1	6	2.01
Appendix 1	7-8	2.02
Appendix 1	9	2.01
Appendix 1	10	2.02
Appendix 1	11-12	2.01
Appendix 2	1-4	2.02
Appendix 2	5	2.03

Chapters	Pages	Revision status
Appendix 2	6-8	2.02
Appendix 2	9-10	2.01
Appendix 3	1-2	2.01
Appendix 3	3	2.02
Appendix 3	4-8	2.01
Appendix 4	1	1.01
Appendix 4	2-3	1.02
Appendix 4	4	1.01
Index	ALL	4.01

Blank page

IMO Resolution A.760(18), MSN 1676(M)

9.4.9 Green signs mean emergency escape or a first-aid sign. The sign is a green square or rectangle, with safety information shown by words or a symbol in white. For example, a white arrow on a green background points to an emergency exit.

9.4.10 If more information is needed to make clear the meaning of any symbols used in a safety sign or notice, then a supplementary sign with text only may appear below the sign, e.g. 'Not drinking water'.

The supplementary sign should be oblong or square and either:

- white with text in black; or
- the same background colour as the safety colour used on the sign it is supplementing, with the text in the relevant contrasting colour.

9.5 Occasional signs

9.5.1 Illuminated signs, acoustic signals, hand signals and spoken signals may also be used for temporary hazards or circumstances.

9.5.2 Illuminated signs and acoustic signals must be tested regularly to ensure that they are working. Acoustic signs should comply with the IMO Code on Alerts and Indicators, 2009.

9.5.3 The internationally understood hand signals for the use of lifting appliances are given in Annex 19.3.

9.5.4 Spoken signals should comply with the IMO Standard Marine Communication Phrases (SMCP), 2002. This is particularly important when communicating with another ship or with shore-side workers where English is not the official language.

9.6 Electrical wiring

9.6.1 The cores of electrical cables should be readily identifiable throughout their length by colours or numbers. Although various standards (British, other national or international) exist for colour coding of cores, the colours specified in the standards differ. The colours found on any ship will, therefore, depend on the country of building or manufacture of the cables. Care should therefore always be taken to make a positive identification of cable duty, and colours should be used primarily as a means of conductor tracing.

9.6.2 Particular care is required when connecting plugs to domestic equipment that has been brought on to a ship, because a wrong connection could prove fatal. UK equipment should be supplied with cable to the EU standard (i.e. brown for 'live', blue for 'neutral' and

yellow/green for 'earth') but older equipment and that purchased in other countries may have different colours.

9.7 Gas cylinders

BS EN 1089-3:2011

9.7.1 There are a variety of standards for the marking of gas cylinders in use globally. It is essential that seafarers are made aware of the standard in use on board.

9.7.2 Each cylinder should be clearly marked with the name of the gas and its chemical formula or symbol. Under British standards, the cylinder body should be coloured according to the contents with, where necessary, a secondary colour band painted around the neck of the cylinder to denote the particular hazards of the gas (flammability, toxicity, etc.). Examples of such colour coding on gas cylinders commonly used on board ship are as follows:

Example of a typical gas cylinder label

A Hazards and precautions, B Name of product, C Hazard diamond(s), D Filled pressure, E Gross weight, F Cylinder size, G Contact information, H Unique cylinder serial number, I Additional company information

17.4 Cradles and stages

MGN 410(M+F), Annex C

17.4.1 Cradles should be at least 430 mm (17 inches) wide and fitted with guardrails or stanchions with taut ropes to a height of 1 metre (39 inches) from the floor. Toe-boards add safety. Annex 17.3 (reproduced from MGN 410(M+F)) gives further guidance.

17.4.2 Planks and materials used for the construction of ordinary plank stages must be carefully examined to ensure adequate strength and absence of defects.

17.4.3 Wooden components of staging should be stowed in a dry, ventilated space and not subjected to heat.

17.4.4 Ancillary equipment, lizards, blocks and gantlines should be thoroughly examined before use.

17.4.5 When a stage is rigged overside, the two gantlines used in its rigging should be at least long enough to trail into the water to provide additional lifelines should a person fall. A lifebuoy and line should be kept ready nearby.

17.4.6 Gantlines used for working aloft should not be used for any other purpose and should be kept clear of sharp edges when in use.

17.4.7 The anchoring points for lines, blocks and lizards must be of adequate strength and, where practicable, be permanent fixtures to the ship's structure. Integral lugs should be hammer tested. Portable rails or stanchions must not be used as anchoring points. Any anchoring points should be treated as lifting points and should be inspected/tested in accordance with Chapter 19, Lifting equipment and operations, of this Code.

17.4.8 Stages and staging that are not suspended should always be secured against movement. Hanging stages should be restricted against movement to the extent practicable.

17.4.9 In machinery spaces, staging and its supports should be kept clear of contact with hot surfaces and moving parts of machinery. In the engine room, a crane gantry should not be used directly as a platform for cleaning or painting, but can be used as the base for a stable platform if suitable precautions are taken.

17.4.10 Where personnel working from a stage are required to raise or lower themselves, great care must be taken to keep movements of the stage small and closely controlled.

MGN 578(M)

17.4.11 Guidance for rail and trolley systems for overside working is in MGN 578(M).

17.5 Bosun's chair

MGN 410(M+F), Annex C

17.5.1 When used with a gantline, the chair should be secured to it with a double-sheet bend and the end seized to the standing part with adequate tail. Annex 17.3 (reproduced from MGN 410(M+F)) gives further guidance.

17.5.2 Hooks should not be used to secure bosun's chairs unless they are of the type that, because of their special construction, cannot be accidentally dislodged, and have a marked safe working load that is adequate for the purpose.

17.5.3 On each occasion that a bosun's chair is rigged for use, the chair, gantlines and lizards must be thoroughly examined and renewed if there is any sign of damage. They should be load tested to at least four times the load they will be required to lift before a person is hoisted.

17.5.4 When a chair is to be used for riding topping lifts or stays, it is essential that the bow of the shackle, and not the pin, rides on the wire. The pin in any case should be seized.

17.5.5 When it is necessary to haul a person aloft in a bosun's chair, it is generally done only by hand rather than by using a winch. In the case of mast access on large sailing yachts, a winch may be used by a competent person, providing a risk assessment has been completed and effective safety measures put in place to control the risks identified.

17.5.6 If a seafarer is required to lower themselves while using a bosun's chair, they should first frap both parts of the gantline together with a suitable piece of line to secure the chair before making the lowering hitch. The practice of holding on with one hand and making the lowering hitch with the other is dangerous. It may be prudent to have someone standing by to tend the lines.

17.6 Working from punts

17.6.1 Punts should be stable and provided with suitable fencing. Unsecured trestles and planks should not be used to give additional height. Safety lines and a working lifejacket should be used.

17.6.2 Before a punt is put to use, the person in charge should have due regard to the strength of tides and other hazards, such as wash from passing vessels.

17.6.3 When work is to be done at or near the stern or near bow/stern thrusters, the person in charge should inform the duty deck and engineering officers so that equipment is isolated and/or warning notices placed in the engine room, on the bridge and at any local controls.

CHAPTER 18

PROVISION, CARE AND USE OF WORK EQUIPMENT

18.1 General

18.1.1 The term 'work equipment' applies to any machinery, appliance, apparatus, tool or installation provided for use at work. The exception to this is any safety equipment or apparatus provided in compliance with the International Convention for the Safety of Life at Sea (SOLAS) requirements, which is subject to other merchant shipping regulations.

18.1.2 Work equipment provided on board is generally the responsibility of the Company. Where any work equipment is provided from ashore, responsibility for its condition rests with the shore provider. However, the Company has responsibility to ensure that it is appropriately maintained while on board and used safely.

18.1.3 All work equipment should comply with any relevant standards laid down by merchant shipping or general UK regulations. Any equipment not covered by regulations or type approvals should comply with the appropriate British or European Standard or its nearest international equivalent. See Annex 18.1 and Annex 18.3 for more details of the standards that apply.

Reg. 34

18.2 Duty of seafarers and workers

18.2.1 All seafarers and workers should comply fully with all instructions or training that they have been given in respect of the use of any work equipment.

18.2.2 No one should operate any item of work equipment unless they are competent, and authorised, to do so. Seafarers unfamiliar with the equipment on board should always be trained in the proper use of any equipment before they are allowed to use it.

S.I. 1999/2205 and MSN 1870(M+F)

18.2.3 Personnel should ensure that they use the correct tools or equipment for a task. Tools should be used only for the purpose for which they were designed. Use of unsuitable tools or equipment may lead to accidents and incidents.

18.2.4 Loose clothing or jewellery should never be worn while using machinery, because there is a risk that it may become caught in moving parts. For the same reason, long hair should always be tied back and covered with a hair net or safety cap. Personal protective equipment (PPE) should be provided and worn as required by the Merchant Shipping and Fishing Vessels (Personal Protective Equipment) Regulations 1999 and merchant shipping notice MSN 1870(M+F).

18.3 Hand tools

18.3.1 Damaged or worn tools should not be used, and cutting edges should be kept sharp and clean. Repair and dressing of tools should be carried out by a competent person.

18.3.2 Wherever practicable, a tool in use should be directed away from the body, so that if it slips it does not cause injury. However, when using a spanner more control is gained by pulling towards the body. When using a tool with a cutting edge, both hands should be kept behind the blade.

18.3.3 A chisel is best held between thumb and base of index finger with thumb and fingers straight, with palm of hand facing towards the hammer blow.

18.3.4 A saw should not be forced through the material being cut: it should be pushed with a light, even movement.

Reg. 9

18.4 Risk assessment and specific risks

18.4.1 A risk assessment should be carried out and safety measures put in place for the safe operation of the equipment and all expected circumstances. In conducting a risk assessment, the risks listed below should be considered as appropriate to the equipment and to protect those who may be at risk whilst using work equipment.

18.4.2 Where any seafarer using work equipment is, or could be, exposed to one or more of the risks or hazards listed, the Company should ensure that any significant risks to their health and safety are prevented by the provision of appropriate work equipment or protective devices or, where that is not practicable, adequately controlled by appropriate means.

18.4.3 Specific risks and hazards that should be considered include:

- mechanical risks such as crushing, impact, trapping, entanglement, cutting or friction;

- non-mechanical risks such as noise, vibration, electrical hazards, temperature and radiation;
- any article or substance falling or being ejected from work equipment;
- rupture or disintegration of parts of work equipment;
- work equipment overheating or catching fire;
- the unintended or premature discharge of any article or any gas, dust, liquid, vapour or other substance that is produced, used or stored in the work equipment;
- the unintended explosion of the work equipment or any article or substance produced, used or stored in it; and
- work equipment being struck by lightning while being used.

18.4.4 Where a specific risk to health or safety is identified in relation to a particular item of work equipment, its use and any repairs, modifications or maintenance must only be carried out by seafarers who have been specifically designated to perform the particular task. These seafarers shall be competent and shall have been provided with appropriate training, either as a result of the seafarer's overall training for the position currently held, or provided by other qualified persons on board or ashore, including the manufacturer of the equipment.

Reg. 23

18.5 Stability of work equipment

18.5.1 Where the safe use of any work equipment depends on its stability, it should be stabilised by use of clamps or another appropriate method.

18.5.2 In deciding the most appropriate method for stabilising work equipment, the potential movement of a ship under all conditions should be taken into account.

Reg. 13

18.6 Dangerous parts of work equipment

18.6.1 Every dangerous or exposed working part of work equipment is to be provided with appropriate guards or protection devices. Such guards or protection devices are to be maintained and/or replaced as necessary and are to be kept in position when the relevant parts are in motion.

18.6.2 When not in use, equipment should be stowed in a tidy and correct manner. Any cutting edges should be protected.

18.6.3 All guards or protection devices provided should:

- be of substantial construction;
- not give rise to any additional hazard;
- not be easily removed;
- be situated at a sufficient distance from the danger zone;
- not restrict the view of the operator of the equipment more than is necessary; and
- be so constructed or adapted that they allow operations necessary to fit or replace parts and for the carrying out of maintenance work, but restrict access only to the area where work is to be carried out and, where possible, without having to dismantle the guard or protection device.

18.6.4 The reference in section 18.6.3, bullet point four, to a danger zone means the zone within or around work equipment where the presence of a seafarer would expose them to a significant risk to their health or safety.

Regs 7 and 25

18.7 Maintenance

18.7.1 All work equipment is to be maintained in good repair and efficient working order in accordance with the manufacturer's instructions.

18.7.2 Maintenance should include regular inspections by a competent person. When there is any suspicion that any work equipment is not working properly, or has been subject to any treatment likely to cause damage, it should be taken out of service until it can be inspected and any necessary repairs or maintenance undertaken.

18.7.3 The decision on what maintenance work is required rests with the Company/competent person, in accordance with the manufacturer's instructions; however, the following should normally form part of a maintenance routine:

- Greasing of bearings, etc. should be thorough and frequent because bearings and other moving parts that are dry will impose additional loads that can lead to failure.
- The condition of all ropes and chains should be checked regularly for wear, damage or corrosion, and replaced as necessary.

- Regular function tests should be carried out on all controls, emergency stop controls, brakes, safety devices, etc. to ensure that they are operating correctly. Such checks should be carried out before the equipment is used.

18.7.4 As far as possible, maintenance operations on powered equipment should be carried out while the equipment is shut down. Where this is not possible, appropriate protective measures must be put in place to enable such maintenance operations to be carried out safely without exposing the person carrying out such maintenance, or any other person, to any significant risk to their health and safety. Such protective measures may include:

- keeping exposure of the dangerous part to the minimum necessary;
- authorisation of the exposure by a responsible ship's officer or other responsible person;
- permitting only a competent person to carry out the operation;
- ensuring that any person working close to the machinery has enough clear space and adequate light while they are working;
- ensuring that any person operating close to the machinery has adequate instruction in safe systems of work for that machinery, the dangers arising from its operation and the precautions to be taken; and
- the placing and display of a conspicuous warning notice on or close to the machinery.

18.7.5 Where any machinery has a maintenance log, the log should be kept up to date.

Reg. 8

18.8 Inspection

When to inspect

18.8.1 Where the safety of work equipment depends on the installation conditions, the equipment should be inspected by a competent person after the initial installation, or after re-assembly at a new site or in a new location, and before being put into service for the first time. This is to ensure that it has been installed correctly, in accordance with the manufacturer's instructions, and is safe to use. In this context, inspection means the carrying out of such visual or more rigorous inspection by a competent person and may include testing when it is considered appropriate.

18.8.2 Any work equipment exposed to conditions causing deterioration should be inspected by a competent person at suitable intervals. On each occasion that exceptional circumstances have occurred that may jeopardise the safety of the work equipment, an additional inspection should take place to enable any necessary remedial action to be taken to ensure its continuing safety. In this context, exceptional circumstances include modification work, accidents, exposure to extreme weather, any use which falls outside the equipment's design parameters and prolonged periods of inactivity.

18.8.3 Any work equipment used for lifting loads, including personnel, is also subject to the provisions of the Merchant Shipping and Fishing Vessels (Lifting Operations and Lifting Equipment) Regulations 2006, which set out specific requirements for the inspection, testing and thorough examination of such lifting equipment. This is dealt with in detail in Chapter 19, Lifting equipment and operations, of this Code.

How to inspect

18.8.4 Inspections should cover factors such as the standard of welding or other fixing and materials used, together with the strength of any part of the ship that supports it and to which it is attached. Account should also be taken of any inspection requirements or guidance produced by the manufacturer. Work equipment should be re-inspected at regular intervals, not exceeding five years or more frequently if recommended by the manufacturer, to ensure that no deterioration in its installation has occurred.

18.8.5 Structures should be examined frequently for corrosion, cracks, distortion or wear of bearings, securing points, etc. Hollow structures, such as gantries or masts, should also be checked for water trapped inside them. If water is found, the structure should be drained, suitably treated where practicable, and then sealed to prevent further ingress of water.

18.8.6 The results of all inspections are to be recorded and all such records are to be retained, readily available for inspection, until such time as a further inspection has been undertaken and recorded.

18.8.7 Where any ship's work equipment is to be used outside the ship, or work equipment from outside the ship is obtained for use on the ship, it must be accompanied by physical evidence that the last inspection required to be carried out under the Merchant Shipping and Fishing Vessels (Provision and Use of Work Equipment) Regulations 2006 has actually been carried out. In this context, used outside the ship includes equipment used on the quayside, dock or jetty, the ship's boats, pontoons or on board another ship; it also applies to equipment operated by workers who are not employed by the Company.

Reg. 10

18.9 Information and instructions

18.9.1 Incorrect use of tools and equipment can cause accidents and incidents, as well as damage to the equipment in question.

18.9.2 All seafarers and any managers or supervisors who use work equipment should have access to all necessary health and safety information and written instructions, including manufacturers' instructions, relating to the use of that equipment. These should be in an easily understood form and should include information and, where appropriate, written instructions on the conditions in which the work equipment may be used and its method of use. This should include foreseeable abnormal situations and the action to be taken if such a situation occurs; and information on any conclusions drawn from previous experience of using that work equipment.

18.9.3 Where any seafarer likely to use any item of work equipment does not understand the language in which such information and instructions are provided, appropriate measures should be taken to ensure that the information/instructions are provided in the working language of the vessel or in a language that the seafarer understands.

Reg. 11

18.10 Training

18.10.1 All seafarers who use work equipment, or who supervise its use, should have received adequate training covering the method of use of the equipment, any risks that may arise from its use and any precautions to be taken.

18.10.2 Similarly, seafarers specifically designated to carry out repairs, modifications, maintenance or servicing to work equipment, or who supervise such work, should have received adequate training for that purpose when the use of that equipment may involve a specific health and safety risk to the person using it, e.g. electrical equipment or mechanical cutting equipment.

18.10.3 In accordance with the International Safety Management (ISM) Code for Merchant Shipping, all such training is to be recorded and should indicate when full competence is achieved.

18.10.4 All instruction or information must be in the working language of the vessel.

18.11 Electrical equipment

18.11.1 Isolation equipment and PPE appropriate to the ship's electrical installation should be carried, supplied and used as and when required.

Reg. 16

18.12 High or very low temperatures

18.12.1 Where any equipment, parts of equipment or anything produced by, used by, or stored in such equipment has the potential to burn, scald or cause any other injury to any seafarer by virtue of being at a high or low temperature, appropriate measures should be taken to prevent injury.

18.12.2 Appropriate measures may include guards or barriers to the hazardous parts of the equipment, isolation of the equipment or the provision of PPE.

Reg. 18

18.13 Controls

18.13.1 Any seafarer operating the controls of any work equipment should be able to ensure from the control position that no other seafarer will be exposed to any significant risk to their health and safety as a result of the starting up or use of that equipment. Where such an arrangement is not reasonably practicable, appropriate systems of work must be introduced to ensure that no seafarer is exposed to any significant risk to their health and safety as a result of the starting up or use of the equipment. This may include audible, visible or other suitable warning devices, as required by sections 18.15 or 18.16 so that any seafarers likely to be affected are aware that the equipment is about to be started. See Annex 18.3 for more details.

18.13.2 Any seafarers who are in the position where they would be exposed to a risk to their health and safety as a result of the starting or stopping of work equipment must be given sufficient time and suitable means to get out of the way prior to the starting or stopping of the equipment.

Reg. 24

18.14 Lighting

18.14.1 Adequate lighting, appropriate for the work to be undertaken, should be provided at any place where work equipment is used.

Reg. 26
MGN 556(M+F)

18.15 Markings

18.15.1 Where any health and/or safety markings are required to comply with the requirements of the Merchant Shipping and Fishing Vessels (Safety Signs and Signals) Regulations 2001, such markings that comply with MGN 556(M+F) and Chapter 9, Safety signs and their use, of this Code are to be provided and applied to the equipment in such a way that they are clearly visible to any person using or in the vicinity of that equipment.

Reg. 27

18.16 Warnings

18.16.1 Where any work equipment is required to be fitted with warning signs, warning devices, etc., their meaning should be clear and they should be easily seen or heard.

18.17 Portable power-operated tools and equipment

18.17.1 Power-operated equipment may be dangerous unless properly maintained, handled and used, and should only be operated by competent persons. The flexible cables of electric tools should comply with the relevant British or International Standard. Before work begins, personnel should ensure that power supply leads and hoses are in good condition, laid safely clear of all potentially damaging obstructions and do not obstruct safe passage. Where they pass through doorways, the doors should be secured open.

18.17.2 The risk of electric shock is increased by perspiration and locations that are damp, humid or have large conductive surfaces. In such conditions, power tools should be operated from low voltage supplies, i.e. no more than 55 volts AC with a maximum of 30 volts to earth or 50 volts DC.

18.17.3 When it is not practicable to use low voltages, other precautions such as a local isolating transformer supplying one appliance only or a high-sensitivity earth leakage circuit breaker (also known as a residual current device) should be used.

18.17.4 The risk associated with portable electric tools also applies to portable electric lamps. The supply to these should not exceed 110 volts.

18.17.5 Double-insulated tools should not be used on ships outside the accommodation because water can provide a contact between live parts and the casing, increasing the risk of a fatal shock. An earth leakage circuit breaker may also fail to operate when used with such tools because there may be no earth wire in the power supply cable fitted to the tool.

18.17.6 Chain linkages or similar devices should be fitted between sections of pneumatic hose to prevent whiplash in the event of breakage. Alternatively, safety valves that close off the lines can be used.

18.17.7 Accessories and tool pieces (drill bits, chisel, etc.) should be absolutely secure in the tool. In particular, retaining springs, clamps, locking levers and other built-in safety devices on pneumatic tools should be replaced after the tool piece is changed. Accessories and tool pieces should not be changed while the tool is connected to a power source.

18.17.8 Correct safety guards should be securely fixed to appliances requiring them and should be checked for security before starting any operation. Such guards should only be removed when the equipment is not operating. If removal whilst operating is essential for maintenance or examination of the equipment, the following precautions should be taken:

- Removal should be authorised by a responsible person, and only a competent person should carry out the work or examination.
- There should be adequate clear space and lighting for the work to be done.
- Anyone working close to the machinery should be told what the risks are and instructed in a safe system of work and precautions to take.
- A warning notice should be conspicuously posted.

18.17.9 During temporary interruptions to work (e.g. meal breaks, and on completion of a task), equipment should be isolated from power sources and left safely or stowed away correctly.

18.17.10 When a work operation causes high noise levels, hearing protection should be worn. When flying particles may be produced, the face and eyes should be protected (see Chapter 8, Personal protective equipment).

18.17.11 The vibration caused by reciprocating tools (pneumatic drills, hammers, chisels, etc.) or high-speed rotating tools can give rise to a permanent disablement of the hands known as 'dead' or 'white' fingers. In its initial stages, this appears as a numbness of the fingers and an increasing sensitivity to cold but, in more advanced stages, the hands become blue and the fingertips swollen. Seafarers subject to the symptoms described should not use such equipment. Other seafarers should be advised not to use them for more than 30 minutes without a break, unless the risk assessment indicates a lesser period of use. Further information is given in Chapter 12, Noise, vibration and other physical agents.

18.18 Workshop and bench machines (fixed installations)

18.18.1 Fixed installations should only be operated by competent personnel. The operator should check a machine every time before use, and ensure that all safety guards and devices are in position and operative, that all tool pieces (drill bits, cutting blades, etc.) are in good condition, and that the work area is adequately lit and free from clutter.

18.18.2 No machine should be used when a guard or safety device is missing, incorrectly adjusted or defective, or when it is itself in any way faulty. If any defect is identified, the machine should be isolated from its power source until it has been repaired.

18.18.3 During operations, personnel should ensure that work pieces are correctly secured in position, and that machine residues (swarf, sandings, etc.) do not build up excessively and are disposed of in a correct and safe manner.

18.18.4 Whenever machinery is left unattended, even if only briefly, the power supply should be switched off and isolated, and the machinery and any safety guards should be re-checked before resuming work.

18.19 Abrasive wheels

18.19.1 Abrasive wheels should be selected, mounted and used only by competent persons and in accordance with manufacturers' instructions. They are relatively fragile and should be stored and handled with care.

18.19.2 Manufacturers' instructions should be followed on the selection of the correct type of wheel for the job in hand. Generally, soft wheels are more suitable for hard material and hard wheels for soft material.

18.19.3 Before a wheel is mounted, it should be brushed clean and closely inspected to ensure that it has not been damaged in storage or transit. The soundness of a vitrified wheel can be further checked by suspending it vertically and tapping it gently. If the wheel sounds dead, it is probably cracked and should not be used.

18.19.4 A wheel should not be mounted on a machine for which it is unsuitable. It should fit freely but not loosely to the spindle; if the fit is unduly tight, the wheel may crack as the heat of the operation causes the spindle to expand.

18.19.5 The clamping nut should be tightened only sufficiently to hold the wheel firmly. When the flanges are clamped by a series of screws, the screws should be first screwed home with the fingers and diametrically opposite pairs tightened in sequence.

18.19.6 The speed of the spindle should not exceed the stated maximum permissible speed of the wheel.

18.19.7 A strong guard, enclosing as much of the wheel as possible, should be provided and kept in position at every abrasive wheel, both to contain wheel parts in the event of a burst and to prevent an operator having contact with the wheel (see also section 18.17.8 above).

18.19.8 When a work rest is provided, it should be properly secured to the machine and adjusted as close as practicable to the wheel, the gap normally being not more than 1.5 mm (1/16 inch).

18.19.9 The side of a wheel should not be used for grinding: it is particularly dangerous when the wheel is appreciably worn.

18.19.10 The work piece should never be held in a cloth or pliers.

18.19.11 When dry grinding operations are being carried out and when an abrasive wheel is being trued or dressed, suitable transparent screens should be fitted in front of the exposed part of the wheel and operators should wear properly fitting eye protectors. Eye protection should always be worn for grinding operations.

18.20 Hydraulic/pneumatic/high-pressure jetting equipment

18.20.1 Seafarers using hydraulic/pneumatic/high-pressure systems should have received adequate training and be competent to use such equipment. Manufacturers' operating guidelines should be followed at all times. Equipment should not be operated at pressures that exceed manufacturers' recommendations.

18.20.2 Before starting work, seafarers should ensure that the equipment and supply systems are in sound condition, and that incorporated safety devices are in place and functioning correctly. Where equipment is defective or suspect, systems should be shut down, isolated and depressurised to allow effective replacement or repair. Such repairs should only be carried out by authorised competent personnel using approved components.

18.20.3 Before activating a pressure system, and also when closing it down, the recommended checks should be made to ensure that no air pockets or trapped pressure are in the system, because these may cause erratic action of the equipment.

18.20.4 When handling hydraulic fluid, personnel should ensure that:

- the correct grade is used when topping up systems;
- spillages are cleaned up immediately;
- any splashes of such fluid onto skin areas are cleaned off immediately – many such fluids are mineral based;
- naked lights are kept away from equipment during service/test periods – hydraulic fluids may give off vapours that may be flammable.

18.20.5 In the event of a high-pressure release of oil, air or any other substance that penetrates the skin, medical advice should be sought immediately.

18.20.6 Seafarers using high-pressure jetting equipment should wear the correct protective equipment. Such systems may involve use of a heated supply source and operators should therefore guard against splashing and scalding. Warning notices should be displayed on approaches to areas where such work is being undertaken to warn other seafarers of the use of a high-pressure system in the area. Finally, seafarers should take great care in ensuring that the direction of such jetting is safe.

18.20.7 When compressed air is used, the pressure should be kept no higher than is necessary to undertake the work satisfactorily.

18.20.8 Compressed air should not be used to clean the working space and in no circumstances should it be directed at any part of a person's body.

18.21 Hydraulic jacks

18.21.1 Jacks should be inspected before use to ensure that they are in a sound condition and that the oil in the reservoir reaches the minimum recommended level.

18.21.2 Before a jack is operated, care should be taken to ensure that it has an adequate lifting capability for the work for which it is to be used, and that its foundation is level and of adequate strength.

18.21.3 Jacks should be applied only to the recommended or safe jacking points on equipment.

18.21.4 Equipment under which seafarers are required to work should be properly supported with chocks, wedges or by other safe means – never by jacks alone.

18.21.5 Jack operating handles should be removed if possible when not required to be in position for raising or lowering the jack.

Reg. 30

18.22 Use of mobile work equipment

18.22.1 Where mobile work equipment is to be used on board a ship:

- no ship's powered vehicle or powered mobile lifting appliance shall be driven in the course of a work activity except by a competent person who is authorised to do so;
- where work equipment is moving around in a work area, appropriate traffic rules are drawn up and followed for the safety of seafarers and others;
- seafarers on foot should, so far as is reasonably practicable, be prevented from entering the area of operation of self-propelled work equipment;
- where work cannot be done properly unless seafarers on foot are present, appropriate measures are in place to prevent them from being injured by the work equipment.

18.22.2 Seafarers should be carried on mobile work equipment only when safe facilities are provided for this purpose. The speed of the work equipment should be adjusted as necessary for the safety of the seafarers.

18.22.3 Mobile work equipment fitted with a combustion engine should not be used in working areas unless sufficient ventilation can be guaranteed, so that the operation of the combustion engine presents no risk to the health or safety of seafarers.

Reg. 28

18.23 Carrying of seafarers on mobile work equipment

18.23.1 No seafarer is to be carried on any mobile work equipment unless it is designed for that purpose. In this context, designed for that purpose includes being fitted out in such a way as to minimise risks to the safety of any seafarer, including any risks from wheels or tracks. Such equipment must also incorporate measures to prevent it rolling over or, where that is not possible, reduce the risks to health or safety of seafarers should it roll over whilst being used. Such measures could include:

- stabilisation of the work equipment to prevent it rolling over;
- provision of a protection structure so that the work equipment cannot fall on its side;
- provision for a structure giving sufficient clearance around the seafarers being carried if the work equipment can overturn further than that; or
- any device that is equally effective in providing protection for the seafarers being carried.

18.23.2 Where there is a risk of any seafarer being carried by mobile work equipment being crushed in the event of it rolling over, it should be fitted with a restraining system for the person. This does not apply to a fork-lift truck with a structure as described in section 18.23.1, bullet points two and three.

Reg. 29

18.24 Overturning of fork-lift trucks

18.24.1 Any fork-lift truck to which section 18.23.2 applies and which carries a seafarer must be adapted or equipped to minimise the risk to health or safety from its overturning. In deciding what adaptations are required, account should be taken of the manner and conditions in which the fork-lift truck is being used.

18.24.2 Any seafarer operating a fork-lift truck must have received appropriate safety training including that relating to the individual type of fork-lift truck.

Reg. 31

18.25 Self-propelled work equipment

18.25.1 When any self-propelled work equipment could present a hazard to health and safety while in motion:

- it should be fitted with a means (e.g. a key-operated switch) for preventing it from being started by an unauthorised person;

- where there is more than one item of rail-mounted work equipment in motion at the same time, it should be fitted with appropriate facilities for minimising the consequences of a collision;
- it should be fitted with braking and stopping devices;
- it should be fitted with emergency facilities operated by a readily accessible control or automatic system for braking and stopping if the main device fails;
- where the driver's direct field of vision is inadequate to ensure safety, there are adequate devices for improving their vision;
- if used in the dark:
  - it is to be fitted with lighting appropriate to the work to be carried out; and
  - it is sufficiently safe for such use;
- if it or anything carried or towed by it involves a risk from fire and is liable to injure seafarers, it should carry appropriate fire-fighting appliances, unless such appliances are kept sufficiently close to it.

Reg. 32

18.26 Remote-controlled self-propelled work equipment

18.26.1 Where any remote-controlled self-propelled equipment could endanger the safety of seafarers while it is in motion, it must be set up in such a way that it stops automatically once it leaves its control range. Additionally features to guard against the risk of crushing or other impact should be incorporated.

Reg. 33

18.27 Drive units and power take-off shafts

18.27.1 Where the seizure of a drive unit or power take-off could present a risk to seafarers, appropriate measures including the provision of guards or other protection devices referred to in section 18.6.1 should be taken.

18.28 Ropes and wires

18.28.1 The safety of a ship or individual crew member is often dependent on the rope that is being used.

18.28.2 Many types of rope of both man-made and natural fibre are available, each with different properties and with different resistance to contamination by substances in use about the ship that may seriously weaken the rope. The following table is a guide to the resistance of the main rope types but is indicative only of the possible extent of deterioration of rope; in practice, much depends on the precise formulation of the material, the amount of contamination the rope receives and the length of time and the temperature at which it is exposed to contamination. In some cases, damage may not be apparent even on close visual inspection.

	Resistance to chemicals of rope made of:					
Substance	Manila or sisal	Polyamide (nylon)	Polyester	Polypropylene	Polyethylene (HMPE)	Aramid
Sulphuric (battery) acid	None	Poor	Good	Very good	Good	Poor
Hydrochloric acid	None	Poor	Good	Very good	Very good	Good
Typical rust remover	Poor	Fair	Good	Very good		
Caustic soda	None	Good	Fair	Very good	Very good	Good
Liquid bleach	None	Good	Very good	Very good	Very good	Good
Creosote, crude oil	Fair	None	Good	Very good		
Phenols, crude tar	Good	Fair	Good	Good	Very good	Good
Diesel oil	Good	Good	Good	Good		
Synthetic detergents	Poor	Good	Good	Good		
Chlorinated solvents, e.g. trichloroethylene (used in some paint and varnish removers)	Poor	Fair	Good	Poor	Very good	Good
Other organic solvents	Good	Good	Good	Good	Very good	Very good

18.28.3 Ropes should be stored away from heat, sunlight and extreme cold, if possible in a separate compartment that is dry and well ventilated, away from containers of chemicals, detergents, rust removers, paint strippers and other substances capable of damaging them. Mooring ropes should be covered by tarpaulins or, if the ship is on a long voyage, stowed away. Any accidental contamination should be reported immediately for cleansing or other action.

18.28.4 Man-made fibre ropes have high durability and low water absorption and are resistant to rot. Mildew does not attack man-made fibre ropes but moulds can form on them. This will not normally affect their strength.

18.28.5 Polypropylene ropes, which have the best all-round resistance to attack from harmful substances, are generally preferred. However, they may be subject to degradation in strong sunlight ('actinic degradation'), and should not be exposed for long periods. They should also be of a type providing grip comparable to that of manila or sisal ropes.

18.28.6 New rope, three-strand fibre rope and wire should be taken out of a coil in such a fashion as to avoid disturbing the lay of the rope.

18.28.7 Ropes should be inspected internally and externally before use for signs of deterioration, undue wear or damage.

18.28.8 When using steel wire ropes, it is important that they are properly installed, maintained and lubricated as appropriate to their use. Manufacturers' guidelines and recommendations for use should be followed. When eyes are formed, they should be made by eye-splicing or using appropriate compression fittings (using swages or ferrules). The use of bulldog grips is discouraged, and they must not be used on lifting wires or mooring wires. Annex 18.2 gives further information regarding bulldog grips.

18.29 Characteristics of man-made fibre ropes

18.29.1 Safe handling of man-made fibre ropes requires techniques that differ from those for handling natural fibre ropes.

18.29.2 Man-made fibre ropes are relatively stronger than those of natural fibre and so for any given breaking strain have appreciably smaller circumferences; however, wear or damage will diminish strength to a greater extent than the same amount of wear or damage would on a natural fibre rope. Recommendations for substitution of natural fibre ropes by man-made fibre ropes are given in the table on the following page.

18.29.3 Careful inspection of man-made fibre ropes for wear externally and internally is necessary. A high degree of powdering between strands indicates excessive wear and reduced strength. Ropes with high stretch suffer greater inter-strand wear than others. Hardness and stiffness in some ropes, polyamide (nylon) in particular, may also indicate overworking.

Manila		Polyamide (nylon, etc.)		Polyester (terylene)		Polypropylene	
Diameter (mm)	Size	Diameter (mm)	Size	Diameter (mm)	Size	Diameter (mm)	Size
48	6	48	6	48	6	48	6
56	7	48	6	48	6	52	6.5
64	8	52	6.5	52	6.5	56	7
72	9	60	7.5	60	7.5	64	8
80	10	64	8	64	8	72	9
88	11	72	9	72	9	80	10
96	12	80	10	80	10	88	11
112	14	88	11	88	11	96	12

Diameter given for three-strand, size number for eight-strand plaited.

18.29.4 Unlike natural fibre ropes, man-made fibre ropes give little or no audible warning of approaching breaking point.

18.29.5 Rope of man-made material stretches under load to an extent that varies according to the material. Polyamide rope stretches the most. Stretch imparted to man-made fibre rope, which may be up to double that of natural fibre rope, is usually recovered almost instantaneously when tension is released. A break in the rope may therefore result in a dangerous backlash and an item of running gear breaking loose may be projected with lethal force. Snatching of such ropes should be avoided; when it may occur inadvertently, personnel should stand well clear of the danger areas. The possibility of a mooring or towing rope parting under the load is reduced by proper care, inspection and maintenance and by its proper use in service, but it can nevertheless still happen without warning.

18.29.6 Man-made fibre ropes may easily be damaged by melting if frictional heat is generated during use. Too much friction on a warping drum may fuse the rope with consequential sticking and jumping of turns, which can be dangerous. Polypropylene is more liable to soften than other material. To avoid fusing, ropes should not be surged unnecessarily on winch barrels. For this reason, a minimum of turns should be used on the winch barrel; three turns are usually enough but, on whelped drums, one or two extra turns may be needed to ensure a good grip; these should be removed as soon as practicable.

18.29.7 The method of making eye splices in ropes of man-made fibres should be chosen according to the material of the rope.

- Polyamide (nylon) and polyester fibre ropes need four full tucks in the splice each with the completed strands of the rope, followed by two tapered tucks for which the strands are halved and quartered for one tuck each respectively. The length of the splicing tail from the finished splice should be equal to at least three rope diameters. The portions of the splice containing the tucks with the reduced number of filaments should be securely wrapped with adhesive tape or other suitable material.
- Polypropylene ropes should have at least three but not more than four full tucks in the splice. The protruding spliced tails should be equal to three rope diameters at least.
- Polythene ropes should have four full tucks in the splice with protruding tails of three rope diameters at least.

18.29.8 Mechanical fastenings should not be used in lieu of splices on man-made fibre ropes because strands may be damaged during application of the mechanical fastening, and the grip of the fastenings may be much affected by slight, unavoidable fluctuations in the diameter of the strands.

18.29.9 Man-made fibre stoppers of like material (but not polyamide) should be used on man-made fibre mooring lines, preferably using the 'West Country' method (double and reverse stoppering).

18.30 Laundry equipment

MSN 1838(M)

18.30.1 All seafarers required to work in a laundry, or use any part of the equipment there, must be fully instructed on the proper operation of the machinery. When a seafarer is under 18 years of age, they should not work on industrial washing machines, hydro-extractors, calender presses or garment presses unless they have been fully trained in the operation of the machine and the precautions to be observed and, if appropriate, are closely supervised by a competent person.

18.30.2 Equipment should be inspected before use for faults and damage. Particular attention should be paid to the automatic cut-off or interlocking arrangements on washing machines, hydro-extractors, etc., and the guards and emergency stops on presses, calender presses, mangling and wringing machines. Any defect or irregularity found during inspection, or apparent during operation of the equipment, should be reported immediately and the use of the machine discontinued until such time as any necessary repairs or adjustments have been carried out.

A notice warning against use should be displayed prominently on the defective machine.

18.30.3 Frequent and regular inspection, with thorough checking of all electrical equipment and apparatus, is also necessary to ensure the standard of maintenance essential for laundries.

18.30.4 Machines should not be overloaded and loads should be distributed uniformly.

18.30.5 Reliance should not be placed entirely on interlocking or cut-off arrangements on the doors of washing machines, hydro-extractors and drying tumblers, etc.; doors should not be opened until all movement has ceased.

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Annex 18.3 Standards for work equipment

S.I. 2006/2183 Reg. 6(1)

1. Suitability of work equipment

Work equipment should be:

- suitable for the work to be carried out;
- properly adapted for that purpose; and
- capable of being used without any significant risks to the health and safety of any seafarer.

Reg. 14

2. Electrical equipment

All ship's electrical equipment and installations should be operated and maintained in such a way that there is no electrical hazard to the ship or any person.

Reg. 17

3. Controls for starting or making a significant change in operating conditions

Where any work equipment could constitute a risk to the health or safety of seafarers because it contains moving parts or is mobile, it must be fitted with one or more controls for the purposes of starting it and controlling any change in its speed, pressure or other operating conditions. Additionally, it must only be possible to start the machine or change its speed, etc. by operation of the relevant control.

The requirements in the preceding paragraph do not apply to any automatic restarting or other changes in the operating conditions that occur as a result of the normal operating cycle of any work equipment.

Reg. 20

4. Controls

All operational controls for work equipment should be clearly visible and identifiable, including the provision of appropriate marking where necessary. No control should be placed in a position where any seafarer operating it is exposed to any significant risk to their health and safety.

Reg. 18

5. Stop controls

In addition to the requirements of section 3 (Controls for starting or making a significant change in operating conditions) above, where any work equipment could constitute a risk to health and safety, one or more readily accessible controls must be provided to either bring it to a stop or otherwise render it safe.

Any stop control must override any control required by section 3 in this annex.

Reg. 19

6. Emergency stop controls

In addition to the requirements for stop controls in the section above, where any work equipment could constitute a risk to health and safety, one or more readily accessible emergency stop controls should be provided. An emergency stop control must override any controls required by sections 3 and 5 in this annex.

Reg. 21

7. Control systems

Any control systems for work equipment should be safe and take account of any risks to health and safety that might result from damage to or breakdown of that control system. In this context, a control system cannot be considered safe unless:

- its operation does not create any increased risk to health or safety;
- any fault in, or damage to, any part of the control system, or the loss of power supply to it, does not result in additional or increased risk to health or safety; and
- it does not impede the operation of any stop control required by sections 5 and 6 in this annex.

Reg. 22

8. Isolation from sources of energy

Where the risk assessment indicates the need, work equipment should be provided with a suitable system for isolating it from all its sources of energy. Any isolating system should be clearly identified, capable of being locked off and indicated in the appropriate permit to work.

Suitable measures must also be in place to ensure that re-connection of any energy source to work equipment does not expose the seafarer using the equipment to any significant risk to their health and safety. Such measures must also be identified in the risk assessment and identified on the permit to work.

CHAPTER 19

LIFTING EQUIPMENT AND OPERATIONS

19.1 Introduction

19.1.1 The general principles on provision, care and use of work equipment, set out in Chapter 20, Work on machinery and power systems, are also applicable to lifting equipment. This guidance gives additional information specific to lifting. Where there is any overlap, the more stringent regulations apply.

19.1.2 'Lifting equipment' means work equipment used for lifting or lowering loads and includes the attachments used for anchoring, fixing or supporting it.

19.1.3 'Loose gear' means any gear by means of which a load can be attached to lifting equipment but which does not form an integral part of either the lifting equipment or the load.

19.2 General requirements

Lifting equipment

S.I. 2006/2184 and MGN 332 (M+F)

19.2.1 A valid certificate of testing and thorough examination by a competent person should be in force for every item of lifting equipment, accessory for lifting and loose gear. All items should be tested, and then thoroughly examined and certificated for use,

- after manufacture or installation; or
- after any repair or modification that is likely to alter the safe working load (SWL) or affect the strength or stability of the equipment.

A certificate for a ship's lifting equipment is valid for no more than five years.

The format for such certificates is shown in Annex 19.1.

19.2.2 In addition to the strength and stability of the lifting equipment, consideration should also be given to the stability, angle of heel and potential down-flooding of any vessel as a result of the use of a crane, davit, derrick or other lifting device fitted on it. This is especially important where a crane is to be fitted on a work boat or other small vessel, and it is recommended that advice should be sought from the crane manufacturer in such cases prior to the crane being fitted.

Similarly, it is recommended that a check of the vessel's stability should be carried out by a suitably qualified person prior to installation of a crane, and following any modification to it, to ensure that the vessel is capable of operating safely with the crane fitted and in use. Failure to do this could have serious consequences for the safety of the vessel and the workers on it.

19.2.3 Any welding of material should be to an approved, acceptable standard because any fitting is only as strong as the weld that connects it to the vessel's structure.

19.2.4 If counterbalance weights are moveable, effective precautions should be taken to ensure that the lifting equipment is not used for lifting in an unstable condition. In particular, all weights should be correctly installed and positioned.

19.2.5 Lifting equipment with pneumatic tyres should not be used unless the tyres are in a safe condition and inflated to the correct pressures. Means to check this should be provided.

19.2.6 The operator should check safety devices fitted to lifting equipment before work starts and at regular intervals thereafter to ensure that they are working properly.

Accessories for lifting

19.2.7 When selecting accessories for lifting, the following should be taken into account:

- the loads to be handled;
- the gripping points;
- the loose gear for attaching the load, and for attaching the accessories to the lifting equipment;
- the atmospheric and environmental conditions;
- the mode and configuration of slinging;
- vessel motions;
- stability issues.

19.2.8 Accessories for lifting should be stored in conditions that will not result in damage or degradation.

Controls

19.2.9 Controls of lifting equipment should be permanently and legibly marked with their function and their operating directions shown by arrows or other simple means, indicating the position or direction of movement for hoisting or lowering, slewing or luffing, etc.

19.2.10 Makeshift extensions should not be fitted to controls nor any unauthorised alterations made to them. Foot-operated controls should have slip-resistant surfaces.

19.2.11 No lifting device should be used with any locking pawl, safety attachment or device rendered inoperative. If, exceptionally, limit switches need to be isolated in order to lower a crane to its stowage position, the utmost care should be taken to ensure the operation is completed safely.

19.3 Regular maintenance

19.3.1 In order to ensure that all parts of lifting equipment and related equipment are kept in good repair and working order, regular preventative maintenance should be carried out. Maintenance should include regular examinations by a competent person. Such examinations should be carried out as required by the Regulations but in any event at least once annually. Checks should look for general material defects such as cracks, distortion, corrosion and wear and tear that could affect SWL and overall strength.

19.3.2 When there is any suspicion that any lifting equipment or any part of that equipment may have been subjected to excessive loads, exceeding the SWL, or subjected to treatment likely to cause damage, it should be taken out of service until it can be subjected to a thorough examination by a competent person.

19.3.3 Listed below are some suggested maintenance items:

- Greasing should be thorough and frequent, because dry bearings impose additional loads that can lead to failure.
- The condition of all ropes, wires and chains should be checked regularly for wear, damage and corrosion and replaced as necessary. Particular care should be taken to examining ropes thoroughly including lengths that remain static in use, which may also be located in areas difficult to access.
- Shackles, links and rings should be renewed when wear or damage is evident.
- Structures should be examined frequently for corrosion, cracks, distortion and wear of bearings, securing points, etc.
- Hollow structures such as gantries or masts should be checked for water trapped inside. If water is found, the structure should be drained, appropriately treated and then sealed.

- Regular function tests of controls, stops, brakes, safety devices for hoisting gear, etc. should be carried out preferably before the start of operations.

This list is illustrative only and additional items may be appropriate dependent upon the equipment fitted to an individual vessel.

19.3.4 Any replacement parts must be in accordance with the manufacturer's instructions and of an equivalent construction to the original part. This is because replacement with incorrect parts or counterfeit parts of inferior quality can seriously affect the safety of a lifting equipment.

19.3.5 After any repairs or alterations are made to any lifting equipment, it should undergo a thorough examination and be retested if appropriate. This also applies if any significant changes are made or noticed to the general condition of the equipment.

19.4 Thorough examination and inspection

19.4.1 Where the safety of lifting equipment depends on the installation conditions, it should be inspected by a competent person before it is used for the first time. Such inspections should be undertaken on initial installation or after re-assembly at another location, to ensure that it has been installed correctly, in accordance with any manufacturer's instructions, and is safe for workers to operate as well as being able to function safely.

19.4.2 Any lifting equipment or accessory for lifting that is, or has been, exposed to conditions that could cause deterioration in its condition should be:

- thoroughly examined;
  - in the case of lifting equipment for lifting persons or an accessory for lifting, at least every six months;
  - in the case of other lifting equipment, at least every 12 months; or
  - in either case, in accordance with an examination scheme; and
  - whenever exceptional circumstances that are liable to jeopardise the safety of the lifting equipment have occurred; and
- where appropriate, inspected by a competent person at suitable intervals.

19.4.3 No accessories for lifting, other than that which is subject to section 19.4.2, first bullet point, should be used unless it has been thoroughly examined within the 12 months immediately prior to such use.

19.5 Defect reporting and testing: advice to competent persons

19.5.1 There is a legal requirement for lifting equipment to be tested every five years. This section provides advice to the competent person carrying out the test.

19.5.2 The requirements for testing a lifting equipment will be met if before use one of the following appropriate tests is carried out:

- Proof loading the equipment concerned.
- In appropriate cases, testing a sample to destruction.
- In the case of re-testing after repairs or modifications, such a test that satisfies the competent person who subsequently examines the equipment (the re-testing of a ship's lifting equipment may be effected by means of a static test, e.g. by dynamometer where appropriate).

19.5.3 Where proof loading is part of a test, the test load applied should exceed the SWL as specified in the relevant standard or, in other cases, by at least the following:

Proof load (tonnes)

SWL (tonnes)	Lifting equipment	Single-sheave cargo and pulley blocks	Multi-sheave cargo and pulley blocks	Lifting beams and frames, etc.	Other lifting gear
0–10	SWL × 1.25	SWL × 4	SWL × 2	SWL × 2	SWL × 2
11–20	SWL × 1.25	SWL × 4	SWL × 2	SWL × 1.04 + 9.6	SWL × 2
21–25	SWL + 5	SWL × 4	SWL × 2	SWL × 1.04 + 9.6	SWL × 2
26–50	SWL + 5	SWL × 4	SWL × 0.933 + 27	SWL × 1.04 + 9.6	SWL × 1.22 + 20
51–160	SWL × 1.1	SWL × 4	SWL × 0.933 + 27	SWL × 1.04 + 9.6	SWL × 1.22 +20
160+	SWL × 1.1	SWL × 4	SWL × 1.1	SWL × 1.1	SWL × 1.22+20

Note: Where a lifting equipment is normally used with a specific removable attachment and the weight of that attachment is not included in the marked SWL, then for the purposes of using the above table the SWL of that equipment should be taken as being the marked SWL plus the weight of the attachment.

19.5.4 Any defect found in any lifting equipment, including that provided by a shore authority, should be reported immediately to the master or to another responsible person who should take appropriate action.

19.5.5 Similar principles apply to cargo-securing devices as to lifting equipment. The crew and persons employed for the securing of cargoes should be instructed in the correct application and use of the cargo-securing gear on board the ship. For guidance on the securing of cargoes and handling of security devices, refer to the ship's approved cargo-securing manual.

19.6 Certificates

19.6.1 The Company is required to ensure that a certificate is obtained no later than 28 days after the carrying out of any test and thorough examination of any lifting equipment. Work should not proceed in the absence of a valid certificate.

19.7 Record of lifting equipment

19.7.1 All vessels are required to maintain records of manufacture, examination, inspection and testing of lifting equipment. Records and service history should be kept of equipment, of dates when and where it is brought into use, its safe working load, plus any repairs, modifications, tests and examinations carried out.

19.7.2 A form for the register of lifting appliances and loose gear used for cargo handling, based on the model recommended by the International Labour Organization, is given in Annex 19.2, Register of ship's lifting appliances and cargo-handling gear.

19.8 Positioning and installation

Reg. 8

19.8.1 Permanently installed lifting equipment should not be used unless it has been positioned or installed in such a way as to minimise the risk of:

- the equipment or a load striking a worker;
- a load drifting dangerously or falling freely; or
- a load being released unintentionally.

19.9 Lifting operations

19.9.1 Every lifting operation must be:

- subject to risk assessment;
- properly planned;
- appropriately supervised; and
- carried out in a safe manner.

19.9.2 No lifting operation should begin using equipment that is mobile or can be dismantled unless the Company is satisfied that the lifting equipment will remain stable during use under all foreseeable conditions, taking into account the nature of the surface on which it stands.

19.9.3 All lifting operations must be properly planned, appropriately supervised and carried out to protect the safety of workers. Whilst this applies to all vessels, it is particularly important when cranes are being used on work boats and other small vessels due to the impact on the stability of the vessel. Overloading of a crane, or attempting to lift at the wrong angle could, in some circumstances, result in the vessel sinking.

19.9.4 Weather conditions can play a significant part in lifting operations. High winds or wave action may cause suspended loads to swing dangerously or mobile equipment to topple. Consideration should be given to the effects of weather conditions on all lifting operations, whether inside the ship or outside on deck, and such operations should be suspended before conditions deteriorate to the extent that lifting becomes dangerous.

19.9.5 No person should be lifted except where the equipment is designed or specially adapted and equipped for that purpose, or for rescue or in emergencies.

19.9.6 Contact with bare ropes or warps with moving parts of the equipment should be minimised by the installation of appropriate protective devices.

19.9.7 Under no circumstances should personnel stand on, stand below or pass beneath a load that is being lifted. Loads should not be lifted over any access way.

19.9.8 All loads should be properly slung and properly attached to lifting gear, and all gear properly attached to equipment.

19.9.9 The use of lifting equipment to drag heavy loads with the fall at an angle to the vertical is inadvisable because of the friction and other factors involved, and should only take place in exceptional circumstances where the angle is small, there is ample margin between the loads handled and the SWL of the equipment, and particular care is taken. In all other cases, winches should be used instead. Derricks should never be used in union purchase for such work.

19.9.10 Any lifts by two or more appliances simultaneously can create hazardous situations and should only be carried out when unavoidable. They should be properly conducted under the close supervision of a responsible person, after thorough planning of the operation.

19.9.11 Lifting equipment should not be used in a manner likely to subject them to excessive overturning moments.

19.9.12 Ropes, chains and slings should not be knotted.

19.9.13 A thimble or loop splice in any wire rope should have at least three tucks, with a whole strand of rope and two tucks, with one half of the wires cut out of each strand. The strands in all cases should be tucked against the lay of the rope. Any other form of splice that can be shown as equivalent can also be used.

19.9.14 Lifting gear should not be passed around edges liable to cause damage, without appropriate packing.

19.9.15 Where a particular type of load is normally lifted by special gear, such as plate clamps, other arrangements should only be substituted if they are equally safe.

19.9.16 The manner of use of natural and man-made fibre ropes, magnetic and vacuum lifting devices and other gear should take proper account of the particular limitations of the gear and the nature of the load to be lifted.

19.9.17 Wire ropes should be regularly inspected and treated with suitable lubricants. These should be thoroughly applied so as to prevent internal corrosion as well as corrosion on the outside. The ropes should never be allowed to dry out.

19.9.18 Cargo-handling equipment that is lifted onto or off ships by crane or derrick should be provided with suitable points for the attachment of lifting gear, so designed as to be safe in use. The equipment should also be marked with its own gross weight and SWL.

19.9.19 Before any attempt is made to free equipment that has become jammed under load, every effort should first be made to take the load off safely. Precautions should be taken to guard against sudden or unexpected freeing. Others not directly engaged in the operation should keep in safe or protected positions.

19.9.20 When machinery and, in particular, pistons are to be lifted by means of screw-in eye-bolts, the eye-bolts should be checked to ensure that they have collars, that the threads are in good condition and that the bolts are screwed hard down on to their collars. Screw holes for lifting bolts in piston heads should be cleaned and the threads checked to see that they are not wasted before the bolts are inserted.

19.10 Safe working load

19.10.1 A load greater than the SWL should not be lifted unless:

- a test is required by regulation; and
- the weight of the load is known and is the appropriate proof load; and
- the lift is a straight lift by a single appliance; and
- the lift is supervised by a competent person who would normally supervise a test and carry out a thorough inspection; and
- the competent person specifies in writing that the lift is appropriate in weight and other respects to act as a test of the equipment, and agrees to the detailed plan of the lift; and
- no person is exposed to danger thereby.

19.10.2 Any grab fitted to lifting equipment should be of an appropriate size, taking into account the SWL of the equipment, the additional stresses on the equipment likely to result from the operation and the material being lifted.

19.10.3 In the case of a single sheave block used in double purchase, the working load applied to the wire should be assumed to equal half the load suspended from the block.

19.10.4 The SWL of a lift truck means its actual lifting capacity, which in the case of a fork-lift truck, relates the load that can be lifted to, the distance from the centre of gravity of the load from the heels of the forks. It may also specify lower capacities in certain situations, e.g. for lifts beyond a certain height.

19.11 Operational safety measures

Reg. 10

19.11.1 Powered lifting equipment should always have a person at the controls while it is in operation; it should never be left to run with a control secured in the 'ON' position.

19.11.2 If any powered lifting equipment is to be left unattended with the power on, loads should be taken off and controls put in a 'NEUTRAL' or 'OFF' position. Where practical, controls should be locked or otherwise inactivated to prevent accidental restarting. When work is completed, the power should be shut off.

19.11.3 The person operating any lifting equipment should have no other duties that might interfere with their primary task. They should be in a proper and protected position, facing the controls and, so far as is practicable, with a clear view of the whole operation.

19.11.4 Where the operator of the lifting equipment does not have a clear view of the whole of the path of travel of any load carried by that equipment, appropriate precautions should be taken to prevent danger. Generally this requirement should be met by the employment of a competent and properly trained signaller designated to give instructions to the operator. A signaller includes any person who gives directional instructions to an operator while they are moving a load, whether by manual signals, by radio or otherwise.

19.11.5 The signaller should have a clear view of the path of travel of the load where the operator of the lifting equipment cannot see it.

19.11.6 Where necessary, additional signallers should be employed to give instructions to the first signaller.

19.11.7 Every signaller should be in a position that is:

- safe; and
- in plain view of the person to whom they are signalling unless an effective system of radio or other contact is in use.

19.11.8 All signallers should be instructed in and should follow a clear code of signals, agreed in advance and understood by all concerned in the operation. Examples of hand signals recommended for use with lifting equipment on ships are shown in Annex 19.3, Code of hand signals.

19.11.9 If a load can be guided by fixed guides, or by electronic means, or in some other way, so that it is as safely moved as if it was being controlled by a competent team of driver and signallers, signallers will not be necessary.

Additional measures for small vessels

19.11.10 An inclinometer or other efficient device to display heel angle should be provided on board for guidance to the operator when controlling the lifting of items of unknown weight.

19.11.11 Consideration should be given to which openings below deck should be secured weather tight during lifting operations, and all personnel should be above deck before lifting operation commence. Information should be posted on or near the lifting equipment with this information.

19.12 Use of winches and cranes

19.12.1 The drum end of wire runners or falls should be secured to winch barrels or crane drums by proper clamps or U-bolts. The runner or fall should be long enough to leave at least three turns on the barrel or drum at maximum normal extension. Slack turns of wire or rope on a barrel or drum should be avoided because they are likely to pull out suddenly under load.

19.12.2 When a winch is changed from single to double gear or vice versa, any load should first be released and the clutch secured so that it cannot become disengaged when the winch is working.

19.12.3 Steam winches should be so maintained that the operator is not exposed to the risk of scalding by leaks of hot water and steam.

19.12.4 Before a steam winch is operated, the cylinders and steam pipes should be cleared of water by opening the appropriate drain cocks. The stop valve between winch and deck steam line should be kept unobstructed. Adequate measures should be taken to prevent steam obscuring the driver's vision in any part of a working area.

19.12.5 Ships' cranes should be properly operated and maintained in accordance with the manufacturers' instructions. The Company and the master, as appropriate, should ensure that sufficient technical information is available, including the following:

- length, size and SWL of falls and topping lifts;
- SWL of all fittings;
- boom lifting angles; and
- manufacturers' instructions for replacing wires, topping up hydraulics and other maintenance as appropriate.

19.12.6 Power-operated rail-mounted cranes should have the following facilities incorporated in their control systems:

- Facilities to prevent unauthorised start-up.
- An efficient braking mechanism that will arrest the motion along the rails and, where safety constraints require, emergency facilities operated by readily accessible controls or automatic systems for braking or stopping equipment in the event of failure of the main facility.
- Guards that reduce as far as possible the risk of the wheels running over people's feet, and which will remove loose materials from the rails.

19.12.7 When a travelling crane is moved, any necessary holding bolts or clamps should be replaced before operations are resumed.

19.12.8 Access to a crane should always be by the proper means provided. Cranes should be stationary while accessing.

19.13 Use of derricks

19.13.1 Ships' derricks should be properly rigged and the Company and the master should ensure that rigging plans are available that include information on the:

- position and size of deck eye-plates;
- position of inboard and outboard booms;
- maximum headroom, i.e. permissible height of cargo hook above hatch coaming;
- maximum angle between runners;
- position, size, and SWL of blocks;
- length, size and SWL of runners, topping lifts, guys and preventers;
- SWL of shackles;
- position of derricks producing maximum forces;
- optimum position for guy and preventers to resist maximum forces;
- combined load diagrams showing forces for a load of 1 tonne or the SWL; and
- guidance on the maintenance of the derrick rig.

19.13.2 The operational guidance in the remainder of this section applies generally to the conventional type of ship's derrick. For other types, such as the 'Hallen' and 'Stulken' derricks, manufacturers' instructions should be followed.

19.13.3 Runner guides should be fitted to all derricks so that when the runner is slack, the bight is not a hazard to persons walking along the decks. Where rollers are fitted to runner guides, they should rotate freely.

19.13.4 Before a derrick is raised or lowered, all persons on deck in the vicinity should be warned so that no person stands in, or is in danger from, bights of wire and other ropes. All necessary wires should be flaked out.

19.13.5 When a single span derrick is being raised, lowered or adjusted, the hauling part of the topping lift or bull wire (i.e. winch-end whip) should be adequately secured to the drum end.

19.13.6 The winch driver should raise or lower the derrick at a speed consistent with the safe handling of the guys.

19.13.7 Before a derrick is raised, lowered or adjusted with a topping lift purchase, the hauling part of the span should be flaked out for its entire length in a safe manner. Someone should be available to assist the person controlling the wire on the drum and keeping the wire clear of turns and in making fast to the bitts or cleats. Where the hauling part of a topping lift purchase is led to a derrick span winch, the bull wire should be handled in the same way.

19.13.8 To fasten the derrick in its final position, the topping lift purchase should be secured to bitts or cleats by first putting on three complete turns followed by four crossing turns and finally securing the whole with a lashing to prevent the turns jumping off due to the wire's natural springiness.

19.13.9 When a derrick is lowered on a topping lift purchase, someone should be detailed for lifting and holding the pawl bar, ready to release it should the need arise; the pawl should be fully engaged before the topping lift purchase or bull wire is released. The person employed on this duty should not attempt or be given any other task until this operation is complete; in no circumstances should the pawl bar be wedged or lashed up.

19.13.10 A derrick with a topping winch, and particularly one that is self-powered, should not be topped hard against the mast, table or clamp in such a way that the initial heave required to free the pawl bar prior to lowering the derrick cannot be achieved without putting an undue strain on the topping lift purchase and its attachments.

19.13.11 A heel block should be secured additionally by means of a chain or wire so that the block will be pulled into position under load but does not drop when the load is released.

19.13.12 The derrick should be lowered to the deck or crutch and properly secured whenever repairs or changes to the rig are to be carried out.

19.13.13 If heavy cargo is to be dragged under deck with a ship's winches, the runner should be led directly from the heel block to avoid overloading the derrick boom and rigging. Where a heavy load is to be removed, a snatch block or bull wire should be used to provide a fair-lead for the runner and to keep the load clear of obstructions.

19.14 Use of derricks in union purchase

19.14.1 When using union purchase, the following precautions should be strictly taken to avoid excessive tensions:

- The angle between the married runners should not normally exceed 90° and an angle of 120° should never be exceeded.
- The cargo sling should be kept as short as possible so as to clear the bulwarks without the angle between the runners exceeding 90° (or 120° in special circumstances).
- The derricks should be topped as high as practicable, consistent with safe working.
- The derricks should not be rigged further apart than is absolutely necessary.

19.14.2 The following examples will show how rapidly loads increase on derricks, runners and attachments as the angle between runners increases:

- At a 60° included angle, the tension in each runner would be just over half the load.
- At 90°, the tension would be nearly three-quarters of the load.
- At 195°, the tension would be nearly 12 times the load.

19.14.3 When using union purchase, winch operators should wind in and pay out in step; otherwise, dangerous tensions may develop in the rig.

19.14.4 An adequate preventer guy should always be rigged on the outboard side of each derrick when used in union purchase. The preventer guy should be looped over the head of the derrick, and as close to and parallel with the outboard guy as available fittings permit. Each guy should be secured to individual and adequate deck or other fastenings.

19.14.5 Narrow angles between derricks and outboard guys and between outboard guys and the vertical should be avoided in union purchase because these materially increase the loading on the guys. The angle between the outboard derrick and its outboard guy and preventer should not be too large and may cause the outboard derrick to jack-knife. In general, the inboard derrick guys and preventer should be secured as nearly as possible at an angle of 90° to the derrick.

19.15 Use of stoppers

19.15.1 Where fitted, mechanical topping lift stoppers should be used. Where chain stoppers are used, they should **always** be applied by two half-hitches in the form of a cow hitch, suitably spaced with the remaining chain and rope tail backed round the wire and held taut to the wire.

19.15.2 A chain stopper should be shackled as near as possible in line with the span downhaul and always to an eye-plate, not passed round on a bight, which would induce bending stresses similar to those in a knotted chain.

19.15.3 No stopper should be shackled to the same eye-plate as the lead block for the span downhaul; this is particularly hazardous when the lead block has to be turned to take the downhaul to the winch or secure it to bitts or cleats.

19.15.4 The span downhaul should always be eased to a stopper and the stopper should take the weight before turns are removed from the winch, bitts or cleats.

19.16 Overhaul of cargo gear

19.16.1 When a cargo block or shackle is replaced, care should be taken to ensure that the replacement is of the correct type, size and SWL necessary for its intended use.

19.16.2 All shackles should have their pins effectively secured or seized with wire.

19.16.3 A special check should be made on completion of the work to ensure that all the split pins in blocks, etc. have been replaced and secured.

19.16.4 On completion of the gear overhaul, all working places should be cleaned of oil or grease.

19.17 Trucks and other vehicles/appliances

19.17.1 Personnel other than the driver should not be carried on a truck unless it is constructed or adapted for the purpose. Riding on the forks of a fork-lift truck is particularly dangerous. The driver should be careful to keep all parts of the body within the limits of the width of the truck or load.

19.17.2 Trucks for lifting and transporting should be used only by competent persons and only when the ship is in still water; they should never be used when vessels are in a seaway.

19.17.3 Appliances powered by internal combustion engines should not be used in enclosed spaces unless the spaces are adequately ventilated. The engine should not be left running when the truck is idle.

19.17.4 When not in use or left unattended whilst the vessel is in port, trucks for lifting and transporting should be aligned along the length of the ship with brakes on, operating controls locked and, where applicable, the forks tilted forward flush with the deck and clear of the passageway. If the trucks are on an incline, their wheels should be chocked. If not to be used for some time, and at all times whilst at sea, appliances should be properly secured to prevent movement.

19.17.5 No attempt should be made to handle a heavy load by the simultaneous use of two trucks. A truck should not be used to handle a load greater than its marked capacity or to move insecure or unsafe loads.

19.17.6 Tank containers should not be lifted directly with the forks of fork-lift trucks, because of the risks of instability and of damaging the container with the ends of the forks. Tank containers may be lifted using fork-lift trucks fitted with suitably designed side or top lifting attachments but care should be exercised because of the risk of surge in partly filled tanks.

19.18 Personnel-lifting equipment, lifts and lift machinery

19.18.1 Except under the conditions required by paragraph 19.18.2, no lifting equipment shall be used for lifting persons unless it is designed for the purpose.

19.18.2 If in exceptional circumstances it is necessary to use lifting equipment, which has not been specifically designed for the purpose, to lift persons:

- the control position of the lifting equipment must be manned at all times; and
- the persons being lifted must have a reliable means of communication, whether direct or indirect, with the operator of the lifting equipment.

19.18.3 Lifting equipment that is designed for lifting persons must not be used for that purpose unless it has been constructed, maintained and operated such that a worker may use it or carry out work activities from the carrier without risk to their health and safety, and in particular that:

- the worker will not be crushed, trapped or struck, especially through inadvertent contact with objects;
- the lifting equipment is so designed or has suitable devices:
  - to prevent any carrier falling or, if that cannot be prevented for reasons inherent in the site and height differences, the carrier has an enhanced safety coefficient suspension rope or chain;
  - to prevent the risk of any person falling from the carrier; and
- any person trapped in the carrier in the event of an incident is not thereby exposed to danger and can be freed.

19.18.4 Any rope or chain provided under section 19.18.3, first part of second bullet point, is to be inspected by a competent person every working day.

MGN 332(M+F)

19.18.5 Guidelines on the transfer of personnel is contained in Chapter 31, Ships serving offshore oil and gas installations, of this Code and in MGN 332(M+F).

19.19 Maintenance and testing of lifts

19.19.1 Before a lift is put into normal service, it must be tested and examined by a competent person and a certificate or report issued.

19.19.2 Details of the tests and examinations required for the issue of a certificate are given in British Standards and other equivalent standards. 'Thorough examination and testing of lifts: Simple guidance for lift owners' (INDG339) is also available from the Health and Safety Executive (HSE).

19.19.3 Regular, thorough examination must be carried out by a competent person at least every six months, or in accordance with an examination scheme, and a certificate or report issued. More detailed examination and testing of parts of the lift installation must be carried out by a third party, at periodic intervals determined by the manufacturer or their representative, or at least every 12 months.

19.19.4 A person chosen to act as a competent person must be over 18 years old and have such practical and theoretical knowledge and actual experience of the type of lift that they have to examine as will enable them to detect defects or weaknesses and to assess their importance in relation to the safety of the lift. Specialist lift maintenance courses are available and recommended.

19.19.5 Any work carried out on lifts must only be performed by authorised persons familiar with the work and the appropriate safe-working procedures. These procedures must include provision for the safety of persons working on a lift and others who may also be at risk.

19.19.6 An initial risk assessment must be made to identify hazards associated with work on each lift installation, including work requiring access to the lift trunk. Safe working procedures must be drawn up for each lift installation. Persons who are to be authorised to carry out work on or inspection of a lift installation must comply with these procedures.

19.19.7 The specific areas that the risk assessment should address should include, as appropriate:

- whether there are safe clearances above and below the car at the extent of its travel;
- whether a car-top control station is fitted and its means of operation; and
- the working conditions in the machine and pulley rooms.

19.19.8 Based on the findings of the risk assessment, a permit to work system should be used, as described in Chapter 14, Permit to work systems, when it is necessary for personnel to enter the lift trunk or to override the control safety systems. No person should work alone on lifts.

19.19.9 Appropriate safety signs must be prominently displayed in the area and also on control equipment such as call lift buttons. Barriers must be used when it is necessary for lift landing doors to remain open to the lift trunk.

19.19.10 Experience indicates that the most important single factor in minimising risk of accidents is the avoidance of misunderstandings between personnel. A means of communication to the authorising officer and between those involved in working on a lift must be established and maintained at all times. This might be by telephone, portable hand-held radio or a person-to-person chain. Whatever the arrangement, action should only be taken as a result of the positive receipt of confirmation that the message is understood.

19.19.11 Before attempting to gain access to the trunk of a lift, the lift must be isolated. The mains switch should be locked in the OFF position (or alternatively the fuses should be withdrawn and retained in a safe place) and an appropriate safety sign positioned at the point of such isolation. This should include both main and emergency supplies. In addition, the landing doors should not be allowed to remain open longer than necessary; the machine room should be protected against unauthorised entry and, after completion of work, a check must be made to ensure that all equipment used in the operation has been cleared from the well.

19.19.12 When it is necessary for personnel to travel on top of a car, safety can be enhanced considerably by the use of the car-top control station (comprising a stopping device and an inspection switch/control device) required by British Standards or an equivalent standard. Account should be taken of the arrangement and location of the control station, i.e. whether the stopping device can be operated before stepping on to the car on top of the lift car if no stopping device is fitted.

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Annex 19.4 Standards

S.I. 2006/2184 and MGN 332 (M+F)

The Merchant Shipping and Fishing Vessels (Lifting Operations and Lifting Equipment) Regulations 2006 introduce measures intended to protect workers from risks arising from the provision and use of lifting equipment. Full guidance is given in marine guidance note MGN 332(M+F).

Lifting equipment

Reg. 6

Lifting equipment is required to be:

- of adequate strength and stability for each load, having regard in particular to the stress induced at its mounting or fixing points; and,
- securely anchored; or
- adequately ballasted or counterbalanced; or
- supported by outriggers, as necessary to ensure its stability when lifting.

Lifting equipment should be of steel or other acceptable material and securely fastened to the vessel's structure. The maximum safe working load (SWL) and maximum radius of operation of all derricks and lifting equipment are required to be part of the specification on all new constructions with associated ropes, wires and guys, eye-plates, shackles and blocks designed to meet these loads.

The vessel's structure, crane, davit, derrick or other lifting device and the supporting structure should be of sufficient strength to withstand the loads that will be imposed when operating at its maximum load moment.

Every part of a load that is used in lifting it, as well as anything attached to the load and used for that purpose, should be of good construction, of adequate strength for the purpose for which it is to be used and free from defects.

Marking of equipment

Lifting equipment must be clearly marked to indicate its safe working loads.

Where the safe working load depends on the configuration of the equipment:

- the work equipment is clearly marked to indicate the SWL for each configuration of the equipment; or
- information that clearly indicates the SWL for each configuration of the work equipment is kept with the equipment;

Any lifting equipment where the SWL varies with its operating radius is fitted with an accurate indicator, clearly visible to the operator, showing

the radius of the load lifting attachment at any time and the safe working load corresponding to that radius.

Lifting equipment that is designed for lifting persons is appropriately and clearly marked.

Lifting equipment that is not designed for lifting persons but which may be so used in error is appropriately and clearly marked to the effect that it is not designed for lifting persons.

Loose gear must be clearly and legibly marked with its safe working load or otherwise marked in such a way that it is possible for any user to identify the characteristics necessary for its safe use including, where appropriate, its SWL.

Loose gear that weighs a significant proportion of the SWL of any lifting equipment with which it is intended to be used must be clearly marked with its own weight.

Trucks and other vehicles/appliances

When vehicles/work trucks or other mechanical appliances are used aboard a vessel to carry personnel, they should where possible be constructed so as to prevent them overturning, or they should be equipped or adapted to limit the risk to those carried, by one or more of the following protection measures:

- An enclosure for the driver.
- A structure ensuring that, should the vehicle overturn, safe clearance remains between the ground and the parts of the vehicle where people are located when it is in use.
- A structure restraining the workers on the driving seat so as to prevent them from being crushed. These protection structures may be an integral part of the vehicle/work equipment. They are not required when the work equipment is stabilised or where the equipment design makes rollover impossible.

CHAPTER 25

PAINTING

25.1 Introduction

25.1.1 Based on the findings of the risk assessment, appropriate control measures should be put in place to protect those who may be affected. This chapter identifies some areas that may require attention in respect of painting.

25.2 Preparation and precautions

25.2.1 Because the origin of any paint to be removed may be unknown, precautionary measures should be taken in all circumstances. Painted surfaces should always be rubbed down wet to reduce dust from the old paint, which may be toxic if inhaled. Where the dust is known to contain lead, other dust-treating methods should be used. Appropriate respiratory protective equipment should be worn as protection against other dusts.

25.2.2 If the surface to be rubbed down is known to contain lead, then methods that do not create dust should be adopted. It is safer to avoid or minimise dust creation than to try to clean up the dust afterwards. Sanding or abrasive blasting should be avoided. Lead-based paint should never be burnt off because fumes will contain metallic lead in a readily absorbed form.

25.2.3 Rust removers are acids and contact with unprotected skin should be avoided. Eye/face protection should be worn against splashes (see Chapter 8, Personal protective equipment). If painting aloft or otherwise near ropes, care should be taken to avoid splashes on ropes, safety harness, lines, etc. (see sections 18.28.2 and 18.28.3 on the effect of such contamination on ropes).

25.2.4 Interior and enclosed spaces should be well ventilated, both while painting is in progress and until the paint has dried.

25.2.5 There should be no smoking or use of naked lights during painting or until the paint has dried hard. Some vapours even in low concentrations may decompose into more harmful substances when passing through burning tobacco.

25.2.6 When painting is done in the vicinity of machinery, the power supply should be isolated and the machine immobilised in such a way that it cannot be moved or started up inadvertently. Appropriate warning notices should be posted. Close-fitting clothing should be worn.

25.3 Application of new paint

25.3.1 Paints may be considered hazardous substances and mixtures, and may present risks that require precautions to be taken. Packaging is required to be marked with warning signs, which will give the first indication of any risks. A risk assessment should be carried out using the safety data sheet provided with the product. Seafarers using such paints should be warned of the particular risks arising from their use.

25.4 Use of paint-spraying equipment

25.4.1 Because there are many different types of paint-spraying equipment in use, seafarers should comply with the manufacturer's instructions for use.

25.4.2 Airless spray-painting equipment is particularly hazardous because the paint is ejected at a very high pressure and can penetrate the skin or cause serious eye injuries. Spray should not be allowed to come into contact with the face or unprotected skin.

25.4.3 Suitable protective clothing such as a combination suit, gloves, cloth hood and eye protection should be worn during spraying.

25.4.4 Paints containing lead, mercury or similarly toxic compounds should not be used.

25.4.5 A suitable respirator should be worn according to the nature of the paint being sprayed. In exceptional circumstances, it may be necessary to use specialist breathing apparatus (see section 8.8).

25.4.6 If a spray nozzle clogs, the trigger of the gun should be locked in a closed position before any attempt is made to clear the blockage.

25.4.7 Before a blocked spray nozzle is removed or any other dismantling is attempted, pressure should be relieved from the system.

25.4.8 When blowing through a reversible nozzle to remove a blockage, all parts of the body should be kept clear of the nozzle mouth.

25.4.9 The pressure in the system should not exceed the recommended working pressure of the hose. The system should be regularly inspected for defects.

25.4.10 As an additional precaution against the hazards of a hose bursting, a loose sleeve (e.g. a length of 2 to 3 metres (6 to 10 feet) of old air hose) may be slipped over that portion of the line adjacent to the gun and paint container.

CHAPTER 28

DRY CARGO

Note: Chapters 10, Manual handling, 16, Hatch covers and access lids, and 19, Lifting equipment and operations, also have special relevance to work on dry cargo ships.

28.1 Stowage of cargo

28.1.1 This chapter concerns both packaged and dry bulk cargoes, with the exception of cargoes carried in roll-on/roll-off (ro-ro) ships, which are covered in Chapter 27, Roll-on/roll-off ferries.

28.1.2 All cargoes should be stowed and secured in a manner that will avoid exposing the ship and persons on board to unnecessary risk. The safe stowage and securing of cargo depends upon proper planning, execution and supervision by properly qualified and experienced personnel.

28.1.3 The planned procedures for the handling of cargo should be agreed with berth or terminal operators in advance of loading or unloading. In the case of dry bulk cargo (excluding grain), procedures should follow the International Maritime Organization (IMO) Code of Practice for the Safe Loading and Unloading of Bulk Carriers, with the associated IMO Ship/Shore Safety Checklist. For grain, there is more detailed guidance in the International Code for the Safe Carriage of Grain in Bulk.

S.I. 1999/336 and MGN 107(M)

IMO Resolution A.714(17)

28.1.4 Loading, stowage and securing of cargo other than bulk cargo is to be carried out in accordance with the ship's approved cargo-securing manual. Handling and safety instructions for securing devices are contained in sections 3.1 and/or 4.1 of the manual. Further guidance is contained in the IMO Code of Practice for Cargo Stowage and Securing (IMO Resolution A.714(17)). Cargo securing should be completed before the ship proceeds to sea.

28.1.5 All cargo should be stowed having due regard to the order of discharge at a port or number of ports. When planning the position of cargo and the order of loading and unloading, the effects that these operations will have upon access and the safety of personnel should be considered. The following points should be taken into account:

- Cargo information, including gross mass of the cargo or cargo units and any special properties detailed on board or in the shipping documents, should be recorded and used in planning.

- Wherever practicable, where more than one port is involved for loading or unloading, cargo should be loaded in layers rather than in tiers, so as to avoid the development of high vertical walls of cargo.
- Care should be taken not to overstow lighter cargoes with heavier cargoes, which may lead to a collapse of the stow.
- Wherever practicable, cargo should be stowed so as to leave safe clearance behind the rungs of hold ladders and to allow safe access as may be necessary at sea.
- The need to walk across or climb onto the deck cargo, where this may involve an approach to an unprotected edge with risk of falling, should be minimised.
- Care should be taken to avoid large gaps next to cargo where it is stacked against corrugated bulkheads.

S.I. 1998/2241

28.1.6 Deck cargo should be stowed in accordance with the statutory requirements, and kept clear of hatch coamings to allow safe access. Access to safety equipment, firefighting equipment (particularly fire hydrants) and sounding pipes should also be kept clear. Any obstructions in the access way, such as lashings or securing points, should be painted white or other contrasting colour to make them more easily visible. Where this is impracticable and cargo is stowed against ship's rails or hatch coamings to such a height that the rails or coamings do not give effective protection to personnel from falling overboard or into the open hold, temporary fencing should be provided (see section 11.6, Guarding of openings).

28.1.7 Timber cargo decks shall be loaded, stowed and secured throughout the voyage as per the Code of Safe Practice for Ships Carrying Timber Deck Cargoes 2011, known as the 2011 TDC Code.

The purpose of the 2011 TDC Code is to ensure that timber deck cargoes are loaded, stowed and secured to prevent, as far as practicable, throughout the voyage, damage or hazard to the ship and persons on board as well as loss of cargo overboard.

The 2011 TDC Code provides:

- practices for safe transportation;
- methodologies for safe stowage and securing;
- design principles for securing systems;
- guidance for developing procedures and instructions to be included in ships' cargo-securing manuals on safe stowage and securing; and
- sample checklists for safe stowage and securing.

be taken when dangerous substances are carried in refrigerated spaces where any spillage may be absorbed by the insulating material. Insulation affected in this way should be inspected and renewed if necessary.

28.2.10 Where there is leakage or escape of dangerous gases or vapours from cargo, personnel should leave the danger area and the area should be treated as a dangerous (enclosed) space (see Chapter 15, Entering dangerous (enclosed) spaces). Personnel required to deal with spillages or to remove defective packages should be provided with and wear suitable breathing apparatus and protective clothing as the circumstances dictate. Suitable rescue and resuscitation equipment should be readily available in case of an emergency (see Chapter 8, Personal protective equipment).

28.2.11 Further guidance on the handling and stowage of dangerous goods is contained in the Recommendations on the Safe Transport of Dangerous Cargoes and Related Activities in Port Areas published by IMO.

28.3 Carriage of containers

28.3.1 Containers are simply packages of pre-stowed cargo and sections of Chapters 16, Hatch covers and access lids, and 19, Lifting equipment and operations, may also be relevant to their safe working. Guidance is also published by the UK's Port Skills and Safety organisation in its Health and Safety in Ports series, *SIP Leaflet 008 – Guidance on the storage of dry bulk cargo* (see the Port Skills and Safety website).

28.3.2 Where a container holds dangerous goods, the relevant guidance contained in section 28.2 should be followed. For guidance on control of substances hazardous to health, refer to Chapter 21, Hazardous substances and mixtures.

28.3.3 Freight containers should comply with the International Convention for Safe Containers 1972 (CSC), under which they must carry a safety approval plate (CSC plate). Defective containers, or containers on which the CSC plate is missing, should be reported so that they can be taken out of service. Containers should not be loaded beyond the maximum net weight indicated on the CSC plate, and should be in a safe condition for handling and carriage.

28.3.4 The equipment used for lifting a container should be suitable for the load, and safely attached to the container. The container should be free to be lifted and should be lifted slowly to guard against the possibility of it swinging or some part of the lifting appliances failing, should the contents be poorly secured, unevenly loaded and poorly distributed or the weight of contents incorrectly declared. The process of

loading and securing of goods into a container should follow the IMO/ILO/UN/ECE Guidelines for Packing of Cargo Transport Units (CTUs). Special care should be taken when lifting a container with a centre of gravity that is mobile, e.g. a tank container, bulk container or a container with contents that are hanging.

28.3.5 Safe means of access to the top of a container should be provided to release lifting gear and to fix lashings. Personnel so engaged should, where appropriate, be protected from falling by use of a properly secured safety harness or other suitable means.

28.3.6 All containers should be lashed individually by a competent person. Where containers are stacked, account should be taken of the appropriate strength features of the lashing and stacking-induced stress.

28.3.7 On ships not specially constructed or adapted for their carriage, containers should, wherever possible, be stowed fore and aft and securely lashed. Containers should not be stowed on decks or hatches unless it is known that the decks or hatches are of adequate overall and point load-bearing strength. Adequate dunnage should be used.

28.3.8 The system of work should be such as to limit the need to work on container tops. Where the design for securing containers and checking lashing makes access onto container tops necessary, it should be achieved by means of the ship's superstructure or by a purpose-designed access platform or personnel cages using a suitable adapted lifting appliance. If this is not possible, an alternative safe system of work should be in place.

28.3.9 To allow access to the tops of over-height, soft-top or tank containers where necessary for securing or cargo-handling operations, solid top or 'closed containers' should be stowed between them whenever practicable.

28.3.10 Where the ship's electrical supply is used for refrigerated containers, the supply cables should be provided with proper connections for the power circuits and for earthing the container. Before use, the supply cables and connections should be inspected and any defects repaired and tested by a competent person. Supply cables should only be handled when the power is switched off. Where there is a need to monitor and repair refrigeration units during the voyage, account should be taken of the need to provide safe access in a seaway when stowing these containers.

28.3.11 Personnel should be aware that containers may have been fumigated at other points in the transport chain, and there may be a residual hazard from the substances used.

28.4 Working cargo

MGN 157(M), including MSC/Circ.886 and MSC/Circ.888

28.4.1 For regulations and guidance on lifting equipment and lifting operations, including examination and testing requirements, see Chapter 19, Lifting equipment and operations, of this Code.

28.4.2 Safety arrangements made prior to working cargo should ensure that adequate and suitable lifting equipment is available, in accordance with the register of lifting appliances and cargo gear, and that all plant and equipment and any special gear necessary is available and used. Cargo gear should be checked regularly throughout the cargo operation for damage or malfunction.

28.4.3 Repair or maintenance work, such as chipping, spray painting, shot blasting or welding, should not be undertaken in a space where cargo operations are in progress.

28.4.4 Loads being lowered or hoisted should not pass or remain over any person engaged in any work in the cargo space area, or over means of access. Personnel should take care when using access ladders in hatch squares whilst cargo operations are in progress.

28.4.5 Cargo information for goods should always provide the gross mass of the cargo or of the cargo units. Where loads of significant gross mass are not marked with their weight, the loads should be check-weighed unless accurate information is available, as provided by the shipper or packer of the goods.

28.4.6 A signaller should always be employed at a hatchway when cargo is being worked, unless the crane driver or winchman has a complete, unrestricted view of the load or total working area. The signaller should be in a position where they have a total view of the operation; where this is not possible, then additional signallers should be used to assist. Guidance for signallers is given in sections 19.11.5 to 19.11.9 and Annex 19.3.

28.4.7 Before giving a signal to hoist, the signaller should receive clearance from the person making up the load that it is secure, and should ascertain that no one else would be endangered by the hoist. Before giving the signal to lower, the signaller should warn personnel in the way and ensure all are clear.

28.4.8 Loads should be raised and lowered smoothly, avoiding sudden jerks or 'snatching'. When a load does not ride properly after being hoisted, the signaller should immediately give warning of danger and the load should be lowered and adjusted as necessary.

28.4.9 Hooks, slings and other lifting gear should not be loaded beyond their safe working loads. Strops and slings should be of sufficient size and length to enable them to be used safely and be so applied and pulled sufficiently tight to prevent the load or any part of the load from slipping and falling. Loads (sets) should be properly put together and properly slung before they are hoisted or lowered.

28.4.10 Before any heavy load is swung, it should be given a trial lift in order to test the effectiveness of the slinging.

28.4.11 Except for the purpose of breaking out or making up slings, lifting hooks should not be attached to:

- the bands, strops or other fastenings of packages of cargo, unless these fastenings have been specifically provided for lifting purposes; or
- the rims (chines) of barrels or drums for lifting purposes, unless the construction or condition of the barrels or drums is such as to permit lifting to be done safely with properly designed and constructed can hooks.

28.4.12 Suitable precautions, such as the use of packing or chafing pieces, should be taken to prevent chains, wire and fibre ropes from being damaged by the sharp edges of loads.

28.4.13 When slings are used with barrel hooks or other similar holding devices where the weight of the load holds the hooks in place, the sling should be led down through the egg or eye link and through the eye of each hook in turn so that the horizontal part of the sling draws the hooks together.

28.4.14 The angle between the legs of the slings should not normally exceed 90°, because this reduces the safe working load of the sling. Where this is not reasonably practicable, the angle may be increased up to 120° provided that the slings have been designed to work at the greater angles. However, it should be noted that at 120° each sling leg is taking stress equivalent to the whole mass of the load.

28.4.15 Trays and pallets (unit loads) should be loaded using a pallet loader where available. If slings are used, the trays and pallets should be hoisted with four-legged slings and, where necessary, nets and other means should be used to prevent any part of the load falling.

28.4.16 Bundles of long metal goods, such as tubes, pipes and rails, should be slung with two slings or strops and, where necessary, a spreader. Slings or strops should be double wrapped and secured to prevent the sling coming loose. A suitable lanyard should also be attached, where necessary.

CHAPTER 14: PERMIT TO WORK SYSTEMS

None

CHAPTER 15: ENTERING DANGEROUS (ENCLOSED) SPACES

Regulations:

S.I. 1988/1638 The Merchant Shipping (Entry into Dangerous Spaces) Regulations 1988.

CHAPTER 16: HATCH COVERS AND ACCESS LIDS

None

CHAPTER 17: WORK AT HEIGHT

Regulations:

17.1.1. S.I. 2010/332 The Merchant Shipping and Fishing Vessels (Health and Safety at Work) (Work at Height) Regulations 2010.

17.2.4 S.I. 2006/2183 The Merchant Shipping and Fishing Vessels (Provision and Use of Work Equipment) Regulations 2006.

Marine notices:

17.1.1; 17.3.1; 17.4.1; 17.5.1; 17.7.1; Annex 17.1 MGN 410(M+F) The Merchant Shipping and Fishing Vessels (Health and Safety at Work) (Work at Height) Regulations 2010.

17.4.11 MGN 578(M) Use of equipment to undertake work over the side on commercial yachts, small commercial vessels and loadline vessels.

CHAPTER 18: PROVISION, CARE AND USE OF WORK EQUIPMENT

Regulations:

Annex 18.3 S.I. 2006/2183 The Merchant Shipping and Fishing Vessels (Provision and Use of Work Equipment) Regulations 2006.

Marine notices:

18.2.4 MSN 1870(M+F) The Merchant Shipping and Fishing Vessels (Personal Protective Equipment) Regulations 1999.

18.15 MGN 556(M+F) The Merchant Shipping and Fishing Vessels (Safety Signs and Signals) Regulations 2001.

18.30.1 MSN 1838(M) Maritime Labour Convention, 2006: Minimum age.

CHAPTER 19: LIFTING EQUIPMENT AND OPERATIONS

Regulations:

19.2.1; Annex 19.4 S.I. 2006/2184 The Merchant Shipping and Fishing Vessels (Lifting Operations and Lifting Equipment) Regulations 2006.

Marine notices:
19.2.1; 19.18.5; Annex 19.4 MGN 332(M+F) The Merchant Shipping and Fishing Vessels (Lifting Operations and Lifting Equipment) Regulations 2006.

CHAPTER 20: WORK ON MACHINERY AND POWER SYSTEMS

Regulations:
20.3.1 S.I. 2006/2183 The Merchant Shipping and Fishing Vessels (Provision and Use of Work Equipment) Regulations 2006.
20.3.6 S.I. 1996/2154 The Merchant Shipping (Prevention of Oil Pollution) Regulations 1996 (as amended).
Marine notices:
20.3.1 MGN 331(M+F) The Merchant Shipping and Fishing Vessels (Provision and Use of Work Equipment) Regulations 2006.
20.15 MGN 452(M) Electrical – potential hazards of arc flash associated with high and low voltage equipment.

CHAPTER 21: HAZARDOUS SUBSTANCES AND MIXTURES

Regulations:
21.2.1 S.I. 2007/3100 The Merchant Shipping and Fishing Vessels (Health and Safety at Work) (Carcinogens and Mutagens) Regulations 2007.
21.4.1 S.I. 2010/2984 The Merchant Shipping and Fishing Vessels (Health and Safety at Work) (Asbestos) (as amended) Regulations 2010.
21.5.1 S.I. 2010/330 The Merchant Shipping and Fishing Vessels (Health and Safety at Work) (Chemical Agents) (as amended) Regulations 2010.
21.7.1 S.I. 1999/336 The Merchant Shipping (Carriage of Cargoes) Regulations 1999.
21.8.1 S.I. 2010/323 The Merchant Shipping and Fishing Vessels (Health and Safety at Work) (Biological Agents) Regulations 2010.
Marine notices:
21.2.1 MGN 356(M+F) The Merchant Shipping and Fishing Vessels (Health and Safety at Work) (Carcinogens and Mutagens) Regulations 2007.
21.4.1
MGN 429(M+F) The Merchant Shipping and Fishing Vessels (Health and Safety at Work) (Asbestos) Regulations 2010.
MGN 493(M+F) The Merchant Shipping and Fishing Vessels (Health and Safety at Work) (Asbestos) Regulations 2010 as amended by The Merchant Shipping and Fishing Vessels (Health and Safety at Work) (Asbestos) (Amendment) Regulations 2013.
21.5.1
MGN 409(M+F) The Merchant Shipping and Fishing Vessels (Health and Safety at Work) (Chemical Agents) Regulations 2010.

CHAPTER 16: HATCH COVERS AND ACCESS LIDS

None

CHAPTER 17: WORK AT HEIGHT

References:

Annex 17.1 Health and Safety Executive (HSE), 'Advice for first-aiders responding to harness suspension incidents': www.hse.gov.uk/firstaid/whats-new/harness.htm

CHAPTER 18: PROVISION, CARE AND USE OF WORK EQUIPMENT

None

CHAPTER 19: LIFTING EQUIPMENT AND OPERATIONS

References:

19.19.2 Health and Safety Executive (HSE), INDG339 *Thorough examination and testing of lifts: Simple guidance for lift owners*: www.hse.gov.uk/pubns/indg339.pdf

CHAPTER 20: WORK ON MACHINERY AND POWER SYSTEMS

References:

20.3.2 International Maritime Organization (IMO), International Convention for the Safety of Life at Sea, 1974 (SOLAS) II-2 Reg 4.2.2.6 Construction fire-protection, fire detection and fire extinction: Arrangements for oil fuel, lubrication oil and other flammable oils; Protection of high temperature surfaces: www.imo.org/en/About/Conventions/ListOfConventions/Pages/International-Convention-for-the-Safety-of-Life-at-Sea-(SOLAS),-1974.aspx

20.3.4 IMO Resolution A.1021 (26) Code on Alerts and Indicators, 2009: www.imo.org/blast/blastDataHelper.asp?data_id=29981&filename=A1021(26).pdf

20.3.13 IMO, MSC.1/Circ.1321 Guidelines for Measures to Prevent Fires in Engine Rooms and Cargo Pump Rooms: www.imo.org/blast/blastDataHelper.asp?data_id=25964&filename=1321.pdf

20.3.14 IMO, MSC/Circ.834 Guidelines for Engine-Room Layout, Design and Arrangement: http://www.imo.org/blast/blastDataHelper.asp?data_id=8819

20.15.3 National Institutes of Health (NIH), 2010, description of second-degree burns: www.nlm.nih.gov/medlineplus/ency/article/000030.htm

CHAPTER 21: HAZARDOUS SUBSTANCES AND MIXTURES

References:

21.1.10 Control of Substances Hazardous to Health (COSHH) Regulations: www.hse.gov.uk/coshh/index.htm

21.3.4 Health and Safety Executive (HSE), EH40/2005 *Workplace exposure limits*: www.hse.gov.uk/pubns/books/eh40.htm

21.5.2 European Regulation (EC) 1272/2008 Classification, Labelling and Packaging of Substances and Mixtures (CLP Regulation): eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2008:353:0001:1355:en:PDF

21.7.2
International Maritime Organization (IMO) MSC.1/Circ.1264 Recommendations on the Safe Use of Pesticides in Ships Applicable to the Fumigation of Cargo Holds: www.imo.org/blast/blastDataHelper.asp?data_id=22225&filename=1264.pdf
IMO MSC.1/Circ.1358 Recommendations on the Safe Use of Pesticides in Ships: www.imo.org/blast/blastDataHelper.asp?data_id=29809&filename=1358.pdf

21.7.4 HSE, HSG251 *Fumigation: Health and safety guidance for employers and technicians carrying out fumigation operations*: www.hse.gov.uk/pubns/books/hsg251.htm

CHAPTER 22: BOARDING ARRANGEMENTS

References:

22.2.3; 22.7.1; Annex 22.1 International Maritime Organization (IMO) MSC.1/Circ.1331 Guidelines for Construction, Installation, Maintenance and Inspection/Survey of Means of Embarkation and Disembarkation: www.imo.org/blast/blastDataHelper.asp?data_id=25973&filename=1331.pdf

22.7.1 SOLAS II.1/3-9 Construction – Structure, subdivision and stability, machinery and electrical installations: Means of embarkation on and disembarkation from ships.

22.9.1; Annex 22.1, 5 IMO, SOLAS V.23 Safety of navigation: Pilot transfer arrangements: www.imo.org/en/About/Conventions/ListOfConventions/Pages/International-Convention-for-the-Safety-of-Life-at-Sea-(SOLAS),-1974.aspx

22.9.1 IMO Resolution A.1045(27) Pilot Transfer Arrangements: www.imo.org/en/KnowledgeCentre/IndexofIMOResolutions/Documents/A%20-%20Assembly/1045(27).pdf

22.10 International Maritime Pilots' Association, 'Required boarding arrangements for pilots': www.impahq.org/admin/resources/finalimpapladderposter.pdf

22.11 UK Port Skills and Safety, 'SIP021 Guidance to safe access to fishing vessels and small craft in ports': https://www.portskillsandsafety.co.uk/sites/default/files/2017-05/SIP021%20-%20Guidance%20on%20safe%20access%20to%20fishing%20vessels%20and%20small%20craft%20in%20ports%20-%2023%20Nov%202016.pdf

Annex 22.1, 3.1 SOLAS III/3.13 Life-saving appliances and arrangements: Definitions.

CHAPTER 15: ENTERING DANGEROUS (ENCLOSED) SPACES

15.13.3

EN 137:2006 Respiratory protective devices. Self-contained open-circuit compressed air breathing apparatus with full face mask. Requirements, testing, marking.

BS EN 14593-1:2005 Respiratory protective devices. Compressed air line breathing apparatus with demand valve. Apparatus with a full mask. Requirements, testing, marking.

BS EN 14593-2:2005 Respiratory protective devices. Compressed air line breathing apparatus with demand valve. Apparatus with a half mask at positive pressure. Requirements, testing, marking.

BS EN 14594:2005 Respiratory protective devices. Continuous flow compressed air line breathing apparatus. Requirements, testing, marking.

BS EN 1146:2005 Respiratory protective devices. Self-contained open-circuit compressed air breathing apparatus incorporating a hood for escape. Requirements, testing, marking.

CHAPTER 16: HATCH COVERS AND ACCESS LIDS

None

CHAPTER 17: WORK AT HEIGHT

None

CHAPTER 18: PROVISION, CARE AND USE OF WORK EQUIPMENT

None

CHAPTER 19: LIFTING EQUIPMENT AND OPERATIONS

None

CHAPTER 20: WORK ON MACHINERY AND POWER SYSTEMS

None

CHAPTER 21: HAZARDOUS SUBSTANCES AND MIXTURES

None

CHAPTER 22: BOARDING ARRANGEMENTS

22.9.1; Annex 22.1, 4.2 BS ISO 799:2004 Ships and marine technology – pilot ladders.

Annex 22.1, 1.1

BS MA 89:1980 Specification for accommodation ladders.

ISO 5488:1979 Shipbuilding – accommodation ladders.

ISO 7061:1993 Shipbuilding – aluminium shore gangways for seagoing vessels.

Annex 22.1, 2.1 BS MA 78:1978 Specification for aluminium shore gangways.
Annex 22.1, 3.2 ISO 7364:1983 Shipbuilding and marine structures – Deck machinery – Accommodation ladder winches.
Annex 22.1, 3.3 BS MA 39-2:1973 *(withdrawn)* Specification for ships' ladders. Ladders, steel sloping.
Annex 22.1, 4.2 Marine Equipment Directive (MED) (EC Directive 96/98/EC 20 Dec 1996).

CHAPTER 23: FOOD PREPARATION AND HANDLING IN THE CATERING DEPARTMENT

None

CHAPTER 24: HOT WORK

24.4.1
BS EN ISO 11611:2007 Protective clothing for use in welding and allied processes.
BS EN 169:2002 Personal eye-protection. Filters for welding and related techniques. Transmittance requirements and recommended use.
24.6.8 EN 60529:1992+A2:2013 Degrees of protection provided by enclosures (IP code).
24.7.1 BS 7193:1989 *(withdrawn)* Specification for lined lightweight rubber overshoes and overboots.
24.9.14, Annex 24.3 EN 1256:2006 Gas welding equipment. Specification for hose assemblies for equipment for welding, cutting and allied processes.
Annex 24.2 BS EN 60974-1:2012 Arc welding equipment. Welding power sources.
Annex 24.3
BS EN ISO 3821:2010 Gas welding equipment. Rubber hoses for welding, cutting and other allied processes.
BS 3212:1991 Specification for flexible rubber tubing, rubber hose and rubber hose assemblies for use in LPG vapour phase and LPG/air installations.
ISO/TR 28821:2012 Gas welding equipment – Hose connections for equipment for welding, cutting and allied processes – Listing of connections which are either standardised or in common use.
BS EN 561:2002 Gas welding equipment. Quick-action coupling with shut-off valves for welding, cutting and allied processes.
ISO 7289:2010 Gas welding equipment. Quick-action couplings with shut-off valves for welding, cutting and allied processes.

CHAPTER 25: PAINTING

None

APPENDIX 4

ACKNOWLEDGEMENTS

The Maritime and Coastguard Agency (MCA) acknowledges the kind permission for the following sources of information and illustrations used in this Code.

Links to the information are provided in Appendix 2, Other sources of information.

The Code reference is shown in **bold** and the information is arranged in chapter order.

CHAPTER 1: MANAGING OCCUPATIONAL HEALTH AND SAFETY

1.2.8 Eddie Perkins, Knowledge management diagram.
Annex 1.1 John Blaikie, Simple change (management of change).

CHAPTER 2: SAFETY INDUCTION

None

CHAPTER 3: LIVING ON BOARD

3.2.4; 3.3.2; 3.8.3 National Health Service (NHS) Choices, 'Healthy eating'; 'Stop smoking'; 'Frostbite' and 'Hypothermia'.
3.7.2 Health and Safety Executive (HSE), 'Controlling thermal comfort'.
3.8.1 York University, Canada, 'Guidelines for working in cold weather'.

CHAPTER 4: EMERGENCY DRILLS AND PROCEDURES

None

CHAPTER 5: FIRE PRECAUTIONS

None

CHAPTER 6: SECURITY ON BOARD

None

CHAPTER 7: HEALTH SURVEILLANCE

7.4.1 Health and Safety Executive (HSE), The health surveillance cycle diagram.

CHAPTER 8: PERSONAL PROTECTIVE EQUIPMENT

None

CHAPTER 9: SAFETY SIGNS AND THEIR USE

None

CHAPTER 10: MANUAL HANDLING

Annex 10.1 Health and Safety Executive (HSE), Guideline weight diagram.

CHAPTER 11: SAFE MOVEMENT ON BOARD SHIP

None

CHAPTER 12: NOISE, VIBRATION AND OTHER PHYSICAL AGENTS

12.12.6; 12.16.2; 12.16.3 Health and Safety Executive (HSE), 'Vibration at work'; 'Providing health surveillance' (hand–arm vibration); and 'Health monitoring and review' (whole-body vibration).

CHAPTER 13: SAFETY OFFICIALS

None

CHAPTER 14: PERMIT TO WORK SYSTEMS

Annex 14.1 North Star Shipping, Permit to work (general).

CHAPTER 15: ENTERING DANGEROUS (ENCLOSED) SPACES

None

CHAPTER 16: HATCH COVERS AND ACCESS LIDS

None

CHAPTER 17: WORK AT HEIGHT

None

CHAPTER 18: PROVISION, CARE AND USE OF WORK EQUIPMENT

None

CHAPTER 19: LIFTING EQUIPMENT AND OPERATIONS

None

CHAPTER 20: WORK ON MACHINERY AND POWER SYSTEMS

None

CHAPTER 21: HAZARDOUS SUBSTANCES AND MIXTURES

None

CHAPTER 22: BOARDING ARRANGEMENTS

None

INDEX

References are shown by chapter, section and paragraph numbers. The letter A before a chapter number indicates the annex at the end of the chapter.

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